REQUEST FOR QUOTATION (THIS IS NOT AN ORDER)

THIS RFQ [X] IS [ ] IS NOT A SMALL BUSINESS SET-ASIDE

PAGE 1 OF PAGES 293

1. REQUEST NUMBER	2. DATE ISSUED	3. REQUISITION/PURCHASE REQUEST NUMBER	4. CERT. FOR NAT. DEF. UNDER BDSA REG. 2 AND/OR DMS REG. 1	RATING
1333ND23QNB190204	MAR 27, 2023	NB193000-23-01439 NB193000-23-01439		

5a. ISSUED BY
NATIONAL INST OF STDS AND TECHNOLOGY
100 BUREAU DRIVE STOP 1640
BUILDING 301 ROOM B129
GAITHERSBURG MD 20899-1640

6. DELIVER BY (Date)
See Schedule

7. DELIVERY
[X] FOB DESTINATION [ ] OTHER (See Schedule)

5b. FOR INFORMATION CALL (NO COLLECT CALLS)

NAME	TELEPHONE NUMBER	
	AREA CODE	NUMBER
JILLIAN STASKIN	267	243-3015

9. DESTINATION

a. NAME OF CONSIGNEE

8. TO:

a. NAME	b. COMPANY	b. STREET ADDRESS
		See Schedule

c. STREET ADDRESS	c. CITY

d. CITY	e. STATE	f. ZIP CODE	d. STATE	e. ZIP CODE

10. PLEASE FURNISH QUOTATIONS TO THE ISSUING OFFICE IN BLOCK 5a ON OR BEFORE CLOSE OF BUSINESS (Date)
APR 05, 2023

IMPORTANT: This is a request for information and quotations furnished are not offers. If you are unable to quote, please so indicate on this form and return it to the address in Block 5a. This request does not commit the Government to pay any costs incurred in the preparation of the submission of this quotation or to contract for supplies or service. Supplies are of domestic origin unless otherwise indicated by quoter. Any representations and/or certifications attached to this Request for Quotation must be completed by the quoter.

11. SCHEDULE (Include applicable Federal, State and local taxes)

ITEM NUMBER (a)	SUPPLIES/ SERVICES (b)	QUANTITY (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)
	Please See Continuation Page for Line Item Details				

12. DISCOUNT FOR PROMPT PAYMENT	a. 10 CALENDAR DAYS (%)	b. 20 CALENDAR DAYS (%)	c. 30 CALENDAR DAYS (%)	d. CALENDAR DAYS NUMBER	d. CALENDAR DAYS PERCENTAGE

NOTE: Additional provisions and representations [ ] are [ ] are not attached.

13. NAME AND ADDRESS OF QUOTER	14. SIGNATURE OF PERSON AUTHORIZED TO SIGN QUOTATION	15. DATE OF QUOTATION
a. NAME OF QUOTER		
b. STREET ADDRESS	16. SIGNER	
	a. NAME (Type or print)	b. TELEPHONE AREA CODE
c. COUNTY		
d. CITY / e. STATE / f. ZIP CODE	c. TITLE (Type or print)	NUMBER

SCHEDULE Continued

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	Base year of contract				
0001	Passenger and freight traction elevators annual maintenance inspection (no load tests) PR NUMBER: NB193000-23-01439 DELIVERY DATE: 04/30/2024 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2023 to 04/30/2024	**24.00**	EA		
	Base year				
0002	Passenger and freight hydraulic elevators annual maintenance inspection (no load tests) PR NUMBER: NB193000-23-01439 DELIVERY DATE: 04/30/2024 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2023 to 04/30/2024	**18.00**	EA		
	Base year				
0003	Material and incline Lifts / Dumb waiters annual maintenance inspections PR NUMBER: NB193000-23-01439 DELIVERY DATE: 04/30/2024 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2023 to 04/30/2024	**5.00**	EA		
	Base year				
0004	Unscheduled elevator maintenance inspection (no load test) PR NUMBER: NB193000-23-01439 DELIVERY DATE: 04/30/2024 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2023 to 04/30/2024	**5.00**	EA		
	Base year				
0005	Unscheduled elevator maintenance inspection (with load test) PR NUMBER: NB193000-23-01439	**5.00**	EA		

SCHEDULE Continued

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	DELIVERY DATE: 04/30/2024 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2023 to 04/30/2024				
	OPTION 1				OPT
1001	Passenger and freight traction elevators annual maintenance inspection (with load tests) DELIVERY DATE: 04/30/2025 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2024 to 04/30/2025	**24.00**	EA	_____	_____
	OPTION 1				OPT
1002	Passenger and freight hydraulic elevators annual maintenance inspection (no load tests) DELIVERY DATE: 04/30/2025 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2024 to 04/30/2025	**18.00**	EA	_____	_____
	OPTION 1				OPT
1003	Material and incline Lifts / Dumb waiters annual maintenance inspections DELIVERY DATE: 04/30/2025 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2024 to 04/30/2025	**5.00**	EA	_____	_____
	OPTION 1				OPT
1004	Unscheduled elevator maintenance inspection (no load test) DELIVERY DATE: 04/30/2025 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001	**5.00**	EA	_____	_____

SCHEDULE Continued

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	FOB : Destination Period of Performance: 05/01/2024 to 04/30/2025				
	OPTION 1				OPT
1005	Unscheduled elevator maintenance inspection (with load test) DELIVERY DATE: 04/30/2025 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2024 to 04/30/2025	**5.00**	EA		
	OPTION 2				OPT
2001	Passenger and freight traction elevators annual maintenance inspection (no load tests) DELIVERY DATE: 04/30/2026 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2025 to 04/30/2026	**24.00**	EA		
	OPTION 2				OPT
2002	Passenger and freight hydraulic elevators annual maintenance inspection (no load tests) DELIVERY DATE: 04/30/2026 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2025 to 04/30/2026	**18.00**	EA		
	OPTION 2				OPT
2003	Material and incline Lifts / Dumb waiters annual maintenance inspections DELIVERY DATE: 04/30/2026 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2025 to 04/30/2026	**5.00**	EA		
	OPTION 2				OPT
2004	Unscheduled elevator maintenance inspection (no load test)	**5.00**	EA		

SCHEDULE Continued

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	DELIVERY DATE: 04/30/2026 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2025 to 04/30/2026				
	OPTION 2				OPT
2005	Unscheduled elevator maintenance inspection (with load test) DELIVERY DATE: 04/30/2026 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2025 to 04/30/2026	**5.00**	EA	_____	_____
	OPTION 3				OPT
3001	Passenger and freight traction elevators annual maintenance inspection (no load tests) DELIVERY DATE: 04/30/2027 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2026 to 04/30/2027	**24.00**	EA	_____	_____
	OPTION 3				OPT
3002	Passenger and freight hydraulic elevators annual maintenance inspection (no load tests) DELIVERY DATE: 04/30/2027 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2026 to 04/30/2027	**18.00**	EA	_____	_____
	OPTION 3				OPT
3003	Material and incline Lifts / Dumb waiters annual maintenance inspections DELIVERY DATE: 04/30/2027 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE	**5.00**	EA	_____	_____

SCHEDULE Continued

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2026 to 04/30/2027				
3004	OPTION 3 Unscheduled elevator maintenance inspection (no load test) DELIVERY DATE: 04/30/2027 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2026 to 04/30/2027	**5.00**	EA	_____	OPT _____
3005	OPTION 3 Unscheduled elevator maintenance inspection (with load test) DELIVERY DATE: 04/30/2027 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2026 to 04/30/2027	**5.00**	EA	_____	OPT _____
4001	OPTION 4 Passenger and freight traction elevators annual maintenance inspection (no load tests) DELIVERY DATE: 04/30/2028 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2027 to 04/30/2028	**24.00**	EA	_____	OPT _____
4002	OPTION 4 Passenger and freight hydraulic elevators annual maintenance inspection (no load tests) DELIVERY DATE: 04/30/2028 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2027 to 04/30/2028	**18.00**	EA	_____	OPT _____
4003	OPTION 4	**5.00**	EA	_____	OPT _____

SCHEDULE Continued

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	Material and incline Lifts / Dumb waiters annual maintenance inspections DELIVERY DATE: 04/30/2028 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2027 to 04/30/2028				
4004	OPTION 4 Unscheduled elevator maintenance inspection (no load test) DELIVERY DATE: 04/30/2028 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2027 to 04/30/2028	**5.00**	EA	_____	OPT _____
4005	OPTION 4 Unscheduled elevator maintenance inspection (with load test) DELIVERY DATE: 04/30/2028 SHIP TO: NATIONAL INST OF STDS AND TECHNOLOGY BUILDING 301 SHIPPING AND RECEIVING 100 BUREAU DRIVE GAITHERSBURG MD 20899-0001 FOB : Destination Period of Performance: 05/01/2027 to 04/30/2028	**5.00**	EA	_____	OPT _____

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GAITHERSBURG CAMPUS WIDE ELEVATOR ANNUAL CERTIFICATION INSPECTION
Statement of Work (SOW)

Background

NIST has multiple elevators in multiple buildings across Gaithersburg campus. These elevators, and man lifts, and stairwell lifts all require OSHA required annual inspections. The different types of elevators and their respective weight limits are listed individually in a separate attachment. (see attachment A). We require each one of these items to be inspected for OSHA safety requirements. These inspections are required IAW Standards-29 CFRR, para 1917.116(e) and ASME A17.2

Objectives
The contractor shall arrange to have an inspector onsite to observe work being performed on our elevators ensuring all work meets or exceeds standards IAW Standards-29-CFRR, para 1917.116(e) and ASME A17.2. These inspections will be performed once annually, or as needed in the event of an unplanned outage of service.

Scope
The contractor shall provide an inspector to oversee the NIST elevator maintenance staff perform the required annual maintenance as per ASME A17.2 and attest to the safe operability and status of the same elevator, in the form of a required certificate of compliance.

The machines are either Hollister-Whitney for traction or Cemco for hydraulic type.
The controls there are MCE, IMCAC, Motion 2000, 4000, I-box for traction type, and Virginia controls, relay logic, and PLC for hydraulic type.

Tasks
The following is a list of tasks necessary to complete the annual inspections:

1. Contact COR at a minimum of one month in advance to schedule annual inspection visit.
2. Work alongside NIST elevator maintenance personnel for the duration of the inspection.
3. Document all inspections, and issue a “Certification of Inspection,” IAW CFR 29, para 1917.116(e). Supply such inspection reports in digital format to the COR NLT 14 days after completion of inspection.
4. Perform full load test of all traction elevators at least once every five years, or prior to putting elevator back into service following a major outage of 30 days or more.
5. Inspection will include all the items outlined in the checklist provided in ASME A17.2.

Requirements
1. The contractor shall provide verification of employment and individual’s GSA inspection certifications, as well as a “current” QEI credential.

2. Contractor shall submit a sample inspection checklist.

3. Contractor shall submit a sample certification of inspection for official review.

Deliverables
The Contractor shall submit all deliverables to:
National Institute of Standards and Technology
100 Bureau Drive
Building 301, Room A100
Gaithersburg, MD 20899
Attn: Kenneth Bishop, Contract Officer's Representative, COR
kenneth.bishop@nist.gov extn 6952

(1) Health and safety plan – shall be submitted within seven (7) calendar days after award of contract.

(2) Insurance Certificate – shall be submitted within ten (10) calendar days after award of contract.
(3) Payment Bonds – shall be submitted within ten (10) calendar days after award of contract.
(4) Certified Payroll – Shall be submitted with every invoice.
(5) Release of Claims – Shall be submitted with the final invoice.

Place of Performance
The National Institute of Standards and Technology at its main campus located at 100 Bureau Drive, Gaithersburg, Maryland.

Security
NIST is a Federal facility and access is controlled at all entrances to the campus. Only Government employees may grant access to non-Government employees. All non-Government employees must be registered with security prior to site access. Contractor shall notify COR a minimum of 72 hours prior to site access. Contractor shall provide COR with first and last names, country of citizenship, and whether the individual has a permanent resident card, (a.k.a. Green Card), of all personnel requiring site access. If any individuals are here on a work visa, they will need to complete a NIST 1260 form and return to the COR. Please refer to the following web site for additional Visitor Information http://www.nist.gov/public_affairs/visitor/

Automobile & Personnel Access:
Contractor personnel arriving in cars on their first day must check in at the visitor center to receive a temporary paper badge prior to proceeding to the project site. Hours of operation of the visitor center are 0600-1700. Once in possession of a valid NIST badge, workers may enter via the Main Gate (on W Diamond Ave and Bureau Dr) or Gate "C" (on Quince Orchard Rd and Sound Rd) and proceed to the project site. Note that all automobiles are subject to a random inspection.

Trucks: All Trucks are to enter NIST via "C" Gate along Quince Orchard Rd. between 6:00 am and 3:30 pm daily, and at the main gate off of W. Diamond Ave. between 3:30 pm and 4:30 pm. No deliveries will be allowed after 4:30 pm. "Trucks" include such vehicles as pick-ups with storage compartments, delivery trucks, delivery vans, and tractor center. Trucks arriving through Gate C will be directed to the Building 301 Truck Inspection Station. At Building 301, trucks will be registered, inspected, and the drivers will be granted access. Any truck which exits the installation will have to be re-inspected upon re-entry at Building 301. A vehicle dashboard placard will be placed within the truck. Placards change daily.

All work expected to take place during business hours. Monday through Friday 6:00 a.m. to 6:00 p.m. Work schedule outside business hours must be approved by the Contracting Officer Representative and the Contracting Officer.

Work will not take place during federal holidays. Fed holidays are.
Christmas, Thanksgiving, Independence Day, Presidents Day, Memorial Day, Labor Day, New Year's, Veterans Day, Columbus Day, MLK, & Juneteenth

NIST Truck Inspection Stations hours are:
6:00am -3:30pm at Building 301
3:30 pm – 4:30pm at "A" Gate – (Main gate)

Attachment A

Annual Elevator Inspection Data

Number	Bldg	Type	Car Name	Hydraulic	Traction	Wt limit (Lbs)	Status
1	101	Passenger	Car #1		X	3,000	
2	101	Passenger	Car #2		X	3,000	
3	101	Passenger	Car #3		X	3,000	
4	101	Passenger	Car #4		X	3,000	
5	101	Passenger	Car #5	X		3,000	
6	101	Passenger	Car #6	X		2,000	
7	101	Passenger	Car #7	X		3,000	
8	101	Passenger	Car #8	X		3,000	
9	101	Incline Lift	#1			450	
10	101	Incline Lift	#2			450	
11	202	Passenger/Freight	#1	X		10,000	
12	202	Material Lift			(Drum Wound)	1,000	
13	205	Passenger	#1	X		3,500	
14	208	Incline Lift	#1			600	
15	215	Passenger/Freight	#1	X		10,000	
16	215	Freight	#2	X		10,000	
17	217	Passenger	#3	X		3,500	
18	217	Passenger	#4	X		3,500	
19	217-219	Freight	#5	X		30,000	
20	216-218	Passenger	#6	X		3,500	
21	216	Passenger	#8	X		3,500	
22	217-219	Material Lift	#1	X		10,000	
23	215	Dumb Waiter	#1		(Drum Wound)	500	
24	220	Passenger	#1		X	6,000	
25	220	Passenger	#2		X	3,500	
26	221	Passenger	#1		X	6,000	
27	221	Passenger	#2		X	3,500	

28	222	Passenger	#1		X	6,000	
29	222	Passenger	#2		X	3,500	

Annual Elevator Inspection Data

Number	Bldg	Type	Car Name	Hydraulic	Traction	Wt limit	Status
30	223	Passenger	#1		X	6,000	
31	223	Passenger	#2		X	3,500	
32	224	Passenger	#1		X	6,000	
33	224	Passenger	#2		X	3,500	
34	225	Passenger	#1		X	6,000	
35	225	Passenger	#2		X	3,500	
36	226	Passenger	#1		X	6,000	
37	226	Passenger	#2		X	3,500	
38	227	Passenger	#1		X	3,000	
39	227	Passenger	#2		X	3,000	
40	227	Freight	#3		X	10,000	
41	231	Freight	#1	X		5,000	
42	235	Freight	#1	X		8,000	
43	235	Passenger	#2	X		3,000	
44	235	Passenger	#3		X	2,500	
45	235	Passenger	#4		X	2,500	
46	235	Freight	#5		X	3,500	
47	304	Freight	#1	X		20,000	
48	245	Freight	#1	X		40,000	a,b,c
49	245	Freight	#2	X		40,000	a,b,c
50	245	Passenger	#3		X	3,500	a,b,c
51	245	Passenger	#4		X	3,500	a,b,c
52	245	Freight	#5	X		40,000	a,b,c
53	245	Passenger	#6		X	3,500	a,b,c

GUIDELINES FOR OFPM CONTRACTORS

AND

A/E FIRMS

PERFORMING SITE INVESTIGATIONS

AND

FIELDWORK (including construction)

AT THE

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

GAITHERSBURG, MD

Revised date: April 13, 2022

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1. **Emergencies:**

In case of emergency, call x2222 from a campus phone. State your name, building location, room number, and a description of the emergency. The NIST Fire Protection Group provides fire and ambulance service on site. If a phone other than NIST (975 exchange) is used, "911" should be used for emergency calls. The contractor shall state that he/she is located at NIST and give the details as described above. Contractors should become familiar with the NIST Gaithersburg Occupant Emergency Plan, issued September 2012.

2. **Safety Equipment:**

Personal Protective Equipment (PPE) such as head, eye, foot, respiratory, and ear protection shall be worn in identified areas. Hard hats, for example, shall be worn in mechanical rooms. Contractors and A/E firms to provide necessary PPE of the approved type to protect themselves against exposures encountered. NIST provided dosimeters (radiation exposure measurement) may be required to be worn when working in or around specific sections of Building 235 and Building 245.

Unique safety awareness training is mandatory for working in Buildings 235 and 245. Contractor shall plan on 2 hours of training for each employee to complete this training.

3. **Investigation Equipment:**

Site investigations and field work may require the use of a stepladder and/or other investigative equipment (measuring tapes, flashlights, screwdrivers, etc.). Contractors and A/E firms shall provide their own stepladders and/or investigative equipment. The stepladders shall be Type I (industrial) or Type II (commercial).

4. **Mechanical/Electrical Rooms:**

Obtain authorization from the Contracting Officer's Representative (COR) prior to working in electrical and/or mechanical rooms. Lock rooms after use. For work in high-voltage rooms, a NIST high-voltage electrician must be present the entire time. Do not operate any valves, switches, or breakers without prior approval from the COR.

5. **Confined Space Entry:**

If a contractor or A/E must enter a confined space on the NIST site, they shall follow the applicable provisions of the OSHA Permit-Required Confined Space Regulation (29CFR1910.146). The contractor or A/E shall be responsible for implementing and documenting an entry permit system as necessary, giving full consideration to personnel training, atmospheric testing, ventilation, PPE, and emergency procedures and equipment. Should the contractor or A/E have questions regarding any confined space

to be entered on the NIST site, they are to contact the COR or the Plant Division's Safety Coordinator (x6999, Bldg. 428). Copies of the contractor entry permit system shall be submitted to the COR for approval in advance.

6. **Utility Outages, Road Blockages:**

Do not close or partially block any roads or cause utility outages (electrical, steam, chilled water, water, compressed air, gas, sewer, telephone, fire alarm, signal systems, etc.) without prior authorization from the COR. Provide a minimum of 21 days' written notice for all utility systems outages. Complete building outages require a 50 days writing notice. Outages to more than one building require 190 days' notice. All outages and road closures shall be on Saturdays unless noted otherwise within the specifications or statement of work.

Site Coordination Procedures:

All construction or investigation activities that require closure of sidewalks, roads, or other transportation ways, require the contractor to submit a request for closure 21 days in advance.

7. **Hazards:**

Storing, positioning, and use of equipment, tools, and materials, in a manner likely to present a hazard to the public or building occupants by its accidental shifting, ignition, or other hazardous qualities is prohibited.

8. **Corridors:**

No corridor, aisle, stairway, door, or exit shall be obstructed or used in such a manner as to encroach upon routes of ingress or egress utilized by the public or building occupants, or to present unsafe or unhealthy conditions to the public or building occupants.

9. **Operating Equipment:**

Do not turn off, on, or adjust any NIST operating equipment without prior authorization from the COR. Work carefully around rotating equipment. Loosely fitting clothing (neck ties, dangling jewelry, etc.) shall not be worn when working near rotating equipment. Long hair shall be secured. Some equipment may start automatically. (Note: It may become necessary to implement appropriate lock-out, tag-out procedures to control hazardous energy sources to ensure that personnel do not activate equipment during investigation, servicing, or maintenance.) Provisions of NFPA 70E shall be followed when an arc flash hazard exists.

10. **Fire Protection:**

The Contractor or A/E shall comply with all applicable fire protection/prevention requirements of the National Fire Protection Association (NFPA) and the NIST Fire Protection Group. Should any operations capable of providing a source of ignition (for example welding, cutting, burning, or heating) be performed within or adjacent to NIST buildings/structures/equipment, a hot work permit must be obtained from the NIST Fire Protection Group (301-975-6190) prior to such work. Covering of room smoke, heat, or other NFPA 72 defined initiating devices or notification devices is only allowed with advance written approval from the COR.

11. **Internal Combustion Equipment:**

Such equipment will not be allowed within any building without prior written approval. Gasoline or diesel powered equipment (such as fork lifts, loaders, tractors, cutting saws, etc.) will not be authorized for use within any building in any circumstance.

12. **Asbestos:**

Some ductwork and piping may be insulated with asbestos containing materials (ACM). Contact the Plant Division Safety Coordinator (x6999) prior to disturbing suspected ACM. ACM may also be present in floor tile, bench tops, and/or plaster ceilings.

1) If more than three (3) ceiling tiles must be removed at one time in a single location, the Plant Division Safety Coordinator must be notified beforehand so she can review the task to be performed and ensure all safety requirements are adhered to. Contractors shall provide 7 calendar days' notice.

2) Whenever a ceiling tile of any kind is removed, it must be removed slowly and as level as possible. Workers need to check as soon as they can see on top of the tile if there is any debris laying on top, such as a piece of pipe insulation or other bldg materials in general. If there is debris, the worker should re-install the tile and notify his supervisor and COR so the proper measure can be taken to remove whatever debris is found.

3) All contractors at a minimum must wear the following Personnel Protective Equipment while working on/in/above the ceiling and/or removing ceiling tiles:

* Safety glasses with side shields or goggles
* Leather gloves or the Mechanics Red Gloves

4) It is strictly prohibited to perform any type of "aggressive activity" that could break the encapsulate seal or agitate the air above the hallway or concourse ceilings. Examples of "aggressive activity" include - dragging conduit or pipes over ceiling tiles; hammer drilling into the columns; removing numerous ceiling tiles at one

time; striking against pipes or pipe insulation; dropping items on top of ceiling tiles; and numerous workers above the ceiling at one time performing various tasks.

13. **Safety and Health Compliance:**

Contractors and A/E firms shall adhere to all applicable OSHA, NFPA, NEC and NIST safety and occupational health regulations while on site. Federal OSHA (Baltimore area office) has safety jurisdiction at federal facilities in the State of Maryland. The NIST local contact is the OFPM Safety Coordinator (Bldg. 428 301-975-6999).

All contractors are required to wear safety glasses. All contractors working at Buildings 235 and/or 245 are subject to a 2 hour radiation awareness training session.

If any chemicals, hazardous materials, equipment or materials are found in a lab or other contract space, the contractor shall notify the COR so arrangement can be made to have the items removed. Work shall not continue until the items have been cleared by others; Contractors are not to move any chemicals, materials or equipment in any lab.

Contractors are required to submit health and safety plans within 15 days of solicitation award. Health and safety plans are to be specific to the solicitation requirements. Safety plan shall be contract specific and follow activity hazard analysis (AHA) format.

All roof construction shall be in accordance with U.S. Army Corps USACE EM-385-1-1 *"Safety and Health Requirements Manual" (current* edition).

14. **Work Safety:**

The contractor shall take all necessary precautions to prevent injury to personnel, the public, building occupants, and damage to property of others. If unsafe work practices are observed, unsafe work may be stopped by the NIST OFPM Safety Officer and/or COR until corrections are made.

15. **Site Access and Working Hours:**

NIST is a Federal facility and access is controlled at all entrances to the campus. Only Government employees may grant access to non-Government employees.

Vehicles Access:
Automobiles: Contractor personnel arriving in cars on their first day must check in at the visitor center to receive a temporary badge prior to proceeding to the project site to obtain permanent badge. Hours of operation of the visitor center are 0600-1700. Once in possession of a valid NIST badge, workers may enter via the Main Gate or Gate "C"

and proceed to the project site. Note that all automobiles are subject to a random inspection.

Trucks: All Trucks are to enter NIST via "C" Gate along Quince Orchard Rd. between 6:00 am and 3:30 pm daily, and at the main gate off of W. Diamond Ave. between 3:30 pm and 4:30 pm. No deliveries will be allowed after 4:30 pm. "Trucks" include such vehicles as pick-ups with storage compartments, delivery trucks, delivery vans, and tractor trailers. Trucks arriving through Gate C will be directed to the Building 301 Truck Inspection Station. At Building 301, trucks will be registered, inspected, and the drivers will be granted access. Any truck which exits the installation will have to be re-inspected upon re-entry at Building 301. A vehicle dashboard placard will be placed within the truck. Placards change daily.

NIST Truck Inspection Stations hours are:
6:00am -3:30pm at Building 301
3:30 pm – 4:30pm at "A" Gate – (Main gate)

Parking: Loading docks are for loading and unloading equipment and materials. Do not park at or near loading docks or the space between buildings. All Contractors vehicles and personal vehicles are to use the building parking lots or parking lots designated by the Contracting Officer for construction contractors.

Speeding: NIST speed limit is posted on the campus. If a speeding ticket is issued, the offender may be required to appear in Federal Court.

Responsibility: When deliveries are made, the Contractor is responsible providing information and directions to the driver to proceed to the work area and for unloading. NIST will not be responsible for delivering contractor materials to the project site or for unloading materials.

Hours of Operation: NIST opens at 6:00 am (sharp) until 6: 00 pm for Contractors who do not have 24-hour access privileges.

Normal work hours defined in the contract are 7:30 AM to 5:30 PM.

All work over 80 dBA measured at 15 feet shall occur after normal work hours. Contractor shall have a meter on hand to measure dBA.

Painting Hours: All painting shall be per the SOW and/or specifications. If not stated, all painting shall be done from 5:30 PM to 11:00 PM Monday to Friday. Painting on weekends from 6 AM to 4 PM shall be scheduled through the COR, with at least seven days' notice.

16. **Excavation and Trenching Activities:**

Excavation and trenching activities are not permitted without prior written authorization from the COR. Contractor is responsible for locating and identifying all utilities via contract personnel with utility locating devices. Contractor shall turn over a utility marking report plotted on the appropriate construction drawings to the COR within 7 days.

17. **Environmental Management:**

NIST will conduct its operations in an environmentally sound manner. NIST's Environmental Management System (EMS) has been established based on the requirements of the International Organization of Standards (ISO14001). All firms contracted by NIST shall review and be familiar with the NIST Environmental Policy and significant aspects of the NIST EMS, which may be accessed at http://www.nist.gov/public_affairs/envpolicy.cfm

All contractors who provide products and services to NIST shall comply with all applicable environmental regulations, conduct their work using environmentally sound practices, and assess options that will result in the least environmental impacts. The Maryland Department of Environment (MDE) will inspect and enforce sediment control and storm water management regulations and practices for projects at NIST.

18. **Scrap Building Materials Disposal**

In order to reduce disposal volumes of clean scrap wood based building materials taken to landfill dump, segregate such materials and dispose of the materials and dispose of the materials using one or a combination of the following methods.:

Arrange for recycling of materials or provide to companies that receive wood for disposal in biomass to energy facilities.

It is NIST Policy to recycle construction demolition materials and debris to the greatest extent practicable. All NIST contractors shall strive to meet the goal of recycling 50% of construction demolition materials and debris as specified in Executive Order 13514.

Contractor shall store recyclable waste in separate clearly marked containers. Recyclable items include, wood, glass, aluminum, steel, gypsum, paper, cardboard, and plastics.

19. **Electrical Safety:**

All contractors shall comply with current edition of NFPA 70E "Standard for Electrical Safety in the Workplace." If the Contractor selects to work on energized equipment, Contractor shall have a documented permit system for working on energized electrical equipment.

20. **Daily Reports**

Contractor shall provide to COR a daily report of all major activities, personnel on site (includes all subcontractors), major deliveries, and major tools and equipment on site.

Contractor shall inform the COR in writing ten days in advance when painting, new carpet installation, glue applications, using a cleaning solvent, large amount of grinding or core drilling is planned.

21. **Adverse Weather**

To request an adverse weather time extension, the weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month. The Request must be made no more than 30 days after the event.

The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) at Ronald Reagan Airport and will constitute the base line for monthly weather time evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
8	6	8	6	8	7	7	6	6	6	6	7

For roofing projects, contractors will be permitted to work on Saturdays (if the contractor elects to do so) providing they provide the COR four days' notice. Rain on Saturdays and Sundays are not factored into adverse weather delays for any contract,

unless that contract explicitly required all work to be completed on Saturdays and/or Sundays.

22. **Grass within Contractor Area**

Grass within the contractor's area of control (i.e. – lay down area, construction site, etc.) shall be maintained to a height of no more than 18 inches.

23. **Building 101 Restricted Activities**

For two days (total of four (4)) in the months of October and April the contractor will be prevented from completing any work in the courtyards, streets, sidewalks in and around Building 101. In addition, service/construction or other related activities will be prevented from occurring. COR will provide the contractor two days' notice of the implementation of this restriction.

24. **Exterior Construction Sites and Storage**

Exterior construction sites and storage areas shall have woven galvanized steel fabric fencing with steel posts installed during the construction period. Fencing shall surround the entire construction site the contractor is working within. Fencing shall be at a minimum 8 feet tall. Provide opaque fence slats. Slat color shall be dark green/forest green. Fencing sections shall be bound together with mechanical fasteners. Posts shall be suitable for setting in concrete footings, driving into ground, anchoring with base plates, or inserting in precast concrete blocks. Provide a minimum of 3 ft spacing around fire hydrants and/or hose connections. Provide a minimum 20 foot gate for emergency vehicle access.

25. **Restoration of Exterior Construction Site**

The contractor shall restore the entire construction site(s) at the completion of all contract work. This shall include removing all debris and stones of 2 inches or from the subsoil to a depth of 8 inches regardless of the condition the site was turned over to the contractor. Seeding shall be completed by the contractor once all debris and noted stones are removed from the topsoil.

26. **Tours of Construction Site**

Any tours or presentations related to a contract by the contractor shall be submitted at a minimum of 30 days in advance to the COR. The contractor shall provide the following the information for review:

a) Purpose of the Tour/Presentation
b) Time of tour/presentation

c) Number of attendees
d) Names of each attendee
e) Name of each attendee's employer
f) Address of each attendee's employer
g) Indicate if US Citizen, US Permanent Resident Alien, or foreign national

27. Ground Penetrating Radar in Existing Structures

Prior to core boring, drilling, or otherwise penetrating existing floors or walls within facilities the contractor shall clear the area with ground penetrating radar. COR shall observe the test report and/or the identification prior to penetrating the floor, wall, or proposed penetration location.

28. As-Builts and/or Red Line Drawings

Contract specified as-builts and/or red line drawings shall be provided in the following form:

- hard copies on Arch D (24"x36") format, electronic copies on CD disk (adobe PDF, AutoCAD).

29. Operation and Maintenance Equipment Manuals

Contract operation and maintenance equipment manuals must be provided in the following form:

- hard copies in bound or spiral binders. Any drawings supplied in the binders shall not be larger than 11" x 17" and shall be folded to fit inside the binders.
- electronic copies on CD disk (adobe PDF).

30. Roof Access

Roof access permits must be obtained in order to access any roof on a NIST campus, for work or investigation purposes. Request roof access permits from the COR or the construction representative five (5) days before roof access is required.

- Requires Fall Protection training documentation.
- May require the completion of a Health and Safety Plan if work is to be performed on the roof.

31. Security Badges

United States Department of Commerce Office of Security issues badges for contractor access to NIST.

All foreign nationals shall comply with United States Department of Commerce DAO 2017-12 - http://www.osec.doc.gov/opog/dmp/daos/dao207_12.html

For US Citizens and Resident Aliens, the following badging applies

(Yellow) Limited Access PCards are issued for construction/service areas that meet the following criteria –

- Purely exterior construction with no requirement to enter Department of Commerce/NIST facilities
- Locations where work areas are partitioned and/or fully separated from occupied areas, with isolated entrances and exits for construction/maintenance contractors.
- **COMPLETE** Limited Access PCard badge application are approved/disapproved within 7 calendar days of submission to COR.

(Yellow) Limited Access Cards are available for contract personnel for 180 days every two years (24 months) commencing with the issuance of the Card. If a contract employee was issued a Limited Access Card and exceeds the 180 days access within 24 months, he/she would be denied a Limited Access Card until the next 24-month period.

Turnaround time for a (Yellow) Limited Access Card is 7 days from an accepted badge application.

(Green Badge) Site Card (Site Access Badge)/ Personal Identification (PIV) Card for those contract site that do not qualify for a (Yellow) Limited Access Card

- Site Cards will be issued to contract employees who will be on site for less than 30 days. These site cards maybe extended. The total "life" of this badge cannot exceed 179 days. After 179 days, the contractor has to apply for a PIV badge.
- PIV Cards or equivalent will be issued to contract employees who are expected to be on site for more than 30 days. PIV Cards maybe extended.
- A Site Card/PIV Card processing is broken into distinctive time periods once the **COMPLETE** badge application is submitted to the COR
    - Badge application is entered/processed into the "system" within 8 days of submission to COR
    - Contract employee is invited/emailed to complete the on-line security check application https://www.opm.gov/investigations/e-qip-application/
        - Contract employee must monitor his/her email for the invitation
        - E-QIP invitation expires 14 days after it is emailed **
        - E-QIP invitation will be sent to the applicant within 16 days of submission to COR

- Once the contract employee completes E-QIP application, Department of Commerce personnel will review the application within 8 days of EQIP being submitted. The contract employee will be notified if corrections are required.
- Once the application is accepted, the COR will notify the contractor that the individual is ready for fingerprints. A trip to Gaithersburg is needed to be fingerprinted.
- The COR will notify the contractor that employee is ready to be issued a badge at NIST.

Summarizing the Site Card/PIV Timeline (Error free badge applications)

COR submits badge application after award to contractor (NIST Action)	Within 7 days
Contractor submits badge application and OF306 to COR for each and all contract employees *	Within 14 days
Application is entered into the security system (NIST Action)	Within 8 days
Applicant is emailed E-QIP invitation (DoC/NIST Action)	Within 8 days
Applicant completes E-QIP prior to email link expiration **	Within 14 days
E-QIP application is reviewed and approved for fingerprints at NIST (DoC/NIST Action)	Within 8 days
Applicant arranges with COR for visitor center access to obtain fingerprints	Within 8 days
Applicant's fingerprints are reviewed; Applicant is approved for NIST badge (NIST Action)	Within 8 days
Applicant schedules a badge appointment and arrives for badge	Within 7 days
Total (Maximum)	82 days

* If contractor does not submit all badge applications at one time, the last badge application submission date will drive how long the badge process will take.

** If the applicant doesn't complete E-QIP within the 14 days, contractor needs to notify COR to request another E-QIP invitation. Resent E-QIP invitation may take up to 4 days to be sent.

COR notifications are via a weekly report on badge status applications. In this report, it will indicate if the applicant is:

- Pending E-QIP
- Ready for Fingerprints
- Ready for Badge

(White – Paper) Visitor Paper Badge are issued to contractor employees who

- Visiting NIST to complete aspects of the badging process to include badge issuance
- Delivery drivers (material, equipment, etc.)
- Concrete trucks

32. Designer Historical Requirements

The NIST Campus in its entirety has been determined eligible for and is in the process of being nominated to the National Register of Historic Places. As such, all campus projects (buildings, structures and grounds) other than routine maintenance and repair must conform to the Secretary of the Interior's (SOI) Standards for the Treatment of Historic Properties.
Most changes to building exteriors and landscapes as well as Changes to certain building interiors and most landscape features are reviewed and approved at various stages by the NIST Architectural Design Review Board (ADRB), and, ultimately by the NIST federal preservation officer.

All designs for proposed additions and changes to facades, rooflines and building silhouettes other than in-kind repairs, must be reviewed and approved by the NIST Architectural Design Review Board (ADRB) and the Maryland Historical Trust (MHT). Project related communications with the MHT are only conducted by the NIST Federal Preservation Officer who may require technical information and graphic support from the design professional
The design professional shall coordinate with the NIST COR to schedule any needed presentations to the ADRB and/or the MHT. The Design professional shall provide sufficient time in the project schedule to allow for these design reviews.

Because many of NISTs natural and landscape features have been determined to be character defining features and/or contributory resources to the NIST historic district, the design professional shall coordinate with the NIST NEPA coordinator and the FPO.

Any proposed laydown areas, staging areas and or enclosures related to proposed work need to be reviewed and approved with the NIST Site Selection panel. The design professional shall work through the NIST COR to assure review and approval of any such proposed enclosure or site usage prior to issuing construction documents.

Certain campus locations around the central core because of high traffic and high visibility may require enclosed fencing, such as painted plywood panels on structural framing. The Design Professional shall coordinate with the COR to incorporate the design specifications for such enclosure based upon recommendations from the NIST ADRB.

Building 101
Some ceiling tiles may be considered character defining features of buildings that are contributory to the NIST historic district and as such cannot be removed without first consulting

the NIST Federal Preservation Officer (FPO). It is the contractor's responsibility to verify with the FPO if concealed spline ceiling tiles are character defining

33. Temporary Exterior Power:

If the contractor requests exterior power for construction purposes, the contractor shall follow the requirements noted below. In addition, the contractor shall follow requirements identified in paragraph #6 (outages).

Contractor shall furnish the following to the COR

A) Requested tie-in point – identify the voltage, overcurrent protection, and existing equipment (switchboard, panel board, load center, etc) location
B) Provide a one-line diagram for the proposed system
    a. Cable sizes
    b. Overcurrent protection size(s) and type(s) (all devices)
    c. Length of cabling and type of conduit
    d. Transformer sizing to include ground rods and grounding electrode conductors
    e. If any component is aerial, the contractor shall provide construction details on
        i. Height of cables
        ii. How the cables are supported

C) NIST will review the request. Within 17 days if the request is complete, COR via a NIST engineer will provide:

    a. Arc flash labels which the contract shall affix to the one-line devices per NFPA 70E.
    b. Date the outage is approved for the work

34. Security Plan, SP:

Contractor shall provide a security plan to the COR. If not specified in the SOW or specifications, a security plan must be submitted within 21 days of award.

Elements of a security plan must address (if applicable):

- Security of contract trailer/on-site office
- Security of the contract site to unauthorized personnel.
    - For instance, physical barriers restricting access to unauthorized personnel; construction area warning signs; locked construction access points, etc.
- Access control
    - Background checks for contractors and subcontractors,
    - Clearances (if identified in the contract documents as needed),
    - Alien status - https://www.e-verify.gov/employers/federal-contractors).

- Badging
    - Ensuring contractor employees display NIST badges while on campus
    - Processing badge applications to ensure contract employees submit complete and accurate badge applications,
    - Complying with NIST badge policy that contractors are not permitted to escort non-Green badged employees
    - Lost NIST badge procedures & investigation
    - Retrieving NIST badges from contractors who do not need to come on campus any longer
- Vehicular access
    - Contract employees parking in NIST marked parking spots/places
    - Vehicle loading and unloading.
    - Limiting parking times at loading docks
- Internal security
    - Vehicle key control when vehicles are not in use
    - Securing equipment and tools to prevent theft
    - Securing Government equipment so it is not stolen
    - Control of Government keys if furnished to the contractor
- Movement of contract employees
    - Identify how the contractor will ensure contract employees remain on their work sites especially in occupied buildings with other Federal employees.
- Security of procurement drawings/plans (hard copy and electronic) if not posted on Internet for bidding
- Maintaining security during HAZMAT, law enforcement, fire, or medical emergency response.

35. FAR Clause 48 CFR 1352.237-71 Security Processing Requirements - Low Risk Contracts (APR 2010)

(a) Investigative Requirements for Low Risk Contracts. All contractor (and subcontractor) personnel proposed to be employed under a Low Risk contract shall undergo security processing by the Department's Office of Security before being eligible to work on the premises of any Department of Commerce owned, leased, or controlled facility in the United States or overseas, or to obtain access to a Department of Commerce IT system. All Department of Commerce security processing pertinent to this contract will be conducted at no cost to the contractor.

(b) Investigative requirements for Non-IT Service Contracts are:

(1) Contracts more than 180 days - National Agency Check and Inquiries (NACI).

(2) Contracts less than 180 days - Special Agency Check (SAC).

(c) Investigative requirements for IT Service Contracts are:

(1) Contracts more than 180 days - National Agency Check and Inquiries (NACI).

(2) Contracts less than 180 days - National Agency Check and Inquiries (NACI).

(d) In addition to the investigations noted above, non-U.S. citizens must have a background check that includes an Immigration and Customs Enforcement agency check.

(e) Additional Requirements for Foreign Nationals (Non-U.S. Citizens). Non-U.S. citizens (lawful permanent residents) to be employed under this contract within the United States must have:

(1) Official legal status in the United States;

(2) Continuously resided in the United States for the last two years; and

(3) Obtained advance approval from the servicing Security Officer in consultation with the Office of Security headquarters.

(f) DOC Security Processing Requirements for Low Risk Non-IT Service Contracts. Processing requirements for Low Risk non-IT Service Contracts are as follows:

(1) Processing of a NACI is required for all contract employees employed in Low Risk non-IT service contracts for more than 180 days. The Contracting Officer's Representative (COR) will invite the prospective contractor into e-QIP to complete the SF-85. The contract employee must also complete fingerprinting.

(2) Contract employees employed in Low Risk non-IT service contracts for less than 180 days require processing of Form OFI-86C Special Agreement Check (SAC), to be processed. The Sponsor will forward a completed Form OFI-86C, FD-258, Fingerprint Chart, and Credit Release Authorization to the servicing Security Officer, who will send the investigative packet to the Office of Personnel Management for processing.

(3) Any contract employee with a favorable SAC who remains on the contract over 180 days will be required to have a NACI conducted to continue working on the job site.

(4) For Low Risk non-IT service contracts, the scope of the SAC will include checks of the Security/Suitability Investigations Index (SII), other agency files (INVA), Defense Clearance Investigations Index (DCII), FBI Fingerprint (FBIF), and the FBI Information Management Division (FBIN).

(5) In addition, for those individuals who are not U.S. citizens (lawful permanent residents), the Sponsor may request a Customs Enforcement SAC on Form OFI-86C, by checking Block #7, Item I. In Block 13, the Sponsor should enter the employee's Alien Registration Receipt Card number to aid in verification.

(6) Copies of the appropriate forms can be obtained from the Sponsor or the Office of Security. Upon receipt of the required forms, the Sponsor will forward the forms to the servicing Security Officer. The Security Officer will process the forms and advise the Sponsor and the Contracting Officer whether the contract employee can commence work prior to completion of the suitability determination based on the type of work and risk to the facility (*i.e.*, adequate controls and restrictions are in place). The Sponsor will notify the contractor of favorable or unfavorable findings of the suitability determinations. The Contracting Officer will notify the contractor of an approved contract start date.

(g) Security Processing Requirements for Low Risk IT Service Contracts. Processing of a NACI is required for all contract employees employed under Low Risk IT service contracts.

(1) Contract employees employed in all Low Risk IT service contracts will require a National Agency Check and Inquiries (NACI) to be processed. The Contracting Officer's Representative (COR) will invite the prospective contractor into e-QIP to complete the SF-85. Fingerprints and a Credit Release Authorization must be completed within three working days from start of work, and provided to the Servicing Security Officer, who will forward the investigative package to OPM.

(2) For Low Risk IT service contracts, individuals who are not U.S. citizens (lawful permanent residents) must undergo a NACI that includes an agency check conducted by the Immigration and Customs Enforcement Service. The Sponsor must request the ICE check as a part of the NAC.

(h) Notification of Disqualifying Information. If the Office of Security receives disqualifying information on a contract employee, the Sponsor and Contracting Officer will be notified. The Sponsor shall coordinate with the Contracting Officer for the immediate removal of the employee from duty requiring access to Departmental facilities or IT systems. Contract employees may be barred from working on the premises of a facility for any of the following reasons:

(1) Conviction of a felony crime of violence or of a misdemeanor involving moral turpitude.

(2) Falsification of information entered on security screening forms or of other documents submitted to the Department.

(3) Improper conduct once performing on the contract, including criminal, infamous, dishonest, immoral, or notoriously disgraceful conduct or other conduct prejudicial to the Government regardless of whether the conduct was directly related to the contract.

(4) Any behavior judged to pose a potential threat to Departmental information systems, personnel, property, or other assets.

(i) Failure to comply with security processing requirements may result in termination of the contract or removal of contract employees from Department of Commerce facilities or denial of access to IT systems.

(j) Access to National Security Information. Compliance with these requirements shall not be construed as providing a contract employee clearance to have access to national security information.

(k) The contractor shall include the substance of this clause, including this paragraph, in all subcontracts.

(End of clause)

End of Guidelines

NIST SUBORDERS, POLICIES AND NOTICES

TABLE OF CONTENTS

Electrical Safety

NIST N 7101.64
Effective Date: 10/23/2015
Document Approval Date: 10/23/2015

1. PURPOSE

This Notice establishes the requirements, roles, responsibilities, and authorities for performing energized electrical work, including electrical lockout/tagout (electrical LOTO). It will remain in place from its issuance date until the effective date of NIST Suborder (S) 7101.64: Electrical Safety.

NOTE: NIST expects NIST S 7101.64: Electrical Safety to be effective on April 1, 2017, with deployment commencing in the 3rd quarter of FY 2016. NIST S 7101.64 will incorporate the requirements of this notice.

2. BACKGROUND

a. Energized electrical work, including electrical LOTO, can present significant electrical-shock and arc-flash hazards absent implementation of the safety requirements herein.

b. The contents of this Notice are based on the current editions of Occupational Safety and Health Administration (OSHA) standards in 29 CFR 1910, Subpart S, Electrical, and National Fire Protection Association (NFPA) codes/standards NFPA 70, 70B, and 70E.

3. APPLICABILITY

a. The requirements of this Notice apply to the following, regardless of the physical location in which the work is being performed:

(1) NIST employees and associates who could be exposed to electrical hazards, e.g., shock, arc flash, while performing energized electrical work, including electrical LOTO, in the performance of their duties; and

(2) NIST employees who are responsible for outside service providers performing energized electrical work, including electrical LOTO, and as such, are responsible for ensuring that other NIST employees and associates are not exposed to the hazards of that work.

4. REFERENCES

a. OSHA 29 CFR 1910 Subpart S, Electrical

b. NFPA 70, National Electric Code, current edition

c. NFPA 70B, Recommended Practice for Electrical Equipment Maintenance, current edition

d. NFPA 70E, Electrical Safety in the Workplace, current edition

5. APPLICABLE NIST OCCUPATIONAL SAFETY AND HEALTH SUBORDERS

a. NIST S 7101.20: Work and Worker Authorization Based on Hazard Reviews;

b. NIST S 7101.21: Personal Protective Equipment; and

c. NIST S 7101.56: Control of Hazardous Energy (Lockout/Tagout).

6. REQUIREMENTS

Section 6a delineates conditions under which work on electrical equipment and circuits may be conducted in an energized state. Sections 6b and 6c delineate the requirements for de-energizing and re-energizing, respectively, equipment and circuits. Sections 6d and 6e delineate the requirements for performing energized electrical work without and with, respectively, an Energized Electrical Work Permit (EEWP; see Section 7, Definitions).

a. Conditions under which Work on Electrical Equipment and Circuits May Be Conducted in an Energized State

(1) Work on electrical, electronic, and electro-mechanical equipment and circuits shall be performed in a de-energized state unless at least one of the following conditions is met:

(a) Energized electrical conductors and circuit parts to which employees and associates could be exposed operate at less than 50 volts and no other electrical hazards, e.g., potential for electrical burns or explosion, exist;

(b) It can be demonstrated to the responsible OU management that de-energizing would introduce additional hazards, would introduce increased risk, or could cause significant property damage or loss of critical data,;[1]

(c) It can be demonstrated to the responsible OU management that performing the work in a de-energized state is infeasible (not just inconvenient) due to equipment design or operational limitations;[2] or

(d) Normal operation of equipment or circuits for their intended purpose(s) provided the equipment or circuits and any upstream protective devices are known to be properly installed and maintained.

b. De-Energizing Electrical Equipment or Circuits to Perform Work

This section applies to de-energizing electrical equipment or circuits and verifying zero energy in the process of performing electrical LOTO. It does not apply to:

- Work on electrical conductors and circuit parts that operate at less than 50 volts provided no other electrical hazards exist; or

- When equipment is to be taken out of service and workers will not be exposed to electrical hazards.

(1) Electrical LOTO shall be conducted in accordance with the requirements in Section 6 of NIST S 7101.56, *Control of Hazardous Energy (Lockout/Tagout)* and the requirements delineated in the remainder of this subsection.

(2) Instructions for de-energizing equipment or circuits shall include procedures for:

(a) Disconnecting equipment and circuits to be worked on from all electric energy sources;

i. Control circuit devices, such as push buttons, selector switches, and interlocks, shall not be used as the sole means for de-energizing equipment or circuits;[3]

[1] For example, as in the case of interruption of life-support systems or mission-critical equipment or research, deactivation of emergency alarm systems, and shutdown of hazardous location ventilation equipment.
[2] For example, as in the case of diagnostics that can only be performed with the circuit energized, and work on circuits that form an integral part of a continuous process that would otherwise need to be shut down completely to allow work on one circuit or piece of equipment.
[3] Exceptions may be possible for laboratory test equipment with built-in mechanisms designed to de-energize the output and control the electrical hazards associated with the normal use of the equipment. Contact the OSHE Electrical Safety Engineer for further information.

(b) Releasing from components[4] stored electric energy that might endanger personnel;

i. Capacitors shall be discharged; and

ii. High-capacitance elements shall be short-circuited and grounded;

(c) Blocking stored non-electrical energy in devices that could re-energize electric circuit parts; and

(d) Performing electrical LOTO, including steps for inhibiting automatic and remotely activated functionality.

(3) Locks and tags used in conducting electrical group LOTO shall:

(a) Have a distinguishing identifier to identify it as an electrical group LOTO lock;

(b) Locks shall not be keyed alike except to a single master for each work group; and

(c) Each lock shall be individually numbered.

(4) A lock and a tag shall be placed on each disconnecting means used to de-energize equipment and circuits on which work is to be performed. The lock shall be attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

(a) Equipment with a source voltage of 240 volts or less fed by a single cord and plug shall not be required to have a lock and tag on the plug provided that all hazardous energy to which the worker could be exposed is controlled by unplugging the equipment and the plug is under the exclusive control of the worker. Such equipment shall have a lock and tag applied to the plug when workers are not present and there are exposed electrical circuits, components, or parts.

(5) A tag may be placed without a lock only if a lock cannot be applied or ALL of the following conditions are met:

(a) Only one piece of equipment or one circuit is de-energized;

[4] If the components, such as the capacitors, or associated equipment are handled in meeting this requirement, they shall be treated as energized.

(b) The tag is supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock, as determined by the OSHE Electrical Safety Engineer (ESE);[5]

(c) The lockout period does not extend beyond the work shift; and

(d) Employees and associates exposed to the hazards associated with re-energizing the equipment or circuit are trained in this procedure.

(6) An interlock for electric equipment may not be used as a substitute for written electrical LOTO procedures except in a laboratory (see Section 7, Definitions) or in an installation designated for research-and-development (R&D) (see Section 7, Definitions) when all of the following conditions are met:

(a) The electrical LOTO is part of a laboratory or R&D activity;

(b) The interlock is supplemented with a written procedure resulting from an approved OU hazard review; and

(c) Proper PPE is worn in accordance with the procedure resulting from an approved OU hazard review.

(7) The following requirements for verifying the de-energized condition shall be met before any equipment can be considered and worked on as de-energized:

(a) A qualified person (see Section 7, Definitions) shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(b) A qualified person shall use test equipment to verify that electrical parts of equipment and circuit elements to which employees or associates will be exposed are de-energized.

(c) A qualified person shall use test equipment to determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back-feed even though specific parts of the circuit have been de-energized and presumed to be safe.

(d) For voltages below 600 volts or when it has been determined that there are no voltages over 600 volts, a voltmeter or multimeter on the appropriate range/scale shall

[5] Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

be used by a qualified person to verify zero volts phase-to-phase and phase-to-ground for all source phases. Testing shall be as follows:

i. The meter shall be tested on a known source of the same voltage as that being verified for zero electrical energy;

ii. The meter shall be used to test the equipment for zero electrical energy; and

iii. The meter shall be tested again on a known source of the same voltage as that being verified for zero electrical energy.

(e) Until it is determined that the voltage level is 600 volts or less, it shall be assumed that the voltage is above 600 volts and special voltage measuring devices rated for the anticipated voltages shall be used when taking voltage measurement.

(f) Proximity testers or "tic tracers" shall not be used to verify zero volts in the performance of electrical LOTO.

c. Re-Energizing Electrical Equipment or Circuits

(1) The following requirements for re-energizing equipment or circuits shall be met, in the order given, before equipment or circuits are re-energized:

(a) A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed.

d. Energized Electrical Work Not Requiring an EEWP

(1) Energized electrical work may be performed ***without*** an EEWP (see Section 7, Definitions) provided the qualified person conducting the work:

(a) Has been trained on the appropriate safe work practices associated with the task(s);

(b) Uses the required personal protective equipment (PPE) in accordance with Appendices B through G to perform the task(s); and

(c) Performs one of these types of tasks:

i. Work on energized electrical conductors and circuit parts operate at less than 50 volts and no other electrical hazards exist;

ii. Diagnostics, i.e., taking readings or measurements of electrical equipment with approved test equipment that do not require making any physical changes to the equipment;

iii. Thermography and visual inspections if the restricted approach boundary is not crossed;

iv. Tasks involving access to and egress from an area with energized electrical equipment or circuits if no energized electrical work is performed and the restricted approach boundary is not crossed; or

v. General housekeeping and miscellaneous non-electrical tasks if the restricted approach boundary is not crossed and all automatic/remotely activated controls are inhibited.

(2) Energized electrical work that can be performed without an EEWP must still be authorized in accordance with the requirements of NIST S 7101.20: *Work and Worker Authorization Based on Hazard Reviews*.

e. Energized Electrical Work Requiring an EEWP (a.k.a. Permit-Required Energized Electrical Work)

(1) The following types of energized electric work may be conducted only in accordance with the requirements of an authorized EEWP, as described in Section 6f:

(a) Work, other than that described in Section 6d, requiring the qualified person to work within the restricted approach boundary;

(b) Work requiring the qualified person to interact with (e.g., operate, service, maintain, adjust) the equipment when conductors or circuit parts are not exposed but an increased likelihood of injury from an exposure to an arc-flash hazard exists;

(c) Work requiring the qualified person to interact with equipment or circuits[6] that are not known to be properly installed or maintained; or

(d) Work requiring the qualified person to interact with equipment or circuits[4] when the upstream protective devices are not known to be properly installed or maintained.

[6] These requirements do not apply to plugging equipment into, or unplugging equipment from, receptacles or to operating lights utilizing switch-rated devices.

f. EEWPs (NIST-380 and NIST-380A Forms)

OUs shall authorize permit-required energized electrical work by completing EEWPs in accordance with the requirements of this section. There are two categories of permit-required energized electrical work:

- Permit-required energized electrical work associated with laboratory and R&D activities covered by OU-approved hazard reviews, as described in Section 6f(1); and
- All other permit-required energized electrical work, as described in Section 6f(2).

(1) Permit-Required Energized Electrical Work Covered by OU-Approved Hazard Reviews

For permit-required energized electrical work covered by an OU-approved hazard review, the following shall apply:

(a) The hazard review shall comply with the requirements of NIST S 7101.20, *Work and Worker Authorization Based on Hazard Reviews*.

(b) The NIST-380A EEWP short form (see Appendix H) shall be used to document the following:[7]

i. Justification for performing the energized work:

(i) Why de-energizing the equipment or circuit introduces additional hazards, introduces increased risk, or could cause significant property damage or loss of critical data; or

(ii) Why de-energizing the equipment or circuit is infeasible (not just inconvenient) due to equipment design or operational limitations;

ii. The hazard analysis of the energized electrical work to be performed;

iii. The requestor; and

iv. The approval of the NIST-380A short form by the OSHE Electrical Safety Engineer (ESE) (see Section 7, Definitions).

[7] The NIST-380A short form contains Sections A (in part), B, C, F, and G of the NIST-380 form. The hazard review must contain all applicable information required by the other sections of the NIST-380 form.

(c) The approved NIST-380A short form shall be appended to the OU-approved hazard review.

(d) The approved NIST-380A short form and OU-approved hazard review shall be readily available to those performing the energized electrical work.

(2) All Other Permit-Required Energized Electrical Work

For all other permit-required energized electrical work, the NIST-380 EEWP form (see Appendix I) shall be used to document the following:

(a) Details of the work to be completed, including:

i. The work order associated with the work (if applicable);

ii. Location of the work to be performed;

iii. Description of the electrical equipment and circuit description;

iv. Description of the task;

v. The requestor;

vi. The qualified person(s) requested to perform the work; and

vii. The first-level supervisor(s) of the qualified person(s) requested to perform the work.

(b) Justification for performing the energized electrical work based upon one of the following circumstances (it is understood that an outage was first requested and denied if applicable):

i. Why de-energizing the equipment or circuit introduces additional hazards; introduces increased risk, or could cause significant property damage or loss of critical data, or

ii. Why de-energizing the equipment or circuit is infeasible (not just inconvenient) due to equipment design or operational limitations.

(c) The hazard analysis of the energized electrical work to be performed.

(d) The approval of the NIST-380 form by the OSHE ESE (see Section 7, Definitions).

(e) The authorization of the ESE-approved NIST-380 form by the responsible OU Director or an individual designated by the OU Director to authorize the form on his or her behalf.

(3) Just prior to the commencement of work, a documented pre-work meeting shall be held by the first-level supervisor or designee with the employee(s) and associate(s) performing the work to review the authorized NIST-380 form, work steps, and job/site/environment specific hazards.

(4) The authorized NIST-380 form shall be located at the work site for the duration of the work.

(5) Any general comments or issues encountered during the energized electrical work shall be noted on the authorized NIST-380 form so that appropriate revisions to planning and implementation of future energized electrical work can be made.

(6) Hard or electronic copies of authorized NIST-380 forms shall be kept by the OUs for a minimum of 1 year from the completion of the work.

g. Energized Electrical Work Other than Electrical LOTO Performed by Outside Service Providers[8]

(1) Outside service providers shall not be permitted to commence energized electrical work other than electrical LOTO on NIST electrical, electronic, or electro-mechanical equipment or circuits until:

(a) They have exchanged energized-electrical work programs with the NIST controlling organization; and

(b) Arc flash and shock protective boundaries have been established using approved methods to prohibit NIST employees and associates from entering the work area(s).

h. Equipment Labeling

[8] Electrical LOTO performed by outside service providers is addressed in NIST S 7101.56: *Control of Hazardous Energy (Lockout/Tagout)* [see Section 6b(1)].

(1) Electrical equipment such as switchboards, panelboards, industrial control panels, meter-socket enclosures, motor-control centers, and 3-phase service disconnects shall be field-marked with an electrical-safety label containing all the following information for all new installations and when any modifications, i.e. addition/deletions of components or major repairs, of existing installations are performed:

(a) Available incident energy;

(b) Arc flash boundary;

(c) Working distance;

(d) Corresponding working distance;

(e) Nominal system voltage;

(f) Limited approach boundary;

(g) Restricted approach boundary;

(h) Building number;

(i) Panel number or equipment buss name;

(j) Upstream protective device panel number/name; and

(k) Date label issued.

(2) Electrical safety label format shall be as depicted in Appendix J.

i. Training

(1) Employees and associates whose duties require them to be qualified persons (see Definition 7, Definitions) shall complete:

(a) The training provided by OSHE on the electrical safe work practices, the scope of which will depend on the nature of the work the qualified person is to perform; and

(b) The OU-provided activity-specific training on the tasks they perform, including training on the proper use of electrical test equipment, as applicable.

(2) Employees and associates whose duties require them to be competent persons (see Definition 7, Definitions) shall:

(a) Meet all the requirements of a qualified person; and

(b) Be approved by the Authority Having Jurisdiction (AHJ) as having detailed knowledge regarding the exposure to electrical hazards, the appropriate control methods to reduce the risk associated with those hazards, and the implementation of those methods.

j. Incident Response

(1) Employees and associates who have received electric shocks or been exposed to arc flashes shall immediately receive medical evaluations.

k. Incident Investigations

(1) The OSHE ESE (or designee) shall be included in investigations of safety incidents involving electric shocks or arc flashes.

6. DEFINITIONS

a. Authority Having Jurisdiction (AHJ) – The OSHE individual responsible for enforcing the requirements of fire, electrical, and life safety codes and standards at sites owned and operated by NIST, and for approving, as necessary, applicable equipment, materials, installations, and procedures.

b. Arc Flash – A flashover of electric current through the air from one conductor to another, or to ground.

c. Arc Flash Boundary – An approach limit at a distance from exposed live parts at which a person could receive a second degree burn if an electrical arc flash were to occur. The boundary is established at the point away from a potential arc source where the incident energy would be reduced to 1.2 cal/cm^2.

d. Competent Person – An individual who:

(1) Meets all the requirements of a qualified person;

(2) Is responsible for all work activities or safety procedures related to custom or special equipment used in laboratory or R&D activities; and

(3) Has been approved by the AHJ, or by the OSHE ESE as delegated by the AHJ, as having detailed knowledge regarding the exposure to electrical hazards, the appropriate control methods to reduce the risk associated with those hazards, and the implementation of those methods.

e. De-energized – Free from any electrical connection to a source of potential difference and from electrical charge; not having a potential different from that of the earth.

f. Diagnostics – Taking readings or measurements of electrical equipment with approved test equipment that does not require making any physical change to the equipment.

g. Electrical Hazard – A dangerous condition such that contact or equipment failure can result in electric shock, arc flash burn, thermal burn, or blast. The limited and restricted approach boundaries (for shock) and the arc flash boundary are the boundaries within which potential electrical hazards to workers exist.

h. Electrical Safe Work Condition – A state in which an electrical conductor or circuit part has been disconnected from energized parts, locked/tagged in accordance with established standards, tested to ensure the absence of voltage, and grounded if determined necessary.

i. Energized Electrical Work – Work conducted by an employee or associate on electrical, electronic, or electro-mechanical equipment or circuits where:

(a) The equipment or circuit is either known to be energized or not known to have been de-energized in accordance with the requirements of this suborder; and

(b) The employee or associate is within the restricted-approach boundary or interacts with the equipment or circuit within the arc-flash boundary.

j. Energized Electrical Work Analysis and Authorization Permit – A document that details the following:

(1) The circuit, equipment, and location of the job/task to be conducted.
(2) The work that is to be done.

(3) Justification of why the circuit or equipment cannot be de-energized or the work deferred until the next scheduled outage.

k. Equipment – A general term, including circuits, components, devices, and the like, used as a part of, or in connection with, an electrical installation.

l. Exposed (as applied to energized electrical conductors or circuit parts) – Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to electrical conductors or circuit parts that are not suitably guarded, isolated, or insulated.

m. High Voltage – Voltages above 600 volts.

n. Incident Energy – The amount of energy impressed on a surface, a certain distance from a source, generated during an electrical arc event. The incident energy level is expressed in calories per centimeter-squared (cal/cm^2) and is a measure of the heat created by the electrical arc.

o. Laboratory – A building, space, room, or group of rooms intended to serve activities involving procedures for investigation, diagnostics, product testing, or use of custom or special electrical components, systems, or equipment.

p. Limited Approach Boundary – An approach limit at a distance from an exposed energized electrical conductor or circuit part within which a shock hazard exists.

q. Low Voltage – Voltages 600 volts and below**.**

r. Notice – A temporary directive issued in response to any matter requiring prompt action. Occupational safety and health notices are reviewed annually and automatically renewed unless rescinded by the Chief Safety Officer.

s. OSHE Electrical Safety Engineer – The individual in OSHE designated by the AHJ to:

(1) Approve EEWPs; and

(2) Make recommendations to the AHJ on interpretations of the applicable codes/standards, the approval of equipment and materials, and the granting of special permission contemplated in some of the rules.

t. Properly Installed – Equipment or circuit that has been installed in accordance with applicable industry codes and standards and the manufacturer's recommendations.

u. Properly Maintained – Equipment or circuit that has been maintained in accordance with applicable industry codes and standards and the manufacturer's recommendations.

v. Qualified Person – One who has demonstrated knowledge, skills, and abilities related to the construction, installation, and operation of specific electrical equipment or circuits and has received safety training to identify and avoid the hazards involved.

w. Repair – Any physical alteration of electrical equipment, e.g., making or tightening connections, removing or replacing components.

x. Research and Development – An activity in an installation specifically designated for research or development conducted with custom or special electrical equipment.

y. Restricted Approach Boundary – An approach limit at a distance from an exposed live part within which there is an increased risk of shock, due to electrical arc-over combined with inadvertent movement, for personnel working in close proximity to the live part. This area is reserved only for qualified persons. Shock protection techniques and safety equipment are required.

z. Suborder – A directive within the NIST Directives Management System that establishes authorities, technical requirements, and assignment of responsibilities in a specific subject area under an order and focuses on the technical details of the program.

aa. Testing – See definition of "Diagnostics".

bb. Work – See definition of "Working On".

cc. Working – See definition of "Working On".

dd. Working On (Energized Electrical Conductors or Circuit Parts) – Intentionally coming in contact with energized electrical conductors or circuit parts with the hands, feet, or other body parts, with tools, probes, or with test equipment, regardless of the personal protective equipment (PPE) a person is wearing. There are two categories of "working on": "Diagnostics" ("Testing") and "Repair" (see definitions).

8. ACRONYMS

a. ac – Alternating Current

b. AHJ – Authority Having Jurisdiction.

c. EEWP – Energized Electrical Work Permit

d. dc – Direct Current

e. ESE – Electrical Safety Engineer

f. LOTO – Lockout/Tagout

g. NFPA – National Fire Protection Association

h. OU – Organizational Unit

i. OSHA – Occupational Safety and Health Administration

j. OSHE – Office of Safety, Health, and Environment

k. PPE – Personal Protective Equipment

l. R&D – Research and Development

9. RESPONSIBILITIES

For responsibilities applicable to all NIST OSH Suborders, see the "Responsibilities" section of NIST O 7101.00.

a. OU Directors are responsible for:

(1) Ensuring that the requirements of this notice are met in their respective OUs; and

(2) Authorizing EEWPs.

b. OU Line Management is responsible for:

(1) Authorizing, in accordance with OU procedures, energized electrical work not requiring EEWPs.

c. Those Responsible for Outside Service Providers Performing Energized Electrical Work are responsible for:

(1) Ensuring that NIST employees and associates are prohibited access to area(s) in which energized electrical work is taking place until they have been informed of the hazards and of the measures necessary to avoid exposure.

d. Competent Persons are responsible for:

(1) The safety of, and safety procedures related to, custom or special equipment associated with laboratory or R&D activities.

e. OSHE ESE is responsible for:

(1) Approving EEWPs;

(2) Participating in (or designating another individual to participate in) investigations of safety incidents involving electric shocks or arc flashes;

(3) Recommending to the AHJ interpretations of the applicable codes/standards, deciding on the approval of equipment and materials, and granting the *special permission* contemplated in some of the rules; and

(4) Recommending to the AHJ the approval of individuals as competent persons.

f. AHJ is responsible for:

(1) Making interpretations of the applicable codes/standards, deciding on the approval of equipment and materials, and granting the special permission contemplated in some of the rules, i.e., waiving specific requirements in the codes/standards or permitting alternative methods where it is assured that equivalent objectives can be achieved by establishing and maintaining effective safety;

(2) Approving individuals as competent persons; and

(3) Maintaining a list of competent persons.

10. AUTHORITIES

Authorities common to all NIST OSH suborders can be found in the "Authorities" section of NIST O 7101.00. Authorities specific to this suborder are:

a. OU Directors:

(1) To delegate to OU Deputy Directors and Division Chiefs (or equivalent) the authority to authorize EEWPs on their behalf.

b. AHJ:

(1) To delegate to the OSHE ESE the authority to carry out the AHJ responsibilities listed above as they apply to this Notice.

11. DIRECTIVE OWNER

Chief Safety Officer

12. APPENDICES

A. Revision History

B. Approach Boundaries to Energized Electrical Conductors or Circuit Parts for Shock Protection for Alternating-Current Systems

C. Approach Boundaries to Energized Electrical Conductors or Circuit Parts for Shock Protection, Direct-Current Voltage Systems

D. Arc Flash Hazard Identification Table

E. Arc-Flash Hazard PPE Categories for Alternating Current (ac) Systems

F. Arc-Flash Hazard PPE Categories for Direct Current (dc) Systems

G. PPE Categories

H. NIST-380A Form: Energized Electrical Work Permit (EEWP) Short Form

I. NIST-380 Form: Energized Electrical Work Permit (EEWP)

J. Electrical Safety Label Format

Appendix A. Revision History

Revision	Date	Responsible Person	Description of Change
None	10/21/2015	Monroe Charlton	None – Initial document

Appendix B. Approach Boundaries to Energized Electrical Conductors or Circuit Parts for Shock Protection for Alternating-Current Systems (All dimensions are distance from energized electrical conductor or circuit part to employee).
(2015 NFPA 70E Table 130.4(D)(a))

(1)	(2)	(3)	(4)
	Limited Approach Boundaries		Restricted Approach Boundary; Includes Inadvertent Movement Adder
Nominal System Voltage Range, Phase to Phase	Exposed Movable Conductor	Exposed Fixed Circuit Part	
<50 V	Not specified	Not specified	Not specified
50 V–150 V	3.0 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	Avoid contact
151 V–750 V	3.0 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	0.3 m (1 ft 0 in.)
751 V–15 kV	3.0 m (10 ft 0 in.)	1.5 m (5 ft 0 in.)	0.7 m (2 ft 2 in.)
15.1 kV–36 kV	3.0 m (10 ft 0 in.)	1.8 m (6 ft 0 in.)	0.8 m (2 ft 7 in.)
36.1 kV–46 kV	3.0 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	0.8 m (2 ft 9 in.)
46.1 kV–72.5 kV	3.0 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	1.0 m (3 ft 3 in.)
72.6 kV–121 kV	3.3 m (10 ft 8 in.)	2.5 m (8 ft 0 in.)	1.0 m (3 ft 4 in.)
138 kV–145 kV	3.4 m (11 ft 0 in.)	3.0 m (10 ft 0 in.)	1.2 m (3 ft 10 in.)
161 kV–169 kV	3.6 m (11 ft 8 in.)	3.6 m (11 ft 8 in.)	1.3 m (4 ft 3 in.)
230 kV–242 kV	4.0 m (13 ft 0 in.)	4.0 m (13 ft 0 in.)	1.7 m (5 ft 8 in.)
345 kV–362 kV	4.7 m (15 ft 4 in.)	4.7 m (15 ft 4 in.)	2.8 m (9 ft 2 in.)
500 kV–550 kV	5.8 m (19 ft 0 in.)	5.8 m (19 ft 0 in.)	3.6 m (11 ft 10 in.)
765 kV–800 kV	7.2 m (23 ft 9 in.)	7.2 m (23 ft 9 in.)	4.9 m (15 ft 11 in.)

Note (1): For arc flash boundary, see 130.5(A).

Note (2): All dimensions are distance from exposed energized electrical conductors or circuit part to employee.

a For single-phase systems above 250V, select the range that is equal to the system's maximum phase-to- ground voltage multiplied by 1.732.

b See definition in Article 100 and text in 130.4(D)(2) and Informative Annex C for elaboration.

c *Exposed movable conductors* describes a condition in which the distance between the conductor and a person is not under the control of the person. The term is normally applied to overhead line conductors supported by poles.

d This includes circuits where the exposure does not exceed 120V.

Appendix C. Approach Boundaries to Energized Electrical Conductors or Circuit Parts for Shock Protection, Direct-Current Voltage Systems (2015 NFPA 70E Table 130.4(D)(b))

(1)	(2)	(3)	(4)
	Limited Approach Boundaries		Restricted Approach Boundary; Includes Inadvertent Movement Adder
Nominal Potential Difference	Exposed Movable Conductor	Exposed Fixed Circuit Part	
<100 V	Not specified	Not specified	Not specified
100 V–300 V	3.0 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	Avoid contact
301 V–1 kV	3.0 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	0.3 m (1 ft 0 in.)
1.1 kV–5 kV	3.0 m (10 ft 0 in.)	1.5 m (5 ft 0 in.)	0.5 m (1 ft 5 in.)
5 kV–15 kV	3.0 m (10 ft 0 in.)	1.5 m (5 ft 0 in.)	0.7 m (2 ft 2 in.)
15.1 kV–45 kV	3.0 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	0.8 m (2 ft 9 in.)
45.1 kV– 75 kV	3.0 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	1.0 m (3 ft 2 in.)
75.1 kV–150 kV	3.3 m (10 ft 8 in.)	3.0 m (10 ft 0 in.)	1.2 m (4 ft 0 in.)
150.1 kV–250 kV	3.6 m (11 ft 8 in.)	3.6 m (11 ft 8 in.)	1.6 m (5 ft 3 in.)
250.1 kV–500 kV	6.0 m (20 ft 0 in.)	6.0 m (20 ft 0 in.)	3.5 m (11 ft 6 in.)
500.1 kV–800 kV	8.0 m (26 ft 0 in.)	8.0 m (26 ft 0 in.)	5.0 m (16 ft 5 in.)

Note: All dimensions are distance from exposed energized electrical conductors or circuit parts to worker.

* Exposed movable conductor describes a condition in which the distance between the conductor and a person is not under the control of the person. The term is normally applied to overhead line conductors supported by poles.

Appendix D. Arc Flash Hazard Identification Table
(2015 NFPA 70E Table 130.7(C)(15)(A)(a))

Task	Equipment Condition*	Arc Flash PPE Required
Reading a panel meter while operating a meter switch	Any	No
Normal operation of a circuit breaker (CB), switch, contactor, or starter	All of the following: The equipment is properly installed The equipment is properly maintained All equipment doors are closed and secured All equipment covers are in place and secured There is no evidence of impending failure	No
	One or more of the following: The equipment is not properly installed The equipment is not properly maintained Equipment doors are open or not secured Equipment covers are off or not secured There is evidence of impending failure	Yes
For ac systems: Work on energized electrical conductors and circuit parts, including voltage testing	Any	Yes
For dc systems: Work on energized electrical conductors and circuit parts of series-connected battery cells, including voltage testing	Any	Yes
Voltage testing on individual battery cells or individual multi-cell units	All of the following: The equipment is properly installed The equipment is properly maintained Covers for all other equipment are in place and secured There is no evidence of impending failure	No
	One or more of the following: The equipment is not properly installed The equipment is not properly maintained Equipment doors are open or not secured Equipment covers are off or not secured There is evidence of impending failure	Yes
Removal or installation of CBs or switches	Any	Yes

Appendix D. Arc Flash Hazard Identification Table
(2015 NFPA 70E Table 130.7(C)(15)(A)(a))

Task	Equipment Condition*	Arc Flash PPE Required
Removal or installation of covers for equipment such as wireways, junction boxes, and cable trays that does not expose bare energized electrical conductors and circuit parts	All of the following: The equipment is properly installed The equipment is properly maintained There is no evidence of impending failure	No
	Any of the following: The equipment is not properly installed The equipment is not properly maintained There is evidence of impending failure	Yes
Removal of bolted covers (to expose bare energized electrical conductors and circuit parts). For dc systems, this includes bolted covers, such as battery terminal covers.	Any	Yes
Removal of battery intercell connector covers	All of the following: The equipment is properly installed. The equipment is properly maintained Covers for all other equipment are in place and secured There is no evidence of impending failure	No
	One or more of the following: The equipment is not properly installed The equipment is not properly maintained Equipment doors are open or not secured Equipment covers are off or not secured There is evidence of impending failure	Yes

Appendix D. Arc Flash Hazard Identification Table
(2015 NFPA 70E Table 130.7(C)(15)(A)(a))

Task	Equipment Condition*	Arc Flash PPE Required
Opening hinged door(s) or cover(s) (to expose bare energized electrical conductors and circuit parts)	Any	Yes
Perform infrared thermography and other noncontact inspections outside the restricted approach boundary. This activity does not include opening of doors or covers.	Any	No
Application of temporary protective grounding equipment after voltage test	Any	Yes
Work on control circuits with exposed energized electrical conductors and circuit parts, 120 volts or below without any other exposed energized equipment over 120 V including opening of hinged covers to gain access	Any	No
Work on control circuits with exposed energized electrical conductors and circuit parts, greater than 120 V	Any	Yes
Insertion or removal of individual starter buckets from motor control center (MCC)	Any	Yes
Insertion or removal (racking) of CBs or starters from cubicles, doors open or closed	Any	Yes
Insertion or removal of plug-in devices into or from busways	Any	Yes
Insulated cable examination with no manipulation of cable	Any	No
Insulated cable examination with manipulation of cable	Any	Yes
Work on exposed energized electrical conductors and circuit parts of equipment directly supplied by a panelboard or motor control center	Any	Yes
Insertion and removal of revenue meters (kW-hour, at primary voltage and current)	Any	Yes
For dc systems, insertion or removal of individual cells or multi-cell units of a battery system in an enclosure	Any	Yes

Appendix D. Arc Flash Hazard Identification Table
(2015 NFPA 70E Table 130.7(C)(15)(A)(a))

Task	Equipment Condition*	Arc Flash PPE Required
For dc systems, insertion or removal of individual cells or multi-cell units of a battery system in an open rack	Any	No
For dc systems, maintenance on a single cell of a battery system or multi-cell units in an open rack	Any	No
For dc systems, work on exposed energized electrical conductors and circuit parts of utilization equipment directly supplied by a dc source	Any	Yes
Arc-resistant switchgear Type 1 or 2 (for clearing times of <0.5 sec with a prospective fault current not to exceed the arc-resistant rating of the equipment) and metal enclosed interrupter switchgear, fused or unfused of arc resistant type construction, tested in accordance with IEEE C37.20.7: •Insertion or removal (racking) of CBs from cubicles •Insertion or removal (racking) of ground and test device •Insertion or removal (racking) of voltage transformers on or off the bus	All of the following: The equipment is properly installed The equipment is properly maintained All equipment doors are closed and secured All equipment covers are in place and secured There is no evidence of impending failure	No
	One or more of the following: The equipment is not properly installed The equipment is not properly maintained Equipment doors are open or not secured Equipment covers are off or not secured There is evidence of impending failure	Yes
Opening voltage transformer or control power transformer compartments	Any	Yes
Outdoor disconnect switch operation (hookstick operated) at 1 kV through 15 kV	Any	Yes
Outdoor disconnect switch operation (gang-operated, from grade) at 1 kV through 15 kV	Any	Yes

Note: Hazard identification is one component of risk assessment. Risk assessment involves a determination of the likelihood of occurrence of an incident, resulting from a hazard that could cause injury or damage to health. The assessment of the likelihood of occurrence contained in this table does not cover every possible condition or situation. Where this table indicates that arc flash PPE is not required, an arc flash is not likely to occur

Appendix E. Arc-Flash Hazard PPE Categories for Alternating Current (ac) Systems (2015 NFPA 70E Table 130.7(C)(15)(B))

Equipment	Arc Flash PPE Category	Arc-Flash Boundary
Panelboards or other equipment rated 240 V and below Parameters: Maximum of 25 kA short-circuit current available; maximum of 0.03 sec (2 cycles) fault clearing time; working distance 455 mm (18 in.)	1	485 mm (19 in.)
Panelboards or other equipment rated >240 V and up to 600 V Parameters: Maximum of 25 kA short-circuit current available; maximum of 0.03 sec (2 cycles) fault clearing time; working distance 455 mm (18 in.)	2	900 mm (3 ft)
600-V class motor control centers (MCCs) Parameters: Maximum of 65 kA short-circuit current available; maximum of 0.03 sec (2 cycles) fault clearing time; working distance 455 mm (18 in.)	2	1.5 m (5 ft)
600-V class motor control centers (MCCs) Parameters: Maximum of 42 kA short-circuit current available; maximum of 0.33 sec (20 cycles) fault clearing time; working distance 455 mm (18 in.)	4	4.3 m (14 ft)
600-V class switchgear (with power circuit breakers or fused switches) and 600 V class switchboards Parameters: Maximum of 35 kA short-circuit current available; maximum of up to 0.5 sec (30 cycles) fault clearing time; working distance 455 mm (18 in.)	4	6 m (20
Other 600-V class (277 V through 600 V, nominal) equipment Parameters: Maximum of 65 kA short circuit current available; maximum of 0.03 sec (2 cycles) fault clearing time; working distance 455 mm (18 in.)	2	1.5 m (5 ft)
NEMA E2 (fused contactor) motor starters, 2.3 kV through 7.2 kV Parameters: Maximum of 35 kA short-circuit current available; maximum of up to 0.24 sec (15 cycles) fault clearing time; working distance 910 mm (36 in.)	4	12 m (40 ft)
Metal-clad switchgear, 1 kV through 15 kV Parameters: Maximum of 35 kA short-circuit current available; maximum of up to 0.24 sec (15 cycles) fault clearing time; working distance 910 mm (36 in.)	4	12 m (40 ft)
Arc-resistant switchgear Type 1 or 2 [for clearing times of < 0.5 sec (30 cycles) with a perspective fault current not to exceed the arc-resistant rating of the equipment], and metal-enclosed interrupter switchgear, fused or unfused of arc-resistant-type construction, tested in accordance with IEEE C37.20.7, 1 kV through 15 kV	N/A (doors closed)	N/A (doors closed)
Parameters: Maximum of 35 kA short-circuit current available; maximum of up to 0.24 sec (15 cycles) fault clearing time; working distance 910 mm (36 in.)	4 (doors open)	12 m (40 ft)
Other equipment 1 kV through 15 kV Parameters: Maximum of 35 kA short-circuit current available; maximum of up to 0.24 sec (15 cycles) fault clearing time; working distance 910 mm (36 in.)	4	12 m (40 ft)

Appendix F. Arc-Flash Hazard PPE Categories for Direct Current (dc) Systems (2015 NFPA 70E Table 130.7(C)(15)(B))

Equipment	Arc Flash PPE Category	Arc-Flash Boundary
Storage batteries, dc switchboards, and other dc supply sources 100 V > Voltage < 250 V Parameters: Voltage: 250 V Maximum arc duration and working distance: 2 sec @ 455 mm (18 in.)		
Short-circuit current < 4 kA	1	900 mm (3 ft)
4 kA ≤ short-circuit current < 7 kA	2	1.2 m (4 ft)
7 kA ≤ short-circuit current < 15 kA	3	1.8 m (6 ft)
Storage batteries, dc switchboards, and other dc supply sources 250 V ≤ Voltage ≤ 600 V Parameters: Voltage: 600 V Maximum arc duration and working distance: 2 sec @ 455 mm (18 in.)		
Short-circuit current 1.5 kA	1	900 mm (3 ft)
1.5 kA ≤ short-circuit current < 3 kA	2	1.2 m (4 ft)
3 kA ≤ short-circuit current < 7 kA	3	1.8 m (6 ft.)
7 kA ≤ short-circuit current < 10 kA	4	2.5 m (8 ft)

Note: Apparel that can be expected to be exposed to electrolyte must meet both of the following conditions:

(1) Be evaluated for electrolyte protection in accordance with ASTM F1296, *Standard Guide for Evaluating Chemical Protective Clothing*

(2) Be arc-rated in accordance with ASTM F1891, *Standard Specification for Arc Rated and Flame Resistant Rainwear*, or equivalent

Appendix G. Table 130.7(C)(16) Personal Protective Equipment (PPE)

PPE Category	PPE
1	Arc-Rated Clothing, Minimum Arc Rating of 4 cal/cm2 (see Note 1)
	Arc-rated long-sleeve shirt and pants or arc-rated coverall
	Arc-rated face shield (see Note 2) or arc flash suit hood
	Arc-rated jacket, parka, rainwear, or hard hat liner (AN)
	Protective Equipment
	Hard hat
	Safety glasses or safety goggles (SR)
	Hearing protection (ear canal inserts)
	Heavy duty leather gloves (see Note 3)
	Leather footwear (AN)
2	Arc-Rated Clothing, Minimum Arc Rating of 8 cal/cm2 (see Note 1)
	Arc-rated long-sleeve shirt and pants or arc-rated coverall
	Arc-rated flash suit hood or arc-rated face shield (see Note 2) and arc-rated balaclava
	Arc-rated jacket, parka, rainwear, or hard hat liner (AN)
	Protective Equipment
	Hard hat
	Safety glasses or safety goggles (SR)
	Hearing protection (ear canal inserts)
	Heavy duty leather gloves (see Note 3)
	Leather footwear
3	Arc-Rated Clothing Selected so That the System Arc Rating Meets the Required Minimum Arc Rating of 25 cal/cm2 (see Note 1)
	Arc-rated long-sleeve shirt (AR)
	Arc-rated pants (AR)
	Arc-rated coverall (AR)
	Arc-rated arc flash suit jacket (AR)
	Arc-rated arc flash suit pants (AR)
	Arc-rated arc flash suit hood
	Arc-rated gloves (see Note 1)
	Arc-rated jacket, parka, rainwear, or hard hat liner (AN)
	Protective Equipment
	Hard hat
	Safety glasses or safety goggles (SR)
	Hearing protection (ear canal inserts)
	Leather footwear
4	Arc-Rated Clothing Selected so That the System Arc Rating Meets the Required Minimum Arc Rating of 40 cal/cm2 (see Note 1)
	Arc-rated long-sleeve shirt (AR)
	Arc-rated pants (AR)
	Arc-rated coverall (AR)

Appendix G. Table 130.7(C)(16) Personal Protective Equipment (PPE)

	Arc-rated arc flash suit jacket (AR)
	Arc-rated arc flash suit pants (AR)
	Arc-rated arc flash suit hood
	Arc-rated gloves (see Note 1)
	Arc-rated jacket, parka, rainwear, or hard hat liner (AN)
	Protective Equipment
	Hard hat
	Safety glasses or safety goggles (SR)
	Hearing protection (ear canal inserts)
	Leather footwear
	AN: as needed (optional). AR: as required. SR: selection required.
Notes:	(1) *Arc rating* is defined in Article 100.
	(2) Face shields are to have wrap-around guarding to protect not only the face but also the forehead, ears, and neck, or, alternatively, an arc-rated arc flash suit hood is required to be worn.
	(3) If rubber insulating gloves with leather protectors are used, additional leather or arc-rated gloves are not required. The combination of rubber insulating gloves with leather protectors satisfies the arc flash protection requirement.

Appendix H. NIST-380A: Energized Electrical Work Permit (EEWP) Short Form

NIST-380A
(9-2015)
NFPA 70E Article 130.2(B)

U.S. DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

ENERGIZED ELECTRICAL WORK PERMIT SHORT FORM

A. WORK ORDER DETAIL

Work Order Number	Building Number	Building/Area	Date of Request

Electrical Equipment and/or Circuit Description

Task Description

B. JUSTIFICATION FOR ENERGIZED WORK

☐ De-energizing the equipment or circuit introduces additional hazards; introduces increased risk, or could cause significant property damage or loss of critical data

Explain:

☐ De-energizing the equipment or circuit is infeasible (not just inconvenient) due to equipment design or operational limitations

Explain:

☐ An outage was requested and denied. Printed Name/Title _____ Signature/date _____

C. REQUESTOR

Name & Title (Print)	(Signature)

D. QUALIFIED PERSON

Name & Title (Print)	(Signature)

E. REQUESTOR SUPERVISOR/MANAGER

Name & Title (Print)	(Signature)

NIST-380A (9-2015)

Total Number of Pages _____

Appendix H. NIST-380A: Energized Electrical Work Permit (EEWP) Short Form

ENERGIZED ELECTRICAL WORK PERMIT SHORT FORM

F. HAZARD ANALYSIS (SECTION REQUIRED FOR BOTH ON OR NEAR EXPOSED ENERGIZED PARTS)

1. Maximum exposure in Volts _____ Maximum Amperage kA _____ Fault Clear Time _____ (cycles)

2. Energized Exposure Hazard:
   Working on or near:
   - ☐ Bare Bus
   - ☐ Bare conductor
   - ☐ Open circuit(s)
   - ☐ Open Terminals
   - ☐ Panel boards
   - ☐ Switch boards
   - ☐ NEMA E2 Motor Starters
   - ☐ Metal Clad Switch gear
   - ☐ Confined Space
   - ☐ Energized Feeders List: _____

   Other *(List)*:

3. Method of analysis: NFPA 70E Tables ☐ Calculations ☐

4. Shock Hazard Analysis:
   Limited Approach Boundary _____ft_____ in Restricted Approach Boundary _____ft _____in

5. Flash Hazard Analysis:
   Flash Protection Boundary _____ft_____ in Incident Energy Value _____ cal/cm² at _____ ft _____in Working Distance

6. PPE Category: 1 ☐ 2 ☐ 3 ☐ 4 ☐

7. PPE Minimum FR Rating: _____ cal/cm²

8. Required PPE & Tools:
   - ☐ V Rated Gloves
   - ☐ V Rated Tools
   - ☐ Face Shield
   - ☐ Leather Shoes
   - ☐ FR Shirt
   - ☐ FR Pants
   - ☐ Leather Gloves
   - ☐ Flash Suit
   - ☐ Hard Hat
   - ☐ Hearing Protection (Ear Plugs, Muffs or Both)
   - ☐ Coveralls
   - ☐ Flash Hood

9. Is work required to be performed in area classified as a "Confined Space"? Yes ☐ No ☐

10. If manhole work, can the work be performed at least 18" from energized cables or splices? Yes ☐ No ☐

11. Engineering/Administrative Controls Planned to Reduce/Eliminate Exposure to Energized Equipment:
    - Put Protective Relays in Maintenance Settings ☐
    - Insulating Blankets ☐ If checked, provide details below or on an attached diagram (required)
    - Arc Suppression Blankets ☐ If checked, provide details below or on an attached diagram (required)
    - Other Controls ☐ If checked, provide details below or on an attached diagram (required)

12. Additional controls/comments/means to restrict access

13. Engineering Hazard Analysis completed by:

PRINTED NAME _____ SIGNATURE _____ DATE _____

NIST-380A (9-2015) Page 2

Appendix H. NIST-380A: Energized Electrical Work Permit (EEWP) Short Form

ENERGIZED ELECTRICAL WORK PERMIT SHORT FORM

G. OSHE ELECTRICAL SAFETY ENGINEER (ESE) OR DESIGNATED REPRESENTATIVE REVIEW & APPROVAL		
☐ Approved ☐ Disapproved		
Name & Title (Print)	(Signature)	Date
Comments:		

H. ENERGIZED ELECTRICAL WORK PERMIT AUTHORIZATION		
☐ Approved ☐ Disapproved		
(a) DIRECTOR or DESIGNATED REPRESENTATIVE (Title)	(Signature)	Date
Comments:		

I. ATTACHMENTS	
Number Pages	Attachment Title

J. NOTES

NIST-380A (9-2015) Page 3

Appendix I. NIST-380: Energized Electrical Work Permit (EEWP)

NIST-380
(9-2015)
NFPA 70E Article 130.2(B)

U.S. DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

ENERGIZED ELECTRICAL WORK PERMIT

A. WORK ORDER DETAIL

Work Order Number	Building Number	Building/Area	Date of Request

Electrical Equipment and/or Circuit Description

Task Description:

B. JUSTIFICATION FOR ENERGIZED WORK

☐ De-energizing the equipment or circuit introduces additional hazards; introduces increased risk, or could cause significant property damage or loss of critical data

Explain:

☐ De-energizing the equipment or circuit is infeasible (not just inconvenient) due to equipment design or operational limitations

Explain:

☐ An outage was requested and denied Printed Name/Title: _____ Signature/Date: _____

C. REQUESTOR

Name & Title (Print)	(Signature)

D. QUALIFIED PERSON

Name & Title (Print)	(Signature)

E. REQUESTOR SUPERVISOR/MANAGER

Name & Title (Print)	(Signature)

NIST-380 (9-2015) Total Number of Pages _____

Appendix I. NIST-380: Energized Electrical Work Permit (EEWP)

ENERGIZED ELECTRICAL WORK PERMIT

F. HAZARD ANALYSIS (SECTION REQUIRED FOR BOTH ON OR NEAR EXPOSED ENERGIZED PARTS)

1. Maximum exposure in Volts _____ Maximum Amperage kA _____ Fault Clear Time _____ (cycles)

2. Energized Exposure Hazard:
   Working on or near:
   - ☐ Bare Bus
   - ☐ Bare conductor
   - ☐ Open circuit(s)
   - ☐ Open Terminals
   - ☐ Panel boards
   - ☐ Switch boards
   - ☐ NEMA E2 Motor Starters
   - ☐ Metal Clad Switch gear
   - ☐ Confined Space
   - ☐ Energized Feeders

   List: _____

   Other *(List)*:

3. Method of analysis: NFPA 70E Tables ☐ Calculations ☐

4. Shock Hazard Analysis:

   Limited Approach Boundary _____ft_____ in Restricted Approach Boundary _____ft _____in

5. Flash Hazard Analysis:

   Flash Protection Boundary _____ft_____ in Incident Energy Value _____ cal/cm^2 at _____ ft _____in Working Distance

6. PPE Category: 1 ☐ 2 ☐ 3 ☐ 4 ☐

7. PPE Minimum FR Rating: _____ cal/cm^2

8. Required PPE & Tools:
   - ☐ V Rated Gloves
   - ☐ V Rated Tools
   - ☐ Face Shield
   - ☐ Leather Shoes
   - ☐ FR Shirt
   - ☐ FR Pants
   - ☐ Leather Gloves
   - ☐ Flash Suit
   - ☐ Hard Hat
   - ☐ Hearing Protection (Ear Plugs, Muffs or Both)
   - ☐ Coveralls
   - ☐ Flash Hood

9. Is work required to be performed in area classified as a "Confined Space"? Yes ☐ No ☐

10. If manhole work, can the work be performed at least 18" from energized cables or splices? Yes ☐ No ☐

11. Engineering/Administrative Controls Planned to Reduce/Eliminate Exposure to Energized Equipment:
    Put Protective Relays in Maintenance Settings ☐
    - Insulating Blankets ☐ If checked, provide details below or on an attached diagram (required)
    - Arc Suppression Blankets ☐ If checked, provide details below or on an attached diagram (required)
    - Other Controls ☐ If checked, provide details below or on an attached diagram (required)

12. Additional controls/comments/means to restrict access

13. Engineering Hazard Analysis completed by:

    PRINTED NAME _____ SIGNATURE _____ DATE _____

NIST-380 (9-2015) Page 2

Appendix I. NIST-380: Energized Electrical Work Permit (EEWP)

ENERGIZED ELECTRICAL WORK PERMIT

G. OSHE ELECTRICAL SAFETY ENGINEER (ESE) OR DESIGNATED REPRESENTATIVE REVIEW & APPROVAL

☐ Approved ☐ Disapproved

Name & Title (Print)	(Signature)	Date

Comments:

H. ENERGIZED ELECTRICAL WORK PERMIT AUTHORIZATION

☐ Approved ☐ Disapproved

OU DIRECTOR or DESIGNATED REPRESENTATIVE / TITLE *(Print)*	*(Signature)*	Date

Comments:

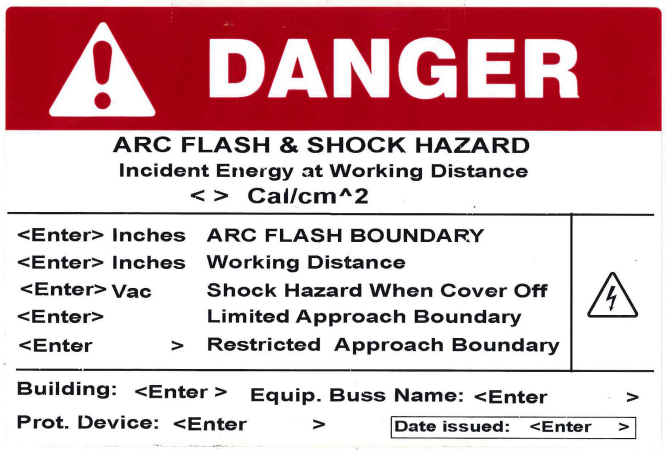
I. ATTACHMENTS

Number	Pages	Attachment Title

J. NOTES

NIST-380 (9-2015) Page 3

Appendix J. Electrical Safety Label Format



Fire and Life Safety

NIST O 7401.00
Approval Date: 05/17/2021
Effective Date: 02/03/2017[1]

PURPOSE

The purpose of this directive is to delineate the requirements, roles, responsibilities, and authorities necessary for the full and effective implementation of NIST Policy for Fire and Life Safety (FLS) – NIST P 7400.00.

APPLICABILITY

This order applies to NIST employees and covered associates at all sites for which NIST has jurisdiction, custody, and control. NIST employees and covered associates working at locations owned and operated by other organizations shall abide by the fire and life safety requirements of the facility owner and local jurisdiction. In the absence of local requirements, staff shall abide by NIST requirements to the extent practical and feasible as determined by the NIST AHJ.

LEGAL AUTHORITY AND REFERENCES

- 15 United States Code (U.S.C) §2227, Federal Fire Prevention and Control Act of 1974, as amended
- 40 U.S.C. §3312, Compliance with nationally recognized codes
- 29 Code of Federal Regulations (CFR) Part 1910. Subpart L, Fire Protection
- 29 CFR Part 1926, Subpart F, Fire Protection and Prevention
- Office of Personnel Management Qualification Standard for the Fire Protection Engineering Series, 0804
- NIST Policy 7400.00: *Fire and Life Safety*
- International Building Code (IBC)
- International Existing Building Code (IEBC)
- International Fire Code (IFC)
- International Mechanical Code (IMC)

[1] For revision history, see Appendix A

REQUIREMENTS

The FLS program shall address, at minimum, the following areas:

- Design and construction of fire protection and life safety systems in new and existing buildings (NIST S 7401.01);
- Inspection, testing, and maintenance (ITM) of fire protection and life safety systems (NIST S 7401.02);
- Fire protection and life safety system impairments (NIST S 7401.03); and
- Fire prevention during welding, cutting, and other hot works (NIST S 7401.04).

The NIST Authority Having Jurisdiction

- The NIST Chief Safety Officer (CSO) shall designate, in writing, a NIST Authority Having Jurisdiction (AHJ), *i.e.*, NIST's Code Official, to ensure compliance with the fire and life safety provisions within the adopted codes and standards set forth in the FLS suborders.
- The NIST AHJ shall be a Fire Protection Engineer (FPE) who meets the minimum qualifications set forth by the Office of Personnel Management Qualification Standard for the Fire Protection Engineering Series, 0804.

Code Adoption

- U.S.C. § 3312 (b) BUILDING CODES states that "Each building constructed or altered by the General Services Administration or any other federal agency shall be constructed or altered, to the maximum extent feasible as determined by the Administrator or the head of the federal agency, in compliance with one of the nationally recognized model building codes and with other applicable nationally recognized codes, including electrical codes, fire and life safety codes, and plumbing codes, as the Administrator decides is appropriate. In carrying out this subsection, the Administrator or the head of the federal agency shall use the latest edition of the nationally recognized codes."
    - The NIST Director, *i.e.*, "Administrator or the head of the federal agency", through implementation of NIST P 7400.00, *Fire and Life Safety Policy* requires compliance with this Order.
    - The "latest edition" of the code shall be that edition which has been published for circulation.

- Consistent with the requirements of U.S.C. § 3312 (b), NIST adopts the following codes and standards, as well as additional requirements set forth within the FLS suborders, as minimum requirements for fire and life safety on all sites owned and operated by NIST.
    - The latest edition of the International Codes (or I-Codes) published by the International Code Council (ICC) and latest edition of the referenced standards within the I-Codes.
    - The latest edition of the National Fire Protection Association (NFPA) codes and the latest edition of the referenced standards within the NFPA codes.

- Where a conflict exists between nationally recognized codes and standards, absent any other determination by the NIST AHJ, the most stringent requirement(s) shall apply.

- For specific information regarding applicable code editions during the design and construction process, see NIST S 7401.01 *Fire Protection & Life Safety for Design and Construction*.

Deviation from a fire and life safety code or standard shall require a Request for Variance (RFV)

- All requests for variance (RFV) to fire and life safety codes or standards shall be submitted by a Division Chief or equivalent, or a higher-level manager, to the NIST AHJ after consultation with the local OSHE Program Manager (PM) for the applicable program.

- In some cases, the OSHE PM in consultation with the NIST AHJ may determine that an exception exists which negates the need for a variance. The NIST AHJ shall document this exception.

- The request for a variance (RFV) shall:
    - Be consistent with the general intent and purpose of the prescriptive code;
    - Not be detrimental to public health, safety, and general welfare;
    - Demonstrate at least one of the following:
        - The code or standard cannot be technically executed; or
        - Execution of the code or standard will increase a hazard or create a new hazard.

- The RFV shall include (in accordance with NIST-384 form):
    - A written justification that includes:
        - A detailed description of the issue;
        - The code or standard for which the variance is requested;
        - The nature and extent of the relief requested;

120 ▪ The architectural and engineering plan(s) of the structure, equipment, property or
121 process (where applicable); and
122 ▪ A detailed explanation of how the variance, if approved, will provide a degree of
123 safety substantially equivalent to that required by the prescriptive code for which
124 the variance is requested;
125 o A hazard analysis including the interpolation or extension of previously tested
126 systems or methods and information on the elements being evaluated and the
127 probable behavior of those elements under fire conditions (where applicable);
128 o Alternatives considered; and
129 o Other pertinent data.
130
131 • The NIST AHJ shall provide a written response approving or disapproving the RFV[2].
132 o Approvals apply only to the specific project indicated in the RFV; prior approvals by
133 the NIST AHJ do not constitute approval for any other existing or future cases that
134 are similar.
135 o Approvals for variances may have an expiration date depending on the nature of the
136 request.
137 o All appeals of denied RFVs shall be submitted to the NIST CSO.
138
139 ▪ The appeal to the NIST CSO shall include (in accordance with NIST-385 form):
140 o The original RFV submitted to the NIST AHJ;
141 o The written response from the NIST AHJ; and
142 o Any other information requested by the NIST CSO.
143
144 • The NIST CSO shall provide a written response approving or disapproving the appeal,
145 after consulting as necessary with independent subject matter experts.[3]
146
147 • Records of variances and appeals shall be maintained by the NIST AHJ on an internal
148 drive that is accessible to OSHE staff.
149
150
151 Deviation to a NIST-specific requirement related to a fire and life safety code or standard shall
152 necessitate a Request for Waiver (RFW)
153
154 • All requests for waiver (RFW) to NIST-specific fire and life safety requirements shall be
155 submitted by a Division Chief or equivalent, or a higher-level manager, to the NIST CSO
156 after consultation with the NIST AHJ and OSHE Site PM for the applicable program.

[2] The time required for review will be determined by the complexity of the request, and the resources needed to review the request.
[3] *Ibid*.

- In some cases, the NIST AHJ and OSHE PM may determine that an exception exists which negates the need for a waiver. The NIST AHJ shall document this exception.

- The RFW shall:
  - Be consistent with the general intent and purpose of the requirement;
  - Not be detrimental to the public health, safety, and general welfare on NIST sites; and
  - Demonstrate at least one of the following:
    - The NIST-specific requirement cannot be technically executed; or
    - Execution of the NIST-specific requirement will increase a hazard or create a new hazard.

- The RFW shall include:
  - A written justification to include:
    - A detailed description of the issue;
    - The NIST-specific requirement for which the waiver is requested;
    - The nature and extent of the relief requested;
    - The architectural and engineering plan(s) of the structure, equipment, property, or process (where applicable); and
    - A detailed explanation of how the waiver, if approved, will provide a degree of safety substantially equivalent to the NIST-specific requirement for which the waiver is requested;
  - A hazard analysis including the interpolation or extension of previously tested systems or methods, and information on the elements being evaluated and the probable behavior of those elements under fire conditions (where applicable);
  - Alternatives considered; and
  - Other pertinent data.

- The NIST CSO shall provide a written response approving or disapproving the RFW[4].
  - Waivers apply only to the specific instance or project described in the RFW; waivers issued by the NIST CSO do not constitute approval for any other existing or future cases that are similar.
  - Waivers may have an expiration date depending on the nature of the request.
  - Denied waivers cannot be appealed.

- Records of waivers shall be maintained by the NIST CSO on an internal drive that is accessible to OSHE staff.

[4] The time required for review will be determined by the complexity of the request, and the resources needed to review the request.

DEFINITIONS

Acting Authority Having Jurisdiction – A qualified[5] FPE in the Office of Safety, Health, and Environment (OSHE) designated by the NIST AHJ to be temporarily assigned all authorities, duties, and obligations of the NIST AHJ during an absence of the NIST AHJ. In the event of a position vacancy, the CSO shall designate an Acting AHJ.

Appeal – A process by which a Division Chief or equivalent, or a higher-level manager, requests that the NIST CSO review a denial or rejection of an RFV by the NIST AHJ.

Associate – An individual conducting work at a NIST workplace who is not a NIST employee.

Authority Having Jurisdiction – A qualified[6] FPE in OSHE designated by the NIST CSO to enforce[7] the NIST-adopted codes and standards relevant to fire and life safety on NIST-owned and operated sites.

Compliance – Meeting or exceeding an applicable requirement(s) of a NIST adopted code(s) and/or standard(s).

Covered Associate – A NIST associate permitted to perform work at a NIST workplace and subject to NIST policies and procedures, and to the extent allowed by law and the terms of the associate's agreement. Covered associates include Foreign and Domestic Guest Researchers (including contractors who perform NIST R&D/technical work); Research Associates; Intergovernmental Agency Personnel Act assignees; Facility Users; Volunteer Students; and other federal employees who perform work at NIST workplaces.

Exception – A condition for which a requirement does not apply because the condition falls outside of the scope or intent of the requirement or because another requirement may capture the issue/concern.

Fire and Life Safety – The protection of life and property by minimizing fire and related hazards through the incorporation of and maintenance of building features, fire protection systems, and egress components, and the implementation of safe work practices.

FLS Program – A FLS suborder; all supporting suborder-specific directives, including procedures, guidance, and notices; and any associated FLS deployment tools and Organizational Unit (OU) procedures.

[5] See requirements for Office of Personnel Management Fire Protection Engineering Series 0804.
[6] *Ibid*.
[7] Nature of enforcement is dependent upon the severity of the violation, e.g. stop work, revoke permit, denial of use and occupancy.

FLS Program Manager – For a given FLS program, an OSHE staff member assigned by the NIST CSO to manage that program.

Hot Work – Work involving welding, brazing, open flame soldering, heat treating, grinding, thawing pipes, powder-driven fasteners, hot riveting, torch-applied roofing, or any other process requiring use of a spark, flame, or heat that is capable of initiating fires or explosions.

Organizational Unit – Term used herein to denote any of the following: Office of the Director; the immediate office of a NIST Associate Director; a NIST Laboratory; a NIST Extramural Program; or a NIST Chief Office.

Shall/Should/May –

- Shall (Must or Will): Indicates that the performance of an item is mandatory.
- Should: Indicates that the performance of an item is not mandatory, but the full implications of not performing that item must be understood and either justified or carefully weighed before choosing a different course.
- May: Indicates that the performance of an item is at the discretion of the individual responsible for the action.

Variance – Authorization to have an alternative means of providing an equal or greater degree of safety than that afforded by strict conformance to:

- NIST-adopted codes and standards overseen by the NIST AHJ; or
- NIST-specific requirements originating from AHJ interpretations and implementation of these same adopted codes and/or standards.

Variances do not exempt a requester from the requirement(s) and its intent[8]

Waiver – Authorization to have an alternative means of providing an equal or greater degree of safety than that afforded by strict conformance to the way NIST implements a NIST-specific requirement or regulatory requirement. Waivers do not exempt the requester from a regulatory requirement or NIST requirement, they simply permit a different means of compliance or implementation.

[8] The codes "establish the minimum requirements to provide a reasonable level of safety, public health and general welfare" to building occupants. The code allows for AHJ discretion in the interpretation of the code and implementation of "policies and procedures to clarify the application of its provisions." The code also allows for more stringent requirements to be implemented to meet the intent of the code and align with the needs of the occupants and occupancies. An individual requesting an equivalency from a more stringent NIST-specific requirement that originates from a general provision or minimum requirement in a code or standard must request a variance.

ACRONYMS

AHJ – Authority Having Jurisdiction
CFR – Code of Federal Regulations
CSO – Chief Safety Officer
FLS – Fire and Life Safety
FPE – Fire Protection Engineer
ICC – International Code Council
LOTO – Lockout/Tagout
NFPA – National Fire Protection Association
NIST – National Institute of Standards and Technology
OSHA – Occupational Safety and Health Administration
OSHE – Office of Safety, Health, and Environment
OU – Organizational Unit
RFV – Request for Variance
RFW – Request for Waiver

RESPONSIBILITIES

NIST Director

- Ensure proper allocation of resources for FLS at NIST;
- Enforce accountability for meeting NIST's FLS program requirements;
- Provide direction as necessary on significant issues involving FLS and regulatory compliance at NIST;
- Provide direction to the NIST Associate Directors, OU Directors, CSO, and NIST AHJ as necessary; and
- Ensure that employees and covered associates are not subject to restraint, interference, coercion, discrimination, or reprisal for reporting hazardous situations or participating in FLS program activities.

NIST Associate Directors

- Support the NIST Director in carrying out the Director's responsibilities with respect to FLS at NIST;
- Ensure that the requirements of NIST's FLS programs are fully implemented in their respective directorates;
- Ensure proper allocation of resources for FLS to the extent possible in their respective directorates; request additional resources as necessary;
- Enforce accountability for meeting NIST's FLS program requirements in their respective directorates; and
- Provides direction as necessary on significant issues involving FLS and regulatory compliance in their respective directorates.

Organizational Unit (OU) Directors

- Support the NIST Associate Directors in carrying out their responsibilities with respect to FLS at NIST;
- Ensure that the requirements of NIST's FLS programs are fully implemented in their respective OUs;
- Ensure proper allocation of resources for FLS to the extent possible in their respective OUs; request additional resources as necessary; and
- Ensure that their OUs work in partnership with OSHE to develop, implement, maintain, and continually improve the NIST FLS programs.

OU Division Chiefs or Equivalents, or Higher-Level Managers

- Submit requests for variances and subsequent appeals if denied; and
- Submit requests for waivers.

NIST CSO (in addition to the responsibilities for other OU Directors)

- Ensure the development, deployment, maintenance, and continual improvement of the suborders, other directives, and deployment tools necessary for the full and effective implementation of NIST P 7400.00 and this order;
- Implement mechanisms to engage the other OUs in the development, deployment, maintenance, and continual improvement of NIST's FLS programs;
- Ensure that OSHE provides high-quality services to support the implementation of NIST's FLS programs by other OUs;
- Approve changes to this order;
- Approve all FLS suborders, suborder-specific directives, and any associated deployment tools and FLS-program-required OU procedures necessary to implement this order;
- Designate an OSHE FPE to serve as the NIST AHJ;
- Designate OSHE employees to serve as FLS Program Managers for NIST's FLS programs;
- Ensure that the NIST AHJ and FLS Program Managers have the authority, resources, and training necessary to carry out their responsibilities;
- Approve or disapprove all appeals of RFVs denied by the NIST AHJ; and
- Approve or disapprove RFWs.

NIST AHJ

- Ensure NIST compliance with the requirements set forth in the 40 U.S.C. §3312 on all NIST-owned and operated sites;
- Maintain a comprehensive list of NIST-adopted codes and standards including applicable code editions;
- Provide final interpretations of the NIST-adopted codes and standards, as outline in this Order, on all NIST-owned and operated sites;

- Enforce conformance to the adopted codes and standards on all NIST-owned and operated sites;
- Enforce industry best practices when the adopted codes and standards do not address specific issues;
- Enforce the more stringent requirement(s) when the adopted codes and/or standards conflict;
- Review all proposed changes to fire and life safety systems;
- Order the correction of any deficiencies related to fire and life safety and ensure that corrective actions have been properly implemented;
- Issue Temporary Certificates of Occupancy and Certificates of Occupancy;
- Revoke Temporary Certificates of Occupancy or Certificates of Occupancy when code violations are present which cannot be immediately mitigated and present an imminent danger to building occupants;
- Approve or disapprove RFVs;
- Establish industry best practices for FLS through evaluation of techniques or methodologies employed by other federal agencies or research institutes, scientific literature or treatise, or other data or fact that provides a strong basis of opinion;
- Designate an Acting AHJ to temporarily carry out all authorities, duties, and obligations of the NIST AHJ during an absence of the NIST AHJ;
- Delegate to other qualified OSHE engineers certain authorities, as outline within the relevant suborders, to enforce compliance with NIST adopted codes and standard; and
- Determine when code exceptions exist which negate the need for a variance and document such instances.

FLS Program Managers

- Develop, deploy, and maintain their assigned programs;
- Carry out responsibilities specific to their assigned programs;
- Serve as the primary points of contact and subject matter experts for their assigned programs; and
- Ensure effective communications with management and staff on program-related issues.

DELEGATIONS OF AUTHORITY

OU Directors

- Delegate to subordinate line managers and other OU staff members, including OU/division safety personnel, the authorities necessary to carry out OU Director responsibilities, provided that such assignments and delegations are not inconsistent with other FLS directives.

NIST CSO

- Delegate to the Deputy CSO, subordinate line managers, and other OSHE employees the authorities necessary to carry out CSO responsibilities, provided that such delegations are not inconsistent with other FLS directives.

NIST AHJ

- Delegate to other qualified OSHE engineers certain authorities to enforce compliance with NIST adopted codes and standards.

DIRECTIVE OWNER

150 – Chief Safety Officer

APPENDICES

A. Revision History

404 **Appendix A**

405 **Revision History**

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Revision No.	Approval Date	Effective Date	Brief Description of Change; Rationale
0	02/03/17	02/03/17	None – Initial document
1	04/06/18	04/06/18	Modified the responsibilities of the NIST AHJ to include designating an Acting NIST AHJ during an absence of the NIST AHJ.
2	05/17/21	05/17/21	• Modified document to add requirement to use latest edition of recognized codes that has been published for circulation (per 40 U.S.C. §3312); • Modified requirements for Variance request; • Added requirements for Waiver request; • Added definitions for Variance, Waiver, and Exception; • Added responsibilities for AHJ related to changes in requirements; and • Minor editorial revisions

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Utility Outages

NIST PR 2103.06
Effective Date: 6/5/2018
Issue Date: 6/5/2018

PURPOSE

This document provides instructions to plan, minimize, consolidate, communicate, coordinate, execute and close-out any outage to a utility under the control of the Office of Facilities and Property Management (OFPM).

APPLICABILITY

This procedure applies to all personnel at NIST working on or using any utilities under the control of OFPM and provided to any NIST-controlled facilities.

SCOPE

A. This outage procedure covers the shutdown of building systems under OFPM control. Building system outages are typically required for the purposes of construction, renovation, inspection, isolation, maintenance, replacement or repairs to existing systems, subsystems or component parts thereof.

B. Systems included in these guidelines include, but are not limited to:

1. Steam and condensate
2. Domestic hot and/or cold water
3. Chilled water supply and return
4. Processed chilled water
5. Compressed air
6. Electrical
7. Heating Ventilation and Air Conditioning (HVAC)
8. Natural Gas
9. Nitrogen gas
10. Vacuum systems
11. Elevator systems
12. Heating hot water systems
13. De-ionized (DI) water systems

C. These guidelines do not apply to fire protection and life safety systems, see NIST S7401.03 Impairment of Fire Protection and Life Safety Systems (in draft).

1. Any outage or impact to fire protection and/or life safety system shall be coordinated with the Emergency Services Office (ESO) and Office of Safety, Health and Environmental (OSHE). Any impairment to fire protection and/or life safety system(s) shall be handled as indicated in NIST S 7401.03 (in draft).

D. These guidelines do not apply to isolation valves, switches or other such devices that isolate a point of service device that will result in only the loss of service of the specific piece of equipment, fixture or another device. In these cases, the primary contact must still notify all affected stakeholders of the impact of the outage.

Examples of such situations would include, but not be limited to:

1. Plumbing fixtures (sinks, toilets, showers, drinking fountains, etc.)
2. Redundant devices such as pumps, fans or other equipment that are being appropriately backed up by operational duplicate devices.
3. Individual Variable Air Volume boxes, air terminals, reheat valves, coils, radiators, fan coils, unit heaters or other HVAC devices controlling a single space.
4. Lighting and power circuits serving a single space or device, including discrete electrical devices such as occupancy sensors, light fixtures, light switches and receptacles.

REFERENCES

- NIST O 2103.00 Facilities and Site Management
- NIST O 2201.00 Emergency Management Program
- NIST PR 2201.03 Energy Contingencies
- NIST S 7401.03 Impairment of Fire Protection and Life Safety Systems (in draft)

DEFINITIONS

Access - entry or egress paths within a building.

Building Facilitator - The primary representative of the Organizational Unit (OU) and/or occupant of a building who is knowledgeable of the personnel, equipment and ongoing research in that building and acts as the Point of Contact (POC) for emergency planning and outages. This person would be assigned and trained by the Emergency Services Office. (Gaithersburg ONLY)

Building Manager - The primary POC from OFPM responsible for facilities engineering and maintenance management of building(s) and operates as the coordinator with building occupants regarding outages, modifications, repairs and service requests (Boulder ONLY).

Emergency Outage - An interruption in utility services that cannot be foreseen. Emergency outages are required when repairs must be accomplished immediately to safeguard property, research and/or occupant health.

Minor Outage - A utility outage that affects a small group of occupants or a small section of a building (e.g., less than six (6) offices or labs, exceptions decided on a case-by-case basis by the Outage Coordinator).

Major Outage - A utility outage that affects a large group of occupants (e.g., more than six (6) offices or labs) or a large section of a building (e.g., most of a floor, wing, quadrant or riser) or an entire building.

OFPM Outage Coordinator (OC) – The person who receives outage requests, approves schedules for outages and officially communicates all utility outages for OFPM.

Outage - An interruption or shutdown of a building's utility service(s) or access.

Planned Outage - An interruption in utility services which can be foreseen. Planned outages include minor, major or site outages AND any repair, renovation or installation of scientific tools with enough lead time to allow the outage to be accomplished with adequate advanced notice.

Primary Contact (PC) - The project leader or Contracting Officer Representative (COR) with overall stewardship and accountability for a utility outage. The Primary Contact (PC) is the requestor of the outage and could be a mechanic, scientist, engineer or project leader. The PC could be within any division of OFPM or outside of OFPM. This person will be responsible for oversight of interrupting the utility service.

Site Outage - Outage of all/most site utilities. Generally performed twice a year over a weekend in the Spring and in the Fall to perform necessary maintenance to site services.

Stakeholder - Individuals and groups who are involved in and/or are impacted by an outage, typically a lab user, occupant(s), Division Chief(s) or equivalents, Division Safety Representative and Building Manager or Building Facilitator.

Utility - Any utility service provided by OFPM through an outside source or manufactured in-house (gas, water, electricity, chilled water, steam, vacuum, etc.), which facilitates building and/or scientific operations.

RESPONSIBILITIES

A. Organizational Unit (OU) Building Facilitator:

1. Notify appropriate employees in their building about the upcoming utility service interruption and provide details of which utilities will be affected.
2. Identify any additional stakeholders beyond those identified by the PC during meeting to determine who will be impacted and prepare the stakeholder list.
3. Provide OFPM with feedback from staff on outage requests.

B. OFPM Building Manager:

1. As directed by the OC, take every precaution to ensure minimum interference with critical experiments and technical projects.
2. Maximum use should be made of each scheduled outage. Consider simultaneous performance of maintenance work in that outage area.
3. As directed by the OC, schedule and coordinate all planned interruptions of utility services with groups affected by outages and those wanting to interrupt the utilities.

C. OFPM Outage Coordinator:

1. The Facilities Maintenance Division Chief will fill the role of OFPM OC for their respective campus.
2. The OC may utilize other individuals to assist with managing the outages; however, this position has the ultimate responsibility for overall schedule, frequency of outages, communication and coordination of all outages.
3. Act as the primary POC for proposed schedule of utility interruptions and outages. Take primary responsibility to implement and communicate this procedure.
4. Make final decisions on dates for utility outages.
5. Make the official notifications for each outage. Outage notices will have a full description of the outage, the location and utility system(s) affected, impact to systems (especially impacts not obvious, e.g., fume hoods not working) and the anticipated duration of the outage.
6. Respond to proposed outage requests in a timely manner.
7. Ensure proper communication of changes, delays and completion of outages to Stakeholders.

D. Primary Contact (PC):

1. Plan for minimal impact to all Stakeholders and discuss such plans with the OFPM OC.
2. Present proposed outages to the OFPM OC as far in advance as possible of the dates in the table titled “Outage Notice Schedule”. Proposed outages will include utility to be shut off, date, duration and impact – what rooms, what systems and what people.
3. Identify all stakeholders affected by meeting with senior, tenant organizational unit (OU) division representative AND building facilitator or building manager. Prepare a list of stakeholders based upon input from each person and sharing of what rooms, systems and utilities will be affected.
4. Coordinate with Stakeholders after dates are approved by the OC.

5. Prepare the draft outage notice after coordination. Submit the draft notice to the OC by the dates shown in the table titled "Outage Notice Schedule".
6. Execute the outage after the schedule is approved and the outage notice has been issued by the OC.
7. Immediately notify the OC if any portion of the outage has been canceled or must be altered. Also, notify Stakeholders so they may adjust their operations.
8. Present previously unforeseen problems, delays, etc., to the OC.
9. Notify the OC of completion.

E. Stakeholder:

1. Provide the PC with information on the impact of a requested outage.

PROCEDURE FOR PLANNED OUTAGE

A. Planning Within OFPM

1. The PC will notify the OFPM OC as far in advance as possible of planned outages (see chart titled "Outage Notice Schedule" for minimum notification times).
2. The PC will provide to the OC the utility to be shut off, date, duration and impact.
3. OC will decide if this is a minor, major or site outage.
4. OC should minimize the number of outages per year in any one facility or affecting any one customer.

B. Preliminary Communication and Planning with Other OUs and Building Occupants

1. After setting the tentative outage date, the OC (or could designate to PC and/or Building Manager) will meet with appropriate Stakeholders to discuss:
    a. Impacts
    b. Preferred Scheduling
    c. Outage Duration
    d. Contingency plans to minimize disruption and protect the building systems and program operations.
        i. Alternate dates if unsuccessful on original schedule
        ii. Possibility of extending outage
        iii. Who to be called if issues arise during planned outage events
    e. Special logistics such as room access, etc.
    f. Contact information for the designated person and their availability during outage.

2. The PC will notify the building manager and building facilitator (if applicable) of all possible outages. This effort will be done to minimize the impact to the building and to consolidate outages when possible. Any changes will be brought back to the OC for possible rescheduling.

C. Official Outage Notice

1. The PC will complete the draft outage notification (see attached templates and examples) and submit to the OC for publication.
2. The OC will issue all official outage notices. Outage notifications will be emailed to affected building(s) staff and posted on the OFPM website (if available).
3. For major outages, the OC should post notices in the main lobby of impacted buildings.
4. Timeframe – outages will be planned so notifications can be sent out per the chart below:

Outage Type	Submit to Outage Coordinator	Official Notice to Site/Occupants
Minor outage	2 weeks	1 week*
Major outage	6 weeks	1 month*
Site utility outage	Min. 6 months	3 to 6 months

Outage Notice Schedule

***(Exceptions must be approved by Outage Coordinator or Chief Facilities Management Officer)**

D. Execute Outage

1. The PC shall execute the outage or inform those responsible to perform the outage.
2. If the outage is unsuccessful within allotted time (i.e., the intended scope of work could not be accomplished), the PC shall notify and/or meet with the appropriate Stakeholders to discuss problems and propose extending the outage or a rescheduled date.
3. Return to "Planning Within OFPM" step if a rescheduled date is proposed, prior to confirming with Stakeholders.

E. Follow-through (mandatory for Major Outages)

1. The PC shall notify the OC that the outage is complete and utilities are back in service.

2. The OC will send out a building notification that the outage is complete and services have been restored for any major or site outage.

F. Follow-through for minor outages. The PC shall notify stakeholders that the outage is complete and utilities are back in service.

PROCEDURE FOR EMERGENCY OUTAGES

Emergency outages are required for repairs that must be accomplished immediately to safeguard property and health. This type of outage does not allow for extensive pre-planning or coordination prior to the interruption.

A. Any responsible party may take immediate action to reduce the threat to life, health, safety, or the environment.

B. That responsible party should notify occupants in the local area, then contact the OFPM OC as soon as situation is stabilized.

C. The OC will officially notify the Stakeholders of the outage. The notification will be labeled as EMERGENCY. Typically, this should occur within minutes of outage.

D. The OC shall notify the NIST Emergency Coordinator (Emergency Services Office) in the event an outage is significant enough to impact multiple buildings.

E. A PC will be identified that will plan for repairs and eventual returning utility to service in accordance with any special instructions from Stakeholders.

F. The OC must give approval in advance of returning utility to service. The OC will contact Stakeholders to coordinate the schedule of the utility being returned to service.

G. The OC should follow through with official notification that the outage is complete and services have been restored. Inform the occupants of the current state and possible next steps.

OUTAGE NOTICE GUIDELINES

A. Template. Outage notices should follow a standard format, following the template shown in Appendix A for major outages.

B. What. Explain what will be turned off/closed/de-energized/etc. Equipment and systems may be identified, but only if the occupant needs to know.

1. Example of too much detail in impact statement: "All 120/208V power will be turned off at electric panel ***B-2*** to include breakers ***B-246, B-248, B-250***, and ***B-252***."

2. Better Impact Statement: "All electricity will be turned off to all outlets in Room ***E-XXX*** through ***E-ZZZ***. Lights will remain on."

C. When and Who. Explain when, how long, and who will turn off the service. You should put an expected time/date when service will be restored.

D. Why Now. If applicable, explain why “now” is a good time for an outage. For example, we anticipate the weather will be temperate and conducive to shutting down heat for a short time.

E. Impact. Explain how the occupants will be impacted in layman’s terms. Typically, only explain in terms that the occupant can identify with or that have meaning to them.

   1. Example of unfamiliar language in impact statement: “The modulating control valve to ***ACU-123*** will be out resulting in no steam supply to the air handling unit.”

   2. Better Impact Statement: “Temperature control will be impacted to Rooms ***E-AAA*** through ***E-BBB***.”

F. Avoid words that generate anxiety (such as "asbestos" or "contaminated") yet still be forthcoming. You can say that the work area is restricted while abatement activities are being conducted which would have the same effect.

G. Follow-up Explanation. In follow up notices, explain why something happened in addition to the cancellation notice or the rescheduling of the outage.

H. Explain Coordination and POC. Identify that coordination has occurred with the building managers/facilitators and that they agree this will have minimal impact. Give their contact information and provide the PC phone numbers to include a work cell phone number.

DIRECTIVE OWNER

190.00 – Chief Facilities Management Officer

APPENDICES

A. Template for Major Outage Notice

B. Revision History

APPENDIX A

MAJOR OUTAGE TEMPLATE/EXAMPLE

Notice: Utility or Service (e.g., Electrical) Outage Building xxx

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OFPM will have an electrical outage in Building xxx on Day, Month, Year, from start time to end time. **All utility service (in simplest terms, e.g., electrical power) will be out to room numbers AAA-BBB.** The outage is in support of the brief description of project (e.g., new electrical distribution panels being installed).

Special instructions. (e.g., It is recommended that you turn off all sensitive electrical equipment in the affected areas during the outage period.)

If you have any questions or concerns, please contact Primary Contact Name (x#### or ###-###-####).

If you have any other maintenance issues, please report them to our service desk at x6928 or submit an M-slip by following this link/email: Maintenance Service Request (M-Slip).

APPENDIX B

REVISION HISTORY

Revision	Date	Responsible Person	Description of Change
	3-5-2018	Skip Vaughn	Initial Version
Rev. .01	3/5/2018	Dan Cipra	Formatting updates
Rev. .02	5/11/2018	Tom Weister	Adjudicated OCC comments

National Institute of Standards and Technology • U.S. Department of Commerce

Control of Hazardous Energy (Lockout/Tagout)

NIST S 7101.56
Approval Date: 03/14/2018
Effective Date:[1] TBD

1. PURPOSE

This suborder establishes the safety requirements necessary to protect NIST employees and covered associates from exposure to hazardous energy during the servicing or maintenance of machines or equipment (hereafter referred to as "equipment"), and the organizational roles and responsibilities for ensuring that those requirements are met.

2. BACKGROUND

a. NIST must meet or exceed the requirements established by Occupational Safety and Health Administration in 29 Code of Federal Regulations (CFR) 1910.147, The Control of Hazardous Energy. Implementation of this suborder fulfills those requirements.

b. Work involving exposure[2] to electrical hazards (e.g. shock, arc flash) from work on, near, or with conductors or equipment in electric-utilization installations, NIST must meet or exceed the requirements established by OSHA in 29 CFR 1910.333, Selection and Use of Work Practices. Implementation of this suborder and NIST Suborder (S) 7101.64, Electrical Safety fulfills those requirements.

c. This suborder supersedes NIST Health and Safety Instruction (HSI) 21, Control of Hazardous Energy (Lockout/Tagout), June 1994.

[1] For revision history, see Appendix A.
[2] Exposed (as applied to energized electrical conductors or circuit parts) – Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to electrical conductors or circuit parts that are not suitably guarded, isolated, or insulated.

3. APPLICABILITY

a. The provisions of this suborder apply to equipment servicing and maintenance activities, conducted by NIST employees, covered associates, and non-Research-and-Development (non-R&D) contractors that could harm NIST workers if the equipment being serviced or maintained were to unexpectedly energize, start up, or release stored energy.

b. When servicing or maintenance activities are conducted exclusively by non-R&D contractors, Organizational Units (OUs) need only follow Section 6g and meet the Affected-Worker training requirements in Section 6j.

c. Applicability to Normal Production Operations.

(1) The provisions of this suborder apply to servicing and maintenance that takes place during normal production operations only when:

(a) A NIST employee or covered associate is required to remove or bypass a guard or other safety device; or

(b) A NIST employee or covered associate is required to place any part of his/her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists during an equipment operating cycle.

(2) The provisions of this suborder do not apply to minor tool changes and adjustments and other minor servicing activities that take place during normal production operations if these activities are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures, such as machine guarding, that provide effective protection.

d. For work involving exposure to electrical hazards (e.g. shock, arc flash) from work on, near, or with conductors or equipment in electric-utilization installations, the electrical LOTO requirements of NIST N 7101.64, Electrical Safety, not the LOTO requirements of this suborder, apply.

e. Where the work to be performed only involves the operation of circuit breakers or service disconnects to perform LOTO and the tasks involved do not result in exposing any electrical or electro-mechanical circuits, components, or parts, the LOTO requirements of this suborder, not the electrical LOTO requirements of NIST N 7101.64, Electrical Safety, apply, but those performing the task of operating circuit breakers or service disconnects shall be

trained and qualified to perform those tasks in accordance with the requirements of NIST N 7101.64, Electrical Safety.

f. Exclusions. The provisions of this suborder do NOT apply to:

(1) The act of taking equipment out of service provided no hazards to personnel exist.

(2) Work on cord- and plug-connected electrical equipment that meets ALL of the following conditions:

(a) The equipment has a single energy source;

(b) All hazardous energy to which workers could be exposed can be controlled by unplugging the equipment; and

(c) The plug is under exclusive control of the worker servicing or maintaining the equipment.

(3) Hot-tap operations involving transmission and distribution systems for substances such as gas, steam, water, or petroleum products are performed on pressurized pipelines, provided that it can be demonstrated that:

(a) Continuity of service is essential;

(b) Shutdown of the system is impractical;

(c) Special equipment (e.g., bolted blinds and blank flanges) is used which will provide proven effective protection for NIST employees and covered associates; and

(d) Documented procedures are followed.

4. REFERENCES

a. 29 CFR 1910.147, The Control of Hazardous Energy (lockout/tagout).

b. 29 CFR 1910.333, Selection and Use of Work Practices.

c. ANSI Z535.5, Safety Tags and Barricade Tapes (for Temporary Hazards) (most recent version).

d. NIST O 7101.00, Occupational Safety and Health Management System

5. APPLICABLE NIST OCCUPATIONAL SAFETY AND HEALTH SUBORDERS

a. NIST S 7101.20: Work and Worker Authorization Based on Hazard Reviews

b. NIST S 7101.64, Electrical Safety

6. REQUIREMENTS

a. General Requirements

(1) OUs shall establish energy-control procedures, worker training, and annual inspections prior to conducting servicing or maintenance on equipment where the unexpected energizing, startup, or release of stored energy could occur and cause injury.

(2) LOTO locks and tags are not to be used for equipment removed from service when that equipment presents no hazards to personnel.

(3) Tagout without Lockout

(a) If an energy-isolating device is not capable of being locked out by any means, a tagout system shall be used.

(b) If an energy-isolating device is capable of being locked out, lockout shall be used unless it can be demonstrated that the utilization of a tagout system will provide employees and covered associates with full protection, which requires that ALL of the following be met:

i. The tagout device shall be attached at the same location that the lockout device would have been attached.

ii. Full compliance with all tagout-related provisions of this suborder shall be demonstrated.

iii. Such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device shall be demonstrated. Additional means to be considered shall include the implementation of additional safety measures such as removal of an isolating circuit element, blocking of a

controlling switch, opening of an extra disconnecting device, or removal of a valve handle to reduce the likelihood of inadvertent energization.

(c) Whenever replacement or major repair, renovation, or modification of equipment is performed, and whenever new equipment is installed, energy-isolating devices for such equipment shall be designed to accept a lockout device whenever the unexpected energization or startup of the equipment, or release of stored energy, could cause injury to workers.

b. Requirements for Written LOTO Procedures

(1) Written LOTO procedures are required unless ALL of the following circumstances pertain:

(a) The equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger workers;

(b) The equipment has a single energy source which can be readily identified and isolated;

(c) The isolation and locking out of that energy source will completely de-energize and deactivate the equipment;

(d) The equipment is isolated from that energy source and locked out during servicing or maintenance;

(e) A single lockout device will achieve a locked-out condition;

(f) The lockout device is under the exclusive control of the Authorized Worker performing the servicing or maintenance;

(g) The servicing or maintenance does not create hazards for Other Workers; and

(h) The OU, in utilizing this exception, has had no accidents involving the unexpected activation or re-energization of the equipment during servicing or maintenance.

(2) If a written procedure is required, the Authorized Worker shall:

(a) Use NIST's online energy-control procedure application to develop an equipment-specific LOTO procedure; or

(b) If not using NIST's online energy-control procedure application, ensure that the procedure clearly and specifically outlines the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance, including, but not limited to, the following:

i. A specific statement of the intended use of the procedure;

ii. Specific procedural steps for shutting down, isolating, blocking, and securing the equipment to control hazardous energy;

iii. Specific procedural steps for the placement, removal, and transfer of LOTO devices and the responsibility for them; and

iv. Specific requirements for testing the equipment to determine and verify the effectiveness of LOTO devices and other energy-control measures.

c. Conduct of LOTO

(1) Each OU shall establish a procedure for tracking the application of LOTO locks and tags when equipment is required to be taken out of service for 24 hours or more and LOTO devices are applied. The information shall be readily available for auditing purposes and contain at a minimum the following information:

(a) Tag number (if applicable);

(b) Name of employee applying the LOTO device and tag;

(c) Date and time LOTO devices and tags are applied;

(d) Location and equipment being locked and tagged, including where the LOTO devices are applied; and

(e) Date LOTO devices are removed.

(2) LOTO shall be performed only by trained Authorized Workers in the following sequence.

(a) Notifications shall be initiated prior to LOTO to ensure area supervisors and affected personnel are aware of the energy source being locked out or controlled. This notification should also include the anticipated duration of the shutdown. Authorized Workers will also advise on any support equipment that may be impacted, additional safety precautions being taken, and the type of control device(s) being used.

(b) Preparations for the shutdown shall begin after all notifications have been made. Authorized Workers must be fully aware of the type and magnitude of the energy, associated hazards, and control methods of the energy involved. Authorized Workers shall refer to owner/service manuals of the equipment they are working on to ensure they are fully aware of any and all associated hazards.

(c) In performing the shutdown, Authorized Workers shall first advise Affected Workers that shutdown is taking place. They shall then locate the energy source(s) (always looking for hidden energy sources) and follow the procedures established to shut down the equipment as prescribed. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to workers as a result of the equipment stoppage.

(d) All energy-isolating devices that are needed to control the energy to the equipment shall be physically located and operated by an Authorized Worker in such a manner as to isolate the equipment from the energy source(s).

(e) LOTO devices shall be affixed to energy-isolating devices by Authorized Workers.

i. Lockout devices, where used in accordance with this suborder, shall be affixed in a manner that will hold the energy-isolating devices in a "safe" or "off" position.

ii. A lock and a tag shall be placed on each disconnecting means used to de-energize equipment on which work is to be performed. The lock shall be attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

iii. Tagout devices, where used in accordance with this suborder, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy-isolating devices from the "safe" or "off" position is prohibited. Where tagout devices are used with energy-isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached. Where a tag cannot be affixed directly to the energy-isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

(f) After LOTO devices have been applied to energy-isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, or otherwise rendered safe. If there is a possibility of re-accumulation of stored energy

to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

(g) Prior to starting work on equipment that has been locked or tagged out, the Authorized Worker shall verify that isolation and de-energization of the equipment have been accomplished.

(h) Before LOTO devices are removed and energy is restored to the equipment, actions shall be taken by the Authorized Worker(s) to ensure that:

i. The work area is inspected to ensure that any nonessential items have been removed and that the equipment components (e.g., guards) are operationally intact;

ii. The work area is checked to ensure that all workers have been safely positioned or removed;

iii. After LOTO devices have been removed by the Authorized Worker(s) who applied them but before energy is restored to the equipment, Affected Workers are notified of the removal of the LOTO devices; and

iv. When the Authorized Worker who applied a LOTO device is unavailable to remove it, that device may be removed under the procedures outlined in Section 6h.

d. Temporary Removal of LOTO Devices

In situations in which LOTO devices must be temporarily removed from the energy-isolating device and the equipment energized to test or position it or a component thereof, the following steps shall be taken in sequence:

(1) Clear the equipment of tools and materials;

(2) Remove workers from the equipment area;

(3) Remove the LOTO devices;

(4) Energize and proceed with testing or positioning; and

(5) De-energize all systems and reapply energy-control measures in accordance with Section 6c of this suborder to continue the servicing and/or maintenance.

e. Group LOTO Procedure

When multiple Authorized Workers (including servicing contractors) perform service or maintenance on the same piece of equipment, a supervisor may determine that a group LOTO procedure is appropriate.

(1) General Requirements

(a) When more than one worker would be required to apply a LOTO device to the same electrical power disconnecting device, a group LOTO device shall be utilized to allow each worker's LOTO lock to be affixed at the disconnecting device.

(b) When it is not practical to have all worker LOTO locks attached at the electrical power disconnecting device, a group lockbox shall be utilized.

(c) When LOTO is required to be performed and doing so requires securing multiple energy sources with multiple authorized workers, a lockbox shall be utilized.

(2) When servicing or maintenance is performed by a crew, craft, department, or other group, that entity shall utilize a procedure that affords the workers a level of protection equivalent to the implementation of a personal LOTO device.

(3) When a group lockbox is required, all of the following requirements apply:

(a) A group LOTO lock shall be applied to each disconnecting device;

(b) The group LOTO lock keys shall be placed in the lockbox;

(c) All workers, including the person in charge, shall affix their LOTO locks to the lockbox; and

(d) The person in charge shall then affix a supervisor LOTO lock and tag to lockbox.

(4) The supervisor shall convene a meeting of all group members covered under the procedure.

(5) The supervisor shall describe the tasks to be performed and document those tasks in a written energy-control procedure.

(6) The supervisor may delegate an Authorized Worker the primary responsibility for a specified group working under the protection of the group LOTO procedure. Supervisory responsibility is then vested in the Designated Lead Authorized Worker for the specific workers working under the protection of the group LOTO devices.

(7) Each member of the specified group shall be trained and Authorized as described in this suborder's training requirements.

(8) The Designated Lead Authorized Worker shall ensure that each step of the written LOTO procedure has been completed and shall ascertain the exposure status of individual group members with regard to the lockout or tagout of the equipment.

(9) Each Authorized Worker performing work on the equipment shall ensure every step of the written procedure has been completed prior to placing their personal LOTO device on the group LOTO device, group lockbox, or comparable mechanism when he/she begins work.

(10) When the work has been completed, and after each worker has removed his/her respective lock or tag from the group LOTO device, the Designated Lead Authorized Worker shall remove his/her LOTO lock or tag from the group LOTO device and return the equipment to service as described in the procedure.

f. LOTO Procedures for Shift Changes

The following procedures shall be utilized during shift or personnel changes to ensure the continuity of LOTO protection, including provision for the orderly transfer of LOTO device protection between departing and oncoming workers, to minimize exposure to hazards from the unexpected energization or start-up of the equipment, or the release of stored energy.

(1) The requirements for group LOTO apply.

(2) The group LOTO lock shall remain attached to each energy control device.

(3) The supervisor lock shall remain affixed to the lockbox or other approved group LOTO device.

(4) All off-going shift workers shall remove their individual LOTO locks and tags from the lockbox or other approved group LOTO device.

(5) The off-going person in charge shall brief the oncoming person in charge of the status of the project and inform all oncoming workers of any potential hazards.

(6) The person in charge of the off-going shift shall transfer custody of the key for the supervisor LOTO lock attached to the lockbox or approved group LOTO device to the oncoming person in charge.

(7) All oncoming Authorized Workers shall place their locks and/or tags onto the group LOTO device.

(8) Before work begins, the oncoming Authorized Workers shall verify isolation and de-energization of the equipment that has been locked or tagged out prior to restarting work.

g. LOTO Conducted by Non-R&D Contractors

(1) Contracting Officers (COs) or Contracting Officer Representatives (CORs) overseeing non-R&D contractor shall ensure non-R&D contractors are not permitted to commence work on NIST equipment when LOTO is required until:

(a) They have been provided with a copy of this suborder by the controlling NIST organization and understand the requirements for LOTO devices;

(b) They have exchanged LOTO programs with the controlling NIST organization;

(c) The exchange of LOTO programs has been documented using the exchange-of-LOTO-programs form provided by the Office of Safety, Health, and Environment (OSHE); and

(d) Information concerning non-R&D contractor LOTO procedures has been communicated to NIST Affected Workers.

(2) When LOTO is performed by non-R&D contractors, the CO or COR shall ensure the following:

(a) Prior to the non-R&D contractor performing their LOTO steps, the NIST organization responsible for the system and/or equipment being turned over to the contractor shall:

i. Document and obtain the non-R&D contractor's agreement via the COR on the condition/status of the system and/or equipment being turned over; and

ii. Affix their LOTO device(s) on all sources of energy and verify zero energy.

(b) The non-R&D contractor has applied their LOTO devices in accordance with their contractor safety plan accepted by NIST.

(c) Prior to any testing of any system or equipment that requires re-introducing the system or equipment into the NIST infrastructure, the NIST organization responsible for the system and/or equipment shall ensure by applicable means that doing so would have no impact to the NIST infrastructure.

(d) Prior to acceptance and the introduction or re-introduction of any system into the NIST infrastructure by a non-R&D contractor, the NIST organization responsible for the system or equipment shall ensure by applicable means that doing so would have no impact to the NIST infrastructure.

(e) The LOTO lock and tag from the responsible NIST organization for the system and/or equipment shall be the last to be removed.

h. LOTO Device Emergency Removal
WARNING: This is considered to be an emergency procedure only to be undertaken in extreme circumstances with a supervisor's approval and using extreme care.

(1) When an Authorized Worker who has applied a LOTO device is not available to remove it, someone in his/her immediate supervisory chain may authorize its removal in accordance with this emergency removal procedure. If the Authorized Worker's immediate supervisor is not available, the emergency removal may be performed by one level of management above the Authorized Worker's immediate supervisor or by a delegated individual with documented authorization from the immediate supervisor.

(2) The following steps must be performed and documented using the Emergency LOTO Lock Removal form provided by OSHE.

(a) The supervisor must verify the Authorized Worker is not at the NIST facility. The supervisor must make every reasonable effort to contact the Authorized Worker. This may include a telephone call to the worker's home or other location. These efforts must be documented (e.g., email, registered letter, voicemail, or telephone verbal assurance, etc.) by the supervisor.

(b) If the Authorized Worker is contacted, the supervisor must inform the worker that his/her LOTO device is being removed.

(c) The supervisor must verify that it is safe to remove the LOTO device.

(d) The supervisor may then authorize another Authorized Worker to remove the LOTO device.

(e) The supervisor must ensure that before the LOTO device owner returns to work, he/she is presented with the removed device and is informed of the reasons for the emergency removal.

(f) The emergency procedure form must be signed by the supervisor and the Authorized Worker who removed the lock and be retained in the OU's LOTO records.

i. Locks, Tags, and Devices

Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by the OU for isolating, securing, or blocking of equipment from hazardous-energy sources.

(1) General lockout device and tag requirements include:

(a) Locks and tags must be singularly identifiable;

(b) LOTO locks and tags must be the only devices used for controlling hazardous energy during LOTO activities and not be used for any other purpose (e.g., for restricting access, removing from service);

(c) LOTO locks and tags must be durable enough to withstand wet, damp, and corrosive environments while they are in use on equipment, including ensuring the print on the tag does not become illegible;

(d) LOTO locks must be substantial enough to prevent removal without the use of excessive force or unusual techniques such as using bolt cutters or other metal cutting tools.

(e) LOTO tags must be substantial enough to prevent inadvertent or accidental removal, which means that they must have an attachment means of a non-reusable type, be attachable by hand, be self-locking, and be non-releasable with a minimum unlocking strength of no less than 225 N (50 lbf)), i.e., they must have characteristics similar to those of a one-piece all-environment-tolerant nylon cable tie; and

(f) LOTO locks and tags shall be standardized in at least one of the following criteria: color, shape, or size; additionally, in the case of tagout devices, print and format shall be standardized.

(2) NIST's LOTO device requirements are as follows:

(a) Personal locks shall have red bodies and singular keys.

i. Authorized Workers with multiple personal locks may have them keyed alike.

ii. Personal locks must contain the identity of the Authorized Worker who applies them.

iii. Supervisors of Authorized Workers may maintain copies of the keys to the Authorized Workers' personal locks to be used for emergency device removal only.

(b) Group locks shall have red bodies and be keyed alike for each work group.

i. Group locks must contain the identity of the responsible organization that applies them.

ii. Supervisors shall maintain copies of the keys to the group locks to be used for emergency device removal only.

(c) Supervisor locks shall have red bodies and may be keyed alike.

i. Supervisor locks must contain the identity of the responsible organization that applies them.

ii. Supervisors may maintain copies of the keys to the group locks to be used for emergency device removal only.

(d) Lockout tags must meet the following ANSI Z535.5 criteria:

i. Danger tags shall have the word "Danger" in safety white letters on a rectangular safety red background;

ii. Danger tags will be on a safety white stock;

iii. Danger tags must contain the action statement, "Do Not Operate," and, at a minimum, the Authorized Worker's name and phone number; pictures and other information may also be applied to the tags;

iv. Tag message lettering should be typed; if printed messages are applied, they must be legibly printed; and

v. Backs of tags may be used to give additional operating instructions, emergency procedures, emergency telephone numbers, or to reinforce the critical role that the LOTO tag holds; the back side of the tag should refer to the front side of the tag and vice versa.

vi. Locks and tags used in conducting group LOTO shall:

(i) Have a distinguishing identifier to identify it as a group LOTO lock and tag;

(ii) Locks shall be keyed alike to a single master for each work group; and

(iii) Each lock shall be individually numbered.

vii. Locks and tags used as supervisor locks and tags shall:

(i) Have a distinguishing identifier to identify them as a supervisor LOTO lock and/or tag;

(ii) Locks shall not be keyed alike; and

(iii) Each lock shall have an identifier indicating the organization to which it belongs.

j. Training

(1) Training of Authorized, Affected, and Other Workers and their Official First-Level Supervisors

(a) Authorized Workers shall complete:

i. The training provided by OSHE on the Control of Hazardous Energy (LOTO) program;

ii. The activity-specific training required by hazard reviews applicable to the work to be conducted, including

(i) The recognition of applicable hazardous-energy sources;

(ii) The types and magnitudes of those hazardous-energy sources; and

(iii) The methods and means necessary for energy isolation and control, and where tagout only is used, review of the following key points:

[i] Tags are essentially warning devices and do not provide physical restraint like a lock.

[ii] When a tag is attached to an energy-isolating device, it is not to be removed without authorization from the Authorized Worker identified on the tag, and it is never to be bypassed, ignored, or otherwise defeated.

[iii] Tags shall be legible and understandable by all workers.

[iv] Tags and their means of attachment shall be made of materials that will withstand environmental conditions encountered while on equipment.

[v] Tags may evoke a false sense of security and their meaning needs to be understood as part of the overall energy-control program.

[vi] Tags shall be securely attached to energy-isolating devices so they cannot be inadvertently or accidentally detached during use.

(b) Affected Workers shall complete activity-specific training on the purpose and use of the energy-control procedures applicable to their assigned duties and work locations and of the prohibition of attempts to re-start or re-energize equipment that is locked or tagged out.

(c) When non-R&D contractors perform LOTO, Affected Workers shall be provided with information concerning the non-R&D contractor's energy control procedures.

(d) The activity-specific training for Authorized and Affected Workers shall be provided by Authorized Workers who have successfully completed training on the Control of Hazardous Energy (LOTO) program and who are familiar with the applicable energy sources and the methods and means of energy isolation and control.

(e) Official First-Level Supervisors of Authorized Workers shall complete the training provided by OSHE on the Control of Hazardous Energy (LOTO) program.

(f) Other Workers shall complete training provided by OSHE on the general purpose and use of energy-control procedures and of the prohibition of attempts to re-start or re-energize equipment that is locked or tagged out.[3]

(2) Retraining of Authorized and Affected Workers

(a) Authorized and Affected Workers shall complete activity-specific retraining whenever:[4]

i. A change in their job assignment requires Authorized and Affected Workers to service and maintain or operate additional equipment or introduces them to new energy sources;

ii. A change in equipment or its operation presents a new hazard;

iii. A change in LOTO procedures is introduced;

iv. A LOTO annual inspection points to a systemic deficiency warranting retraining; or

v. A LOTO annual inspection, observation, or other condition reveals deviations from LOTO procedures or a worker is found to lack knowledge of those procedures.

(3) Training shall be documented and recorded in accordance with the requirements, roles, and responsibilities in the Safety Education and Training suborder.

k. LOTO Annual Inspections

(1) Annual Inspection of LOTO Procedures.

[3] This training is part of training assigned automatically by the NIST electronic safety-training application to all employees and covered associates entering on duty.
[4] The requirements in Sections 6j(2)(a)i-iii coincide with requirements in the Hazard Review suborder (a) to conduct hazard reviews when changes to existing activities introduce new or increase existing hazards, and (b) for the authorization of workers.

(a) Each energy-control procedure shall be separately inspected annually to ensure that the energy-control procedure is adequate and is being properly implemented by Authorized Workers.

(b) At a minimum, these inspections shall include a demonstration of the procedures by Authorized Workers while servicing and/or maintaining equipment.

(c) The inspector, who must be an Authorized Worker other than the one(s) utilizing the energy-control procedure being inspected, shall observe the implementation of the energy-control procedure for the servicing and/or maintenance being evaluated and talk with employees and covered associates implementing the procedure to determine that all the requirements of this suborder are understood and being followed.

(d) The Authorized Worker performing the inspection may be someone who previously has or currently implements the energy-control procedure being inspected, as long as he/she is not implementing any part of the energy-control procedure while it is being inspected.

(e) The inspector must be able to determine whether:

i. The steps in the energy-control procedure are being followed;

ii. The workers involved know their responsibilities under the procedure; and

iii. The procedure is adequate to provide the necessary protection, and, if inadequate, what modifications are needed.

(f) Procedures may be reviewed together during one inspection as long as they involve the same or similar types of energy-control methods.

(g) If procedures are grouped together for annual inspection, it is recommended that one or more of the individual procedures (from the same group or from similar procedures from the previous year) be reviewed on its own so that over time each procedure is reviewed individually.

(2) Annual inspections shall be recorded using the LOTO inspection form provided by OSHE and maintained by the OU until the completion of the next annual inspection. If inspections reveal inadequate or improper LOTO procedures, the hazard or discrepancy must be mitigated immediately and Authorized and Affected Workers must be retrained as indicated in Section 6j.

7. DEFINITIONS

a. Affected Worker – Any worker who uses equipment subject to being serviced or maintained under LOTO, or whose job requires him or her to work in an area in which such servicing or maintenance is being performed.

b. Authorized Worker – A person who has completed the required hazardous-energy-control training (general and procedure-specific) and is authorized by their Division Chief or designee to lock and tag out the energy-control points in specific equipment or apparatus in order to perform service or maintenance. A person must be an Authorized Worker to apply a lock or tag to control hazardous energy.

c. Capable of Being Locked Out – An energy-isolating device is considered capable of being locked out if it has a hasp or other means to attach a lock, has a locking mechanism built into it, or can be locked without dismantling, rebuilding, or replacing the energy-isolating device or permanently altering its energy-control capability.

d. Energized – Connected to an energy source or containing stored energy.

e. Energy-Isolating Device – A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: a manually operated electrical-circuit breaker; a disconnect switch; a manually-operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches, and other control-circuit-type devices are not energy-isolating devices.

f. Energy-Isolation Point – A location at which the flow or release of hazardous energy can be prevented when a mechanism such as a valve, breaker, switch, blank off, or block-out is placed in the "OFF" position. Control circuits such as computer-control circuitry and software are not energy-isolation points.

g. Exclusive Control – A condition in which a worker has taken actions or is continuously in a position to prevent (exclude) other individuals from re-energizing or starting equipment while it is being serviced or maintained.

h. Group Lock Box – A key box containing the key(s) used to lock out equipment being serviced by multiple Authorized Workers. Each Authorized Worker involved in the servicing places his/her personal locks on the group lock box. The keys to the equipment cannot be accessed until all Authorized Workers remove their locks.

i. Group LOTO – A procedure to coordinate service or maintenance work by several Authorized Workers on locked/tagged out equipment. More than one Authorized Worker may need access to the locked/tagged out equipment because it has multiple energy sources, requires multiple LOTO procedures, or the work to be performed extends across shifts.

j. Group Lockout Devices – Locks and tags used for group LOTO.

k. Hazardous Energy – Energy capable of causing personal harm or property damage if it is not controlled. Types of hazardous energy include, but are not limited to, electrical, mechanical, rotational, gravitational, chemical, radioactive, hydraulic, pneumatic, and thermal.

l. Hazardous-Energy Control – The process of systematically implementing engineering and administrative means to prevent hazardous energy from flowing to a person.

m. Hazardous-Energy-Control Procedure – An equipment-specific procedure Authorized Workers must follow to safely control hazardous energy during servicing or maintaining of the equipment.

n. Hazardous-Energy Source – Equipment, machine, apparatus, process piping, and so on, which is a source of hazardous energy.

o. Hot Tap – A procedure used in servicing and/or maintenance that involves welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or appurtenances. Hot taps are commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

p. Lockout – The placement of a lockout device on an energy-isolating device, in accordance with an established procedure, to ensure the energy-isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

q. Lockout Device – Any device that uses a positive means such as a lock, blank flanges, and bolted slip blinds to hold an energy-isolating device in a safe position to prevent equipment from unexpectedly energizing.

r. Non-R&D Contractor – A NIST associate who performs non-R&D work at a NIST workplace in accordance with the safety requirements of a contract or other legal arrangement, such as a Memorandum of Understanding, with NIST Non-R&D contractors include, but are not limited to, construction contractors; facilities contractors; equipment

installation, service, and maintenance contractors; Health Unit contractors; contract cafeteria workers; and janitorial contractors.

s. Normal Operations – The utilization of equipment to perform intended functions.

t. Other Worker – A worker with duties that are or may be in an area where energy-control procedures may be utilized.

u. Personal Lock (or Locks) – A singularly keyed lock, or singularly keyed locks, issued to an Authorized Worker used exclusively for the control of hazardous energy.

v. Personal Lockout Devices – Locks and tags used for personal LOTO.

w. Personal LOTO – LOTO performed by a single Authorized Worker on equipment with one of more sources of hazardous energy.

x. Servicing and/or Maintenance – Workplace activities such as constructing, installing, setting up, adjusting, inspecting, and modifying equipment that could expose workers to the unexpected release of hazardous energy. Maintenance activities may also include lubrication, cleaning, or unjamming equipment, and making adjustments or tool changes.

y. Setting up – Any work performed to prepare equipment to perform its normal operation.

z. Stored Energy – Energy located within any device after equipment is shut down. This includes, but is not limited to, capacitors, tanks, pipes, springs, and flywheels.

aa. Supervisor Lock – A lock used in the performance of LOTO to allow for maintaining continuity of a lockout/tagout condition between shift or workgroup changes.

bb. Supervisor Tag – A tag used with a supervisor lock in the performance of LOTO to allow for maintaining continuity of a lockout/tagout condition between shift or workgroup changes.

cc. Tagout – The placement of a tagout device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled shall not be operated until the tagout device is removed.

dd. Tagout Device – A prominent warning device, such as a tag and a means of attachment that can be securely fastened to an energy-isolating device in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed.

8. ACRONYMS

a. CO – Contracting Officer

b. COR – Contracting Officer Representative

c. LOTO – Lockout/Tagout

d. OSHE – Office of Safety, Health, and Environment

e. OU – Organizational Unit

f. R&D – Research and Development

9. ROLES AND RESPONSIBILITIES

a. OUs: Ensuring that the requirements in Section 6 are met.

b. Chief Safety Officer: Ensuring that the training specified in Sections 6j for Other Workers is included in training assigned automatically by the NIST electronic safety-training application to employees and covered associates entering on duty.

10. AUTHORITIES

There are no authorities specific to this suborder alone.

11. DIRECTIVE OWNER

Chief Safety Officer

12. APPENDICES

A. Revision History

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Revision No.	Approval Date	Deployment Start Date	Effective Date	Brief Description of Change; Rationale
0	03/20/14	06/25/14	04/01/15	None – Initial document
1	11/05/15	11/05/15	11/05/15	• Made suborder applicable to "associates". • Added new Section 3c(1) to clarify the relationship between this suborder and NIST N 7101.64, Electrical Safety; added "to which workers could be exposed" to Section 3c(2)(b).
2	03/14/18	TBD	TBD	• Changed "Associates" and "Contractors" to "Covered Associates" and "Non-R&D Contractors" to align the suborder with NIST O 7101.00, Occupational Safety and Health Management System. • Indicated that LOTO locks and tags are not to be used for equipment taken out of service when that equipment presents no hazards to personnel. • Added requirements for tracking of locks and tags. • Added additional requirements for group LOTO. • Revised the LOTO procedure for shift changes. • Added additional requirements for LOTO conducted by non-R&D contractors.

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COMPRESSED GAS SAFETY

NIST S 7101.61
Document Approval Date:[1] 07/09/2021
Effective Date: XX/XX/2020

1. PURPOSE

The purpose of this program is to establish requirements to minimize the potential hazards associated with compressed gases in cylinders, vessels, and systems.

2. BACKGROUND

a. NIST P 7100.00 articulates NIST's commitment to making occupational safety and health an integral core value and vital part of the NIST culture, in part by complying with applicable laws, regulations, and other promulgated safety and health requirements.

b. The content of this suborder was derived primarily from applicable Compressed Gas Association (CGA P-1) and National Fire Protection Association (NFPA) Codes/Standards (NFPA 45, NFPA 55, NFPA 70, and NFPA 704). The hazard definitions and numeric ratings in this suborder are based on NFPA definitions. These are similar to the definitions published in the 1994 version of Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200 – *Hazard Communication*.

c. Compressed gases are subject to the requirements of NIST S 7101.59: *Chemical Hazard Communication* and NIST S 7101.60: *Chemical Management*.

d. This suborder supersedes the NIST *Health and Safety Instruction No. 5 – Compressed Gas Cylinders*.

3. APPLICABILITY

a. The provisions of this suborder apply to all NIST employees and covered associates[2] whose work activities involve use or storage of compressed gases.

[1] The revision history for this document can be found in Appendix A.
[2] See NIST O 7101.00: Occupational Safety and Health Management System.

b. Site-specific Engineering and Administrative controls that are not practical at non-NIST sites do not apply as long as equally protective local controls and practices, consistent with applicable standards, are implemented by the host entity. Equivalency shall be determined by the OU in consultation with OSHE, as warranted.

4. REFERENCES[3]

a. Compressed Gas Association (CGA) Pamphlet C-6, Standards for Visual Inspection of Steel Compressed Gas Cylinders.

b. CGA Pamphlet C-7, Guide to Preparation of Precautionary Labeling and Marking of Compressed Gas Containers.

c. CGA Pamphlet C-8, Standard for Requalification of DOT-3HT, CTC-3HT, and TC-3HTM Seamless Steel Cylinders.

d. CGA Pamphlet P-1, Safe Handling of Compressed Gases in Containers.

e. CGA Pamphlet P-19, Recommended Hazard Ratings for Compressed Gases.

f. CGA Pamphlet P-20, Standard for Classification of Toxic Gas Mixtures.

g. CGA Pamphlet S-1.1, Pressure Relief Device Standards Part 1 – Cylinders for Compressed Gases.

h. CGA Pamphlet S-1.2, Pressure Relief Device Standards Part 2 – Portable Containers for Compressed Gases.

i. Industrial Ventilation, a Manual of Recommended Practice, American Conference of Governmental Industrial Hygienists (ACGIH).

j. International Organization for Standardization (ISO) Standard 10156, Gas Cylinders – Gases and Gas Mixtures – Determination of Fire Potential and Oxidizing Ability

k. ISO 10298, Determination of Toxicity of a Gas or Gas Mixture.

l. NFPA 45, Fire Protection for Laboratories Using Chemicals.

m. NFPA 50A, Gaseous Hydrogen Systems at Consumer Sites.

[3] Where no date is specified, the most recent version applies.

n. NFPA 51, Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes.

o. NFPA 51B, Cutting and Welding Processes.

p. NFPA 55, Compressed and Liquefied Gases in Portable Containers.

q. NFPA 70, National Electric Code (NEC)

r. NFPA 72, Installation, Maintenance, and Use of Protective Signaling Systems.

s. NFPA 497, Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas.

t. NFPA 704, Identification of the Fire Hazards of Materials.

u. Odor Thresholds for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association.

v. OSHA Standard 29 CFR §1910.101, Compressed Gases (general requirements).

w. OSHA Standard 29 CFR §1910.307, Hazardous (Classified) Locations

x. Pocket Guide to Chemical Hazards, DHHS (NIOSH), Pub. No. 90-117, National Institute of Occupational Safety and Health LBNL/PUB-3122, Maintenance Program Guidelines for Programmatic Equipment.

y. Threshold Limit Values for Chemical Substances and Physical Agents, ACGIH.

5. APPLICABLE NIST OCCUPATIONAL SAFETY AND HEALTH DIRECTIVES

a. NIST S 7101.20: *Work and Worker Authorization (Based on Hazard Review)*

b. NIST S 7101.21: *Personal Protective Equipment (PPE)*

c. NIST S 7101.22: *Hazard Signage*

d. NIST S 7101.23: *Safety Education and Training*

e. NIST S 7101.58: *Respiratory Protection*

f. NIST S 7101.59: *Chemical Hazard Communication*

g. NIST S 7101.60: *Chemical Management*

h. NIST P 7400.00: *Fire and Life Safety*

i. NIST S 7401.02: *Inspection, Testing, and Maintenance of Fire Protection and Life Safety Systems*

6. REQUIREMENTS

a. General Requirements for the Use of Compressed Gases[4]

(1) Area Signage where Highly Toxic Gases are Present

(a) All entrances to areas containing cylinders, vessels, or systems containing highly toxic gases or gases with an NFPA 704 health hazard rating of 4 shall be marked with a "DANGER" sign in accordance with NIST S 7101.20: Hazard Signage. See examples in Figure 1.

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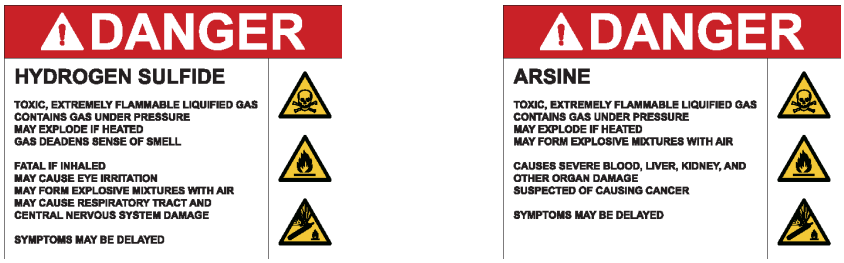

Figure 1: Specific Hazard Signs for Areas Containing Highly Toxic Gases

(2) Area Signage where Compressed Gases are Present

[4] Apart from hazard signage, consideration of the chemical hazards associated with the use of specific gases is covered separately in NIST S 7101.60: Chemical Management.

(a) If smoking is not already prohibited in and near areas containing compressed gases, signs shall be posted in such areas stating that smoking is prohibited within 25 ft (7.6 m) of the storage or use area perimeter.[5] See an example in Figure 2.

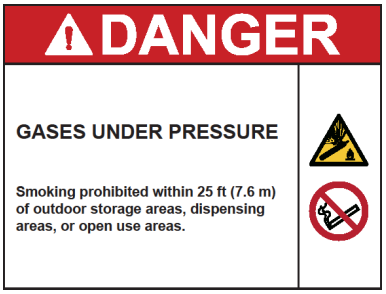

Figure 2: Smoking Prohibited Sign

(3) Ventilation of Compressed Gases

(a) If compressed gases are introduced into laboratory fume hoods, steps must be taken to ensure that there is no backflow from the fume hood into the surrounding space.

(b) Local and general exhaust systems used to exhaust hazardous gases shall be constructed of materials that are compatible with the gases to be exhausted.

(c) Incompatible gases shall be exhausted using separate ventilation systems.

(d) Ventilation systems that will handle flammable gases at concentrations of 10 percent of their Lower Explosive Limit or greater must be explosion-proof and have non-sparking exhaust fans.

(e) Vacuum pumps, high-pressure systems, and pressure-relief devices protecting equipment to be attached to compressed gas cylinders, vessels, or systems containing flammable, toxic, or otherwise hazardous gases should be vented directly outdoors or through an exhaust hood discharging away from windows and doors, and no less than 50 feet (ft) (15 meters (m)) from intakes of air-handling systems, air-conditioning equipment, and air compressors. If these requirements cannot be met, or their intent can be met using a different approach, the applicable hazard review must identify alternative controls that provide an equivalent level of safety.

[5] Smoking is prohibited in NIST buildings and within 25 ft of building entrances and air intakes.

(4) Gas Detection Systems for Toxic and Highly Toxic Compressed Gases

(a) A continuous gas detection system shall be provided for the indoor storage or use of all toxic or highly toxic compressed gases in cylinders, vessels, or systems, except for toxic gases that have physiological warning properties at a level below the OSHA Permissible Exposure Limit (PEL) or ACGIH Threshold Limit Value (TLV), whichever is lower.[6]

i. A continuous gas detection system may also be appropriate for other hazardous gases, including flammables, pyrophorics, oxidizers, and corrosives, particularly in cases where there are special hazards (for example, as in the case of continuous operations that are unattended). This shall be decided on a case-by-case basis during the applicable hazard review.

(b) The gas-detection system shall detect the presence of gas at or below the ACGIH TLV, OSHA PEL, or ceiling limit of the gas, whichever is lowest, at all of the following locations:

i. In the room or indoor area in which the gas is used (the point of use);

ii. At the location of the source container, cylinder, or tank used for delivery of the gas to the point of use;

iii. In the room or area in which the gas is stored; and

iv. At the point of discharge of the exhaust system from gas cabinets, exhausted enclosures, and gas rooms, if the point of discharge is not outside the building.

(c) The gas detection system shall detect the presence of the gas at one-half of the Immediately Dangerous to Life and Health (IDLH) level or less at the discharge from any exhaust or waste gas treatment system that is present.

(d) The gas-detection system shall initiate a local alarm that is both audible and visible.

(e) All personnel who may be in the area of a local alarm shall be trained in the recognition of the alarms and in the appropriate response in the case of an alarm.

[6] Contact OSHE at x5375, Option 3 to determine if this requirement applies to a specific compressed gas.

(f) Gas detection systems shall be required to transmit a signal to a constantly attended monitoring station for any location that contains two or more compressed gas cylinders of toxic or highly toxic gas. The attending organization shall develop response protocols for each different alarm.

(g) Activation of the gas detection system at a location where compressed gas is hooked up to a system shall automatically shut off the flow of the compressed gas related to the system being monitored.

i. An automatic shutdown shall not be required for chemical reactors used to produce toxic or highly toxic gases when those reactors are operated at pressures less than 103.4 kPa[7] (15 psig), constantly attended, and have readily accessible, emergency-shutoff valves.

(h) Newly installed and modified existing combustible gas detectors, oxygen depletion sensors, and toxic gas detectors shall be commissioned in accordance with NFPA 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems*, 2015 edition.

Refer to NIST S 7401.02: *Inspection, Testing, and Maintenance of Fire Protection and Life Safety Systems* for additional information.

(i) Combustible gas detectors, oxygen depletion sensors, and toxic gas detectors shall be commissioned, inspected, tested, and maintained in accordance with:

i. NFPA 72, *National Fire Alarm and Signaling Code*, 2013 edition; and

ii. Manufacturer instructions.

Refer to NIST S 7401.02: *Inspection, Testing, and Maintenance of Fire Protection and Life Safety Systems* for additional information.

[7] Pressure measurements are "gauge pressure", the pressure relative to ambient atmospheric pressure.

(5) Personal Protective Equipment

(a) Personal protective equipment (PPE), including respiratory protection as applicable, shall be used when working with compressed gases, as required by the applicable hazard review.[8]

(6) Eyewashes and Showers

(a) An eyewash station and/or safety shower shall be provided in each area where corrosive gases are used. Refer to NIST S 7101.60: *Chemical Management* for additional information.

b. Compressed Gas Cylinders

(1) Purchasing Compressed Gas Cylinders

(a) The smallest volumes and numbers of compressed gas cylinders needed to conduct the work effectively shall be purchased.

(b) Returnable lecture bottles should be purchased whenever possible.

(2) Point-of-Delivery Inspection of Compressed Gas Cylinders

Employees and associates who receive compressed gas cylinders from outside vendors shall conduct point-of-delivery inspections of the cylinders in accordance with the following considerations.[9] Employees and associates who receive compressed gas cylinders from other individuals within NIST are encouraged to conduct such inspections. Any cylinder not meeting these considerations should not be accepted.[10]

(a) Labeling Requirements

i. It shall be verified that the compressed gas cylinder is labeled and that the label contains the following information:

[8] The MSDS/SDS for the chemical product will provide guidance on appropriate PPE. The NIOSH Pocket Guide to Chemical Hazards provides guidance on the selection of proper respiratory protection. Personnel shall consult with OSHE prior to using respiratory protection.
[9] For the purposes of this section, the Storeroom, Logistics Group, Facilities Services Division, Office of Facilities and Property Management in Gaithersburg (hereafter referred to as "Storeroom") is not considered an external vendor.
[10] If a cylinder not meeting these considerations has been accepted, contact OSHE at x5375, Option 3.

(i) Product identifier; and

(ii) Words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the compressed gas, and which, in conjunction with the other information immediately available to employees and associates under NIST S 7101.59: *Chemical Hazard Communication*, will provide employees and associates with the specific information regarding the physical and health hazards of the compressed gas.

(b) Visual Inspection

i. It shall be verified that the compressed gas cylinder is free of visible signs of damage, *e.g.*, cuts, digs, gouges, dents, bulging, corrosion.

(c) Leak Testing

i. It is recommended that compressed gas cylinders containing toxic, highly toxic, corrosive, or flammable gases are leak tested using a hand-held direct-reading thermal conductivity meter (preferred method) or a liquid soap solution or commercially available liquid leak detection solution. If the cylinder cap does not have openings in it, it must be removed before performing the leak test.

(d) Valid Hydrostatic or Ultrasonic Test Date[11]

i. It shall be verified that the compressed gas cylinder has a valid hydrostatic or ultrasonic test date clearly indicated on the cylinder, typically stamped near the shoulder or into the valve guard ring welded to the cylinder, if present. This testing is performed by the vendor or supplier prior to refilling a cylinder.[12]

(i) Most cylinders require a hydrostatic or ultrasonic test every 5 years.

(ii) Certain steel cylinders require testing only once every 10 years. These can be recognized by the five-pointed star stamped after the test date.

[11] Contact OSHE at x5375, Option 3, with questions or concerns.
[12] A cylinder may remain onsite, either in use or in storage, beyond its retest date. Retesting is only required when a cylinder is refilled and then transported in public. Retesting is also appropriate any time a cylinder had been damaged or potentially weakened, such as by being in a fire. [See DOT regulation 49 CFR 180.205(c)].

(3) Transport of Compressed Gas Cylinders

(a) Gas cylinders shall not be dragged, rolled on their sides, slid, or allowed to strike each other forcefully. Cylinders may be moved short distances (5-10 ft) by rolling them on their bottom edges.

(b) When lifting a cylinder with a crane, hoist, or derrick, an appropriate lifting device, such as a cradle or net, shall be used. Cylinders shall not be lifted with magnets or slings.

(c) Cylinders must never be lifted by their valve caps or valve guards.

(d) Cylinders transported by truck shall be fastened securely so that they will not fall or strike each other.

(e) Once delivered to the user, cylinders being moved more than a short distance (5-10 ft) shall only be transported in a cart or vehicle equipped to secure the cylinder in place.

i. Such carts or vehicles shall be inspected for defects prior to use.

ii. Cylinders weighing 11 Kg (25 lb) or less may be hand-carried.

(f) If a cylinder is to be transported in an elevator, the elevator should be unoccupied, and a sign stating, “Gas Cylinder in Transit, Do Not Ride”, or equivalent, should be attached to the gas cylinder cart or the interior of the elevator. An example is shown in Figure 3. Once the gas cylinder has been placed in the elevator and the desired floor selected, the gas cylinder should be met at the selected floor.

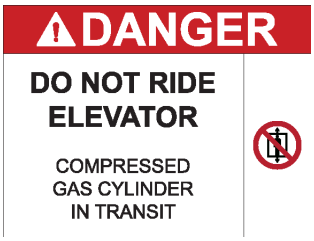

Figure 3: Sign for Transporting Compressed Gas Cylinder in Elevator

i. Special care should be taken in moving compressed gas cylinders onto and off elevators with regard to both the elevator threshold and the opening and closing of the elevator doors.

ii. No one not actually engaged in transporting a compressed gas cylinder on an elevator shall be permitted in the elevator while a cylinder is in transit.

(g) Cylinders shall only be moved or transported with the regulator removed and the valve protection cap properly secured.

i. It is acceptable to move or relocate a cylinder within an individual laboratory space (*i.e.*, a single room) without removing the regulator provided the cylinder is secured and transported on a stable cart.

(4) Storage of Compressed Gas Cylinders

(a) Gas cylinders shall be stored only in indoor and outdoor storage areas that have been determined by a hazard assessment to meet the requirements of applicable regulations, codes, and standards, especially NFPA 45 and 55.[13]

i. Gas cylinders shall not be stored in laboratories [see Section 6b(5)(c), Maximum Number of Cylinders in Use].[14]

(b) Gas cylinders shall be stored in such areas in accordance with the requirements of applicable regulations, codes, and standards, especially NFPA 45 and 55.

(c) Cylinders shall not be stored in the delivery cages at Building 1 in Boulder. All cylinders shall be moved out of these cages as soon as possible after the person that ordered them is notified of their arrival, preferably that same day. Cylinders shall never stay in a cage for more than two days.

(d) Cylinders Stored in Building Loading Docks in Gaithersburg[15]

[13] For assistance in establishing new indoor or outdoor storage areas, or of modifying existing storage areas, contact OSHE at x5375, Option 3.

[14] A request for variance (RFV) may be submitted to the NIST AHJ by a Division Chief (or equivalent) detailing the programmatic need for storing gas cylinders in a laboratory. The NIST AHJ will evaluate the request from a safety and regulatory compliance standpoint and either approve or disapprove it. The NIST AHJ will document its evaluation and provide it to the requesting Division Chief. If the request is approved, the NIST AHJ's evaluation must be appended to appropriate hazard review(s).

[15] A request for waiver (RFW) may be submitted to the Chief Safety Officer by a Division Chief (or equivalent) detailing the programmatic need for exceeding the storage timeframes. In this case, the Storeroom in Gaithersburg

i. Cylinders of normally-stocked gases may be stored in building loading docks for no more than 30 days.

ii. Cylinders of non-stocked (special order) gases may be stored in building loading docks for no more than 90 days.

(e) Cylinders containing liquified flammable gases and flammable gases in solution shall be positioned in the upright position.

i. Cylinders with a water capacity of 5 liters (1.3 gallons) or less shall be permitted to be stored in a horizontal position.

ii. Cylinders designed for use in a horizontal position shall be permitted to be stored in a horizontal position.

(f) Cylinders of flammable gases shall not be stored near highly flammable solids or liquids such as oil, gasoline, flammable solvents, or near combustible waste material, or similar substances. Cylinders of flammable gases, including small cylinders such as lecture bottles, shall not be stored in flammable storage cabinets if flammable or combustible solids or liquids are also present in the cabinet.

(5) Handling and Use of Compressed Gas Cylinders

(a) General Requirements

i. Cylinders shall be secured at all times to prevent them from falling or being knocked over by securing them to a gas cylinder cart, framework, or fixed object by use of a restraint. Restraints shall be used in such a way that they secure each cylinder individually.[16]

(i) Restraints designed for the purpose of restraining cylinders should be used.

(ii) In locations with large numbers of compressed gas cylinders, nesting using a contiguous 3-point contact system may be utilized. For more

and the OU responsible for managing the loading-dock storage area [see Section 9.a(2)] will be included in the safety evaluation of the request.

[16] The best practice for larger cylinders (e.g., 55 inches tall) is to apply one restraint one third of the way up the cylinder and a second restraint two thirds of the way up the cylinder. If only one restraint is available, it should be applied between one half and two thirds of the way up the cylinder.

information, refer to the definition of "nesting" in Section 7 and Appendix A of CGA P-1.

ii. Cylinders containing liquified flammable gases and flammable gases in solution shall be used in the upright position unless they are specifically designed for use in a horizontal position.

iii. Compressed gas cylinders, containers, and tanks shall not be placed where they could become a part of an electrical circuit.

iv. Compressed gas cylinders containing toxic, highly toxic, corrosive, or flammable gases should be leak tested before being put into service using a hand-held direct-reading thermal conductivity meter (preferred method) or a liquid soap solution or commercially available liquid leak detection solution. If the cylinder cap does not have openings in it, it must be removed before performing the leak test.

v. Static producing equipment located in flammable gas areas shall be grounded.

vi. Heating, where provided, shall be by indirect means. Equipment used for heating applications in rooms or areas where flammable gases are stored or used shall be listed and labeled for use in hazardous environments established by the gases present and shall be installed in accordance with the conditions of the listing and the manufacturer's installation instructions.

vii. When not in service, regulators shall be removed and valve protection caps that are not integrated into the cylinder design (and hence technically never removed) properly secured.

viii. One oxygen cylinder and one fuel gas cylinder may be located side-by-side on the same cart for welding and cutting, as long as they are in use or connected for use. When not in use or connected for use, the cylinders must be capped, removed from the cart, and placed in properly segregated storage areas, unless the cart is equipped with a five foot high, half hour rated fire wall located between the two cylinders, in which case the cylinders may remain on the cart even when not in use or connected for use.

ix. Cylinders, even when partially empty, shall never be heated by any device that could raise the surface temperature of the cylinder to above 52° C (125° F).

x. Cylinders should not be emptied to pressures lower than 172 kPa (25 psig) when such pressures could result in contaminants back-flowing into the cylinders and carrying over to when the cylinders are refilled and reused.

xi. Refilling or transfilling of cylinders shall be performed only by personnel who:

(i) Are properly trained and/or qualified to refill or transfill cylinders;

(ii) Have the proper equipment to refill or transfill cylinders;

(iii) Have approved hazard reviews and written operating procedures for refilling or transfilling cylinders; and

(iv) Are familiar with the precautions necessary to avoid the hazards of the product being handled.

xii. If a cylinder is connected to a closed system where there is a possibility of flow reversal, the cylinder shall be shut off and removed from the system while the pressure remaining in the cylinder is still greater than the pressure in the closed system.

(b) Valves and Regulators

i. Cylinder pressure shall be reduced through a regulator mounted to the cylinder-valve outlet or through a manifold.

ii. The cylinder valve shall be closed as soon as the necessary amount of gas has been released. The cylinder valve shall never be left open when the equipment is not in use, including when the cylinder is empty.

iii. The cylinder valve, not the regulator, shall be used for turning gas off when the cylinder is not in use.

iv. Only standard combinations of valves and fittings, as specified in CGA Standard V-1, or equivalent DIN or ISO standards, shall be used.

v. Cylinders that are opened with a valve spindle or stem instead of a hand-wheel shall have a spindle key on the spindle while the cylinder is in service.

vi. If tools are required to open cylinder caps or valves, only wrenches or tools specified by the manufacturer or supplier shall be used; tools shall not be used that could damage the cylinder, cylinder cap, or valve, or result in the valve being unintentionally opened while the cap is in place.

vii. Screwdrivers shall never be used to pry off a stuck cap.

viii. Pliers shall never be used to open a cylinder valve.

(c) Maximum Number of Cylinders in a Laboratory or Work Area

i. Cylinders not "in use" shall not be stored in the laboratory unit[17].

ii. A compressed gas cylinder shall be considered to be "in use" if it is in compliance with one of the following:

(i) Connected through a regulator to deliver gas to a laboratory operation; or

(ii) Connected to a manifold being used to deliver gas to a laboratory operation; or

(iii) A single cylinder secured alongside the cylinder connected through a regulator to deliver gas to a laboratory operation as a reserve cylinder.

(iv) The restriction against keeping cylinders that are not "in use" in a laboratory may not apply to laboratories that handle only chemicals with a hazard rating of 0 or 1 for health, flammability, and instability, as defined in NFPA 704, or in situations where storing a cylinder in a laboratory does not create an additional hazard. See footnote 12 regarding requesting an exception.

iii. Quantities of compressed and liquefied gases in laboratories and work areas shall be in accordance with NFPA 55.[18]

(i) The number of lecture-bottles in use or reserve shall be limited to 25 per lab or work area.

[17] Variances are possible under certain circumstances to increase the maximum number of cylinders in a space. Please contact OSHE for assistance at x5375, option #3.

[18] For assistance in determining quantity limits, contact OSHE at x5375, Option 3

(6) Mechanically Ventilated Enclosures and Gas Cabinets

(a) Lecture bottle-sized cylinders of the following gases located in laboratories shall be kept in continuously mechanically ventilated hoods or other continuously mechanically ventilated enclosures:

i. All gases that have a NFPA 704 health hazard rating of 3 or 4;

ii. All gases that have a NFPA 704 health hazard rating of 2 without physiological warning properties such as odor or irritation; and

iii. Pyrophoric gases.

(b) Compressed gas cylinders that are larger than lecture bottles and contain the following gases shall be kept in approved continuously mechanically ventilated, sprinklered gas cabinets:

i. All gases that have a NFPA 704 health hazard rating of 3 or 4;

ii. All gases that have a NFPA 704 health hazard rating of 2 without physiological warning properties; and

iii. Pyrophoric gases.

(c) Gas cabinets shall be constructed in accordance with NFPA 55.

(d) Gas cabinets shall be tested before they are put into service for any of the following events to ensure that the velocity at the face of the access ports or windows, with the access port or window open, is at least 200 ft per minute (fpm) average, and at least 150 fpm at each single point of measurement:

i. Installation;

ii. Modification; or

iii. Repaired.

(e) Gas cabinets shall be tested annually to ensure they meet the criteria listed in Section 6.b(6)(d).

(f) Gas cabinets shall be used as follows:

i. Gas cabinets shall contain no more than three containers, cylinders, or tanks; and

ii. Incompatible gases shall be stored and used in separate gas cabinets.

(7) Disposition of Empty and No-Longer-Needed Compressed Gas Cylinders

(a) When a cylinder is emptied to a pressure of 172 kPa (25 psig), the following actions shall be taken:

i. The regulator shall be removed;

ii. If the cylinder is designed to take a valve cap, the valve cap shall be installed;

iii. The cylinder shall be marked as empty; and

iv. The cylinder shall be returned to the storage area for pickup.

(b) If the contents of a cylinder are unknown or appropriate DOT labeling is not present on the cylinder, the cylinder shall not be moved from the laboratory. OSHE shall be contacted to assist with the identification of the cylinder contents and to provide guidance on appropriate disposal procedures.

(c) Lecture bottles shall not be abandoned in building loading docks or other storage areas.

(d) Chemical Waste Pick-Up requests shall be submitted to OSHE for pick-up and disposal of empty and no-longer-needed lecture bottles.

c. Compressed Gas Vessel and System Design

(1) System Design

(a) All systems shall be designed and constructed in accordance with the references listed in Section 4 of this suborder.

(b) Supply, piping, valves, connections, *etc.*, must be placed in such a way that they can be inspected and will not release into an occupied area without sufficient ventilation to prevent an oxygen-deficient atmosphere.

(c) If reserve cylinders or back-up supplies are connected, the arrangement shall preclude discharge of reserve cylinders during normal operation of primary supply.

(d) Systems shall be designed to be free of cross-connections that could allow gas to pass from a section of the system where the gas is intended to be present to a section of the system where the gas is not intended to be present.

(e) Tubing

i. Sharp tube bends shall be avoided. Tubing shall not be bent more sharply than recommended by the manufacturer.

ii. Flexible or plastic tubing shall only be used within "line of sight."

iii. Flexible tubing lengths shall be kept as short as possible, shall be protected from mechanical damage, and shall be anchored at the ends to prevent whipping in case of tubing or tube-fitting failure.

iv. Flexible tubing connections shall be secured with clamps approved for the maximum allowable pressure subjected to the connection. Flexible tubing connections shall not be secured with wire.

(f) Valves

i. The number and placement of valves shall be sufficient to facilitate maintenance, and to isolate systems for renovation and in case of emergency.

ii. Continuous access to valves located above ceilings, in utility rooms, or behind equipment shall be maintained.

iii. Valves shall be provided on each line running from a supply line to equipment so the equipment can be isolated for maintenance, repair, or replacement.

iv. Where fuel gas is permitted, a shut-off valve shall be provided immediately adjacent to the safety cabinet or hood or other location where the gas is used.

v. On liquefied-gas systems, all terminal-block (liquid-withdrawal) valves shall:

(i) Be rated above the vapor pressure of the liquid gas at 38 degrees Celsius (°C) (100 degrees Fahrenheit (°F)); or

(ii) Have properly set relief valves permanently installed on the outlet side of each terminal-block valve.

(g) Gauges

i. Gauges subject to pressure surges or cyclic pulses shall be protected by installing a needle valve or orifice for damping.

ii. When large pressure gauges (over 100 mm in face diameter) are used on gas systems with operating pressures over 1.4 MPa (200 psig) or on liquid systems over 140 MPa (20,000 psig), they shall have a special safety-type design including:

(i) Shatterproof faces;

(ii) Solid fronts; and

(iii) Blowout or generously vented cases.

If a large pressure gauge is used that does not have a special safety-type design, operators must be protected by a Lexan safety shield that is securely mounted over the existing gauge face, or the equivalent.

(h) Flammable Gas-Specific Requirements

i. Systems using flammable gases shall be designed to prevent a release in concentrations that are within flammable limits.

(i) Intentional release of any flammable gas indoors, even outside of flammable limits, must have prior approval of the NIST Authority Having Jurisdiction (AHJ). Please contact OSHE to request this approval.

ii. When using flammable gas-air mixtures, a flame arrester shall be utilized to prevent flashback.

iii. When using a flammable gas in the absence of an oxidizer, a flame arrester shall be required if a risk of flashback exists e.g. where air could infiltrate via a leak in a closed system

iv. Backflow prevention or check valves shall be provided where the backflow of a gas could create a hazardous condition, e.g. backflow of air into a closed system via a purge line.

v. Electrical and electronic equipment and wiring that is to be used in gas systems or locations where fire or explosion hazards may exist due to flammable gases must be approved for that use.

(i) The approval shall be from a nationally recognized testing laboratory such as Factory Mutual Insurance Co. (FM Global) or Underwriter's Laboratory (UL).

(ii) The potential hazard shall be categorized by Class and Division in accordance with Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1910.307 and NFPA 70, Article 500.

(a) Class I: Class I locations are those in which flammable gases, flammable liquid–produced vapors, or combustible liquid–produced vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

(b) Class I, Division 1: A Class I, Division 1 location is a location (1) In which ignitible concentrations of flammable gases, flammable liquid–produced vapors, or combustible liquid–produced vapors can exist under normal operating conditions.

(c) Class I, Division 2: A Class I, Division 2 location is a location (1) In which volatile flammable gases, flammable liquid–produced vapors, or combustible liquid–produced vapors are handled, processed, or used, but in which the liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems or in case of abnormal operation of equipment.

(2) Pipes, Tubing, and Component Materials

(a) Gas pipes, valves, fittings, regulators, and related components must be constructed of materials compatible with the gases to be contained and must be rated for the service. Stainless steel components are preferred in most systems. Where nonmetallic tubing is approved, additional controls may be required.

(b) Pipes and Tubing

i. Nonmetallic tubing shall not be used on flammable, toxic, and/or radioactive gas systems.

ii. Flexible tubing shall not be used for highly toxic gases.

(c) Fittings

i. Brass fittings shall be used with copper or brass tubing.

ii. Stainless-steel fittings shall be used with steel or stainless-steel tubing.

(3) Labeling of Gas Lines Emanating from Enclosures

(a) Each compressed gas line outside of the source gas cabinet or ventilated enclosure must be labeled:

i. At least every 6 m (20 ft) unless the gas line is shorter than 6 m (20 ft) and the gas line and gas source are in sight;

ii. At critical shutoff valves;

iii. At wall, floor, or ceiling penetrations; and

iv. As otherwise necessary to provide clear identification.

(b) Labels must be durable and display the gas name and direction of gas flow.

(c) Piping that may contain more than one type of gas at various times shall be marked to provide clear identification of that fact.

(4) System Testing

(a) Prior to operation, all newly constructed, newly installed, and remodeled compressed gas systems shall be tested per all applicable codes and standards as well as manufacturer specifications.

(b) Prior to operation, all lines and equipment shall be leak tested with an inert gas.

(5) Inspection and Repair

(a) Flexible tubing shall be inspected for aging, deterioration, and damage with a frequency in accordance with the manufacturer's recommendations.

(b) Any tubing showing leaks, burns, wear, or other defects shall be repaired or replaced immediately. The vessel or system shall not be used until the defective part is repaired or replaced.

(6) Deviations from the Requirements of Sections 6c(1)-(5)

(a) When requirements for specialized compressed gas vessels or systems make it impossible to comply with any of the provisions of Sections 6c(1)-(5), measures must be implemented to provide a level of protection equivalent that provided by these provisions.

(b) Any deviations from these provisions shall be identified as part of the applicable hazard review, and the alternative measures implemented documented therein.

(c) Alternative measures may include the following:

i. Ventilated enclosures;

ii. Gas detectors;

iii. Emergency off buttons;

iv. Emergency power;

v. Pneumatic shut-off valves;

vi. Smoke detectors;

vii. Fire sprinklers;

viii. Exhaust scrubbers;

ix. Flow restrictors; and

x. Ventilation alarms.

d. Hazardous Material Release

(1) In the case of an accidental or uncontrolled release, excluding a small amount that may be released during a cylinder exchange, of a hazardous compressed gas, the individual that discovers the release shall warn others in the immediate area, move to a safe location, and report the leak.

(a) In Boulder, the incident shall be reported by dialing 911 for Boulder Fire-Rescue and x7777 for NIST Police.

(b) In Gaithersburg, the incident shall be reported by dialing x2222 for NIST Emergency Services.

(c) Ignition sources in the vicinity of leaking flammable gas should be turned off if it is obvious that this can be done safely.

e. Training

(1) Training provided by OSHE on the Compressed Gas Safety Program and activity-specific training required by applicable hazard reviews shall be assigned and documented, and its completion by affected employees and associates recorded, in accordance with the requirements, roles, and responsibilities of NIST S 7101.23: *Safety Education and Training*. In particular:

(a) Employees and associates who are to engage in activities involving compressed gases shall complete:

i. The training provided by OSHE on the Compressed Gas Safety Program; and

ii. The activity-specific training, provided by their Organizational Units, required by applicable hazard reviews.

(b) The official first-level supervisors of employees and associates who are to engage in activities involving compressed gases shall complete the training provided by OSHE on the Compressed Gas Safety Program.

7. DEFINITIONS

a. Asphyxiant – A material capable of reducing oxygen in a person's body to dangerous levels, most commonly caused by displacing breathable air in an enclosed environment.

b. Ceiling Limit – An occupational exposure limit that should not be exceeded during any part of the working exposure. If instantaneous exposure levels cannot be determined, an average exposure over a 15-minute time period is generally used.

c. Compressed Gas – A material, or mixture of materials, that (1) is a gas at 20°C (68°F) or less at an absolute pressure of 101.325 kPa (14.696 psia) and (2) that has a boiling point of 20°C (68°F) or less at an absolute pressure of 101.325 kPa (14.7 psia) and that is liquefied, non-liquefied, or in solution, except those gases that have no other health or physical hazard properties are not considered to be compressed gases until the pressure in the packaging exceeds an absolute pressure of 280 kPa (40.6 psia) at 20°C (68°F).

d. Compressed Gas Cylinder (Cylinder) – A pressure vessel designed for pressures higher than 276 kPa (40 psia) and having a circular cross-section. It does not include a portable tank, multiunit tank car tank, cargo tank, or tank car.

e. Corrosive Gas – A gas that causes visible destruction of, or irreversible alterations in, materials or living tissue by chemical action at the site of contact.

f. Design Pressure – The maximum pressure at which a vessel or the weakest member of a pressure system has been designed to safely function at the normal operating temperature. Also the maximum setting of a pressure-relief device on a vessel or pressure system.

g. Exception – A condition for which a requirement does not apply because the condition falls outside of the scope or intent of the requirement.

h. Flammable Gas – Any substance that exists in the gaseous state at normal atmospheric temperature and pressure and is capable of being ignited and burned when mixed with the proper proportions of air, oxygen, or other oxidizers.

i. Highly Toxic Gas – A gas that can kill 50 percent of the test subjects (LC_{50}) with a concentration of less than or equal to 200 parts per million (ppm), a gas that has an ACGIH TLV or OSHA PEL of one ppm or less, or a gas designated as a "Poison A" by the DOT and

defined as a poisonous gas of such nature that a very small amount of the gas mixed with air is dangerous to life. Lists of LC_{50} values for toxic gases and vapors are available in ISO 10298. (An NFPA 704 Health Hazard rating of 4 is given to gases having an LC_{50} in air of less than or equal to 1000 ppm.)

j. Hydrostatic Test – A test of the strength and leak-resistance of a compressed gas cylinder by internal pressurization with a test liquid.

k. Immediately Dangerous to Life or Health (IDLH) – Defined by NIOSH as exposure to airborne contaminants that is "likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment."

l. Lecture Bottle – A small compressed gas cylinder up to a size of approximately 5 centimeters in diameter and 33 centimeters tall (2 in. x 13 in.).

m. Nesting – A method of securing flat-bottom cylinders upright in a tight mass using a contiguous three-point contact system whereby all cylinders within a group have a minimum of three points of contact with other cylinders, walls, or bracing (see CGA P-1, Appendix A).

n. Operating Pressure – The maximum pressure at which a vessel or pressure system is intended to be used under normal circumstances. This will generally be 5 percent to 25 percent lower than the design pressure for systems protected by a spring-loaded relief device and approximately 33 percent lower than the design pressure for systems protected by rupture-disk relief devices, depending on the fatigue life of the disc used, the temperature, and load pulsation.

o. Oxidizing Gas – A gas that can initiate or support combustion and can accelerate the combustion of other materials.

p. Oxygen-Deficient Atmosphere – An atmosphere containing less than 19.5 percent oxygen by volume.

q. Permissible Exposure Limit (PEL) –A legally enforceable occupational exposure limit established by OSHA that sets the maximum time-weighted average concentration of an air contaminant that workers may be exposed to over an 8-hour workday of a 40-hour workweek.

r. Pressure Relief Valve – A device designed to open at a predetermined pressure in order to prevent an unsafe rise of internal pressure in a pressure vessel or system.

s. Pyrophoric Gas – A chemical in a gaseous state that will ignite spontaneously in air at a temperature of 54.4°C (130°F) or below.

t. Regulator – A device that controls the release of gas from cylinders or other vessels.

u. Safety Data Sheet (SDS/MSDS) – A document produced by chemical manufacturers or importers in accordance with 29 CFR 1910.1200 to relay chemical, physical, and hazard information about specific substances.

v. Storage Area – A designated area, either indoors or outdoors, where cylinders that are not being used, loaded, or unloaded are stored safely for future use, and to which cylinders that are empty are returned for pickup.

w. Threshold Limit Value (TLV) – A recommended occupational exposure limit established by ACGIH, which is the time-weighted average of a contaminant to which nearly all workers may be repeatedly exposed day after day without adverse health effects.

x. Toxic Gas – A gas with an LC_{50} between 200 ppm to 2,000 ppm, or a gas that has an ACGIH TLV or OSHA PEL between 1 ppm to 50 ppm. Lists of LC_{50} values for toxic gases and vapors are available in ISO 10298. (An NFPA 704 Health Hazard rating of 3 is assigned to gases having LC_{50} air concentrations between 1,000 ppm to 3,000 ppm.)

y. Transfilling – Transfer of compressed gas from one container to another.

z. Variance – Authorization to have an alternative means of providing an equal or greater degree of safety (*i.e.*, equivalency) than that afforded by strict conformance to:

- NIST-adopted codes and standards overseen by the NIST AHJ; or
- NIST-specific requirements originating from AHJ interpretations and implementation of these same adopted codes and/or standards.

Variances do not exempt a requester from the requirement(s) and its intent.[19]

[19] The codes "establish the minimum requirements to provide a reasonable level of safety, public health and general welfare" to building occupants. The code allows for AHJ discretion in the interpretation of the code and implementation of "policies and procedures to clarify the application of its provisions." The code also allows for more stringent requirements to be implemented to meet the intent of the code and align with the needs of the occupants and occupancies. An individual requesting an equivalency from a more stringent NIST-specific requirement that originates from a general provision or minimum requirement in a code or standard must request a variance.

aa. Waiver – Authorization to have an alternative means of providing an equal or greater degree of safety (i.e. equivalency) than that afforded by strict conformance to the way NIST implements a NIST-specific requirement or regulatory requirement. Waivers do not exempt the requester from a regulatory requirement or NIST requirement, they simply permit a different means of compliance or implementation.[20]

8. ACRONYMS

a. ACGIH – American Conference of Governmental Industrial Hygienists

b. AHJ – Authority Having Jurisdiction

c. CFR – Code of Federal Regulations

d. CGA – Compressed Gas Association

e. CSO – Chief Safety Officer at NIST

f. DOT – Department of Transportation

g. IDLH – Immediately Dangerous to Life and Health

h. ISO – International Organization for Standardization

i. LC_{50} – Lethal Concentration 50 Percent

j. NFPA – National Fire Protection Association

k. NIOSH – National Institute of Occupational Safety and Health

l. OSHA – Occupational Safety and Health Administration

m. OSHE – NIST Office of Safety, Health, and Environment

n. PEL – Permissible Exposure Limit

[20] In some instances, the regulations task the employer with defining methods to implement requirements. For example, OSHA 1910.147(c)(5)(ii)(B) states that "Lockout and tagout devices shall be standardized within the facility in at least one of the following criteria: Color; shape; or size…" In this example, OSHA defers to the employer to establish a policy for lock color, shape, or size. If an individual wants to deviate from the requirements set forth by NIST regarding color, shape, or size of locks used for LOTO, they must request a waiver.

o. RFV – Request for Variance

p. RFW – Request for Waiver

q. TLV – Threshold Limit Value

9. RESPONSIBILITIES

a. OU Directors are responsible for:

(1) Ensuring that the requirements of Section 6 of this suborder are met in their OUs; and

(2) Determining which OU or division in an OU is responsible for managing gas cylinder storage areas shared by multiple OUs.[21]

b. Chief Safety Officer is responsible for:

(1) Approving or disapproving all appeals of requests for variance (RFV) denied by the NIST AHJ; and

(2) Approving or disapproving all requests for waiver (RFW).

c. Division Chiefs are responsible for:

(1) Submitting a RFV, RFW, and exception to the following requirements based on an evaluation of programmatic need:

(a) Section 6b(4)(a)i regarding the storage of compressed gas cylinders in laboratories;

(b) Section 6b(4)(d)i-ii regarding the storage of compressed gas cylinders in loading docks at NIST Gaithersburg, in consultation with the Storeroom; and

(c) Section 6b(5)(c)i regarding reserve cylinders being alongside cylinders in use.

d. NIST AHJ is responsible for:

(1) Making interpretations of the applicable codes/standards, deciding on the approval of equipment and materials, and granting the special permission contemplated in some of

[21] For example, this responsibility could be assigned to the OU that is the heaviest user of gas cylinders in a particular storage area, or to a division in that OU.

the rules, i.e., allowing deviation from specific requirements in the codes/standards or permitting alternative methods where it is assured that equivalent objectives can be achieved by establishing and maintaining effective safety; and

(2) Approving or disapproving RFVs.

e. Storeroom Supervisor is responsible for:

(1) Ensuring that compressed cylinders delivered to the Storeroom by outside vendors are inspected in accordance with the requirements of Section 6b(2) on point-of-delivery inspection of compressed gas cylinders;

(2) Delivering full compressed gas cylinders to building loading docks per customer orders;

(3) Not delivering compressed gas cylinders to building loading docks when storage rack areas are unavailable to secure the cylinders safely;

(4) Ensuring that cylinders of normally-stocked gases stored in building loading docks for more than 30 days are returned to the storeroom;

(5) Ensuring that cylinders of non-stocked (special order) gases stored in building loading docks for more than 90 days are returned to the storeroom and then to the supplier; and

(6) Consulting with the NIST AHJ on the approval or disapproval of variances to the requirements of Section 6b(4)(c)i-ii regarding the storage of compressed gas cylinders in loading docks at NIST Gaithersburg.

10. AUTHORITIES

There are no authorities specific to this suborder.

11. DIRECTIVE OWNER

Chief Safety Officer

12. APPENDICES

a. Revision History

Appendix A. Revision History

Revision	Date	Effective Date	Description of Change
None	05/27/15	04/01/2016	None – initial document.
1	11/23/2020	TBD	• Changed document dates to match current format. • Corrected typo in section 3.b. • Allowed transporting cylinders on cart with regulator attached within a room • Forbid storing flammable gas cylinders with other flammable materials • Added wording describing when oxygen and fuel gas cylinders could be together on a welding cart • Revised wording about "in use" cylinders to more closely match NFPA 45 and address exceptions • Added requirement to test new gas cabinets • Added requirements for releasing flammable gases indoors • Revised requirements for flame arresters and backflow prevention • Added requirement that electrical equipment be approved for hazardous locations • Added requirement for requesting variances and waivers • Added definitions for variance, waiver, and exception. • Modified Responsibilities Section to include responsibilities for requesting and approving variances and waivers
2	07/09/2021	TBD	• Footnote 17 modified to indicate variance and not exception is possible

NIST National Institute of Standards and Technology • U.S. Department of Commerce

FIRE PROTECTION & LIFE SAFETY FOR DESIGN AND CONSTRUCTION

NIST S 7401.01
Document Approval Date: 01/12/2021
Effective Date:[1] 10/01/2018

1. PURPOSE

The purpose of this suborder is to provide the requirements for fire protection and life safety for new construction and additions or alterations to existing buildings. The codes and standards adopted within this suborder are the baseline fire and life safety standards for design and construction that will be enforced on all NIST-owned and operated sites. Where applicable, the suborder specifies changes to, additions to, and adoptions of more stringent codes and standards.

The minimum fire and life safety requirements within the adopted codes and standards are wholly focused on the reduction or elimination of injuries and deaths related to fire. Property protection is a secondary benefit in some cases, however, it is not the focus or primary goal in most of the design standards referenced within the suborder. In cases where equipment is irreplaceable or the benefit-cost ratio is high, consideration should be given to other types of protection (e.g., early detection or specialty suppression systems) which go beyond the minimum requirements of the suborder.

2. BACKGROUND

a. NIST Policy (P) 7400.00, *Fire and Life* Safety, articulates NIST's commitment to making fire and life safety an integral core value and vital part of the NIST culture, in part by complying with applicable laws, regulations, and other promulgated fire and life safety requirements.

[1] For revision history, see Appendix A.

b. NIST Order (O) 7401.00, *Fire and Life Safety*, details the duties and powers of the NIST Authority Having Jurisdiction (AHJ)[2] with respect to fire protection and life safety requirements for new construction and additions or alterations to existing buildings.

3. APPLICABILITY

The provisions of this suborder apply to all new construction and to additions and alterations of existing buildings involving modifications to one or more of the following:

a. Fire alarm system components;

b. Fire suppression system components;

c. Fire-rated construction and smoke control features;

d. Means of egress components (e.g., exit signs, emergency lighting, travel paths, travel distance, etc.); or

e. Occupant loading or use and occupancy classification.

In existing buildings, the following table in accordance with the IEBC shall be referenced for determination of IEBC classification and if a NIST AHJ review is required:

IEBC CLASSIFICATION	DEFINITION EXAMPLES	NIST-AHJ REVIEW & Work Permit
Repairs	The reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage. Repairs include the patching or restoration or replacement of damaged materials, elements, equipment or fixtures for the purpose of maintaining such components in good or sound condition with respect to existing loads or performance requirements.	No
Alteration – Level 1	Alterations include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials,	No

[2] As detailed in Section 10, the NIST AHJ may delegate the authority to carry out any AHJ responsibilities to other Fire Protection Engineers (FPEs) in the Office of Safety, Health, and Environment (OSHE).

IEBC CLASSIFICATION	DEFINITION EXAMPLES	NIST-AHJ REVIEW & Work Permit
	elements, equipment or fixtures that serve the same purpose.	
Alteration – Level 2	Alterations include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment.	Yes
Alteration – Level 3	Alterations where the work area exceeds 50% of the building area.	Yes
Change of Occupancy	A change in the use of the building or a portion of a building. A change of occupancy shall include any change of occupancy classification, any change from one group to another group within an occupancy classification or any change in use within a group for a specific occupancy classification.	Yes
Additions	An extension or increase in floor area, number of stories, or height of a building or structure.	Yes

4. REFERENCES

a. 29 Code of Federal Regulations (CFR) Part 1910. Subpart L, Fire Protection

b. 29 CFR Part 1926, Subpart F, Fire Protection and Prevention

c. American Glovebox Society (AGS) *Guideline for Gloveboxes*

d. AGS *Standard of Practice for Glovebox Fire Protection*

e. American National Standards Institute (ANSI) A117.1, *Standard for Accessible and Usable Buildings and Building*

f. Division 21,[3] *Fire Suppression Specifications*

[3] Divisions refer to divisions of construction information, as defined by the Construction Specifications Institute (CSI)'s MasterFormat. This is the most widely used standard for organizing specifications and other written information for commercial and institutional building projects in the United States.

g. Division 28,[4] *Electronic Safety and Security Specifications*

h. Factory Mutual (FM) Data Sheet 1-53, Anechoic Chambers, April 2012 edition

i. FM Data Sheet 1-56, Cleanrooms

j. Federal Fire Prevention and Control Act of 1974

k. International Building Code (IBC), 2015 edition

l. International Existing Building Code (IEBC), 2015 edition

m. International Fire Code (IFC), 2015 edition

n. International Mechanical Code (IMC), 2015 edition

o. NFPA 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems*, 2015 edition

p. NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*, 2015 edition

q. National Fire Protection Association (NFPA) 10, *Standard for Portable Fire Extinguishers,* 2013 edition

r. NFPA 11, *Low, Medium, and High-Expansion Foam*, 2010 edition

s. NFPA 12, *Standard for Carbon Dioxide Extinguishing Systems*, 2011 edition

t. NFPA 13, *Standard for Installation of Sprinkler Systems,* 2013 edition

u. NFPA 14, *Standard for Installation of Standpipe and Hose Systems,* 2013 edition

v. NFPA 15, *Water Spray Fixed Systems for Fire Protection*, 2012 edition

w. NFPA 16, *Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, 2011 edition

x. NFPA 17, *Standard for Dry Chemical Extinguishing Systems*, 2013 edition

[4] Ibid.

y. NFPA 17A, *Wet Chemical Extinguishing Systems*, 2013 edition

z. NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals,* 2011 edition

aa. NFPA 70, *National Electrical Code*, 2014 edition

bb. NFPA 72, *National Fire Alarm and Signaling Code,* 2013 edition

cc. NFPA 75, *Standard for Fire Protection of Information Technology Equipment,* 2013 edition

dd. NFPA 80, *Fire Doors and Fire Windows,* 2013 edition

ee. NFPA 101, *Life Safety Code,* 2015 edition

ff. NFPA 110, *Standard for Emergency and Standby Power Systems*, 2013 edition

gg. NFPA 115, *Standard for Laser Fire Protection,* 2012 edition

hh. NFPA 291, *Recommended Practice for Fire Flow Testing and Marking of Hydrants*, 2010 edition

ii. NFPA 318, *Standard for the Protection of Semiconductor Facilities*, 2015 edition

jj. NFPA 750, *Water Mist Fire Protection Systems*, 2015 edition

kk. NFPA 801, *Standard for Fire Protection of Facilities Handling Radioactive Materials,* 2014 edition

ll. NFPA 2001, *Clean Agent Fire Extinguishing Systems*, 2012 edition

5. APPLICABLE NIST DIRECTIVES

a. NIST P 7400.00: *Fire and Life Safety*

b. NIST O 7401.00: *Fire and Life Safety*

c. NIST S 7401.02: *Inspection, Testing, and Maintenance of Fire Protection and Life Safety Systems*

d. NIST S 7401.03: *Impairment of Fire Protection and Life Safety Systems*

e. NIST S 7401.04: *Fire Prevention During Welding, Cutting and Other Hot Works*

f. NIST S 7101.60: *Chemical Management*

g. NIST S 7101.72: *Laser Safety*

6. REQUIREMENTS

a. Design and Construction Criteria

(1) NIST shall adopt the following codes and standards as baseline fire and life safety requirements for design and construction activities[5]:

(a) The 2015 International Code Council (ICC) suite of codes, including the IBC, IEBC, IFC, and IMC;

(b) The reference standards within the ICC suite of codes; and the referenced standards listed in Section 4 of this document.

(2) For existing NIST buildings undergoing additions or alteration, the following shall be adhered to:

(a) IEBC; and

(b) Federal Fire Prevention and Control Act of 1974

(3) For Request for Variance (RFV) and Appeal of Denied Request

(a) See NIST O7401-00 Fire & Life Safety and Appendices E and F.

(4) The following requirements are in addition to the adopted codes and standards listed in Section 6a(1), or are provided for additional clarity or emphasis.

(a) Building Design and General Fire and Life Safety Features

i. Type of construction, fire resistance requirements, penetrations, allowable floor area, building height limitations, building separation distance requirements, and allowable fire areas shall be in accordance with the IBC.

[5] A list of additional adopted codes and standards, to include those standards not referenced in this suborder but referenced in other FLS suborders, is provided in NIST O7401.00: Fire and Life Safety, Appendix B.

(i) Existing metal walls found in the NIST lab buildings are acceptable for reconfiguration within the limits of the adopted codes and standards.

ii. Means of egress requirements shall comply with IBC, Chapter 10 and NFPA 101[6], *Life Safety Code*, for new and existing buildings.

iii. Door openings in fire resistive construction shall be protected in accordance with NFPA 80, *Fire Doors and Fire Windows*.

(i) Approved fire doors and their frames shall not be modified in the field.

b. Fire Suppression Systems

(1) Any new fire suppression system or any alteration to an existing fire suppression system shall require a NIST Work Permit.

(2) All new construction shall have complete automatic sprinkler protection designed and installed in accordance with the IBC and NFPA 13, *Standard for the Installation of Sprinkler Systems*. The requirements for the installation of automatic sprinkler protection in existing buildings undergoing renovations shall be in accordance with the IEBC.

(a) Automatic sprinkler systems shall use equipment and devices listed by a Nationally Recognized Testing Laboratory (a.k.a. "NRTL"), and shall be acceptable per the NIST AHJ.

(b) Automatic sprinkler systems shall provide for 100% coverage of the building, unless otherwise permitted within NFPA 13.

i. NIST buildings/areas deemed sensitive to water damage or areas with irreplaceable equipment may be evaluated by the NIST AHJ for an exception to the 100% fire sprinkler requirement by the NIST AHJ. However, an alternative means for fire protection and life safety shall be provided.

(c) Backflow preventers shall be installed on all new systems in accordance with NFPA 13 and manufacturer requirements. Hydraulic calculations shall include pressure

[6] The requirements within Chapter 10 of the IBC supersede those requirements within NFPA 101 to the extent that the two codes conflict. In instances where additional requirements are provided within NFPA 101 that are not present in Chapter 10 of the IBC, those requirements shall be implemented unless otherwise deemed unnecessary by the NIST AHJ.

losses for backflow preventers, per manufacturer data sheets or a minimum of 5 PSI, whichever is greater.

(d) Fire sprinkler systems shall be designed using the Area/Density method from NFPA 13.

(e) Fire sprinkler piping shall be designed and installed in accordance with NFPA 13 and with the following NIST requirements:

i. All fire sprinkler piping shall be Schedule 40 for sizes of 6 inches and smaller;

ii. Fire sprinkler piping 6 inches or more may be exempt from the Schedule 40 requirements with prior NIST AHJ approval; and

iii. Incoming fire sprinkler feeds shall be dedicated and provided with a locked post indicator valve.

(f) Hydraulic calculations shall include a minimum 10% factor of safety for residual pressure.

(g) Shop drawings and calculations (when required) for new fire suppression systems or altered fire suppression systems shall be prepared by one of the following:

i. National Institute for Certification in Engineering Technologies (NICET) Level III for Automatic Sprinkler Systems;

ii. NICET Level IV for Special Hazards Suppression Systems; or

iii. A registered FPE.

(h) Fire suppression systems shall be designed, fabricated, and installed by a qualified person[7].

(i) All fire suppression systems shall be monitored unless otherwise permitted by the NIST AHJ.

[7] The term "qualified" is defined in the NFPA Glossary of Terms as "A competent and capable person or company that has met the requirements and training for a given field acceptable to the authority having jurisdiction." The term "qualified person" is defined in the NFPA Glossary of Terms as "A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to perform the work."

(3) For water-based fire protection systems, water flow tests shall be conducted in accordance with NFPA 291, *Recommended Practice for Fire Flow Testing and Marking of Hydrants,* to determine the available water supply.

(a) The water flow test shall be witnessed by the NIST AHJ.

(b) Historical water supply information may be presented for reference, but it shall not be accepted as input information for new or modified water-based fire protection systems.

(4) Standpipe systems shall be designed and installed in accordance with NFPA 14, *Installation of Standpipe and Hose Systems.*

(a) Class II and III standpipe systems are not permitted at NIST-owned and operated sites.

(5) Water spray systems shall be designed and installed in accordance with NFPA 15, *Water Spray Fixed Systems for Fire Protection.*

(6) Water mist systems shall be designed and installed in accordance with NFPA 750, *Water Mist Fire Protection Systems.*

(7) Foam systems shall be designed and installed in accordance with NFPA 11, *Low, Medium, and High-Expansion Foam*, and NFPA 16, *Installation of Foam-Water Sprinkler and Foam-Water Spray Systems.*

(8) Dry chemical extinguishing systems shall be designed and installed in accordance with NFPA 17, *Dry Chemical Extinguishing Systems.*

(9) Carbon dioxide systems shall be designed and installed in accordance with NFPA 12, *Carbon Dioxide Extinguishing Systems.*

(a) Total flooding systems are not allowed in normally occupied spaces, *i.e.*, in areas where a pipe break/leak could make a normally occupied area unsafe for occupants.

(10) Wet chemical extinguishing systems shall be designed and installed in accordance with NFPA 17A, *Wet Chemical Extinguishing Systems.*

(11) Wetting agent fire extinguishing systems and water additive fire controls shall be designed and installed in accordance with NFPA 18, *Wetting Agents*, and NFPA 18A, *Water Additives for Fire Control*

(12) Clean agent fire extinguishing systems shall be designed and installed in accordance with NFPA 2001, *Clean Agent Fire Extinguishing Systems.*

(a) With total flooding and local application clean agent systems, consideration shall be given to compartment under/over pressurization that could occur during discharge.

(13) Portable fire extinguishers shall be designed and installed in accordance with NFPA 45; *Standard on Fire Protection for Laboratories using Chemicals*, NFPA 101, *Life Safety Code*, and NFPA 10, *Portable Fire Extinguishers*.

(a) Fire extinguishers may be installed in recessed or semi-recessed enclosed cabinets. If necessary due to building restrictions, fire extinguishers may be placed on hooks without reducing egress widths beyond acceptable limits.

(14) Halon 1301 systems are prohibited at NIST-owned and operated sites.

c. Fire Detection Systems

(1) Any new fire detection system or alteration to an existing fire detection system shall require a NIST Work Permit.

(2) Fire alarm systems shall be designed and installed in accordance with NFPA 72, *National Fire Alarm Code*, and NFPA 70, *National Electric Code.*

(3) Duct smoke detectors

(a) New and existing building construction requirements for duct smoke detectors shall comply with the IMC.

(b) Duct detector bypass capabilities shall be provided at the fire alarm control panel (FACP) to allow for exhausting of smoke via the AHU(s).

(4) Fire alarm system shop drawings and calculations (when required) shall be prepared by one of the following:

(a) NICET Level III for Fire Alarm Systems; or

(b) A registered FPE.

(5) Fire alarm shop drawings and calculations (when required) shall satisfy the following requirements:

(a) Voltage drop calculations shall be limited to a 10% voltage drop; and

(b) Actual circuit lengths shall be utilized; and

(c) Battery calculations shall provide a minimum safety factor of 20%; and

(d) Batteries size shall be limited to 55 amp-hours. If calculations plus safety factor require larger batteries, then multiple 55 amp-hour batteries will be provided, unless otherwise approved by the NIST AHJ; and

(e) Battery shall be sized to provide a minimum of 36 hours of stand-by and 15 minutes of alarm for Gaithersburg and 24 hours of stand-by and 15 minutes of alarm for Boulder.

(6) Fire alarm systems shall be designed, fabricated, and installed by a qualified person[8].

(7) All fire alarm systems shall be monitored unless otherwise permitted by the NIST AHJ

(8) Fire Alarm System Components/Devices.

(a) The NIST fire alarm system shall be:

i. Compatible with the Simplex brand on the Gaithersburg campus; or

ii. Compatible with the Notifier brand on the Boulder campus.

(b) The NIST fire alarm systems shall be independent and stand-alone systems that are not dependent on security systems, energy monitoring and control systems, or any other systems.

[8] The term "qualified" is defined in the NFPA Glossary of Terms as "A competent and capable person or company that has met the requirements and training for a given field acceptable to the authority having jurisdiction." The term "qualified person" is defined in the NFPA Glossary of Terms as "A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to perform the work."

i. A fire alarm system may be combined with a building mass notification system or with a combination building mass notification and public-address system.

(c) The NIST fire alarm systems may be connected to security systems for monitoring purposes only, but shall not rely on any components of the security system for operation.

(d) The NIST fire alarm system shall not be utilized to perform functions unrelated to fire and life safety, e.g. building automation and/or mechanical and electrical system monitoring.

(e) Audio/Visual (AV) devices may be either wall or ceiling mounted devices, and shall be selectable for 15/30/75/110 candela rating/s.

(f) Wireless interior fire alarm systems are not allowed at NIST-owned and operated sites without written approval of NIST AHJ.

(g) Fire Alarm System Circuitry.

i. NIST fire alarm circuits shall be Class A on the Gaithersburg campus. Class B circuitry is acceptable on the Boulder campus.

ii. No T-taps are allowed.

iii. Minimum wire gauge is 14.

iv. All fire alarm circuits shall be in conduit.

(i) Conduits filling shall conform to conduit fill requirements of NFPA 70, *National Electrical Code*.

(9) The NIST fire alarm system shall report the following fire events/occurrences as follows:

(a) Manual pull stations shall transmit a fire alarm signal to the NIST monitoring system. The building notification devices shall be activated.

(b) Water flow switches (where present) shall transmit a fire alarm signal to the NIST monitoring system. The building notification devices shall be activated.

(c) Heat, smoke, flame (IR), and beam detectors shall transmit a fire alarm signal to the NIST monitoring system. The building notification devices shall be activated.

i. Exception: Detectors located in compartmented, fire-rated mechanical rooms shall transmit a supervisory signal to the NIST monitoring system.

(d) Duct smoke detectors shall transmit a supervisory signal to the NIST monitoring system. The respective air-handling unit (AHU) shall automatically shut down.

(e) Tamper switches shall transmit a supervisory signal to the NIST monitoring system.

(f) Local dedicated system control panels shall be monitored for alarm, supervisory, and trouble signals, which shall be transmitted to the NIST monitoring system unless deemed unnecessary by the NIST AHJ.

i. The NIST AHJ shall have final decision over how specific actions from local control panels are transmitted to the NIST monitoring system.

d. Special Occupancies & Hazards

(1) Laboratories Using Chemicals

(a) All laboratory buildings, laboratory units, and laboratory work areas shall be constructed and protected in accordance with NFPA 45, *Fire Protection for Laboratories Using Chemicals*.

(2) Data/Server Rooms

(a) Electronic equipment rooms shall be constructed and protected in accordance with IBC; NFPA 75, *Protection of Information Technology Equipment*; and NFPA 70, *National Electric Code*.

i. These areas include, but are not limited to, automatic data processing areas (data/server rooms), communication centers, and battery rooms.

ii. Incidental electronic equipment including, but not limited to, printers, desk top computers, office automation systems, individual computer work stations, telephones, video conference rooms, administration telephone rooms, and reproduction equipment would not be required to comply with this section.

(3) Battery Rooms

(a) Battery rooms shall be constructed and protected in accordance with NFPA 70, *National Electric Code*.

(4) Anechoic Chambers

(a) FM Global Data Sheet 1-53, *Anechoic Chambers*, should be consulted for design guidance.

(b) Anechoic chambers shall be protected by either a water based sprinkler system in accordance with NFPA 13, or a clean agent system in accordance with NFPA 2001.

(c) Anechoic chambers construction shall use only noncombustible materials for structure, wall, floor, and ceiling panels.

(d) Fire suppression systems shall be controlled by dedicated U.L. listed control valve assembly.

(e) Anechoic chambers shall be equipped with dedicated high sensitivity smoke detection (HSSD) system.

i. New anechoic chambers may be protected by expansion of an existing HSSD system with prior approval from NIST AHJ.

(f) Power shall be shunted to the anechoic chambers, and all equipment within the chamber, upon activation of fire suppression or detection system.

(5) Laser laboratories which are capable of producing beam ignition hazards and which utilize materials or components presenting a fire hazard shall be constructed and protected in accordance with NFPA 115, *Standard for Laser Fire Protection.*

(6) Clean rooms shall be constructed and protected in accordance with FM Global Data Sheet 1-56, unless otherwise approved by the NIST AHJ, where applicable, NFPA 318, *Standard for the Protection of Semiconductor Facilities* and IFC Chapter 27

(a) Clean rooms shall be protected by a complete fixed-based extinguishing system, designed and installed in accordance with one of the nationally recognized standards listed in Section 4.

(b) Where airflow within the cleanroom is such that buoyant drive flows will be disrupted, such as in the case of downward air flow or high flow velocities, an evaluation must be performed to determine if standard ceiling mounted detection will provide adequate protection or an alternative detection mechanism, e.g., very early smoke detection apparatus (a.k.a. "VESDA"), shall be provided.

(7) Environmental chambers, such as temperature and humidity controlled enclosures used for testing electronics, biological materials, or other industrial products, shall be protected by a complete fixed-based extinguishing system, designed and installed in accordance with one of the nationally recognized standards listed in Section 4.

(a) Where the chamber is composed of non-combustible materials[9] and is not contained within a building protected by sprinklers, fixed fire suppression may not be required.

i. Chambers shall be equipped with an approved detection system if a fixed fire suppression system is not utilized to protect the chamber.

ii. Electrical shunting shall be coupled with fire detection.

(b) Fire suppression and detection systems should be designed and installed to withstand the range of environmental conditions that may be present in the chamber.

(c) Combustible gas detection and carbon monoxide detection equipped with a local alarm shall be provided in the chamber where heat is provided by a gas-powered furnace.

(8) Gloveboxes shall be protected in accordance with NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals,* AGS *Guideline for Gloveboxes*, and AGS *Standard of Practice for Glovebox Fire Protection.*

(a) Where radioactive materials are utilized within gloveboxes, the requirements within NFPA 801, *Standard for Fire Protection of Facilities Handling Radioactive Materials,* shall also apply.

[9] The NFPA glossary of terms defined a "noncombustible material" as "a material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors, when subjected to fire or heat. Materials that are reported as passing ASTM E 136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C, shall be considered noncombustible materials."

e. Statements of Work (SOW's)

(1) All SOWs involving NIST activities subject to the requirements of this suborder (see Section 3. APPLICABILITY), whether for external or internal work, shall specify compliance with:

(a) NIST adopted codes, standards, amendments;

(b) Other NIST Fire and Life Safety suborder requirements; and

f. A/E Design and Construction Submittals

(1) A/E firms shall provide design submittal packages, as defined below, for 35%, 65%, and 95%.

(a) Requirements for the design submittal phases may be altered with approval from the NIST AHJ for both design-bid-build and design-build projects.

(b) The NIST AHJ shall review design submittals within the period designated in the contract.

(c) All open comments shall be addressed prior to 100%/Issue for Construction (IFC) Set being issued to NIST AHJ office. The IFC set shall be submitted to the NIST AHJ office prior to start of construction.

(2) 35% Basis of Design Narrative Submittal Package.

(a) Building Code Submittal Package (35%)

i. Project Summary;

ii. Applicable codes/standards with referenced editions;

iii. Occupancy classification;

iv. Building construction type;

v. Building height and allowable area calculations;

vi. Building separation distances if applicable; and

vii. Occupancy separations.

(b) Fire Alarm Submittal Package (35%)

i. Preliminary design specifications from Division 28.

ii. One (1) preliminary half-size drawing set with the following at a minimum:

(i) General design & installation notes;

(ii) Fire alarm zones; and

(iii) Preliminary device layout.

(c) Fire Suppression Submittal Package (35%)

i. Preliminary design specifications from Division 21; and

ii. One (1) preliminary half-size drawing set with the following at a minimum:

(i) General design & installation notes;

(ii) Flow test data, not to be over 12 months old from the time of submission;

(iii) Fire suppression zones;

(iv) Hazard classifications identified per NFPA 13, *Standard for Installation of Sprinkler Systems*; and

(v) Preliminary hydraulic calculations to determine if a fire pump will be required.

(d) Life Safety Submittal Package (35%)

i. One (1) half-size drawing set with the following at a minimum:

(i) Occupant load factors and calculated occupant loads;

(ii) Maximum travel distance(s);

(iii) Common path(s) of travel;

(iv) Maximum dead-end travel;

(v) Exit remoteness measurements;

(vi) Required wall ratings; and

(vii) Exit capacity.

(3) 65% Design Submittal

(a) Building Code Submittal Package (65%)

i. All 35% comments addressed with revision clouds and notes referencing appropriate comments; and

ii. Updated basis of design narrative.

(b) Fire Alarm Submittal Package (65%)

i. All 35% comments addressed with revision clouds and notes referencing appropriate comments;

ii. Updated design specifications from Division 28; and

iii. One (1) updated half-size drawing set with the following at a minimum:

(i) General design & installation notes;

(ii) Fire alarm zones;

(iii) Updated device layout;

(iv) Sequence of operations;

(v) Riser diagram; and

(vi) Installation details.

(c) Fire Suppression Submittal Package (65%)

i. All 35% comments addressed with revision clouds and notes referencing appropriate comments;

ii. Updated design specifications from Division 21; and

iii. One (1) updated half-size drawing set with the following at a minimum:

(i) General design and installation notes;

(ii) Flow test data, not to be over 12 months old from the time of submission;

(iii) Fire suppression zones;

(iv) Fire suppression main sizes and locations;

(v) Fire suppression riser sizes and locations;

(vi) Fire suppression valve details;

(vii) Fire department connection locations and details;

(viii) Post indicator valve locations and details;

(ix) Fire suppression incoming size and location;

(x) Hazard classifications identified per NFPA 13, *Standard for Installation of Sprinkler Systems*;

(xi) Detailed hydraulic calculations done with NIST AHJ approved software; and

(xii) Manufacturer Product Data Sheets (design-build only).

(d) Life Safety Submittal Package (65%)

i. All 35% comments addressed with revision clouds and notes referencing appropriate comments.

ii. One (1) updated half-size drawing set with the following at a minimum:

(i) Occupant load factors and calculated occupant loads;

(ii) Maximum travel distance(s);

(iii) Common path(s) of travel;

(iv) Maximum dead-end travel;

(v) Exit remoteness measurements;

(vi) Required wall ratings; and

(vii) Exit capacity.

(4) 95% Design Submittal

(a) Building Code Submittal Package (95%)

i. All 65% comments addressed with revision clouds and notes referencing appropriate comments;

ii. Final basis of design narrative; and

iii. Manufacturer Product Data for Penetrations and Underwriters Laboratory (a.k.a. "UL") Listed Assemblies (Design-Build only).

(b) Fire Alarm Submittal Package (95%)

i. All 65% comments addressed with revision clouds and notes referencing appropriate comments;

ii. Final design specifications from Division 28; and

iii. One (1) final half-size drawing set with the following at a minimum:

(i) General design and installation notes;

(ii) Fire alarm zones;

(iii) Updated device layout;

(iv) Sequence of operations;

(v) Riser diagrams;

(vi) Installation details;

(vii) Battery and voltage calculations (design-build only); and

(viii) Manufacturer Product Data Sheets (design-build only).

(c) Fire Suppression Submittal Package (95%)

i. All 65% comments addressed with revision clouds and notes referencing appropriate comments;

ii. Final design specifications from Division 21; and

iii. One (1) final half-size drawing set with the following at a minimum:

(i) General design and installation notes;

(ii) Flow test data, not to be over 12 months old from the time of submission;

(iii) Fire suppression zones;

(iv) Fire suppression main sizes and locations;

(v) Fire suppression riser sizes and locations;

(vi) Fire suppression valve details;

(vii) Fire department connection locations and details;

(viii) Post indicator valve locations and details;

(ix) Fire suppression incoming size and location;

(x) Hazard classifications identified per NFPA 13, *Standard for Installation of Sprinkler Systems*;

(xi) Updated detailed hydraulic calculations done with NIST AHJ approved software; and

(xii) Updated manufacturer Product Data Sheets (design-build only).

(d) Life Safety Submittal Package (95%)

i. All 65% comments addressed with revision clouds and notes referencing appropriate comments;

ii. Final building code summary; and

iii. One (1) final half-size drawing set with the following at a minimum:

(i) Occupant loads and occupant load factors;

(ii) Maximum travel distance(s);

(iii) Common path(s) of travel;

(iv) Maximum dead-end travel;

(v) Exit remoteness measurements;

(vi) Required wall ratings; and

(vii) Exit capacity.

(5) 100%/IFC Set

(a) Building Code Submittal Package (100%)

i. All previous comments addressed and closed out; and

ii. All revision clouds and notes referencing appropriate comments deleted.

(b) Fire Alarm Submittal Package (100%/IFC Set)

i. All previous comments addressed and closed out;

ii. All revision clouds and notes referencing appropriate comments deleted;

iii. Final design specifications from Division 28; and

iv. One (1) final half-size drawing set.

(c) Fire Suppression Submittal Package (100%/IFC Set)

i. All previous comments addressed and closed out;

ii. All revision clouds and notes referencing appropriate comments deleted;

iii. Final design specifications from Division 21; and

iv. One (1) final half-size drawing set.

(d) Life Safety Submittal Package (100%/IFC Set)

i. All previous comments addressed and closed out; and

ii. All revision clouds and notes referencing appropriate comments deleted.

(6) Construction Submittals

(a) Fire Alarm

i. Submittals shall be in accordance with approved Division 28 specifications.

(b) Fire Suppression

i. Submittals shall be in accordance with approved Division 21 specifications.

g. OFPM Work Order Submittals

(1) OFPM shall submit work orders to the NIST AHJ for review in accordance with Section 3 (Applicability) of this suborder.

(a) It is the obligation of the organization performing the work to ensure compliance with the requirements of this suborder and to ensure that a NIST Work Permit is obtained when required. If there is any uncertainty regarding the requirements for a permit, the organization performing the work shall consult with the NIST AHJ.

(2) All work orders shall contain the following information:

(a) Building and room number;

(b) OU Point of Contact

(c) Description of work;

(d) Work area plans and/or sketch; and

(e) OFPM contact name and contact information.

h. OU-Managed Projects

(1) All contracts that involve work in accordance with Section 3 (Applicability) of this suborder shall by reviewed by the NIST AHJ.

(a) It is the obligation of the organization performing the work to ensure compliance with the requirements of this suborder and to ensure that a NIST Work Permit is obtained when required. If there is any uncertainty regarding the requirements for a permit, the organization performing the work shall consult with the NIST AHJ. (b) All submittals from contractors shall follow the applicable requirements set forth in Section 6e and 6f.

(2) All projects executed in-house, e.g. design and construction work performed by NIST staff, that involve work in accordance with Section 3 (Applicability) of this suborder shall be reviewed by the NIST AHJ.

(a) It is the obligation of the organization performing the work to ensure compliance with the requirements of this suborder and to ensure that a NIST Work Permit is obtained when required. If there is any uncertainty regarding the requirements for a permit, the organization performing the work shall consult with the NIST AHJ.

(b) All submittals for projects executed in-house shall contain the following information:

i. Building and room number;

ii. Statement of work per Section 6b;

iii. Work area plans and/or sketch, which when required by the NIST AHJ, shall be reviewed and approved by a licensed professional engineer or other qualified person;

iv. Information on the individual(s) performing the specific work required:

(i) Name;

(ii) Training required to perform that work; and

(iii) When required by the NIST AHJ, certifications indicating that the individuals are competent to perform the work.

v. OU contact name and contact information.

i. NIST Work Permit

(1) Work involving New construction and additions or alterations to existing buildings shall not commence until a NIST Work Permit, when required, has been issued by the NIST AHJ

(2) The NIST AHJ shall issue a NIST Work Permit subsequent to:

(a) Signing the 100% drawings and documents related to A/E firm design submittals; and

i. The issuance of a NIST Work Permit prior to 100% drawing acceptance may be approved by the NIST AHJ for design-build projects.

(b) Approving the OFPM work order submittal; or

(c) Approving the OU-managed project submittal.

(3) The NIST Work Permit shall contain the following information (see Appendix B):

(a) Location where the work will be performed (*e.g.*, specific location on campus or building and room number);

(b) Description of work;

(c) Work permit expiration date;[10]

(d) Signature of the NIST AHJ; and

(e) Name and contact information for the Contracting Officer's Representative and for the OFPM, or OU contact, whichever is applicable.

(3) Audits

(a) The NIST AHJ shall perform, at minimum, an annual audit of all NIST 260 forms submitted to OFPM to ensure compliance with the requirements of this suborder.

(b) Failure to obtain a work permit, when required, may result in a Stop Work Order (see NIST S 7101.03), revocation of a Use and Occupancy Certificate (see below), or delay in issuance of a Use and Occupancy Certificate.

j. Construction Phase

(1) All NIST Work Permits shall be prominently posted on the job site for the duration of work being performed.

(2) All requests for information (a.k.a. "RFIs") involving work in accordance with Sections 3a-e (Applicability) of this suborder shall be submitted to the NIST AHJ in hard-copy or electronic format.

(3) Inspections of fire and life safety construction activities shall be performed or witnessed by the NIST AHJ prior to close-ins.

(a) The NIST AHJ shall be notified at least two (2) weeks prior to the requested inspection date.

(b) Shorter notification periods are acceptable for projects lasting less than 30 days.

[10] The expiration date for the work permit shall be coordinated with the project manager.

(c) A third party qualified company may perform inspections of fire and life safety construction activities with prior approval by the NIST AHJ.

(4) Acceptance Testing

(a) Shall be in accordance with NFPA 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems*.

(b) Shall be in accordance with NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*.

(c) All fire alarm and fire suppression systems shall be acceptance tested per NFPA 72, *National Fire Alarm and Signaling Code,* and NFPA 13, *Standard for Installation of Sprinkler Systems*, respectively.

(d) Pre-testing documentation shall be provided to the NIST AHJ at least one (1) week prior to scheduling final acceptance testing.

i. Shorter notification periods are acceptable for projects lasting less than 30 days.

(e) The NIST AHJ shall be notified at least two (2) weeks prior to the requested final acceptance testing date.

i. Shorter notification periods are acceptable for projects lasting less than 30 days.

(f) Where feasible, acceptance testing shall be conducted during normal business hours (8:00 am to 5:00 pm), Monday through Friday.

k. Use and Occupancy (U&O) Certificates

(1) U&O certificates shall be issued by the NIST AHJ prior to occupancy of any newly constructed building, occupancy of an addition of an existing building, or change in occupancy of an altered space in an existing building.

(a) U&O certificates shall be maintained in the possession of the OU responsible for the space.

(2) The NIST AHJ shall issue U&O certificates subsequent to being provided with the following:

(a) Final inspection report(s) for fire and life safety systems and/or components as conducted by NIST AHJ or approved third party company; and

(b) Acceptance testing(s) documents in accordance with NFPA 3, 13, and 72.

(3) The U&O certificate shall indicate the following, where applicable (see Appendix C):

(a) Certificate number;

(b) Date of issue;

(c) Use & occupancy classification;

i. Laboratory classification, as defined in NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*; and

(d) Building and room number(s).

(4) Temporary U&O certificate shall indicate the following, where applicable (see Appendix D):

(a) Date of issue;

(b) Use & occupancy classification;

(c) Deficiencies requiring correction prior to final U&O issuance.

(d) Building and room number(s); and

(e) Date of expiration.

(5) Existing spaces not undergoing alterations shall be grandfathered from the requirement for a U&O certificate until such time that the space is inspected by the NIST AHJ.

7. DEFINITIONS

a. Acceptable – Considered by the NIST AHJ as adequate for satisfying the goals, performance objectives, and/or performance criteria.

b. Acting Authority Having Jurisdiction – A qualified[11] FPE in the Office of Safety, Health, and Environment (OSHE) designated by the CSO to be temporarily assigned all authorities, duties, and obligations of the NIST AHJ during the NIST AHJ's absence or in the event of position vacancy.

c. Addition – An extension or increase in floor area, number of stories, or height of a building or structure.

d. Alteration – Any construction or renovation to an existing structure other than repair or addition. This would also include a change of occupancy.

e. Anechoic Chamber – Any space designed and constructed to absorb sound or electromagnetic wave reflections.

f. Appeal – A process by which a Division Chief or equivalent, or a higher-level manager, requests that the NIST CSO review a denial or rejection of an RFV by the NIST AHJ.

g. Authority Having Jurisdiction – A qualified FPE[12] in OSHE designated by the NIST CSO to enforce[13] the NIST-adopted codes and standards relevant to fire, electrical, and life safety on NIST-owned and operated sites.

h. Change of Occupancy – A change in the purpose or level of activity within a building that involves a change in application of the requirements of this suborder, *e.g.*, modifying a laboratory space to an office space.

i. Compliance – Meeting or exceeding all applicable requirements of the NIST adopted code(s) and standard(s).

j. Delegated Authority Having Jurisdiction – A qualified engineer in OSHE designated by the NIST AHJ to enforce the NIST-adopted codes and standards that fall within their relevant discipline(s).

[11] See requirements for Office of Personnel Management Fire Protection Engineering Series 0804.
[12] See requirements for Office of Personnel Management Fire Protection Engineering Series 0804.

[13] Nature of enforcement is dependent upon the severity of the violation, e.g. stop work order, revocation of work permit, denial of use and occupancy, etc.

k. Equivalency – A proposed alternative means of providing an equal or greater degree of safety than that afforded by strict conformance to prescribed codes and standards.

l. Existing Building – A building erected prior to the adoption of the appropriate code, or one for which a NIST Work Permit has been issued.

m. NIST Work Permit – A document issued by the NIST AHJ which indicates approval to begin work in a building or tenant space where alterations to fire, or life safety components will be performed/managed by OFPM, OU, or a contractor.

n. Performance-Based Approach – An approach that relies upon measurable (or calculable) outcomes to be met but provides more flexibility as to the means of meeting those outcomes.

o. Repair – The reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage.

p. Shall/Should/May –

- Shall (Must or Will): Indicates that the performance of an item is mandatory.
- Should: Indicates that the performance of an item is not mandatory, but the full implications of not performing that item must be understood and either justified or carefully weighed before choosing a different course.
- May: Indicates that the performance of an item is at the discretion of the individual responsible for the action.

q. Use and Occupancy Certificate – A document issued by the NIST AHJ certifying that the building or space is compliant with the NIST adopted codes and standards.

r. Variance – An equivalency or an exception (i.e. modification) from the code and/or suborder requirement(s).

8. ACRONYMS

a. A&E – Architectural/Engineering

b. AGS – American Glovebox Society

c. AHJ – Authority Having Jurisdiction

d. ANSI – American National Standards Institute

e. CFR – Code of Federal Regulations

f. CSO – Chief Safety Officer

g. FM – Factory Mutual

h. FPE – Fire Protection Engineer

i. GPL – General Purpose Lab

j. IBC – International Building Code

k. ICC – International Code Council

l. IEBC – International Existing Building Code

m. IFC – International Fire Code

n. IMC – International Mechanical Code

o. NCEES – National Council of Examiners for Engineering and Surveys

p. NFPA – National Fire Protection Association

q. NICET – National Institute for Certification in Engineering Technologies

r. OFPM – Office of Facility and Property Management

s. OSHA – Occupational Safety and Health Administration

t. PE – Professional Engineer

u. U&O – Use and Occupancy

9. RESPONSIBILITIES

a. NIST AHJ or Delegated AHJ is responsible for:

(1) Reviewing all A/E design submittals, within the timeframes specified in the contracts, to ensure compliance with the adopted fire and life safety codes and standards.

(2) Reviewing all work orders within five (5) business days, and identifying necessary submittal documents.

(3) Reviewing all design and construction documents for OFPM and OU-managed projects to ensure compliance with the adopted fire and life safety codes and standards;

(4) Issuing NIST Work Permits for OFPM and OU-managed projects when required.

(5) Inspecting fire and life safety system components prior to close-ins,

(6) Overseeing acceptance testing of fire protection and life safety systems;

(7) Issuing U&O certificates for newly renovated or newly constructed spaces; and

(8) Inspecting existing, occupied spaces not undergoing alterations and issuing U&O certificates.

b. OU Directors are responsible for:

(1) Ensuring that the requirements of Section 6 of this suborder are met for OU managed project; and

(2) Ensuring that all newly renovated or newly constructed spaces owned by the OUs have a Use and Occupancy certificate prior to occupancy and that Use and Occupancy certificates are readily available upon the request of the NIST AHJ.

(3) For OU-managed projects:

(a) Ensuring that the NIST AHJ is consulted on all new construction, renovations, and alterations of spaces including alteration to fire alarm system components, suppression system components, fire-rated assemblies, life safety and means of egress components (*e.g.*, exit signage, emergency lighting, travel path, travel distance, *etc.*), occupant loading or U&O classification;

(b) When appropriate, submitting design and construction documents to the NIST AHJ for review and approval through all submittal phases;

(c) Ensuring that work is not started without NIST AHJ review to determine if a NIST Work Permit is required; and

(d) Ensuring the NIST Work Permits issued by the NIST AHJ are posted on the site during construction activities.

c. Contracting Officer's Representative/Project Manager is responsible for:

(1) Submitting design and construction documents to the NIST AHJ for review and approval through all submittal phases

(2) Ensuring that the NIST AHJ is consulted on all new construction, renovations, and alterations of spaces including alterations to fire alarm system components, suppression system components, fire-rated assemblies, life safety and means of egress components (e.g. exit signage, emergency lighting, travel path, travel distance, etc.), occupant loading or U&O classification.

(3) Ensuring that work is not started without NIST AHJ review to determine if a NIST Work Permit is required.

(4) Ensuring the NIST Work Permits issued by the NIST AHJ are posted on the site during construction activities.

(5) Ensuring the As-built drawings are submitted by the contractors for project close-out.

d. Chief Facility Maintenance Officer is responsible for:

(1) Ensuring that the requirements of Section 6 of this suborder are met for all A/E and OFPM projects; and

(2) Ensuring As-built drawings for fire systems are managed and updated as needed.

10. AUTHORITIES

a. The NIST Authority Having Jurisdiction may delegate the authority to carry out any AHJ responsibilities to FPEs in the Office of Safety, Health, and Environment.

11. DIRECTIVE OWNER

Chief Safety Officer

12. APPENDICES

A. Revision History

B. NIST Work Permit Form

C. Certificate of Use and Occupancy

D. Temporary U&O Certificate

E. Request for Variance Form

F. Request for Appeal Form

Appendix A. Revision History

Revision No.	Approval Date	Deployment Start Date	Effective Date	Brief Description of Change; Rationale
0	09/30/17	05/01/18	10/01/18	• None – Initial document
1	01/12/21	April Camenisch		• Updated NIST suborder links.

Appendix B. Work Permit Form

NIST-XXX	**U.S. DEPARTMENT OF COMMERCE** NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

NIST WORK PERMIT

OSHE-FFSG

A. PERMIT DETAIL

Permit Number	Building Number	Room Number	Date of Issue	Date of Expiration

B. CONTACT INFORMATION

Name	Phone Number

C. DESCRIPTION OF WORK

D. DECISION

☐ Approved ☐ Not Approved		Comments
Name (Print)	Phone Number	Title Authority Having Jurisdiction (AHJ)
Signature		Date

Appendix C. Certificate of Use and Occupancy

Federal Building Owned by the
National Institute of Standards & Technology
Department of Commerce

Certificate No:	
Permit No:	
Date of Issue:	
Building:	
Room:	
Primary Occupancy Use:	
Contact Name & Title:	
Contact Phone Number:	

This certifies that the above facility conforms to the approved plans on file with the National Institute of Standards and Technology Office of Facilities and Property Management and complies with all building, safety, and fire codes adopted by NIST and required by Federal law and regulations for the use and occupancy designated above as of the date of final inspection and approval.

Title	**Name**	**Signature**	**Date**
Director - OFPM	_____	_____	_____
Division Chief – OFPM, Design & Construction	_____	_____	_____
Authority Having Jurisdiction – OSHE	_____	_____	_____
Group Leader (min.) – OSHE	_____	_____	_____

Appendix D. Temporary Certificate of Use and Occupancy

Federal Building Owned by the
National Institute of Standards & Technology
Department of Commerce

Certificate No:	
Permit No:	
Date of Issue:	
Date of Expiration (If applicable):	
Building:	
Room:	
Primary Occupancy Use:	
Contact Name & Title:	
Contact Phone Number:	
Outstanding Deficiencies:	

This certifies that the above facility conforms to the approved plans on file with the National Institute of Standards and Technology Office of Facilities and Property Management and complies with all building, safety, and fire codes adopted by NIST and required by Federal law and regulations for the use and occupancy designated above as of the date of final inspection and approval.

Title	**Name**	**Signature**	**Date**
Director - OFPM	_____	_____	_____
Division Chief – OFPM, Design & Construction	_____	_____	_____
Authority Having Jurisdiction – OSHE	_____	_____	_____
Group Leader (min.) – OSHE	_____	_____	_____

1293 **Appendix E. Request for Variance Form**

1294

NIST-XXX	**U.S. DEPARTMENT OF COMMERCE** NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

REQUEST FOR VARIANCE

OSHE-FFSG

A. REQUESTER

Name	Division	Building	Room	Phone

B. PROJECT INFORMATION

Project Title	Work Order Number (If applicable)
Building	**Room**

Description of Variance

Prescriptive Requirement/s from which Variance is Sought

Alternative Means for Prescriptive Requirement

D. TO BE COMPLETED BY AHJ

Assigned Variance Number:	☐ Approved ☐ Not Approved

Comments		
Name (Print)	Phone Number	Title ☐ Authority Having Jurisdiction (AHJ) ☐ Acting AHJ
Signature		Date
Name (Print)	Phone Number	Title OSHE Program Manager
Signature		Date

1295

1296

1297 **Appendix F. Request for Appeal Form**

1298

NIST-XXX	**U.S. DEPARTMENT OF COMMERCE** NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

REQUEST FOR APPEAL

OSHE-FFSG

A. REQUESTER

Name	Division	Building	Room	Phone

B. PROJECT INFORMATION

Project Title	Variance Number
Building	**Room**

Supporting Information for Appeal

D. TO BE COMPLETED BY CHIEF SAFETY OFFICER

☐ Approved	☐ Not Approved

Comments

Name (Print)	Phone Number	Title Chief Safety Officer
Signature		Date

1299

NIST National Institute of Standards and Technology • U.S. Department of Commerce

INSPECTION, TESTING, AND MAINTENANCE OF FIRE PROTECTION AND LIFE SAFETY SYSTEMS

NIST S 7401.02
Approval Date: 03/28/2018
Effective Date:[1] 04/01/2019

1. PURPOSE

The purpose of this suborder is to establish requirements and associated roles and responsibilities related to inspection, testing, and maintenance (ITM) of fire protection and life safety systems on NIST-owned and operated sites.

2. BACKGROUND

a. NIST Policy (P) 7400.00: *Fire and Life Safety*, articulates NIST's commitment to making fire and life safety an integral core value and vital part of the NIST culture, in part by complying with applicable laws, regulations, and other promulgated fire and life safety requirements.

b. NIST Order (O) 7401.00: *Fire and Life Safety*, details the duties and powers of the NIST Authority Having Jurisdiction (AHJ)[2] with respect to inspection, testing, and maintenance of fire protection and life safety systems.

c. In general, there are two considerations with respect to fire protection and life safety systems:

(1) A ***building*** fire protection and life safety system (see Section 7, **DEFINITIONS**) is any system that:

(a) Is required by the NIST-adopted codes and standards; and

[1] For revision history, see Appendix A.
[2] The NIST AHJ may delegate the authority to carry out any AHJ responsibilities to other Fire Protection Engineers in the Office of Safety, Health, and Environment.

(b) Serves as part of the overall building fire and life safety protection.

As such, it is the responsibility of NIST, as an institution, to ensure these systems are inspected, tested, and maintained according to the established requirements. These systems are monitored (see Section 7, **DEFINITIONS**).

(2) A ***research-specific*** fire protection and life safety system (see Section 7, **DEFINITIONS**) is any system that:

(a) Is required due to a hazard created by a research task; and

(b) Is not part of the overall building fire and life safety protection.

These systems may be monitored or local (see Section 7, **DEFINITIONS**), *i.e.*, non-monitored. Regardless of their "monitored" status, it is the responsibility of the OU that owns the system to ensure these systems are inspected, tested, and maintained according to the established requirements.

3. APPLICABILITY

a. The provisions of this suborder apply to the following building and research-specific fire protection and life safety systems on NIST-owned and operated sites:

(1) Fire alarm systems;

(2) Fixed fire suppression systems;

(3) Handheld fire extinguishing systems;

(4) Fire and smoke control (and compartmentation) systems;

(5) Emergency and standby power systems;

(6) Explosion prevention and control systems;

(7) Commercial cooking suppression systems;

(8) Elevator systems;

(9) Means of egress and associated systems;

(10) Monitored life safety systems; and

(11) Local (non-monitored) life safety systems.

4. REFERENCES

a. National Fire Protection Association (NFPA) 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems*, 2015 edition.

b. NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*, 2015 edition.

c. NFPA 10, *Standard for Portable Fire Extinguishers,* 2013 edition.

d. NFPA 11, *Low, Medium, and High-Expansion Foam*, 2010 edition.

e. NFPA 12, *Standard for Carbon Dioxide Extinguishing Systems*, 2015 edition.

f. NFPA 13, *Standard for Installation of Sprinkler Systems,* 2013 edition.

g. NFPA 15, *Water Spray Fixed Systems for Fire Protection*, 2012 edition.

h. NFPA 16, *Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, 2015 edition.

i. NFPA 17, *Standard for Dry Chemical Extinguishing Systems*, 2013 edition.

j. NFPA 17A, *Wet Chemical Extinguishing Systems*, 2013 edition.

k. NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, 2013 edition.

l. NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2014 edition.

m. NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals,* 2015 edition.

n. NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, 2013 edition.

o. NFPA 69, *Standard on Explosion Prevention Systems,* 2014 edition.

p. NFPA 72, *National Fire Alarm and Signaling Code,* 2013 edition.

q. NFPA 80, *Standard for Fire Doors and Other Opening Protectives,* 2013 edition.

r. NFPA 90A, *Standard for Installation of Air-Conditioning and Ventilating Systems,* 2015 edition.

s. NFPA 90B*, Standard for the Installation of Warm Air Heating and Air-Conditioning Systems,* 2015 edition.

t. NFPA 92, *Standard for Smoke Control Systems*, 2015 edition.

u. NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, 2014 edition.

v. NFPA 101, *Life Safety Code,* 2015 edition.

w. NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives*, 2013 edition.

x. NFPA 110, *Standard for Emergency and Standby Power Systems*, 2013 edition.

y. NFPA 111, *Standard for Stored Electrical Energy Emergency and Standby Power Systems*, 2013 edition.

z. NFPA 204, *Standard for Smoke and Heat Venting*, 2015 edition.

aa. NFPA 291, *Recommended Practice for Fire Flow Testing and Marking of Hydrants*, 2013 edition.

bb. NFPA 318, *Standard for the Protection of Semiconductor Fabrication Facilities*, 2015 edition.

cc. NFPA 720*, Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*, 2015 edition.

dd. NFPA 750, *Water Mist Fire Protection Systems*, 2015 edition.

ee. NFPA 2001, *Clean Agent Fire Extinguishing Systems*, 2015 edition.

5. APPLICABLE NIST DIRECTIVES

a. NIST P 7400.00: *Fire and Life Safety*

b. NIST O 7401.00: *Fire and Life Safety*

c. NIST S 7401.01: *Fire Protection & Life Safety Systems for Design and Construction*

d. NIST S 7401.03: *Impairment of Fire Protection and Life Safety Systems*

e. NIST S 7101.52: *Cryogen Safety*

f. NIST S 7101.60: *Chemical Management*

g. NIST S 7101.61: *Compressed Gas Safety*

6. REQUIREMENTS

a. System Commissioning (*i.e.*, Acceptance Testing)

(1) Newly installed and modified existing fire protection and life safety systems shall undergo pre-functional testing in accordance with the relevant codes identified in Section 6b of this document, prior to acceptance testing.

(2) Newly installed and modified existing fire protection and life safety systems shall undergo acceptance testing in accordance with:

(a) NFPA 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems*, 2015 edition; and

(b) System specific codes identified in Section 6.b of this document.

(3) The NIST AHJ shall witness acceptance testing of all newly installed and modified existing fire protection and life safety systems.

(a) A minimum written (including electronic) notice of five (5) business days[3] should be provided to the NIST AHJ for acceptance testing.

b. Fire Protection and Life Safety System Inspection, Testing, and Maintenance (see Appendix B for a consolidated list of ITM requirements from the NIST adopted codes and standards).

(1) Fire Alarm Systems

(a) Fire alarm systems (*e.g.*, smoke detectors, heat detectors, UV/IR detectors, beam detectors, strobes, horns, speakers, control panels, *etc.*) shall be inspected, tested, and maintained in accordance with NFPA 72, *National Fire Alarm and Signaling Code,*

[3] Where necessary and feasible, a shorter notification period may be approved by the NIST AHJ.

2013 edition.

i. Modifications to the programming of fire alarm systems shall meet the requirements set forth in Section 14.4.2.5 of NFPA 72, *National Fire Alarm and Signaling Code*, 2013 edition, which states "Changes to the system executive software shall require a 10 percent functional test of the system, including a test of at least one device on each input and output circuit to verify critical system functions such as notification appliances, control functions, and off-premises reporting."

(b) Life safety systems monitored on the fire alarm system shall be inspected, tested, and maintained in accordance with NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*, 2015 edition as well as the requirements listed below for each specific device.

i. Carbon monoxide detectors shall be inspected, tested, maintained in accordance with:

(i) NFPA 72, *National Fire Alarm and Signaling Code,* 2013 edition; and

(ii) NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*, 2015 edition.

ii. Combustible gas detectors (*e.g.*, hydrogen, natural gas, propane, *etc.*) shall be inspected, tested, and maintained in accordance with:

(i) NFPA 72, *National Fire Alarm and Signaling Code,* 2013 edition; and

(ii) Manufacturer instructions.

iii. Oxygen depletion sensors shall be inspected, tested, and maintained in accordance with:

(i) NFPA 72, *National Fire Alarm and Signaling Code,* 2013 edition; and

(ii) Manufacturer instructions.

iv. Toxic gas detectors shall be inspected, tested, and maintained in accordance with:

(i) NFPA 72, *National Fire Alarm and Signaling Code,* 2013 edition; and

(ii) Manufacturer instructions.

v. Automated external defibrillator (AED) cabinet alarms shall be inspected, tested, and maintained in accordance with NFPA 72, *National Fire Alarm and Signaling Code,* 2013 edition.

(c) Mechanical and electrical devices monitored on the fire alarm system (*e.g.*, water detection, freeze stat, pumps, heaters, fans, breakers, etc.) shall be inspected, tested, and maintained in accordance with manufacturer instructions and shall be maintained in such a manner that the fire alarm system is kept free of reoccurring or standing trouble conditions and nuisance alarms resulting from a failure of the device.

i. Only mechanical and electrical devices that are deemed "critical" for monitoring shall be approved by the NIST AHJ to be added to the fire alarm system.

(2) Fixed Fire Suppression Systems

(a) Water-Based Fire Protection Systems

i. Sprinkler systems shall be inspected, tested, and maintained in accordance with:

(i) NFPA 13, *Standard for Installation of Sprinkler Systems,* 2013 edition; and

(ii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2014 edition.

ii. Standpipe and hose systems shall be inspected, tested, and maintained in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2014 edition.

iii. Private fire service mains shall be inspected, tested, and maintained in accordance with:

(i) NFPA 291, *Recommended Practice for Fire Flow Testing and Marking of Hydrants*, 2013 edition; and

(ii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2014 edition.

iv. Fire pumps shall be inspected, tested, and maintained in accordance with:

(i) NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, 2013 edition; and

(ii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2014 edition.

v. Water spray fixed systems shall be inspected, tested, and maintained in accordance with:

(i) NFPA 15, *Water Spray Fixed Systems for Fire Protection*, 2012 edition; and

(ii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2014 edition.

vi. Foam-water sprinkler systems shall be inspected, tested, and maintained in accordance with:

(i) NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, 2010 edition; or

(ii) NFPA 16, *Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, 2015 edition; and

(iii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2014 edition.

vii. Water mist systems shall be inspected, tested, and maintained in accordance with:

(i) NFPA 750, *Water Mist Fire Protection Systems*, 2015 edition; and

(ii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2014 edition.

viii. Valves (*e.g.*, control, alarm, check, pre-action, deluge, dry pipe, relief, backflow, fire department connections), valve components, trim, and piping shall be inspected, tested, and maintained in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2014 edition.

(b) Non-Water-Based Fire Protection Systems

i. Carbon dioxide extinguishing systems shall be inspected, tested, and maintained in accordance with NFPA 12, *Standard for Carbon Dioxide Extinguishing Systems*, 2015 edition.

ii. Dry chemical extinguishing systems shall be inspected, tested, and maintained in accordance with NFPA 17, *Standard for Dry Chemical Extinguishing Systems*, 2013 edition.

iii. Wet chemical extinguishing systems shall be inspected, tested, and maintained in accordance with NFPA 17A, *Standard for Wet Chemical Extinguishing Systems*, 2013 edition.

iv. Clean agent extinguishing systems shall be inspected, tested, and maintained in accordance with NFPA 2001, *Standard for Clean Agent Fire Extinguishing Systems*, 2015 edition.

(c) Commercial Cooking Suppression Systems

i. Commercial cooking systems shall be inspected, tested, and maintained in accordance with NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, 2014 edition.

(3) Handheld Fire Extinguishing Systems

(a) Handheld fire extinguishers (*e.g.*, water-type, dry chemical, wet chemical, carbon dioxide, halogen agent) shall be maintained in accordance with NFPA 10, *Standard for Portable Fire Extinguishers,* 2013 edition.

(4) Fire and Smoke Control (and Compartmentation) Systems

(a) Fire doors shall be inspected, tested, and maintained in accordance with NFPA 80, *Standard for Fire Doors and Other Opening Protectives,* 2013 edition.

(b) Air-conditioning, heating, ventilating ductwork, and related equipment, including smoke dampers and combination fire and smoke dampers shall be inspected, tested, and maintained in accordance with:

i. NFPA 90A, *Standard for Installation of Air-Conditioning and Ventilating Systems,* 2015 edition; and

ii. NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems,* 2015 edition.

(c) Smoke control systems shall be inspected, tested, and maintained in accordance with NFPA 92, *Standard for Smoke Control Systems*, 2015 edition.

(d) Smoke dampers and combination fire and smoke dampers shall be inspected, tested, and maintained in accordance with NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives*, 2013 edition.

(e) Smoke and heat venting systems shall be inspected, tested, and maintained in accordance with NFPA 204, *Standard for Smoke and Heat Venting*, 2015 edition.

(5) Emergency and Standby Power Systems

(a) Emergency and standby power systems providing secondary power to fire protection and life safety systems shall be inspected, tested, and maintained in accordance with:

i. NFPA 110, *Standard for Emergency and Standby Power Systems*, 2013 edition; or

ii. NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, 2013 edition.

(6) Explosion Prevention and Control Systems

(a) Deflagration vents shall be inspected, tested, and maintained in accordance with NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, 2013 edition.

(b) Explosion prevention systems shall be inspected, tested, and maintained in accordance with NFPA 69, *Standard on Explosion Prevention Systems,* 2014 edition.

(7) Elevator Systems

(a) Elevator emergency operations (*e.g.*, firefighter operation, recall, and shunt trip) shall be inspected, tested, and maintained in accordance with:

i. NFPA 101, *Life Safety Code*, 2015 edition; and

ii. ASME A17.1, *Safety Code for Elevators and Escalators*, 2007 edition.

(8) Means of Egress and Associated Systems

(a) Means of egress (*e.g.*, corridors, hallways, stairwells, vestibules, walkways, *etc.*) and associated systems (*e.g.*, doors, turnstiles, locks, latches, stairs, railings, exit signs, emergency lights, elevators, *etc.*) shall be inspected, tested, maintained in accordance with Chapter 7 of NFPA 101, *Life Safety Code*, 2015 edition.

i. As stated in Section 4.6.12 of NFPA 101 and added here for emphasis "Whenever and wherever any device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or any other feature is required for compliance with the provisions of this *Code*, such device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or other feature shall thereafter be continuously maintained. Maintenance shall be provided in accordance with applicable NFPA requirements or requirements developed as part of a performance-based design, or as directed by the authority having jurisdiction."

(9) Local (Non-Monitored) Life Safety Systems

(a) The following local (non-monitored) detectors/sensors shall be inspected, tested, and maintained in accordance with manufacturer instructions:

i. Carbon monoxide detectors;

ii. Combustible gas detectors (*e.g.*, hydrogen, natural gas, propane, *etc.*);

iii. Oxygen depletion sensors; and

iv. Toxic gas detectors

(i) The criteria set forth in Section 7.9.6.3 of NFPA 55, *Compressed Gases and Cryogenic Fluids*, 2013 edition, must be met for a locally monitored systems to be deemed acceptable.

(10) Equipment Safety Systems and Interlocks

(a) Equipment safety systems and interlocks designed to stop the flow of hazard chemicals to equipment or tools upon detection of smoke or fire shall be inspected, tested, and maintained in accordance with manufacturer instructions.

(b) Systems providing inputs to the fire alarm systems shall also be inspected, tested, and maintained in accordance with:

i. NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*, 2015 edition; and

ii. NFPA 72, *National Fire Alarm and Signaling Code,* 2013 edition.

(11) Other Safety Systems

(a) Chemical fume hoods and associated low flow air sensors shall be inspected, tested, and maintained in accordance with NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*, 2015 edition, and *NIST S 7101.60, Chemical Management*.

(b) Safety showers and eyewashes shall be inspected, tested, and maintained in accordance with *NIST S 7101.60, Chemical Management*.

c. Fire Protection and Life Safety System Impairments

(1) Impairment of any fire or life safety system shall comply with the requirements set forth in NIST S 7401.03: *Impairment of Fire Protection and Life Safety Systems*.

d. Performance of Inspection, Testing, and Maintenance

(1) Inspection, testing, and maintenance of fire protection and life safety systems shall be performed by an individual that meets the requirements set forth in the system-specific codes and standards referenced in Section 6b.

e. Recordkeeping

(1) ITM records shall be maintained per the requirements established within the relevant system-specific codes or for a minimum of two (2) years from the date of ITM completion where not specified within the code.

(2) ITM records shall be readily available for review by the NIST AHJ upon request.

7. DEFINITIONS

a. Acceptance Testing – Testing performed on an installation to confirm compliance with applicable manufacturers' installation specifications, applicable codes and standards, and the project Basis of Design and Owner's Project Requirements (NFPA *Glossary of Terms*).

b. Authority Having Jurisdiction (AHJ) – A qualified Fire Protection Engineer[4] in Office of Safety Health and Environment designated by the NIST Chief Safety Officer to enforce[5] the NIST-adopted codes and standards relevant to fire, electrical, and life safety on NIST-owned and operated sites.

c. Building Fire Protection and Life Safety Systems – Any system that is required by the NIST adopted codes and standards which also serves as part of the overall building fire and life safety protection.

d. Commissioning – A systematic process that provides documented confirmation that fire protection and life safety systems function according to the intended design criteria set forth in the project documents and satisfy the owner's operational needs, including compliance with any applicable laws, regulations, codes, and standards requiring fire protection and life safety systems (NFPA *Glossary of Terms*).

e. Commissioning Record – The complete set of commissioning documentation for a project that is turned over to the owner at the end of the construction phase.

f. Compartmentation – The interposing of a physical barrier that is not required to be fire or explosion resistant to limit combustible particulate solid migration and hence to control the size of a hazard area (NFPA *Glossary of Terms*).

g. Compliance – Meeting or exceeding all applicable requirements of the NIST adopted code(s) and standard(s).

h. Delegated Authority Having Jurisdiction – A qualified engineer in Office of Safety Health and Environment designated by the NIST AHJ to enforce the NIST-adopted codes and standards that fall within their relevant discipline(s).

i. Emergency Power System – A system designed to provide secondary power to fire protection and life safety systems.

j. Fire Alarm System – A system or portion of a combination system that consists of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices and to initiate the appropriate response to those signals (NFPA *Glossary of Terms*).

[4] See requirements for Office of Personnel Management Fire Protection Engineering Series 0804.
[5] Nature of enforcement is dependent upon the severity of the violation, e.g. stop work order, revocation of work permit, denial of use and occupancy, etc.

k. Fire and Life Safety – The protection of life and property by minimizing fire and related hazards through the incorporation of and maintenance of building features, fire protection systems, and egress components, and the implementation of safe work practices.

l. Fire Protection System – Any fire alarm device or system or fire-extinguishing device or system, or combination thereof, that is designed and installed for detecting, controlling, or extinguishing a fire or otherwise alerting occupants, or the fire department, or both, that a fire has occurred.

m. Fixed Fire Suppression System – A total flooding or local application system consisting of a fixed supply of extinguishing agent permanently connected for fixed agent distribution to fixed nozzles that are arranged to discharge an extinguishing agent into an enclosure (total flooding), directly onto a hazard (local application), or a combination of both; or an automatic sprinkler system (NFPA *Glossary of Terms*).

n. Impairment – Temporary shutdown (in whole or in part) of a Fire Protection System where the system is damaged, disabled, or out of order. The resulting condition is that the Fire Protection System does not function as intended in the event of a fire or other emergency.

o. Inspection – A visual examination of a system or portion thereof to verify that it appears to be in operating condition and is free of physical damage (NFPA *Glossary of Terms*).

p. Life Safety Systems – Those systems that enhance or facilitate evacuation, smoke control, compartmentalization, and/or isolation.

q. Local (Non-Monitored) Systems – Fire protection and life safety systems that, when a change of state occurs, result in an audible and/or visual alarm at the device only; the change of state is not monitored at a supervised central station.

r. Monitored Systems – Fire protection and life safety systems connected to the NIST fire alarm system that, when a change of state occurs, result in a trouble, supervisory, and/or alarm signal at a supervised central station.

s. Means of Egress – A continuous and unobstructed way of travel from any point in a building or structure to a public way consisting of three separate and distinct parts: (1) the exit access, (2) the exit, and (3) the exit discharge (NFPA *Glossary of Terms*).

t. Pre-Functional Testing – Testing performed prior to acceptance testing to confirm compliance with manufacturers' specifications, applicable codes and standards, and the project documents (NFPA *Glossary of Terms*).

u. Private Fire Service Main – Private fire service main is that pipe and its appurtenances on private property:

(1) Between a source of water and the base of the system riser for water-based fire protection systems;

(2) Between a source of water and inlets to foam-making systems;

(3) Between a source of water and the base elbow of private hydrants or monitor nozzles;

(4) Used as fire pump suction and discharge piping; or

(5) Beginning at the inlet side of the check valve on a gravity or pressure tank (NFPA *Glossary of Terms*).

v. Research-Specific Fire Protection and Life Safety Systems – Any system required due to a hazard created by a research task and which is not part of the overall building fire and life safety protection.

w. Shall/Should/May –

- Shall (Must or Will): Indicates that the performance of an item is mandatory.

- Should: Indicates that the performance of an item is not mandatory, but the full implications of not performing that item must be understood and either justified or carefully weighed before choosing a different course.

- May: Indicates that the performance of an item is at the discretion of the individual responsible for the action.

x. Testing – A procedure used to determine the operational status of a component or system by conducting periodic physical checks, such as water flow tests, fire pump tests, alarm tests, and trip tests of dry pipe, deluge, or pre-action valves (NFPA *Glossary of Terms*).

8. ACRONYMS

a. AHJ – Authority Having Jurisdiction

b. ITM – Inspection, Testing, and Maintenance

c. NFPA – National Fire Protection Association

d. OFPM – Office of Facilities and Property Management

9. RESPONSIBILITIES

a. Laboratory Organizational Unit (OU) Directors are responsible for:

(1) Ensuring that the *Inspection, Testing, and Maintenance of Fire Protection and Life Safety Systems Suborder* is adapted and used in their spaces for research-specific fire protection and life safety systems; and

(2) Ensuring that research-specific fire protection and life safety systems are inspected, tested, and maintained in accordance with Section 6.

(3) Ensuring that individuals performing the inspection, testing, and maintenance of fire protection and life safety systems are qualified per the requirements set forth in the system-specific codes and standards referenced in Section 6.

(4) Ensuring that all ITM records for research-specific fire protection and life safety systems are maintained per the requirements of Section 6d.

b. Chief Facilities Management Officer is responsible for:

(1) Ensuring that building fire protection and life safety systems are inspected, tested, and maintained in according with Section 6;

(2) Ensuring that individuals performing the inspection, testing, and maintenance of fire protection and life safety systems are qualified per the requirements set forth in the system-specific codes and standards referenced in Section 6.

(3) Ensuring that new and modified building fire protection and life safety systems undergo:

(a) Pre-functional testing; and

(b) Acceptance testing and commissioning;

(4) Ensuring that acceptance and commissioning records are:

(a) Received from the commissioning agent;

(b) Provided to the NIST AHJ in electronic or hard copy form; and

(c) Maintained by OFPM for the life of the system; and

(5) Ensuring that all ITM records for building fire protection and life safety systems are maintained per the requirements of Section 6e.

c. Fire Protection Group is responsible for (Gaithersburg only):

(1) Ensuring that handheld fire extinguishers are inspected, tested, and maintained in accordance with the requirements of this suborder;

(a) Ensuring that all extinguishers are barcoded to allow for tracking of annual maintenance requirements; and

(2) Ensuring that all ITM records are maintained per the requirements of Section 6e.

d. NIST AHJ or (Delegated AHJ) is responsible for:

(1) Ensuring that the requirements of this suborder are enforced;

(2) Witnessing acceptance testing of all new and modified fire protection and life safety systems; and

(3) Annually auditing ITM records to ensure that program requirements are being met and records are being appropriately maintained.

10. AUTHORITIES

a. The NIST AHJ may delegate the authority to carry out any AHJ responsibilities to Fire Protection Engineers in the Office of Safety, Health, and Environment.

b. As the owner of a research-specific system(s), the Laboratory OU is ultimately responsible for ITM of the system(s). However, the Laboratory OU may transfer the responsibilities for conducting ITM or managing a contract for ITM to another entity, such as OFPM, provided this agreement is formalized in a Memorandum of Understanding (MOU) and a copy of that MOU is provided to the NIST AHJ.

c. As owner of building fire protection and life safety systems, OFPM is ultimately responsible for ITM of those systems. However, OFPM may transfer a portion of these responsibilities to another entity, such as the NIST Gaithersburg Fire Protection Group, provided this agreement is formalized in an MOU and a copy of that MOU provided to the NIST AHJ.

11. DIRECTIVE OWNER

Chief Safety Officer

12. APPENDICES

A. Revision History

Appendix A. Revision History

Revision No.	Approval Date	Deployment Start Date	Effective Date	Brief Description of Change; Rationale
0	03/28/18	TBD	TBD	• None – Initial document

708
709 Appendix B. ITM Requirements Extracted from NIST Adopted Codes and Standards
710
711

Component	Periodic Frequency	Method	NFPA Reference
1. All equipment	Annual	Inspection	NFPA 72- Section 14.3
2. Control equipment			NFPA 72- Section 14.3, 14.4
(a) Fire alarm systems monitored for alarm, supervisory, and trouble signals			
(1) Functions	Annual	Test	
(2) Fuses	Annual	Test and Inspection	
(3) Interfaced Equipment	Annual	Test and Inspection	
(4) Lamps and LEDs	Annual	Test and Inspection	
(5) Primary (main) power supply	Annual	Test and Inspection	
(6) Trouble Signals	Semiannual	Inspection	
i. Audible and visual	Annual	Test	
ii. Disconnect switches	Annual	Test	
iii. Ground-fault monitoring circuit	Annual	Test	
iv. Transmission of signals to off-premises location	Annual	Test	
(b) Fire alarm systems unmonitored for alarm, supervisory, and trouble signals			
(1) Function	Annual	Test	
(2) Fuses	Weekly	Inspection	
	Annual	Test	
(3) Interfaced Equipment	Weekly	Inspection	
	Annual	Test	
(4) Lamps and LEDs	Weekly	Inspection	
	Annual	Test	
(5) Primary (main) power supply	Weekly	Inspection	
	Annual	Test	
(6) Trouble Signals	Weekly	Inspection	
	Annual	Test	
3. Supervising station alarm systems-transmitters			NFPA 72- Section 14.3, 14.4
(a) All equipment	Annual	Test and Inspection	
(b) Digital alarm communicator transmitter (DACT)	Annual	Test and Inspection	
(c) Digital alarm radio transmitter (DART)	Annual	Test and Inspection	
(d) McCulloh transmitter	Annual	Test and Inspection	
(e) Radio alarm transmitter (RAT)	Annual	Test and Inspection	
(f) All other types of communicators	Annual	Test and Inspection	
4. In-building fire emergency voice/alarm communications equipment	Semiannual	Inspection	NFPA 72- Section 14.3, 14.4
(a) Amplifier/tone generators	Annual	Test	
(b) Call-in signal silence	Annual	Test	
(c) Off-hook indicator (ring down)	Annual	Test	
(d) Phone jacks	Annual	Test	
(e) Phone set	Annual	Test	
(f) System performance	Annual	Test	
5. Engine-driven generator	Monthly	Test	NFPA 72-Section 14.4
6. Secondary (standby) power supply	Annual	Test	NFPA 72-Section 14.4
7. Uninterruptible power supply (UPS)	Annual	Test	NFPA 72-Section 14.4
8. Batteries			NFPA 72-Section 14.3, 14.4
(a) Lead-acid	Monthly	Inspection	
(1) Battery replacement	Annual	Test	
(2) Charger test	Annual	Test	
(3) Discharge test	Annual	Test	
(4) Load voltage test	Semiannual	Test	
(5) Specific gravity	Semiannual	Test	

(b) Nickel-cadmium	Semiannual	Inspection	
(1) Battery replacement	Annual	Test	
(2) Charger test	Annual	Test	
(3) Discharge test	Annual	Test	
(4) Load voltage test	Semiannual	Test	
(c) Primary (dry cell)	Monthly	Inspection	
(d) Sealed lead-acid	Semiannual	Inspection	
(1) Battery replacement	Annual	Test	
(2) Charger test	Annual	Test	
(3) Discharge test	Annual	Test	
(4) Load voltage test	Semiannual	Test	
9. Public emergency alarm reporting system-wired system	Daily	Test	NFPA 72- Section 14.4
10. Remote annunciators	Semiannual Annual	Inspection Test	NFPA 72- Section 14.3, 14.4
11. Notification appliance circuit power extenders	Annual	Inspection	NFPA 72- Section 14.3
12. Remote power supplies	Annual	Inspection	NFPA 72- Section 14.3
13. Transient suppressors	Semiannual	Inspection	NFPA 72- Section 14.3
14. Fiber-optic cable connections	Annual	Inspection	NFPA 72- Section 14.3
15. Conductors circuit integrity	Annual	Test	NFPA 72- Section 14.4
16. Initiating Devices			NFPA 72- Section 14.3, 14.4
(a) Air sampling	Semiannual Annual	Inspection Test	
(b) Duct Detectors	Semiannual Annual	Inspection Test	
(c) Electromechanical releasing devices	Semiannual Annual	Inspection Test	
(d) Fire extinguishing system(s) or suppression system(s) switches	Semiannual Annual	Inspection Test	
(e) Manual fire alarm boxes	Semiannual Annual	Inspection Test	
(f) Heat detectors	Semiannual Annual	Inspection Test	
(g) Radiant energy fire detectors	Quarterly Semiannual	Inspection Test	
(h) Video image smoke and fire detectors	Quarterly Semiannual	Inspection Test	
(i) Smoke detectors	Semiannual Annual	Inspection Test	
(1) Sensitivity testing	5 years	Test	
(j) Projected beam smoke detectors	Semiannual Annual	Inspection Test	
(k) Supervisory signal devices	Quarterly Annual	Inspection Test	
(l) Waterflow devices	Quarterly Semiannual	Inspection Test	
(m) Carbon monoxide detectors	Semiannual Annual	Inspection Test	
(n) Multi-sensor fire detector or multi-criteria fire detector or combination fire detector	Annual	Test	
(o) Fire-gas and other detectors	Annual	Test	
17. Special hazard equipment			NFPA 72- Section 14.4
(a) Abort switch	Annual	Test	
(b) Cross-zone detection circuit	Annual	Test	
(c) Matrix-type circuit	Annual	Test	
(d) Release solenoid circuit	Annual	Test	
(e) Squibb release circuit	Annual	Test	
(f) Verified, sequential, or counting zone circuit	Annual	Test	
(g) All above devices or circuits or combinations thereof	Annual	Test	

18. Combination Systems			NFPA 72- Section 14.3, 14.4
(h) Fire extinguisher electronic monitoring device/systems	Semiannual Annual	Inspection Test	
(i) Carbon monoxide detectors/systems	Semiannual Annual	Inspection Test	
19. Fire alarm control interface and emergency control function interface	Semiannual Frequency required by the applicable NFPA standard(s) for the equipment being supervised.	Inspection Test	NFPA 72- Section 14.3, 14.4
20. Notification appliances			NFPA 72- Section 14.3, 14.4
(a) Audible appliances	Semiannual Annual	Inspection Test	
(b) Audible textual notification appliances	Semiannual Annual	Inspection Test	
(c) Visible appliances	Semiannual Annual	Inspection Test	
21. Exit marking audible notification appliances	Semiannual Annual	Inspection Test	NFPA 72- Section 14.3, 14.4
22. Emergency control functions	Annual	Test	NFPA 72- Section 14.4
23. Area of refuge two-way communication system	Annual	Test and Inspection	NFPA 72- Section 14.3, 14.4
24. Special Procedures			NFPA 72- Section 14.4
(a) Alarm verification	Annual	Test	
(b) Multiplex systems	Annual	Test	
25. Supervising station alarm systems-receivers			NFPA 72- Section 14.3, 14.4
(a) All equipment	Monthly	Test	
(b) Signal receipt	Daily	Inspection	
(c) Receivers	Annual	Inspection	
26. Public emergency alarm reporting system transmission equipment	Semiannual	Test and Inspection	NFPA 72- Section 14.3, 14.4
(a) Publicly accessible alarm box			
(b) Auxiliary box	Annual	Test and Inspection	
(c) Master box			
(1) Manual operation	Semiannual	Test and Inspection	
(2) Auxiliary operation	Annual	Test and Inspection	
27. Mass notification system			NFPA 72- Section 14.3, 14.4
(a) Functions	Annual	Test	
(b) Monitored for integrity			
(1) Control Equipment			
i. Fuses	Annual	Test and Inspection	
ii. Interfaces	Annual	Test and Inspection	
iii. Lamps/LED	Annual	Test and Inspection	
iv. Primary (main) power supply	Annual	Test and Inspection	
(2) Secondary power	Annual	Test and Inspection	
(3) Initiating devices	Annual	Inspection	
(4) Notification appliances	Annual	Test and Inspection	
(b) Not monitored for integrity; installed prior to adoption of 2010 edition			
(1) Control equipment			
i. Fuses	Semiannual Annual	Inspection Test	
ii. Interfaces	Semiannual Annual	Inspection Test	
iii. Lamps/LED	Semiannual Annual	Inspection Test	
iv. Primary (main) power supply	Semiannual Annual	Inspection Test	
(2) Secondary power	Semiannual Annual	Inspection Test	
(3) Initiating devices	Semiannual	Inspection	
(4) Notification appliances	Semiannual Annual	Inspection Test	

(c) Control unit functions and no diagnostic failures are indicated	Annual	Test	
(d) Control unit reset	Annual	Test	
(e) Control unit security	Annual	Test	
(f) Audible/visible functional test	Annual	Test	
(g) Software backup	Annual	Test	
(h) Wireless signals	Annual	Test	
(i) Antenna	Annual	Test and Inspection	
(j) Transceivers	Annual	Test and Inspection	
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Gauges			NFPA 25- Chapter 5
(a) Wet system gauges	Quarterly	Inspection	
	5 years	Test	
(b) Deluge system gauges	Quarterly	Inspection	
	5 years	Test	
(c) Dry system gauges			
(1) Gauges where air pressure supervision is not connected to a constantly attended location	Weekly	Inspection	
	5 years	Test	
(2) Gauges where air pressure supervision is connected to a constantly attended location	Monthly	Inspection	
	5 years	Test	
(a) Preaction system gauges	Weekly	Inspection	
	5 years	Test	
2. Waterflow alarm devices			NFPA 25- Chapter 5
(a) Mechanical devices	Quarterly	Test and Inspection	
(b) Vane and pressure-switch-type devices	Quarterly	Inspection	
	Semiannual	Test	
3. Hydraulic name plate	Quarterly	Inspection	NFPA 25- Chapter 5
4. Buildings	Annual (prior to freezing weather)	Inspection	NFPA 25- Chapter 4
5. Hanger/seismic bracing	Annual	Inspection	NFPA 25- Chapter 5
6. Pipe and fittings	Annual	Inspection	NFPA 25- Chapter 5
7. Sprinklers			NFPA 25- Chapter 5
(a) All	Annual	Inspection	
	At 50 years and every 10 years thereafter	Test	
	At 75 years and every 5 years thereafter	Test	
(b) Extra-high or greater temperature solder type	5 years	Test	
(c) Fast-response	At 20 years and every 10 years thereafter	Test	
(d) Dry	At 10 years and every 10 years thereafter	Test	
(e) In harsh environments	5 years	Test	
8. Sprinklers and automatic spray nozzles protecting commercial cooking equipment and ventilation systems	Annual	Test	NFPA 25- Chapter 5
9. Spare sprinklers	Annual	Inspection	NFPA 25- Chapter 5
10. Information sign	Annual	Inspection	NFPA 25- Chapter 5
11. Obstruction, internal inspection of piping	5 years	Inspection	NFPA 25- Chapter 14
12. Heat trace	Per manufacturer requirements	Inspection	NFPA 25- Chapter 5
13. Antifreeze solution	Annual	Maintenance	NFPA 25- Chapter 5
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Piping	Annual	Inspection	NFPA 25- Chapter 6
2. Cabinet	Annual	Inspection	NFPA 1962
3. Gauges			NFPA 25- Chapter 6
(a) Automatic wet system gauges	Quarterly	Inspection	
(b) Semiautomatic dry system gauges	Quarterly	Inspection	NFPA 25- Chapter 6
(c) Automatic dry system gauges	Weekly	Inspection	NFPA 25- Chapter 6

(d) Gauges where air pressure supervision is connected to a constantly attended location	Monthly	Inspection	NFPA 25- Chapter 6
4. Hose	Annual At 5 years and every 3 years thereafter	Inspection Test	NFPA 1962
5. Hose storage device	Annual	Test and Inspection	NFPA 1962
6. Hose nozzle	Annual and after each use	Inspection	NFPA 1962
7. Hydraulic design information sign	Annual	Inspection	NFPA 25- Chapter 6
8. Hydrostatic test	5 years	Test	NFPA 25- Chapter 6
9. Flow test	5 years	Test	NFPA 25- Chapter 6
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Hose houses	Quarterly Annual	Inspection Maintenance	NFPA 25- Chapter 7
2. Hydrants	Annual	Flow test, Inspection, and maintenance	NFPA 25- Chapter 7
3. Monitor nozzles	Semiannual Annual	Inspection Flow test and maintenance	NFPA 25- Chapter 7
4. Mainline strainers	Annual	Inspection and maintenance	NFPA 25- Chapter 7
5. Piping (a) Exposed (b) Underground	 Annual 5 years 5 years	 Inspection Flow test Flow test	NFPA 25- Chapter 7
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Pump house, heating ventilation louvers	Weekly	Inspection	NFPA 25- Chapter 8
2. Fire pump system	Weekly	Inspection	NFPA 25- Chapter 8
3. Pump operation (a) No-flow condition i. Diesel engine-driven fire pump ii. Electric motor-driven fire pump 1. Fire pumps serving high rise buildings 2. Fire pumps with limited service controllers 3. Vertical turbine fire pumps 4. Fire pumps taking suction from ground level tanks or a water source that does not provide sufficient pressure to be of material value without the pump 5. All other fire pumps (b) Flow condition (c) Fire pump alarm signals	 Weekly Weekly Weekly Weekly Weekly Monthly Annual Annual	 Test Test Test Test Test Test Test Test	NFPA 25- Chapter 8
4. Hydraulic	Annual	Maintenance	NFPA 25- Chapter 8
5. Mechanical transmission	Annual	Maintenance	NFPA 25- Chapter 8
6. Motor	Annual	Maintenance	NFPA 25- Chapter 8
7. Controller, various components	Per manufacturer recommendations	Maintenance	NFPA 25- Chapter 8
8. Diesel engine system, various components	Per manufacturer recommendations	Maintenance	NFPA 25- Chapter 8
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Drainage	Quarterly	Inspection	NFPA 25- Chapter 10
2. Fittings	Quarterly	Inspection	NFPA 25- Chapter 10
3. Hangers	Annual	Inspection	NFPA 25- Chapter 10
4. Nozzles	Annual	Test and Inspection	NFPA 25- Chapter 10
5. Pipe	Annual	Test and Inspection	NFPA 25- Chapter 10
6. Strainers (a) Baskets/screens	Per manufacturer recommendations Annual 5 years	Inspection Test and maintenance Maintenance	NFPA 25- Chapter 10
7. Supports	Quarterly	Inspection	NFPA 25- Chapter 10
8. UHSWSS (a) Detectors	 Monthly Annual	 Inspection Test	NFPA 25- Chapter 10

(b) Controllers (c) Valves	Daily Annual Daily Annual	Inspection Test Inspection Test	
9. Flushing	Annual	Test	NFPA 25- Chapter 10
10. Water spray system	Annual	Test and maintenance	NFPA 25- Chapter 10
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Discharge device location (a) Sprinkler (b) Spray Nozzle	 Annual Monthly Annual	 Test and Inspection Inspection Test	NFPA 25- Chapter 11
2. Discharge device position (a) Sprinkler (b) Spray Nozzle	 Annual Monthly Annual	 Test and Inspection Inspection Test	NFPA 25- Chapter 11
3. Discharge device obstruction	Annual	Test	NFPA 25- Chapter 11
4. Foam concentrate pump operation	Monthly	Maintenance	NFPA 25- Chapter 11
5. Foam concentrate strainer	Quarterly Annual	Inspection and maintenance Test	NFPA 25- Chapter 11
6. Foam concentrate samples	Annual	Maintenance	NFPA 25- Chapter 11
7. Drainage in system area	Quarterly	Inspection	NFPA 25- Chapter 11
8. Proportioning system (a) Standard pressure type i. Ball drip (automatic type) drain valves ii. Foam concentrate tank-drain and flush iii. Corrosion and hydrostatic test (b) Bladder tank type i. Sight glass ii. Foam concentrate tank- hydrostatic test (c) Line type i. Foam concentrate tank-corrosion and pickup pipes ii. Foam concentrate tank- drain and flush (d) Standard balanced pressure type i. Foam concentrate pump ii. Balancing valve diaphragm iii. Foam concentrate tank (e) In-line balanced pressure type i. Foam concentrate pump ii. Balancing valve diaphragm iii. Foam concentrate tank	Monthly Annual 5 years 10 years 10 years 10 years 10 years 10 years 10 years 5 years 5 years 10 years 5 years 5 years 10 years	Inspection Test Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance	NFPA 25- Chapter 11
9. Complete foam-water system	Annual	Test	NFPA 25- Chapter 11
10. Foam-water solution	Annual	Test	NFPA 25- Chapter 11
11. Manual actuation device	Annual	Test	NFPA 25- Chapter 11
12. Pipe corrosion	Annual	Inspection	NFPA 25- Chapter 11
13. Pipe damage	Annual	Inspection	NFPA 25- Chapter 11
14. Fittings corrosion	Annual	Inspection	NFPA 25- Chapter 11
15. Fittings damage	Annual	Inspection	NFPA 25- Chapter 11
16. Hangers/supports	Annual	Inspection	NFPA 25- Chapter 11
17. Waterflow devices (a) Mechanical devices (b) Vane-type and pressure switch-type	 Quarterly Quarterly Semiannually	 Test and Inspection Inspection Test	NFPA 25- Chapter 11 NFPA 25- Chapter 11
11. Strainers-mainline	Per manufacturer recommendations	Inspection	NFPA 25- Chapter 11
12. Pressure vacuum vents	5 years	Maintenance	NFPA 25- Chapter 11
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. System flush	Annual	Maintenance	NFPA 25- Chapter 12
2. Water supply (general)	Quarterly Annual	Inspection Test	NFPA 25- Chapter 12
3. Water storage tanks (a) Water level-unsupervised (b) Water level-supervised (c) Sight glass (d) Tank pressure gauges (e) Valves, appurtenances	 Monthly Quarterly Monthly Quarterly Semiannual	 Inspection Inspection Inspection Inspection Inspection	NFPA 25- Chapter 12

(f) Tank interior	Annually	Inspection and maintenance	
4. Water storage cylinder (high pressure)			NFPA 25- Chapter 12
(a) Water level-load cells	Semiannual	Inspection	
(b) Water level-unsupervised	Quarterly	Inspection	
(c) Support frame/restraints	Annual	Inspection	
(d) Vent plugs	Annual	Inspection	
(e) Cylinder pressure on discharge	Annual	Inspection	
(f) Filters on refill connection	Annual	Inspection	
5. Additive storage cylinders			NFPA 25- Chapter 12
(a) General condition	Quarterly	Inspection	
(b) Quantity of additive agent	Semiannual	Inspection	
(c) Quality of additive agent	Annual	Test	
(d) Additive injection, full discharge test	Annual	Test	
6. Water recirculation tank			NFPA 25- Chapter 12
(a) Water level-unsupervised	Monthly	Inspection	
(b) Water level-supervised	Quarterly	Inspection	
(c) Supports, attachments	Annual	Inspection	
(d) Low water level alarm	Annual	Test	
(e) Water quality, drain, flush, and refill	Annual	Inspection	
(f) Float-operated valve	Annual	Test	
(g) Pressure at outlet during discharge	Annual	Test	
(h) Backflow prevention device	Annual	Test	
(i) Filters, strainers, and cyclone separator	Annual	Inspection and maintenance	
7. Compressed gas cylinders			NFPA 25- Chapter 12
(a) Support frame and cylinder restraints	Quarterly	Inspection	
(b) Cylinder pressure-unsupervised	Monthly	Inspection	
(c) Cylinder pressure-supervised	Quarterly	Inspection	
(d) Cylinder control valve	Monthly	Inspection	
(e) Cylinder capacity and pressure rating	Annual	Inspection	
(f) Cylinder compliance specification	Annual	Inspection	
(g) Compressed gas specifications	Annual	Test	
(h) Hydrostatic test	5-12 years	Test	
8. Plant air, compressors, and receivers			NFPA 25- Chapter 12
(a) Air pressure-unsupervised	Weekly	Inspection	
(b) Air pressure-supervised	Monthly	Inspection	
(c) Compressor	Weekly	Test	
(d) Compressor/receiver capacity, changes	Semiannual	Test	
(e) Compressed air moisture content	Annual	Test	
(f) Filter, moisture traps	Semiannual	Maintenance	
(g) Full capacity, duration, and any changes in other demands	Annual	Test	
9. Standby pump			NFPA 25- Chapter 12
(a) Moisture trap, oil injection (pneumatic)	Monthly	Inspection and maintenance	
(b) Compressed gas supply, inlet air pressure	Monthly	Inspection	
(c) Outlet water (standby) pressure	Monthly	Inspection	
(d) Start/stop pressure settings for standby pressure	Quarterly	Test	
10. Pneumatic valves			NFPA 25- Chapter 12
(a) Cylinder valves, master release valves	Monthly	Inspection	
(b) All tubing associated with release valves	Quarterly	Inspection	
(c) Solenoid release of master release valve	Semiannual	Test	
(d) Manual release of master release valve	Annual	Test	
(e) Operation of slave valves	Annual	Test	
(f) All pneumatic cylinder release valves	Annual	Maintenance	
(g) On-off cycling of valves intended to cycle	Annual	Test	
11. Enclosure features, interlocks	Semiannual	Test	NFPA 25- Chapter 12
12. Ventilation			NFPA 25- Chapter 12
(a) Interlocked systems (e.g., ventilation shutdown)	Annual	Test	
(b) Shutdown of fuel/lubrication systems	Annual	Test	
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
13. Control valves			NFPA 25- Chapter 13
(a) Sealed	Weekly	Inspection	
(b) Locked or electrically supervised	Monthly	Inspection	
(c) All control valves	Annual	Maintenance	
i. Position	Annual	Test	
ii. Operation	Annual	Test	
iii. Supervisory	Semiannual	Test	
14. Valve supervisory signal initiating device	Quarterly	Inspection	NFPA 25- Chapter 13
15. Alarm valves			NFPA 25- Chapter 13
(a) Exterior of valve	Monthly	Inspection	
(b) Interior of valve	5 years	Inspection	

(c) Strainers, filters, orifices	5 years	Inspection	
16. Check valves- interior	5 years	Inspection	NFPA 25- Chapter 13
17. Preaction/Deluge valves	Annual	Maintenance	NFPA 25- Chapter 13
(a) Enclosure (during cold weather)			
i. Not equipped with low temperature alarms	Daily	Inspection	
ii. Equipped with low temperature alarms	Weekly	Inspection	
(b) Exterior of valve	Monthly	Inspection	
(c) Interior of valve			
i. Valves that cannot be reset without removal of a faceplate	Annual	Inspection	
ii. Valves that can be reset without removal of a faceplate	5 years	Inspection	
(d) Strainers, filters, orifices	5 years	Inspection	
(e) Priming water	Quarterly	Test	
(f) Low air pressure alarms			
i. Not installed in valve enclosures	Quarterly	Test	
ii. Installed in valve enclosures	Annual	Test	
(g) Full flow	Annual	Test	
(h) Air leakage	3 years	Test	
18. Dry pipe valves/quick-opening devices	Annual	Maintenance	NFPA 25- Chapter 13
(a) Gauges			
i. Gauges on systems with low air or nitrogen pressure alarm	Monthly	Inspection	
ii. Gauges on systems without low air or nitrogen pressure alarm	Weekly	Inspection	
(b) Enclosure (during cold weather)			
i. Not equipped with low temperature alarms	Daily	Inspection	
ii. Equipped with low temperature alarms	Weekly	Inspection	
(c) Exterior of valve	Monthly	Inspection	
(d) Interior of valve	Annual	Inspection	
(e) Strainers, filters, orifices	5 years	Inspection	
(f) Air leakage	3 years	Test	
(g) Priming water	Quarterly	Test	
(h) Low air pressure alarm	Quarterly	Test	
(i) Quick-opening devices	Quarterly	Test	
(j) Trip test	Annual	Test	
(k) Full flow trip test	3 years	Test	
19. Pressure-reducing and relief valves			NFPA 25- Chapter 13
(a) Sprinkler systems	Quarterly	Inspection	
	5 years	Test	
(b) Hose connections	Annual	Inspection	
	5 years	Test	
(c) Hose racks	Annual	Inspection	
	5years	Test	
(d) Fire pumps			
i. Casing relief valves	Weekly	Inspection	
ii. Pressure-relief valves	Weekly	Inspection	
(e) Pressure relief valves	Annual	Test	
(f) Circulation relief	Annual	Test	
20. Backflow prevention assemblies	Annual	Test	NFPA 25- Chapter 13
(a) Isolation valves	Weekly	Inspection	
(b) Valves secured with locks or electrically supervised	Monthly	Inspection	
(c) RPAs and RDAs	Weekly	Inspection	
(d) Interior of assembly	5 years	Inspection	
21. Fire department connections	Quarterly	Inspection	NFPA 25- Chapter 13
22. Main drains			NFPA 25- Chapter 13
(a) Systems where the sole water supply is through a backflow preventer and/or pressure-reducing valves	Quarterly	Test	
(b) All other systems	Annual	Test	
23. Gauges	5 years	Test	NFPA 25- Chapter 13
18. Waterflow devices			NFPA 25- Chapter 13
(a) Mechanical devices	Quarterly	Test	
(b) Vane-type and pressure switch-type	Semiannually	Test	NFPA 25- Chapter 13

Component	Periodic Frequency	Method	NFPA Reference
1. All system components	Monthly Per manufacturer recommendations	Inspection Test and maintenance	NFPA 12- Section 4.8
2. Hose	5 years	Test and visible inspection	NFPA 12- Section 4.8
3. Carbon dioxide system	Annual	Test and visible inspection	NFPA 12- Section 4.8
4. Size, type, and configuration of the hazard and system	Annual	Test and visible inspection	NFPA 12- Section 4.8

5. Time delays for operation	Annual	Test and visible inspection	NFPA 12- Section 4.8
6. Audible alarms for operation	Annual	Test and visible inspection	NFPA 12- Section 4.8
7. Visible alarms for operation	Annual	Test and visible inspection	NFPA 12- Section 4.8
8. Warning signs	Annual	Inspection	NFPA 12- Section 4.8
9. High pressure cylinder weights	Semiannual	Inspection	NFPA 12- Section 4.8
10. Low-pressure container liquid levels	Weekly	Inspection	NFPA 12- Section 4.8
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. System	Monthly Semiannual	Inspection Maintenance	NFPA 17- Chapter 11
2. Dry chemical in stored pressure systems	6 years	Maintenance	NFPA 17- Chapter 11
3. Pressure regulators	Annual	Test	NFPA 17- Chapter 11
4. Auxiliary pressure cylinders	Annual 12 years	Inspection Test-Hydrostatic	NFPA 17- Chapter 11
5. Fixed temperature sensing element- fusible metal alloy type	Semiannual	Maintenance	NFPA 17- Chapter 11
6. Dry chemical containers	12 years	Test-Hydrostatic	NFPA 17- Chapter 11
7. Hose assemblies	12 years	Test-Hydrostatic	NFPA 17- Chapter 11
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. System	Monthly Semiannual	Inspection Maintenance	NFPA 17A- Chapter 7
2. Fixed temperature sensing element- fusible metal alloy type	Semiannual	Maintenance	NFPA 17A- Chapter 7
3. Wet chemical containers	12 years	Test-Hydrostatic	NFPA 17A- Chapter 7
4. Auxiliary pressure containers	12 years	Test-Hydrostatic	NFPA 17A- Chapter 7
5. Hose assemblies	12 years	Test-Hydrostatic	NFPA 17A- Chapter 7
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. System	Annual	Test and Inspection	NFPA 2001- Chapter 7
2. Agent quantity and pressure	Semiannual	Inspection	NFPA 2001- Chapter 7
3. Pressure gauges	Annual	Inspection	NFPA 2001- Chapter 7
4. Factory-charges, nonrefillable containers that do not have a means of pressure indication	Semiannual	Inspection	NFPA 2001- Chapter 7
5. Clean agent cylinders	5 years	Inspection	NFPA 2001- Chapter 7
6. Hose	Annual 5 years	Inspection Test	NFPA 2001- Chapter 7
7. Enclosure	Annual	Inspection	NFPA 2001- Chapter 7
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Fire extinguishers and Class D extinguishing agents	Monthly Annual	Inspection External examination	NFPA 10- Chapter 7
2. Inside of fire extinguishers (a) Stored-pressure loaded stream and antifreeze	 Annual 5 years	 Inspection-internal Test-Hydrostatic	NFPA 10- Chapter 7
(b) Pump tank water and pump tank, calcium chloride based	Annual	Internal inspection and maintenance	NFPA 10- Chapter 7
(c) Dry chemical, cartridge and cylinder operated, with mild steel shells	Annual	Inspection-internal	NFPA 10- Chapter 7
(d) Dry powder, cartridge and cylinder operated, with mild steel shells	Annual	Inspection-internal	NFPA 10- Chapter 7
(e) Wetting agent	Annual 5 years	Inspection-internal Test-Hydrostatic	NFPA 10- Chapter 7
(f) Stored-pressure water	5 years	Inspection-internal	NFPA 10- Chapter 7
(g) AFFF	3 years 3 years 5 years	Maintenance Inspection-internal Test-Hydrostatic	NFPA 10- Chapter 7
(h) FFFP	3 years 3 years 5 years	Maintenance Inspection-internal Test-Hydrostatic	NFPA 10- Chapter 7
(i) Stored-pressure dry chemical, with stainless steel shell	5 years	Internal inspection and hydrostatic test	NFPA 10- Chapter 7
(j) Carbon dioxide	5 years	Internal inspection and hydrostatic test	NFPA 10- Chapter 7
(k) Wet chemical	5 years	Internal inspection and hydrostatic test	NFPA 10- Chapter 7

(l) Dry chemical stored-pressure, with mild steel shells, brazed brass shells, and aluminum shells	6 years 12 years	Inspection-internal Test-Hydrostatic	NFPA 10- Chapter 7
(m) Halogenated agents	6 years 12 years	Inspection-internal Test-Hydrostatic	NFPA 10- Chapter 7
(n) Dry powder, stored-pressure, with mild steel shells	6 years 12 years	Inspection-internal Test-Hydrostatic	NFPA 10- Chapter 7
3. Stored-pressure type extinguishers containing a loaded stream agent	Annual	Maintenance	NFPA 10- Chapter 7
4. Wetting agent extinguishers	Annual	Maintenance	NFPA 10- Chapter 7
5. Nonrechargeable fire extinguishers	12 years	Removed from service	NFPA 10- Chapter 7
6. Carbon dioxide hose assembly	Annual	Test	NFPA 10- Chapter 7
7. Electronic monitoring device/system	Annual	Test and maintenance	NFPA 10- Chapter 7
(a) Units	5 years	Test	NFPA 10- Chapter 7
8. Discharge hoses on wheeled-type fire extinguishers	Annual	Inspection	NFPA 10- Chapter 7
9. Pressure regulators on wheeled-type fire extinguishers	Annual	Test	NFPA 10- Chapter 7
10. Pressure gauges	Annual	Maintenance	NFPA 10- Chapter 7
11. Nitrogen cartridges, argon cartridges, carbon dioxide cartridges, or cartridges used for inert gas storage that are used as expellants for wheeled fire extinguishers and carbon dioxide extinguishers	5 years	Test-Hydrostatic	NFPA 10- Chapter 7
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Fire doors	Annual	Test and inspection	NFPA 80- Section 5.2.4
2. Fire shutters	Annual	Test and inspection	NFPA 80- Section 5.2.4
3. Fire windows	Annual	Test and inspection	NFPA 80- Section 5.2.4
4. Opening protectives other than fire dampers and fabric fire safety curtains	Annual	Test and inspection	NFPA 80- Section 5.2.4
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
5. Air-conditioning, heating, ventilating ductwork, and related equipment			NFPA 90A-Annex B
(a) Electrical equipment of automatic filters	Semiannual	Inspection and maintenance	
(b) Drive motors and gear reductions	Semiannual	Inspection and maintenance	
(c) Ducts	Quarterly	Inspection and maintenance	
(d) Apparatus casing and air-handling unit plenums	Monthly	Inspection and maintenance	
(e) Ceiling cavity plenums, raised floor plenums, and duct distribution plenums	Quarterly	Inspection and maintenance	
(f) Fans and fan motors	Quarterly	Inspection and maintenance	
(g) Fan controls	Annual	Test and inspection	
6. Smoke detection for automatic HVAC control			NFPA 90A-Section 6.4
(a) All automatic shutdown devices	Annual	Test	
7. Smoke dampers and combination fire and smoke dampers	1 year after installation and every 4 years thereafter	Test and inspection	NFPA 80- Section 19.4
8. Smoke and heat venting systems			NFPA 204-Chapter 12
(a) Mechanically opened vents	Annual	Test and inspection	
(b) Special mechanisms such as gas cylinders, thermal sensors, or detectors	Annual	Test and inspection	
(c) Thermoplastic drop-out vents	Annual	Inspection	
(d) Inlet air sources	Annual	Inspection	
9. Mechanical smoke-exhaust systems	Semiannual	Test and inspection	NFPA 204-Chapter 12
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Emergency power supply systems- all appurtenant components	Weekly Monthly	Inspection Test	NFPA 110-Chapter 8
2. Level 1 emergency power supply systems	Quarterly	Test	NFPA 110-Chapter 8
3. Diesel generator sets	Monthly	Test	NFPA 110-Chapter 8
4. Spark-ignited generator sets	Monthly	Test	NFPA 110-Chapter 8
5. Transfer switches	Monthly	Test	NFPA 110-Chapter 8
6. Circuit breakers for Level 1 system usage, including main and feed breakers between the emergency power system and the transfer switch load terminals	Annual	Test	NFPA 110-Chapter 8
7. Circuit breakers rated in excess of 600 volts for Level 1 system usage	Semiannual 2 years	Test Test-Simulated overload	NFPA 110-Chapter 8

8. Storage batteries	Weekly	Inspection	NFPA 110-Chapter 8
9. Lead-acid batteries	Monthly	Test and maintenance	NFPA 110-Chapter 8
10. Fuel quality	Annual	Test	NFPA 110-Chapter 8
11. Stored electrical energy emergency and standby power systems			NFPA 111-Chapter 8
(a) Battery			
i. Float voltage	Monthly	Inspection	
ii. Cable connection	Semiannual	Inspection	
iii. Terminals	Quarterly	Maintenance	
iv. Electrolyte gravity	Quarterly	Test	
v. Electrolyte level	Monthly	Inspection	
(b) Energy conversion equipment			
i. Power supply voltage	Monthly	Inspection	
ii. Terminals	Semiannual	Inspection	
iii. Panel meters	Monthly	Inspection	
iv. Panel lamps	Monthly	Inspection	
v. Circuit breakers, fuses	2 years	Inspection and maintenance	
(c) Battery charger			
i. Output terminal volts	Monthly	Inspection	
ii. Fuses	2 years	Inspection and maintenance	
iii. Charge current	Quarterly	Test and inspection	
iv. Equalize voltage	Quarterly	Inspection	
v. Panel meters	Monthly	Inspection	
vi. Panel lamps	Monthly	Inspection	
(d) Load			
i. Load current	Quarterly	Inspection	
ii. Panel meters	Monthly	Inspection	
(e) Transfer switch	Semiannual	Test	
i. Contacts	Annual	Inspection	
(f) Fuel cell			
i. System	Quarterly	Test and inspection	
ii. Fuel supply	Quarterly	Inspection	
iii. Piping	Annual	Inspection	
iv. Cooling system	Annual	Inspection	
v. Connectors	Annual	Maintenance	
vi. Fuel system pressure/leakage	Annual	Test	
vii. Full load test	Annual	Test	
viii. Calibrate H_2 detector	Annual	Maintenance	

Component	Periodic Frequency	Method	NFPA Reference
1. Vent closures	Annual	Inspection	NFPA 68-Chapter 11
2. Explosion prevention systems	Quarterly	Test and inspection	NFPA 69-Chapter 15

Component	Periodic Frequency	Method	NFPA Reference
1. System	Semiannual	Maintenance	NFPA 96-Chapter 11
2. Fusible links- metal alloy type	Semiannual	Replace	NFPA 96-Chapter 11
3. Automatic sprinklers- metal alloy type	Semiannual	Replace	NFPA 96-Chapter 11
4. Detection devices that are bulb-type automatic sprinklers and fusible links	Annual	Inspection and maintenance	NFPA 96-Chapter 11
5. Fixed temperature-sensing elements other than the fusible metal alloy type	Annual	Inspection and maintenance	NFPA 96-Chapter 11
6. Grease buildup			NFPA 96-Chapter 11
(a) Systems serving solid fuel cooking operations	Monthly	Inspection and maintenance	
(b) Systems serving high-volume cooking operations	Quarterly	Inspection and maintenance	
(c) Systems serving moderate-volume cooking operations	Semiannual	Inspection and maintenance	
(d) Systems serving low-volume cooking operations	Annual	Inspection and maintenance	
7. Cooking equipment	Annual	Inspection and maintenance	NFPA 96-Chapter 11

Component	Periodic Frequency	Method	NFPA Reference
1. Electric elevators	Semiannual Annual 5 years	Inspection Test- Category 1 Test- Category 5	ASME A17.1-Appendix N
2. Hydraulic elevators	Semiannual Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
3. Escalators and moving walks	Semiannual	Inspection	ASME A17.1-Appendix N

	Annual	Test- Category 1	
4. Sidewalk elevators	Semiannual Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
5. Hand elevators	Semiannual Annual 5 years	Inspection Test- Category 1 Test- Category 5	ASME A17.1-Appendix N
6. Dumbwaiters	Annual Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
7. Material lifts and dumbwaiters with automatic transfer devices	Annual Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
8. Special purpose personnel elevators	Semiannual Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
9. Incline elevators	Semiannual Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
10. Shipboard elevators	Semiannual Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
11. Screw-column elevators	Semiannual Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
12. Rooftop elevators	Semiannual Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
13. Limited-use/limited-application elevators	Semiannual Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
14. Elevators used for construction	Quarterly Annual 3 years 5 years	Inspection Test- Category 1 Test- Category 3 Test- Category 5	ASME A17.1-Appendix N
15. Fire fighters' emergency operations	Monthly	Test	NFPA 101-Section 9.4
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Door leaves equipped with panic hardware got fire exit hardware	Annual	Test and inspection	NFPA 101-Chapter 7
2. Door assemblies in exit enclosures	Annual	Test and inspection	NFPA 101-Chapter 7
3. Electronically controlled egress doors	Annual	Test and inspection	NFPA 101-Chapter 7
4. Door assemblies with special locking arrangements	Annual	Test and inspection	NFPA 101-Chapter 7
5. Emergency lighting system	Monthly Annual	Test- 30 seconds Test- 1.5 hours	NFPA 101-Chapter 7
6. Exit signs	Monthly	Test and inspection	NFPA 101-Chapter 7
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. System	As specified in the commissioning plan	Test	NFPA 4-Chapter 15
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Chemical fume hoods	Annual	Inspection	NFPA 45-Section 7.14
2. Chemical fume hood exhaust system	Annual	Inspection	NFPA 45-Section 7.14
3. Laboratory special exhaust system	Annual	Inspection	NFPA 45-Section 7.14
4. Air system flow detectors	Annual	Inspection	NFPA 45-Section 7.14
5. Air supply and exhaust fans, motors, and components	Annual	Inspection	NFPA 45-Section 7.14

6. Fan belts where airflow detectors are not provided or airflow tests are not made (a) Double sheaves and belts	Quarterly Semiannual	Inspection Inspection	NFPA 45-Section 7.13
7. Fixed fire-extinguishing systems protecting filters	Quarterly	Inspection and maintenance	NFPA 45-Section 7.14

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IMPAIRMENT OF FIRE PROTECTION AND LIFE SAFETY SYSTEMS

NIST S 7401.03
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1. PURPOSE

The purpose of this suborder is to define the requirements and associated roles and responsibilities when performing any activity that may require the impairment (see Section 7, **DEFINITIONS**) of a fire protection and/or life safety system.

2. BACKGROUND

a. NIST Policy (P) 7400.00: *Fire and Life Safety*, articulates NIST's commitment to making fire and life safety an integral core value and vital part of the NIST culture, in part by complying with applicable laws, regulations, and other promulgated fire and life safety requirements.

b. NIST Order (O) 7401.00: *Fire and Life Safety*, details the duties and powers of the NIST Authority Having Jurisdiction (AHJ)[2] with respect to fire protection and life safety requirements for impairments to fire protection and life safety systems.

c. Impairment of a fire protection and/or life safety system may be necessary under specific circumstances, such as unique laboratory operations, asbestos abatement, demolition, renovation, *etc.* This type of work may produce smoke, sparks, steam, flames, fumes, dust, or similar particulates that could result in the unintended activation of one or more of these systems. Impairments may also come in the form of hampering or impeding the use of egress components such as corridors, stairwells, doorways, *etc.*, through any number of means. Impairments may be made to building systems or research-specific systems (see Section 7, **DEFINITIONS**). During these impairments, building occupants and emergency responders are exposed to a higher degree of hazard (*e.g.*, delayed notification due to fire

[1] For revision history, see Appendix A.
[2] As indicated in Section 10, the NIST AHJ may delegate the authority to carry out any AHJ responsibilities to other Fire Protection Engineers (FPEs) in the Office of Safety, Health, and Environment (OSHE).

alarm systems impairment, progressed fire development due to fire suppression system impairment, slower occupant egress due to blockages in a hallway or temporary closure of a stairwell, *etc.*). Further, buildings and spaces with impaired fire protection and/or life safety systems are more susceptible to increased impact from a fire event (*e.g.*, greater loss of equipment, room or building damage, unnecessary downtime, *etc.*). For the above reasons, it is imperative that requirements and responsibilities for impairments are established and implemented to minimize risk to life and property.

3. APPLICABILITY

The provisions of this suborder apply to all NIST activities occurring on NIST-owned and operated sites that as a part of their conduct will require the impairment of a fire protection or life safety system.

4. REFERENCES

a. International Building Code (IBC), 2015 edition.

b. International Fire Code (IFC), 2015 edition.

c. International Existing Building Code (IEBC), 2015 edition.

d. NFPA 13, *Standard for Installation of Sprinkler Systems,* 2013 edition.

e. NFPA 72, *National Fire Alarm and Signaling Code,* 2013 edition.

f. NFPA 101 *Life Safety Code,* 2015 edition.

g. NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations,* 2013 edition.

5. APPLICABLE NIST DIRECTIVES

a. NIST S 7101.03: *Stop Work*

b. NIST P 7400.00: *Fire and Life Safety*

c. NIST O 7401.00: *Fire and Life Safety*

d. NIST S 7401.01: *Fire Protection and Life Safety for Design and Construction*

e. NIST S 7401.02: *Inspection, Testing, and Maintenance of Fire Protection and Life Safety Systems*

f. NIST S 7401.04: *Fire Prevention During Welding, Cutting, and Other Hot Work*

6. REQUIREMENTS

a. The following fire protection and/or life safety systems shall require approval from the NIST Authority Having Jurisdiction (AHJ)[3] prior to impairment:

(1) Building systems; and

(2) Research-specific systems.

b. Impairment of fire protection and/or life safety systems shall only be performed after approval by the AHJ except as noted in Section 6h.

(1) Components of the means of egress shall only be impaired when it is determined by the AHJ that, in their absence, the minimum requirements of IBC Chapter 10 and/or NFPA 101 are still met.

(2) The AHJ may issue an oral stop-work order[4] pursuant to NIST S 7101.03 *Stop Work* for activities that present an imminent danger.

c. The duration of impairment shall be minimized, to the fullest extent possible, and the restoration of fire protection and/or life safety systems shall be a priority.

d. Planning for Impairments

(1) The Impairment Coordinator (see Section 7, **DEFINITIONS**) should be consulted when considering a request for impairment.

(2) Work requiring impairment should be scheduled outside of normal business hours (8:30 a.m. to 5:00 p.m.) to limit affected occupants, whenever possible.

(3) Systems impairment should be limited, to the fullest extent possible, to the device or component as opposed to the entire system.

[3] In the context of this document, the use of the term AHJ also includes delegated AHJs.
[4] Written stop work orders must be issued by the Contracting Officer (CO).

(a) The full system should not be rendered inoperable, whenever possible.

(b) A phased work plan may be necessary when multiple system components are affected or the duration of impairment is deemed excessive by the AHJ.

e. Impairment Permitting

(1) Planned Impairments

(a) Permit requests (Please see Appendix B) shall be submitted to the Impairment Coordinator at least five (5) business days prior to the impairment start date.

i. If requested in writing to the Impairment Coordinator, an expedited review of the permit request may be available where justified.

(b) Permits shall be requested by:

i. OFPM staff members executing work orders;

ii. OU Group leaders for OU managed projects; and

iii. Contract Officer Representatives (COR) for contractor performed projects.

(c) The individual(s) submitting the Impairment Permit shall provide the following information (see Appendix B):

i. Reason for the request;

ii. Building and room number(s) where impairment will occur;

iii. Extent of system impairment;

iv. Expected duration of impairment;

v. Specific devices to be impaired; and

vi. Interim safety measures, as required by the AHJ, to reduce hazards and risks in the affected area.

(d) The AHJ will issue the permit within two (2) business days of the permit request.

i. An expedited review of the permit request may be available where justified, see Section 6e(1)(a)i of this suborder.

(2) Routine Impairments (see Section 7, **DEFINITIONS**)

Annual impairment permits may be approved, where deemed necessary by the AHJ, due to special circumstances in which an OU has the need to routinely or frequently impair Fire Protection Systems due to normal operational needs.

(a) In lieu of the standard permitting process and requirements of this suborder, a standard operating procedure (SOP) may be developed by the OU.

(b) All SOPs must be submitted to the AHJ for approval.

(c) Custody of keys or other devices used to impair Fire Protection Systems must be approved by the AHJ.

(d) Renewal of annual impairment permits must be requested by the OU for AHJ approval before expiration and is subject to reevaluation by the AHJ for necessity or modifications to the existing SOP.

(e) The AHJ reserves the right to revoke annual impairment permits immediately if it is determined that approved SOPs are not being strictly adhered to.

f. Implementation of Impairment

(1) Notification

(a) Building Systems – The Impairment Coordinator shall notify building occupants and OFPM via email of impairments that affect building fire and life safety systems.

(b) Research-specific systems – The individual(s) responsible for the laboratory space shall notify affected laboratory users via email of impairments that affect research-specific systems.

(c) Notifications shall be sent 3 days before commencement of work and on the day of work commencement.

i. In cases of expedited reviews, notifications shall be sent as soon as the requester of the permit is informed of the approval.

(d) Notifications shall include the following:

i. Building areas impacted;

ii. Impaired systems;

iii. Duration of impairment;

iv. Point of Contact;

v. Interim evacuation routes, where necessary; and

vi. Any interim safety measures required by the AHJ.

(2) Postings

(a) A copy of the Impairment Permit shall be displayed in a highly visible location outside of the room/space with the impairment, or as determined by the Impairment Coordinator or AHJ and the COR.

(b) If required by the AHJ, additional signage, such as temporary exit or evacuation route signs or signage at building lobbies or entrances, will be posted by the Impairment Coordinator or AHJ.

(3) All workers, materials, equipment and tools shall be on-site and ready before any system is shut down or disabled.

(4) Combustibles, hazardous processes and other sources of ignition shall be minimized or eliminated in the impaired area.

(5) The individual requesting the impairment shall be required to obtain additional passive fire protection systems, *e.g.*, fire extinguishers, if required by the AHJ when extinguishing systems are impaired.

(6) An "Out of Service" tag or signage shall be attached on the control valve associated with the impaired extinguishing system component, if applicable.

(7) All impairment activities related to the fire alarm system or components tied into the fire alarm system (*e.g.*, water flow switches, tamper switches) must be coordinated with the Impairment Coordinator.

(a) The Impairment Coordinator shall:

i. Notify the Fire Protection Group (Gaithersburg) or Security Command Center (Boulder) prior to impairing or disabling the device;

ii. Provide the Fire Protection Group (Gaithersburg) and Security Command Center (Boulder) with the device type, location, and permitted impairment period; and

iii. Keep a log of disabled devices and the impairment expiration.

(8) Fire Watch

As a part of an Impairment Permit request, the AHJ may require a fire watch over the building or portion thereof affected by the impairment. The requirement for a fire watch will be based on the risks associated with the extent or duration of the impairment and will be based on the hazards associated with the work being performed.

(a) A fire watch may be required where an impairment prevents a system from functioning as required by design.

(b) A continuous fire watch shall be maintained for the duration of the impairment until all Fire Protection Systems are placed back into service or as required by the AHJ.

(c) It may be necessary to assign more than one employee to fire watch duties, e.g. where multiple floors or buildings may be affected.

(d) The fire watch shall:

i. Be a responsible individual trained in the use of a fire extinguisher and sounding of an alarm;

ii. Have no other responsibilities other than to conduct the fire watch;

iii. Perform visual survey(s) of any area(s) of the building(s) affected by the impairment(s). When impairments occur over multiple areas, surveys shall be performed once every hour, at a minimum;

iv. Verify that exits and means of egress components are unlocked, unobstructed and accessible;

v. Have a means of communications to Emergency Services;

vi. Immediately report any evidence of heat, smoke or fire to Emergency Services by calling x2222 (Gaithersburg) or x7777 (Boulder);

vii. Immediately notify building occupants upon discovery of heat, smoke, or fire by activating a manual fire alarm pull station prior to attempting to extinguish the fire; and

viii. Have fire extinguishers readily available and be trained to use them.

(9) Protection of sprinkler heads, smoke detectors and heat detectors for the purpose of preventing unwanted alarms will be by 3 mils (0.08mm/0.003 inches) cellophane or thin paper bags.

(a) Protective covers supplied in smoke detector packaging are not acceptable alternatives to the above requirements.

(b) Care should be taken to ensure that settled dust and particulates are not disrupted when removing covers, thereby resulting in false alarming.

(c) Polypropylene bags marketed as “Cello” bags are not acceptable.

(10) Systems should be partially or fully restored back to service during periods where work is not being performed and continues for multiple days.

(a) Fire Protection Systems shall not be disabled overnight without prior approval by the AHJ.

(11) The Impairment Coordinator shall contact the permit holder at the end of expected impairment duration to determine if the impairment shall be put back in working order or if additional impairment time is needed.

(a) Additional safety measures, such as fire watch, which were not originally required with the issuing of the impairment permit, may be required if the permit duration is extended.

g. Restoration

(1) The permit holder shall ensure:

(a) Any covers placed on detection or extinguishing devices are removed;

(b) Any damage to devices is promptly reported to the Impairment Coordinator;

(c) The Impairment Coordinator's signature is obtained on the Restoration Checklist (please see Appendix C); and

(d) The Impairment Permit is returned to the Impairment Coordinator upon closeout.

(2) The Impairment Coordinator shall ensure:

(a) All extinguishing valves are re-opened and tamper switches report "normal" status;

(b) All fire protection equipment is removed from manual mode and restored back to automatic mode;

(c) All affected devices are fully functional;

(d) All "Out of Service" tags are removed; and

(e) Fire Protection Group (Gaithersburg) and Security Command Center (Boulder) are notified when all systems are back in service.

h. Emergency and Concealed Impairments

(1) If an emergency impairment is necessary or a concealed impairment is found:

(a) The individual requiring the emergency impairment or discovering the concealed impairment shall notify the Impairment Coordinator or the Fire Protection Group[5] (in Gaithersburg);

(b) The impairment shall be isolated from the remaining Fire Protection System where possible, by the Impairment Coordinator, Fire Protection Group, OFPM Shop personnel, or qualified contractor;

(c) Any hazardous operations in the area shall be discontinued and occupants within the impaired areas notified; and

(d) After the impairment has been completed, the Impairment Coordinator or the Fire Protection Group[6] (in Gaithersburg) shall be notified by the individual(s) completing the impairment that all systems are operational and back in service.

i. Impairments Due to Inspection, Testing, and Maintenance

(1) Impairments that are necessary as a part of routine inspection, testing, and maintenance or are from work associated with an OFPM M-slip can be performed without an Impairment Permit but shall be performed only after notifying the Impairment Coordinator.

(a) The individual requiring the impairment shall notify the Impairment Coordinator or the Fire Protection Group[6] (in Gaithersburg) that an impairment is necessary;

(b) The impairment shall be isolated from the remaining Fire Protection System where possible;

(c) Any hazardous operations in the area shall be discontinued and occupants within the impaired areas notified; and

(d) After the impairment has been completed, the Impairment Coordinator, the Fire Protection Group[6] (in Gaithersburg), and the space owner shall be notified that all systems are operational and back in service by the permit requestor.

[5] In the event of an emergency or in the absence of the Impairment Coordinator, trained and authorized personnel from the NIST Fire Protection Group (Gaithersburg) or Security Command Center (Boulder) may bypass necessary components on the Fire Protection System.
[6] In the event of an emergency or in the absence of the Impairment Coordinator, trained and authorized personnel from the NIST Fire Protection Group (Gaithersburg) or Security Command Center (Boulder) may bypass necessary components on the Fire Protection System.

j. Training

(1) Training shall be provided, documented, and recorded in accordance with the requirements of NIST S7101.23: *Safety Education and Training*.

(2) Fire Protection Group staff members (Gaithersburg) shall undergo annual training provided by the Impairment Coordinator before being authorized to impair a fire protection system by means of the campus fire alarm Graphical Command Center (GCC).

(3) NIST fire watch personnel shall complete OSHE training on fire watch duties and on the use of fire extinguishers. Fire extinguisher training shall be completed annually.

(a) CORs shall ensure that contractors performing fire watch have received fire watch and extinguisher training from their employer.

7. DEFINITIONS

a. Acceptable – Considered by the authority having jurisdiction (AHJ) as adequate for satisfying the goals, performance objectives, and/or performance criteria.

b. Authority Having Jurisdiction – A qualified FPE[7] in OSHE designated by the NIST CSO to enforce[8] the NIST-adopted codes and standards relevant to fire, electrical, and life safety on NIST-owned and operated sites.

c. Building Fire Protection and Life Safety Systems – Any system that is required by codes and standards adopted by NIST which also serves as part of the overall building fire and life safety protection.

d. Concealed Impairment – A concealed impairment is an unknown impairment that may result when a fire protection or life safety system is removed from service by an unauthorized person or when a system is unintentionally left out of service.

e. Fire Alarm System – A system or portion of a combination system that consists of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices and to initiate the appropriate response to those signals.

[7] See requirements for Office of Personnel Management Fire Protection Engineering Series 0804.
[8] Nature of enforcement is dependent upon the severity of the violation, e.g. stop work, revoke permit, denial of use and occupancy, etc.

f. Fire Extinguishing System – An approved system of devices and equipment which discharges an approved fire extinguishing agent or water onto or in the area of a fire.

g. Fire Protection System – Approved devices, equipment and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire, or any combination thereof.

h. Fire Watch – The assignment of a person or persons to an area for the express purpose of notifying the fire department, the building occupants, or both of an emergency; preventing a fire from occurring; extinguishing small fires; or protecting the public from fire or life safety dangers.

i. Impairment – Temporary shutdown (in whole or in part) of a Fire Protection System where the system is damaged, disabled or out of order. The resulting condition is that the Fire Protection System does not function as intended in the event of a fire or other emergency.

(1) Planned – A scheduled impairment that is typically a modification to an existing system for the purposes of improvement or to minimize unwanted activation due to operational needs in an area. All NIST work orders and NIST contracts that require system impairment will be classified under this category and follow the requirements in Section 6b.

(2) Routine – Impairments to a specific system that requires routine or frequent need of impairment as a result of work. An example is beam detectors located in areas where a crane is operated.

(3) Emergency – A condition where a Fire Protection System or portion thereof is out of order due to an unexpected occurrence.

(4) Concealed – A previously unknown or undocumented impairment that is newly discovered.

j. Impairment Coordinator – A term referring to the Fire Alarm System Administrator in Gaithersburg or the Fire Alarm Contractor under OFPM Safety Fire Protection Engineering Specialist in Boulder.

k. Interim Safety Measures – Temporary safety measures put in place to protect the safety of occupants, visitors, staff and emergency responders. These may include but are not limited to temporary Fire Protection Systems, signage, supervision and/or fire watch.

l. Life Safety Systems – Those systems that enhance or facilitate evacuation, smoke control, compartmentalization, and/or isolation.

m. Research-Specific Fire Protection and Life Safety Systems – Any system required due to a hazard created by a research task and which is not part of the overall building fire and life safety protection.

8. ACRONYMS

a. AHJ – Authority Having Jurisdiction

b. COR – Contracting Officer's Representative

c. FPG – Fire Protection Group

d. GCC – Graphical Command Center

e. IBC – International Building Code

f. NFPA – National Fire Protection Association

g. OSHE – NIST Office of Safety, Health, and Environmental

9. RESPONSIBILITIES

a. OU Directors and Line Supervisors are responsible for:

(1) Ensuring that the *Impairment of Fire Protection and Life Safety Systems Suborder* is adopted and used in their spaces;

(2) Providing adequate notice to the Impairment Coordinator of impairment via an Impairment Permit request;

(3) Providing notification via email to laboratory users of research-specific system impairments;

(4) Posting the Impairment Permit; and

(5) Coordinating with the Impairment Coordinator for "Out of Service" tagging, rendering the system impaired, and restoration.

b. OFPM is responsible for:

(1) Ensuring that the *Impairment of Fire Protection and Life Safety Systems Suborder* is adopted and used in their spaces;

(2) Providing adequate notice to the Impairment Coordinator of impairment via an Impairment Permit request, when required (see Section 6h for exclusions related to routine inspection, testing, and maintenance of systems or work associated with M-slips);

(3) Posting the Impairment Permit; and

(4) Coordinating with the Impairment Coordinator for "Out of Service" tagging, rendering the system impaired, and restoration.

c. The NIST AHJ or (Delegated AHJ) is responsible for:

(1) Authorizing all NIST planned impairments and maintaining all permit requests for a period of one (1) year;

(2) Ensuring access control to the fire alarm and fire suppression systems on NIST Gaithersburg and Boulder campuses; and

(3) Determining the requirements and training for fire watch.

d. Impairment Coordinator is responsible for:

(1) Routing Impairment Permits to AHJ for approval;

(2) Posting additional signage, as required by the AHJ;

(3) Providing notice to building occupants via email three (3) days prior to system impairment and after system restoration;

(4) Notifying the Fire Protection Group (Gaithersburg) or Security Command Center (Boulder) at commencement of planned impairment and restoration of systems;

(5) Maintaining contact with impairment permit holders and ensuring restoration of systems upon completion of work;

(6) Notifying the AHJ when impairments exceed their permitted duration; and

(7) Signing the permit holder's Restoration Checklist upon verification of operability.

e. CORs are responsible for:

(1) Providing adequate notice to the Impairment Coordinator of impairment via an Impairment Permit request;

(2) Ensuring that the requirements established by the Impairment Coordinator or AHJ are incorporated into the contractor safety plan;

(3) Posting the Impairment Permit as required by the AHJ;

(4) Coordinating with the Impairment Coordinator for "Out of Service" tagging, rendering the system impaired, and restoration; and

(5) Providing trained personnel (or contractors) for the capacity of fire watch (see Section 9g) when required by the AHJ.

f. Fire Protection Group (Gaithersburg only) is responsible for:

(1) Notifying the Impairment Coordinator of any emergency or concealed impairments as soon as they have been reported;

(2) Providing fire watch personnel in applicable situations;

(3) Completing annual training provided by the Impairment Coordinator before being authorized for Fire Alarm System access control;

(4) Providing trained personnel for the capacity of fire watch (see Section 9g) when required by the AHJ; and

(5) Maintaining constant and continuous monitoring of campus fire alarm GCC.

g. Fire Watch Personnel (when required) are responsible for:

(1) Completing the training provided by OSHE on the duties of fire watch personnel;

(2) Completing annual training provided or approved by OSHE on the use of required fire extinguishers;

(3) Knowing and understanding the work site and work hazards;

(4) Ensuring that safe conditions are maintained during the work operations;

(5) Having fire extinguishment equipment (minimum is a 2A:40B:C extinguisher) readily available;

(6) Knowing how to summon emergency help and call for emergency help when necessary;

(7) Watching for fires in all exposed areas and trying to extinguish them when the fires are obviously within the capacity of the equipment available; and

(8) Visually surveying the area of the building that is affected by the impairment each hour to ensure safe conditions and availability of egress.

10. AUTHORITIES

The NIST Authority Having Jurisdiction may delegate the authority to carry out any AHJ responsibilities to FPEs in the Office of Safety, Health, and Environment.

11. DIRECTIVE OWNER

Chief Safety Officer

12. APPENDICES

A. Revision History
B. Impairment Permit Form
C. Restoration Checklist

608 **Appendix A. Revision History**

Revision No.	Approval Date	Deployment Start Date	Effective Date	Brief Description of Change; Rationale
0	TBD	TBD	TBD	• None – Initial document

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NIST-XXX	**U.S. DEPARTMENT OF COMMERCE** NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

IMPAIRMENT PERMIT

OSHE-FFSG

A. Request Information

Requestor	Requestor's Phone #	Requestor's Email Address	Campus being Impaired ☐ Gaithersburg ☐ Boulder

Impairment Duration	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Buildings Impacted	Rooms/Areas Impacted
Date:	_____	_____	_____	_____	_____	_____	_____		
Start:	_____	_____	_____	_____	_____	_____	_____		
End:	_____	_____	_____	_____	_____	_____	_____		

B. DESCRIPTION OF WORK

C. SYSTEMS BEING IMPAIRED

Fire Alarm
- ☐ Smoke or Heat Detectors [Number of Devices: _____]
- ☐ Beam Detectors [Number of Devices: _____]
- ☐ VESDA Systems
- ☐ Notification Devices (Speakers, Strobes, etc.) [Number of Devices: _____]
- ☐ Tamper Switches [Number of Devices: _____]
- ☐ Other: _____

Suppression Systems
- ☐ Sprinkler Systems
- ☐ Flow Switches [Number of Switches: _____]
- ☐ Valves [Number of Valves: _____]
- ☐ Clean Agent Systems
- ☐ Fire Pumps
- ☐ Specialized Systems: _____

Life Safety / Egress Systems
- ☐ Doors [Number of Doors: _____]
- ☐ Corridors
- ☐ Stairs
- ☐ Generators
- ☐ Other: _____

D. SPECIAL PROVISIONS (Completed by AHJ)
- ☐ Additional Fire Extinguishers
- ☐ Additional Impairment Signage
- ☐ Temporary Evacuation/Egress Routes
- ☐ Fire Watch
- ☐ Other: _____

E. OU Group Lead OR COTR

Signature of OU Group Lead or COTR:	Name (Print) of OU Group Lead or COR:	Phone Number:
F. AUTHORIZATION		
Signature of Authority Having Jurisdiction (AHJ):	Name (Print) of AHJ:	Phone Number:

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615 **Appendix C. Restoration Checklist**

NIST-XXX	**U.S. DEPARTMENT OF COMMERCE** NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

IMPAIRMENT RESTORATION CHECKLIST

OSHE-FFSG

A. Impairment Permit Information

Impairment Permit #	Completion Date / Time	Did Impairment exceed expected duration? ☐ Yes, Reason: _____ _____ ☐ No

B. Systems Restored to Original State and Verified Operational

Fire Alarm
- ☐ Smoke or Heat Detectors [Number of Devices: _____]
- ☐ Beam Detectors [Number of Devices: _____]
- ☐ VESDA Systems
- ☐ Notification Devices (Speakers, Strobes, etc.) [Number of Devices: _____]
- ☐ Tamper Switches [Number of Devices: _____]
- ☐ Other: _____

Suppression Systems
- ☐ Sprinkler Systems
- ☐ Flow Switches [Number of Switches: _____]
- ☐ Valves [Number of Valves: _____]
- ☐ Clean Agent Systems
- ☐ Fire Pumps
- ☐ Specialized Systems: _____

Life Safety / Egress Systems
- ☐ Doors [Number of Doors: _____]
- ☐ Corridors
- ☐ Stairs
- ☐ Generators
- ☐ Other: _____

Temporary Impairment Requirements
- ☐ Remove all Impairment Signage
- ☐ Remove all Evacuation / Egress Signage
- ☐ Remove and Return Additional Fire Extinguishers
- ☐ Other: _____

C. OU Group Lead OR COTR

Signature of OU Group Lead or COTR:	Name (Print) of OU Group Lead or COR:	Phone Number:

D. Verification

Signature of Impairment Coordinator:	Name (Print) of Impairment Coordinator:	Phone Number:

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NIST National Institute of Standards and Technology • U.S. Department of Commerce

FIRE PREVENTION DURING WELDING, CUTTING, AND OTHER HOT WORK

NIST S 7401.04
Document Date: 01/12/2021
Effective Date:[1] 04/01/2020

1. PURPOSE

The purpose of this suborder is to establish the requirements and associated roles and responsibilities for performing activities involving **hot work** in **NIST spaces** (see Section 7, DEFINITIONS).

2. BACKGROUND

a. NIST Policy (P) 7400.00, *Fire and Life Safety* articulates NIST's commitment to making fire and life safety an integral core value and vital part of the NIST culture, in part by complying with applicable laws, regulations, and other promulgated fire and life safety requirements.

b. The content of this suborder was derived primarily from Chapter 35 of the International Fire Code (IFC) and the National Fire Protection Association (NFPA) Standard for Fire Prevention During Welding, Cutting, and Other Hot Works (NFPA 51B).

3. APPLICABILITY

a. The provisions of this suborder apply to all hot work activities performed in NIST spaces with the following exceptions:

(1) NIST activities involving cooking operations;

(2) NIST activities in laboratories or laboratory-owned shops involving candles[2], Bunsen burners, alcohol burners, small hand-held torches, heat or temperature baths, hot plates, furnaces, ovens, small benchtop grinding wheels, or electric soldering irons;

[1] For revision history, see Appendix A.
[2] The use of candles on NIST campuses is prohibited unless related to a laboratory experiment.

(a) This exception does not apply when such activities generate slag or more than incidental amounts of sparks; and

(3) NIST activities in laboratories and laboratory-owned shops where welding does not generate sparks or slag (or generates no more than incidental amounts of sparks) in open air, e.g., enclosed orbital tube welder, small electrical (electric resistance) or water-based spot welders.

(4) Laboratory-related fire and combustion experiments conducted in the National Fire Research Laboratory.

4. REFERENCES

a. 29 CFR 1910, Subpart Q, *Welding, Cutting, and Brazing*

b. 29 CFR 1926, Subpart F, *Fire Protection and Prevention*

c. International Fire Code (IFC), Chapter 33- *Fire Safety During Construction and Demolition*, 2015 edition

d. IFC, Chapter 35-*Welding and Other Hot Work*, 2015 edition

e. NFPA 51B, *Fire Prevention During Welding, Cutting, and Other Hot Work*, 2014 edition

f. NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*, 2013 edition

g. ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, 2012 edition

h. NCNR-3.7, *Policy on Work Requiring a Cutting and Welding Permit*

5. APPLICABLE NIST OCCUPATIONAL SAFETY AND HEALTH SUBORDERS

a. NIST P 7400.00: *Fire and Life Safety*

b. NIST O 7401.00: *Fire and Life Safety*

c. NIST S 7401.03: *Impairment of Fire Protection and Life Safety Systems* (under development)

d. NIST S 7101.20: *Work and Worker Authorization Based on Hazard Reviews ("Hazard Review")*

e. NIST S 7101.21: *Personal Protective Equipment (PPE)*

f. NIST S 7101.23: *Safety Education and Training*

g. NIST S 7101.61: *Compressed Gas Safety*

6. REQUIREMENTS

a. Authorization of Work and Workers Performing Hot Work

(1) Hot work in NIST spaces shall be performed only in **designated areas** and **permit-required areas** approved for the hot work by a NIST **Permit Authorizing Individual (PAI)** (see Section 7, DEFINITIONS).

(2) For hot work to be performed by NIST employees and covered associates:

(a) The requirements established by the PAI in designated area certificates and **hot work permits** (for permit-required areas) (see Section 7, DEFINITIONS) shall be incorporated by the OU into the hazard review or job hazard analysis for the hot work; and

(b) The activity involving the hot work and those performing it shall be authorized by the OU in accordance with the requirements of this suborder and NIST S 7101.20: *Work and Worker Authorization Based on Hazard Reviews*.

(3) For hot work to be performed by non-R&D contractors in NIST spaces, the requirements established by the PAI in a designated area certificate or hot work permit shall be incorporated by the Contracting Officer's Representative (COR) into the non-R&D contractor's safety plan.

(4) The following additional requirements shall be incorporated into the hazard reviews of activities involving hot work performed by NIST employees and covered associates, or into the safety plans for hot work performed by non-R&D contractors, whichever is applicable:

(a) Hot work equipment shall be inspected per manufacturer's instructions by those performing the hot work each time prior to use to ensure that it is in safe operating condition.

i. Equipment with broken, loose, or missing components, which prohibit safe operation of the equipment, shall be placed out-of-service (refer to NIST S 7101-56 for Control of Hazardous Energy and NIST S 7101-64 for Electrical Safety).

(b) Those performing the hot work and nearby personnel shall be suitably protected against dangers such as heat, sparks, slag, and fumes in accordance with the requirements of NIST S 7101.21: *Personal Protective Equipment (PPE)* and 29 CFR 1910.252(b).

b. NIST Permit Authorizing Individuals[3]

(1) Designated areas and permit-required areas related to research activities in NIST spaces (where a hazard review is required) shall be approved by an Office of Safety, Health, and Environment (OSHE) PAI.

(2) Designated areas and permit-required areas related to construction and maintenance activities in NIST spaces shall be approved by an Office of Facilities and Property Management (OFPM) PAI or a NIST Gaithersburg Fire Protection Group (FPG) PAI.

(3) Designated areas and permit-required areas related to laboratory activities not requiring a hazard review can be approved by PAIs from any of the above-mentioned organizations.

(4) The NIST AHJ may approve the assignment of PAIs outside of the above-mentioned organizations (i.e. within a laboratory OU), where special circumstances exist.

c. Process to Obtain a Designated Area Certificate

(1) For hot work to be performed by NIST employees or covered associates, a NIST employee from the OU owning the proposed designated area shall contact the PAI to request an inspection of the area.

(2) For hot work to be performed by non-R&D contractors in NIST spaces, the COR shall contact the PAI to request an inspection of the proposed designated area.

(3) A designated area certificate (see Appendix B) shall be issued by the PAI after inspection of the area and a determination that the requirements for a designated area (see Appendix C) have been met.

[3] An individual must complete the PAI training module to be an approved PAI as indicated in Section 9f.

(a) The PAI shall complete an inspection of the designated area within five (5) business days of the request.

i. Requests requiring urgency will be expedited by the PAI.

(4) The designated area certificate shall be prominently displayed immediately outside of the designated area.

(5) A designated area certificate shall be valid for 1 (one) year.

(6) For reissuance of a designated area certificate for hot work to be performed by NIST employees or covered associates, an employee from the OU owning the designated area shall contact the PAI no later than one (1) month prior to the expiration date of the current designated area certificate to request a re-inspection of the area.

(7) For reissuance of a designated area certificate for hot work to be performed by non-R&D contractors, the COR shall contact the PAI no later than one (1) month prior to the expiration date of the current designated area certificate to request a re-inspection of the area.

(a) After re-inspection of the area and a determination that the requirements for a designated area (see Appendix C) continue to be met, the PAI shall issue a new designated area certificate with a new issuance and expiration date.

d. Process to Obtain a Hot Work Permit (for Permit-Required Areas)

(1) For hot work to be performed by NIST employees or covered associates, a NIST employee from the OU owning the proposed permit-required area shall contact the PAI to request an inspection of the area.

(2) For hot work to be performed by non-R&D contractors in NIST spaces, the COR shall contact the PAI to request an inspection of the proposed permit-required area.

(3) A hot work permit (see Appendix D) shall be issued by the PAI after inspection of the area and a determination that the applicable requirements for a permit-required area have been met.

(a) The PAI shall complete an inspection of the permit-required area within two (2) business days of the request.

i. Requests requiring urgency will be expedited by the PAI.

(3) The hot work permit shall be prominently displayed in the work area during the period of authorized work performance (*e.g.*, issuance to expiration).

(4) The PAI shall determine the length of time for which hot work permits are valid, but the time period shall be no longer than seven (7) calendar days.

(a) If a hot work permit is going to be needed for longer than seven (7) calendar days, the PAI should consider the establishment of a designated area.

(b) If the area cannot be designated as a designated area, a new hot work permit must be issued every seven (7) calendar days for the duration of the hot work.

e. Training

(1) Training shall be provided, documented, and recorded in accordance with the requirements of the NIST S 7101.23: *Safety Education and Training*.

(2) NIST employees and covered associates who are to perform hot work shall complete:

(a) Training provided by OSHE on this program;

(b) Activity-specific training, provided by the Organizational Unit (OU), required by applicable hazard reviews; and

(c) Training provided, arranged, or approved by OSHE on the use of fire extinguishers (refresher training required annually for continuance of activity).

(3) Official first-level supervisors of NIST employees and covered associates who are to perform hot work shall complete the training provided by OSHE on this program.

(4) CORs for non-R&D contractors who are to perform hot work shall complete the training provided by OSHE on this program.

(5) PAIs shall complete the PAI training module provided by OSHE on NFPA 51B and on this suborder.

7. DEFINITIONS

a. Associate – An individual conducting work at a NIST workplace who is not a NIST employee. For a list of NIST associate types, click here.

b. Authority Having Jurisdiction (AHJ) – A qualified FPE[4] in OSHE designated by the NIST CSO to enforce[5] the NIST-adopted codes and standards relevant to fire, electrical, and life safety on NIST-owned and operated sites.

c. Covered Associate – A NIST associate permitted to perform work at a NIST workplace and subject to NIST policies and procedures, and to the extent allowed by law and the terms of the associate's agreement. Covered associates include Foreign and Domestic Guest Researchers (including contractors who perform NIST R&D/technical work); Research Associates; Intergovernmental Agency Personnel Act assignees; Facility Users; Volunteer Students; and other federal employees who perform work at NIST workplaces.

d. Designated Area – A specific area, such as a welding shop or a soldering station, in which hot work is regularly performed and which has been approved for such work by a PAI based on their inspection of the area against the requirements of Appendix C.

e. Designated Area Certificate – A document issued by a PAI pursuant to approving a location for the regular performance of hot work activities.

f. Fire Resistive – Refers to properties or designs to resist the effects of any fire to which a material or structure can be expected to be subjected (extracted from NFPA *Glossary of Terms*).

g. Fire Watch – The assignment of a person (or persons) to an area for the express purpose of notifying the fire department, the building occupants, or both of an emergency; preventing a fire from occurring; extinguishing small fires; or protecting the public from fire or life safety changes.

h. Hot Work – Work involving welding, brazing, open flame soldering, heat treating, grinding, thawing pipes, powder-driven fasteners, hot riveting, torch-applied roofing, or any other process requiring use of a spark, flame, or heat that is capable of initiating fires or explosions.

i. Hot Work Equipment – Electric or gas welding, cutting, and heating equipment used for hot work.

j. Hot Work Permit – A document issued by a PAI pursuant to approving a permit-required area.

[4] See requirements for Office of Personnel Management Fire Protection Engineering Series 0804.

[5] Nature of enforcement is dependent upon the severity of the violation, *e.g.*, stop work, revoke permit, denial of use and occupancy, etc.

k. NIST Space – A space that is owned, operated, and under the control of NIST.

l. Noncombustible – A material that, in the form in which it is used and under conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat. Materials that are reported as passing ASTM E136 shall be considered noncombustible materials (extracted from *NFPA Glossary of Terms*).

m. Non-R&D Contractor – A NIST associate who performs non-R&D work at a NIST workplace in accordance with the safety requirements of a contract or other legal arrangement, such as a Memorandum of Understanding, with NIST Non-R&D contractors include, but are not limited to, construction contractors; facilities contractors; equipment installation, service, and maintenance contractors; Health Unit contractors; contract cafeteria workers; and janitorial contractors.

n. Official First-Level Supervisor (of Another Employee or of a Covered Associate) – The Rating Official on the performance plan of another employee or the supervisor of a covered associate.

o. Permit Authorizing Individual (PAI) – An individual authorized to approve hot work requests by virtue of completing the training provided by OSHE on NFPA 51B and this suborder

p. Permit-Required Area – Any location other than a designated area that has been approved for hot work by a PAI based on their inspection of the area against the requirements of Appendix C.

q. Welding Blanket – A heat–resistant fabric designed to be placed in the vicinity of hot work operations. Intended for use in horizontal applications with light to moderate exposures such as that resulting from chipping, grinding, heat treating, sand blasting, and light horizontal welding. Designed to protect machinery and prevent ignition of combustibles such as wood located on the underside of the blanket. (Extracted from NFPA *Glossary of Terms*)

r. Welding Curtain – A heat–resistant fabric designed to be placed in the vicinity of hot work operations. Intended for use in vertical applications with light to moderate exposures such as that resulting from chipping, grinding, heat treating, sand blasting, and light horizontal welding. Designed to prevent sparks from escaping the area. (Extracted from NFPA *Glossary of Terms*)

s. Welding Pads – A heat–resistant fabric designed to be placed directly under a hot work operation such as welding or cutting. Intended for use in horizontal applications with severe exposures such as that resulting from molten substances or heavy horizontal welding. Designed to prevent ignition of combustibles that are located to the underside of the pad. (Extracted from NFPA *Glossary of Terms*)

8. ACRONYMS

a. AHJ – Authority Having Jurisdiction

b. ANSI – American National Standards Institute

c. CFR – Code of Federal Regulations

d. COR – Contracting Officers Representative

e. CSO – Chief Safety Officer

f. FPG – Fire Protection Group, Emergency Services Office

g. NFPA – National Fire Protection Association

h. OFPM – Office of Facilities and Property Management

i. OSHA – Occupational Safety and Health Administration

j. OSHE – Office of Safety, Health, and Environment

k. OU – Organizational Unit

l. PAI – Permit Authorizing Individual

9. RESPONSIBILITIES

Roles and responsibilities common to all NIST Fire and Life Safety suborders are delineated in NIST O 7401.00: *Fire and Life Safety*. The roles and responsibilities specific to this suborder are as follows:

a. OU Directors:

(1) Ensuring that OU activities involving hot work and those conducting that work are authorized in accordance with the requirements of this suborder and NIST S 7101.20, *Work and Worker Authorization Based on Hazard Reviews*.

b. Official First-Level Supervisors of NIST Employees and Covered Associates Performing Hot Work:

(1) Ensuring that the requirements established by PAIs in designated area certificates and hot work permits are incorporated into the hazard reviews of the activities involving hot work;

(2) Ensuring that the requirements of Section 6a(4) are incorporated into the hazard reviews of activities involving hot work;

(3) Ensuring that the training specified in Section 6c is completed prior to NIST employees and covered associates engaging in hot work;

(4) Completing the training required by Section 6c;

(5) Ensuring that designated area certificates are prominently displayed immediately outside the designated area; and

(6) Ensuring that hot work permits are prominently displayed in the work area during the period of authorized work performance.

c. NIST Employees and Covered Associates Performing Hot Work:

(1) Completing the training specified in Section 6c; and

(2) Ensuring that the requirements established by PAIs in designated area certificates and hot work permits are followed.

d. CORs:

(1) Completing the training specified in Section 6c;

(2) Submitting requests for designated areas and permit-required areas to an appropriate PAI;

(3) Ensuring that the requirements established by the PAI in designated area certificates or hot work permits are incorporated into the non-R&D contractor safety plans;

(4) Ensuring that non-R&D contractors are aware of the hazards in the area where hot work will be performed;

(5) Ensuring that non-R&D contractors are qualified to do the hot work; and

(6) Ensuring that non-R&D contractors comply with the requirements of hot work permits and their safety plans.

e. NIST AHJ:

(1) Approving OSHE, OFPM, and FPG PAIs based on their completion of training;

(2) Maintaining a current list of approved PAIs; and

(3) Annually auditing designated area certificates and hot work permits to ensure that program requirements are being met and records are being appropriately maintained.

f. PAIs:

(1) Completing the PAI training module provided by OSHE on NFPA 51B and this suborder;

(2) Inspecting requested designated areas and permit-required areas against the requirements of Appendix C

(3) Upon determining that all applicable designated area or permit-required area requirements have been met, issuing designated area certificates and hot work permits;

(4) Maintaining electronic or hard copies of all designated area certificates and hot work permits for a minimum of one (1) year; and

(5) Making electronic or hard copies of all designated area certificates and hot work permits available to the AHJ upon request.

g. NIST Employees Assigned to Conduct Fire Watches:

(1) Completing the training provided by OSHE on this program;

(2) Completing annual training provided or approved by OSHE on the use of required fire extinguishers.

(3) Stopping hot work and notifying the PAI if unsafe conditions develop; and

(4) Knowing how to summon emergency help.

10. AUTHORITIES

For authorities applicable to all NIST Fire and Life Safety suborders, see NIST O 7401.00: Fire and Life Safety.

a. NIST Employees in OUs Needing to Perform Hot Work:

(1) Submit requests for designated areas and permit-required areas to an appropriate PAI, with the understanding that they provide the requirements established by the PAI to the official first-level supervisor for incorporation into the hazard review of the activities involving hot work.

11. DIRECTIVE OWNER

Chief Safety Officer

12. APPENDICES

A. Revision History
B. Designated area certificate
C. Requirements for Designated Areas and Permit-Required Areas
D. Hot Work permit

Appendix A. Revision History

Revision No.	Approval Date	Responsible Person	Brief Description of Change; Rationale
0	09/30/17	TBD	• None – Initial document
1	1/12/21	April Camenisch	Updated CFR links and NIST Suborder links.

475 **Appendix B: Designated Area Certificate**
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NIST-XXX	**U.S. DEPARTMENT OF COMMERCE** NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

DESIGNATED (HOT WORK) AREA CERTIFICATE

OSHE-FFSG

A. CERTIFICATE DETAIL

Certificate Number	Building Number	Room Number	Date of Issue	Date of Expiration

B. CONTACT INFORMATION

Name of Supervisor or COR:	Phone Number:

C. TYPE OF HOT WORK

D. PRECAUTIONS CHECKLIST (TO BE COMPLETED BY PAI)

- ☐ Designated area is constructed of noncombustible or fire-resistive materials
- ☐ Designated area is free of combustible and flammable contents including gases and liquids
- ☐ No openings, holes, penetrations, or cracks are present in fire-resistive construction within the designated area.
- ☐ If enclosed, appropriate ventilation (with noncombustible ducting) is present in the designated area.
- ☐ A functional fire extinguisher is mounted in the immediate vicinity of the designated area.
- ☐ All combustibles are located at least _____ feet in all directions from the designated area as determined by the PAI.

D. AUTHORIZATION

Signature of Permit Authorizing Individual (PAI):	Name (Print) of PAI:	Phone Number:

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Appendix C. Requirements for Designated Areas and Permit-Required Areas

a. Designated Areas

(1) Designated areas shall be constructed of noncombustible or fire-resistive materials and shall be free of combustible and flammable contents.

(a) All openings, holes, penetrations, or cracks in the fire-resistive construction shall be sealed with fire-rated or noncombustible material to prevent the passage of sparks to adjacent areas.

(2) Designated areas shall also meet the requirements for permit-required areas listed below.

(3) Enclosed designated areas shall have a working ventilation system. The ductwork must be noncombustible and not capable of transmitting sparks out of the area.

(4) A fire extinguisher having the appropriate classification for the hazard shall be specified by the PAI for mounting immediately adjacent to the designated area.

b. Permit-Required Areas

(1) Floors shall be swept clean for a radius of 35 feet[6,7] (11 meters) of the hot work site to ensure combustible material, such as paper clippings, wood shavings, or textile fibers, are not present.

(2) Floors constructed of a combustible material (*e.g.*, wood) shall be kept wet, covered with damp sand, or protected by a listed or approved welding blanket, welding pad, or equivalent for a radius of 35 feet[6, 7] (11 meters) of the hot work site.

(3) Walls, partitions, ceilings, or roofs of combustible construction shall be protected from hot works occurring near them by a listed or approved welding curtain, welding blanket, welding pad, or equivalent.

[6] In instances where the scope of work, tools used to conduct hot work, or size of the room/space in which hot work is conducted, are known to be incapable of generating or allowing slag, sparks, splatter, or similar mobile sources of ignition to travel farther than 35 feet (11 meters) from the hot work site, the PAI shall be permitted to reduce the distance. The approved distance shall be documented on the permit.

[7] In instances where the scope of work and tools used to conduct hot work may result in the possible travel of slag, sparks, splatter, or similar mobile sources of ignition farther than 35 feet (11 meters) from the hot work site, the PAI shall extend the distance. The approved distance shall be documented on the permit.

(4) Ducts and conveyor systems located within 35 feet[6, 7] (11 meters) of the hot work site that might carry sparks to distant combustibles shall be shielded, shut down, or both.

(5) Openings, holes, penetrations, or cracks in walls, floors, or ducts within 35 feet[6, 7] (11 meters) of the hot work site shall be covered or sealed with listed or approved fire-rated or noncombustible material.

(6) All combustibles within 35 feet[6, 7] (11 meters) of the hot work site shall be relocated.

(a) If relocation of combustibles is impractical, combustibles shall be protected by a listed or approved welding curtain, welding blanket, welding pad, or equivalent.

(b) To prevent the entrance of sparks or slag, the edges of covers at the floor shall be tight, including at the point at which several covers may overlap.

(7) For hot work performed in close proximity to a wall, partition, ceiling, or roof, precautions shall be specified by the PAI to prevent ignition of combustibles that may be located on the other side of the wall, partition, ceiling, or roof.

(8) For hot work performed in close proximity[8] to a fire protection device, precautions shall be specified by the PAI to prevent accidental operation of an automatic fire detection or suppression system[9].

(9) Fully charged and operable fire extinguishers appropriate for the type of possible fire shall be specified by the PAI and available in the work area (*e.g.*, within the 35-foot perimeter or limits of the room/space).

(10) If existing hose lines are located within the hot work area defined by permit, they shall be connected and ready for service but shall not be required to be unrolled or charged.

c. Fire Watches

(1) The PAI may require a fire watch when hot work is performed under any of the following circumstances:

(a) A fire protection system is impaired;

(b) A life safety system is impaired; or

[8] If sufficient heat, smoke, or particulate could be developed such that activation of fire protection devices would be likely, then the hot work would be deemed to be in "close proximity" to the fire protection devices.

[9] Where fire alarm or fire suppression system impairments are necessary, the requirements of NIST S7401.03 *Fire Protection and Life Safety System Impairments* shall be followed.

(c) The requirements for a hot work permit are met, but the PAI is still concerned that ignition from spark or slag could occur.

(2) A fire watch shall be maintained for a minimum of 30 minutes after completion of hot work operations.

(a) The duration of a fire watch may be extended if the PAI determines the conditions warrant an extension.

(3) The PAI shall determine the number of individuals needed to conduct a fire watch.

i. In some cases, it may be necessary to assign more than one employee to conduct fire watch duties, *e.g.*, where multiple floors are affected.

(4) The PAI shall determine the location(s) of the fire watch.

d. Non-Permissible Areas

(1) Hot work shall not be performed in the following areas.[10]

(a) In sprinklered buildings where sprinklers are impaired, unless the requirements of NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection* are met and a fire watch is provided;

(b) In areas where explosive atmospheres may be present, *i.e.*, where mixtures of flammable gases, vapors, liquids, or dusts with air exist;

(c) In areas where contaminated equipment, drums, tanks, or other containers that have previously contained materials that could develop explosive atmospheres may be present;

(d) On a partition, wall, ceiling, or roof with a combustible covering and/or insulation, or combustible sandwich-type panel construction; and

(e) On pipes or other metal that is in contact with combustible walls, ceilings, roofs, or other combustibles if the work is close enough to cause ignition by conduction.

[10] In such areas, techniques other than hot works must be utilized.

NIST-XXX	**U.S. DEPARTMENT OF COMMERCE** NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

HOT WORK PERMIT

OSHE-FFSG

A. PERMIT DETAIL

Permit Number	Building Number	Room Number	Date of Issue	Date of Expiration

B. TYPE OF HOT WORK

C. PRECAUTIONS CHECKLIST (TO BE COMPLETED BY PAI)

Requirements within _____feet of hot work.

- □ Flammable and combustible liquids, dust, lint, and oil deposits are removed.
- □ Flammable and combustible gases are removed.
- □ Floor is swept clean of combustible materials and trash.
- □ Wall, ceiling, and floor openings are covered.

Requirements for hot work on walls, ceilings, or roofs (□ N/A)

- □ Construction is noncombustible and without combustible coverings or insulations
- □ Combustible materials on other side of walls, ceilings, or roofs is moved away.

Requirements for hot work on enclosed equipment (□ N/A)

- □ Enclosed equipment is cleaned of all combustibles
- □ Containers are purged of flammable liquid/vapor
- □ Pressurized vessels, piping, and equipment has been removed from service, isolated, and vented.

Requirements for fire watch (□ N/A)

- □ Fire watch is provided during and for a maximum of 30 minutes after hot work, including any break activity.
- □ Fire watch is provided with a suitable extinguishment method.
- □ Fire watch is trained in use of equipment and in sounding alarm.

D. SPECIAL PROVISIONS

- □ Ductwork blanks required
- □ Overhead spark/slag collection required
- □ Combustible floor wet down required
- □ Welding pads, blankets, or curtains required
- □ Arc-welding screens required
- □ Additional ventilation required
- □ Fire protection system impairment required
- □ Fall protection required
- □ LOTO required
- □ Confined space entry required

☐ Fire watch is required in adjoining areas above and below hot work location. ☐ Fire watch is extended beyond 30 minutes. (Fire Watch duration of _____ minutes is required). ☐ Other:		
D. SUPERVISOR OR COR		
Signature of Supervisor or COR:	Name (Print) of Supervisor or COR:	Phone Number:
E. AUTHORIZATION		
Signature of Permit Authorizing Individual (PAI):	Name (Print) of PAI:	Phone Number:

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Rev 5/10/2022

Outline of a NIST Safety and Health Plan for a Specific Contract

The following areas are typically addressed in a contract specific safety and health plan. A plan shall be job-specific and shall also address any unusual or unique aspects of the project or activity for which it is written.

1. SIGNATURE SHEET.

Title, signature, and phone number of the following:

a. Plan preparer (qualified person such as corporate safety staff person, QC).

b. Plan must be approved, by company/corporate officers authorized to obligate the company (e.g., owner, company president, regional vice president, etc.).

c. Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional, project QC) (provide concurrence of other applicable corporate and project personnel (Contractor)).

2. BACKGROUND INFORMATION. List the following:

a Contractor;

b. Contract number;

c. Project name;

d. Brief project description, description of work to be performed, and location on NIST Gaithersburg site.

e. Contractor and sub-contractor accident experience (provide 2 years OSHA 300 Forms, corporate safety trend analyses); and any OSHA/STATE citations.

3. STATEMENT OF SAFETY AND HEALTH POLICY.

a. List NIST job-specific phases of work and identify any/all hazardous activities. List all safe work practices to be followed during each project activity phases.

b. Provide a copy of your current corporate/company Safety and Health Policy Statement.

4. RESPONSIBILITIES AND LINES OF AUTHORITIES.

a. Identification and accountability of personnel responsible for safety - at both corporate and project level. (Contracts specifically requiring safety or industrial hygiene personnel should include a copy of their resume. The COTR will review the qualifications for acceptance.)

b. Lines of authority to include sub-contractors.

5. SUBCONTRACTORS AND SUPPLIERS.

Provide the following:

a. Identification of subcontractors and suppliers;

b. Means for controlling and coordinating subcontractors and suppliers; and

c. Safety responsibilities of subcontractors and suppliers.

6. TRAINING.

a. List subjects to be discussed with employees in safety indoctrination.

b. List mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, confined space entry, crane operator, excavation, certification, NFPA 70E, PPE) and any requirements for periodic retraining/recertification.

   All applicable training certifications shall be submitted to NIST prior to work proceeding.

c. Outline requirements (who attends, when given, who will conduct, etc.) for supervisory and employee safety meetings.

7. SAFETY AND HEALTH INSPECTIONS.

Provide details on:

a. Who will conduct safety inspections (e.g., PM, safety professional, QC, supervisors, employees), when inspections will be conducted, how the inspections will be recorded, deficiency tracking system, follow-up procedures, etc.

   Copies of safety reports shall be submitted to the NIST COR for review.

b. The names of competent and/or qualified person(s) and proof of competency/ qualification to meet specific OSHA competent/qualified person(s) requirements must be attached.

8. SAFETY AND HEALTH EXPECTATIONS, INCENTIVE PROGRAMS, AND COMPLIANCE.

a. The company's written safety program goals, objectives, and accident experience goals for this contract should be provided.

b. A brief description of the company's safety incentive programs (if any) should be provided.

c. Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for violation of safety requirements) should be identified.

d. Provide written company procedures for holding managers and supervisors accountable for safety.

9. ACCIDENT REPORTING.

The Contractor shall identify who, how, and when the following will be completed:

a. Exposure data (man-hours worked);

b. Accident investigations, reports, and logs;

c. Immediate notification of major accidents to NIST contact.

10. MEDICAL SUPPORT.

Outline on-site medical support and/or offsite medical arrangements including rescue and medical duties for those employees who are to perform them, and the name(s) of onsite Contractor personnel trained in first aid and CPR.

11. PERSONAL PROTECTIVE EQUIPMENT.

Outline procedures (who, when, how) for conducting hazard assessments and written certifications for use of PPE. Outline procedures to be followed to assure the proper use, selection, and maintenance of personal protective and life saving equipment (e.g., protective footwear, protective gloves, hard hats, safety glasses, hearing protection, body harnesses, lanyards).

12. REQUIRED PLANS (when specific work is necessary as part of the contract)

a. Plans for the layout of temporary construction buildings, facilities, fencing, and access routes and anchoring systems for temporary structures shall be submitted to and approved by the COTR.

b. Spill prevention plan and response plan

c. Plan for posting of emergency telephone numbers

d. Hazard communication plan - Provide the location of MSDS, records of Contractor employee training, and inventory of hazardous materials (including approximate quantities and a site map) that will be brought onto Government project by the Contractor and subcontractor. All hazardous materials must have NIST approval prior to materials entering NIST site.

e. Respiratory Protection Plan.

Where respirators are necessary to protect the health of the employee, establish and implement a written respiratory protection program with work site specific procedures in accordance with this section and OSHA's respiratory protection standard at 29 CFR 1910.134.

Designate a competent person as program administrator, who is qualified by appropriate training or experience that is commensurate with the complexity of the program, to administer and oversee the respiratory protection program and conduct the required evaluations of program effectiveness.

All contract employees respirator fit test and medical records must be submitted to NIST before any work is to proceed.

f. Health Hazard Control Plan

The analyses shall identify all substances, agents, and environments that present a hazard and recommend hazard control measures. Engineering and administrative controls shall be used to control hazards; in cases where engineering or administrative controls are not feasible, PPE may be used.

g. Confined Space Access Plan

Confined space work covered by OSHA's General Industry (29 CFR 1910) and Construction (29 CFR 1926) standards shall be performed in accordance with 29 CFR 1910.146 and as provided herein.

h. Control of Hazardous Energy (Lockout/Tagout)

Before an employee performs any servicing or maintenance on a system where the unexpected energizing, start up, or release of kinetic or stored energy could occur and cause injury or damage, the system shall be isolated

All procedures shall be performed in accordance with 29CFR1910.147

i. Fall protection plan

Provide details of the contractors fall protection program to include, but not limited to, roofing, ladders, and scaffolding.

j. Electrical Safety NFPA 70E (current edition)

Provide details on the contractor's energized work program to include, but not limited to fire resistant clothing (FR), PPE, insulated tools, energized work permit, barricades and signs, justification for working on the electrical circuits energized except for trouble shooting, and training for individuals to comply with NFPA 70E related requirements.

Provide details on energized work program for trouble shooting energized circuits, which shall include checking terminals electrical equipment for voltage potential.

Electrical safety shall be discussed in the plan to **all** trades not just to electricians. Mechanical based trades traditionally placed air handling equipment and pumps. Those trades also traditionally replace electrical equipment and/or make electrical connections. Those trades traditionally check phase rotation as an example, and as thus are exposed to energized parts as defined in NFPA 70E.

k. Excavation and Trenching Plan

Provide details on excavation and trenching plan to include, but not limited to, shoring, trench boxes, soil storage area, and means to prevent pedestrians and vehicles within the construction zone. Drawings and/or sketches are encouraged for this plan.

13. CONTRACTOR INFORMATION.

The Contractor and Sub-Contractor(s) shall provide information on how they will meet the requirements of applicable. As a minimum, excavations, scaffolding, medical and first-aid requirements, PPE, fire prevention, machinery and mechanized equipment, electrical safety, public safety requirements; and chemical, exposure prevention requirements shall be addressed as applicable.

Contracts for construction or dismantling, demolition or removal of improvements, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation. (AHA shall be included for each element of work to be performed.)

14. COVID-19

Contractor shall provide safety and processes within the safety plan to address the safety of staff to maintain a safe work environment related to COVID-19 will working on NIST.

- Have these link included in the safety plan https://www.nist.gov/campus-status and https://www.nist.gov/about-nist/visit/nist-visitor-associate-and-contractor-protocols-mitigating-covid-19-exposure-nist for site access requirements.
- Anyone coming onto campus must meet the criteria in the Personal Daily COVID-19 Screening Questionnaire each day that they will be on campus.
- The additional vaccination certification requirements on the page link above.

**** Please note, the federal government now requires that individuals on federal facilities complete a Certification of Vaccination Form. Individuals should carry a copy of this form with them when on a NIST campus, and be prepared to present their form if requested by their COR or sponsor. ****

For covid-19 site access requirements, please follow the below links:

https://www.nist.gov/campus-status and https://www.nist.gov/about-nist/visit/nist-visitor-associate-and-contractor-protocols-mitigating-covid-19-exposure-nist

End of Outline

52.202-1 DEFINITIONS (JUN 2020)
(Reference 52.202-1)

52.203-7 ANTI-KICKBACK PROCEDURES (JUN 2020)
(Reference 52.203-7)

52.204-7 SYSTEM FOR AWARD MANAGEMENT (OCT 2018)
(Reference 52.204-7)

52.204-12 UNIQUE ENTITY IDENTIFIER MAINTENANCE (OCT 2016)
(Reference 52.204-12)

52.204-13 SYSTEM FOR AWARD MANAGEMENT MAINTENANCE (OCT 2018)
(Reference 52.204-13)

52.204-19 INCORPORATION BY REFERENCE OF REPRESENTATIONS AND CERTIFICATIONS (DEC 2014)
(Reference 52.204-19)

52.212-4 CONTRACT TERMS AND CONDITIONS--COMMERCIAL PRODUCTS AND COMMERCIAL SERVICES (DEC 2022)
(Reference 52.212-4)

52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER--SYSTEM FOR AWARD MANAGEMENT (OCT 2018)
(Reference 52.232-33)

52.232-39 UNENFORCEABILITY OF UNAUTHORIZED OBLIGATIONS (JUNE 2013)
(Reference 52.232-39)

52.232-40 PROVIDING ACCELERATED PAYMENTS TO SMALL BUSINESS SUBCONTRACTORS (MAR 2023)
(Reference 52.232-40)

52.233-3 PROTEST AFTER AWARD (AUG 1996)
(Reference 52.233-3)

52.233-4 APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM (OCT 2004)
(Reference 52.233-4)

52.244-6 SUBCONTRACTS FOR COMMERCIAL PRODUCTS AND COMMERCIAL SERVICES (MAR 2023)
(Reference 52.244-6)

52.204-24 REPRESENTATION REGARDING CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT (NOV 2021)

The Offeror shall not complete the representation at paragraph (d)(1) of this provision if the Offeror has represented that it "does not provide covered telecommunications equipment or services as a part of its offered products or services to the Government in the performance of any contract, subcontract, or other contractual instrument" in paragraph (c)(1) in the provision at 52.204-26, Covered Telecommunications Equipment or Services--Representation, or in paragraph (v)(2)(i) of the provision at 52.212-3, Offeror Representations and Certifications-Commercial Products and Commercial Services. The Offeror shall not complete the representation in paragraph (d)(2) of this provision if the Offeror has represented that it "does not use covered telecommunications equipment or services, or any equipment, system, or service that uses covered telecommunications equipment or services" in paragraph (c)(2) of the provision at 52.204-26, or in paragraph (v)(2)(ii) of the provision at 52.212-3.

(a) Definitions. As used in this provision-

Backhaul, covered telecommunications equipment or services, critical technology, interconnection arrangements, reasonable inquiry, roaming, and substantial or essential component have the meanings provided in the clause 52.204-25, Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment.

(b) Prohibition. (1) Section 889(a)(1)(A) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Pub. L. 115-232) prohibits the head of an executive agency on or after August 13, 2019, from procuring or obtaining, or extending or renewing a contract to procure or obtain, any equipment, system, or service that uses covered telecommunications equipment or services as a

substantial or essential component of any system, or as critical technology as part of any system. Nothing in the prohibition shall be construed to--

(i) Prohibit the head of an executive agency from procuring with an entity to provide a service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or

(ii) Cover telecommunications equipment that cannot route or redirect user data traffic or cannot permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(2) Section 889(a)(1)(B) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Pub. L. 115-232) prohibits the head of an executive agency on or after August 13, 2020, from entering into a contract or extending or renewing a contract with an entity that uses any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. This prohibition applies to the use of covered telecommunications equipment or services, regardless of whether that use is in performance of work under a Federal contract. Nothing in the prohibition shall be construed to--

(i) Prohibit the head of an executive agency from procuring with an entity to provide a service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or

(ii) Cover telecommunications equipment that cannot route or redirect user data traffic or cannot permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(c) Procedures. The Offeror shall review the list of excluded parties in the System for Award Management (SAM) (https://www.sam.gov) for entities excluded from receiving federal awards for "covered telecommunications equipment or services."

(d) Representations. The Offeror represents that--

(1) It [ ] will, [ ] will not provide covered telecommunications equipment or services to the Government in the performance of any contract, subcontract or other contractual instrument resulting from this solicitation. The Offeror shall provide the additional disclosure information required at paragraph (e)(1) of this section if the Offeror responds "will" in paragraph (d)(1) of this section; and

(2) After conducting a reasonable inquiry, for purposes of this representation, the Offeror represents that--

It [ ] does, [ ] does not use covered telecommunications equipment or services, or use any equipment, system, or service that uses covered telecommunications equipment or services. The Offeror shall provide the additional disclosure information required at paragraph (e)(2) of this section if the Offeror responds "does" in paragraph (d)(2) of this section.

(e) Disclosures. (1) Disclosure for the representation in paragraph (d)(1) of this provision. If the Offeror has responded "will" in the representation in paragraph (d)(1) of this provision, the Offeror shall provide the following information as part of the offer:

(i) For covered equipment--

(A) The entity that produced the covered telecommunications equipment (include entity name, unique entity identifier, CAGE code, and whether the entity was the original equipment manufacturer (OEM) or a distributor, if known);

(B) A description of all covered telecommunications equipment offered (include brand; model number, such as OEM number, manufacturer part number, or wholesaler number; and item description, as applicable); and

(C) Explanation of the proposed use of covered telecommunications equipment and any factors relevant to determining if such use would be permissible under the prohibition in paragraph (b)(1) of this provision.

(ii) For covered services--

(A) If the service is related to item maintenance: A description of all covered telecommunications services offered (include on the item being maintained: Brand; model number, such as OEM number, manufacturer part number, or wholesaler number; and item description, as applicable); or

(B) If not associated with maintenance, the Product Service Code (PSC) of the service being provided; and explanation of the proposed use of covered telecommunications services and any factors relevant to determining if such use would be permissible under the prohibition in paragraph (b)(1) of this provision.

(2) Disclosure for the representation in paragraph (d)(2) of this provision. If the Offeror has responded "does" in the representation in paragraph (d)(2) of this provision, the Offeror shall provide the following information as part of the offer:

(i) For covered equipment--

(A) The entity that produced the covered telecommunications equipment (include entity name, unique entity identifier, CAGE code, and whether the entity was the OEM or a distributor, if known);

(B) A description of all covered telecommunications equipment offered (include brand; model number, such as OEM number, manufacturer part number, or wholesaler number; and item description, as applicable); and

(C) Explanation of the proposed use of covered telecommunications equipment and any factors relevant to determining if such use would be permissible under the prohibition in paragraph (b)(2) of this provision.

(ii) For covered services--

(A) If the service is related to item maintenance: A description of all covered telecommunications services offered (include on the item being maintained: Brand; model number, such as OEM number, manufacturer part number, or wholesaler number; and item description, as applicable); or

(B) If not associated with maintenance, the PSC of the service being provided; and explanation of the proposed use of covered telecommunications services and any factors relevant to determining if such use would be permissible under the prohibition in paragraph (b)(2) of this provision.

(End Of Provision)

52.204-25 PROHIBITION ON CONTRACTING FOR CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT (NOV 2021)

(a) Definitions. As used in this clause--

Backhaul means intermediate links between the core network, or backbone network, and the small subnetworks at the edge of the network (e.g., connecting cell phones/towers to the core telephone network). Backhaul can be wireless (e.g., microwave) or wired (e.g., fiber optic, coaxial cable, Ethernet).

Covered foreign country means The People's Republic of China.

Covered telecommunications equipment or services means--

(1) Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities);

(2) For the purpose of public safety, security of Government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities);

(3) Telecommunications or video surveillance services provided by such entities or using such equipment; or

(4) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

Critical technology means--

(1) Defense articles or defense services included on the United States Munitions List set forth in the International Traffic in Arms Regulations under subchapter M of chapter I of title 22, Code of Federal Regulations;

(2) Items included on the Commerce Control List set forth in Supplement No. 1 to part 774 of the Export Administration Regulations under subchapter C of chapter VII of title 15, Code of Federal Regulations, and controlled--

(i) Pursuant to multilateral regimes, including for reasons relating to national security, chemical and biological weapons proliferation, nuclear nonproliferation, or missile technology; or

(ii) For reasons relating to regional stability or surreptitious listening;

(3) Specially designed and prepared nuclear equipment, parts and components, materials, software, and technology covered by part 810 of title 10, Code of Federal Regulations (relating to assistance to foreign atomic energy activities);

(4) Nuclear facilities, equipment, and material covered by part 110 of title 10, Code of Federal Regulations (relating to export and import of nuclear equipment and material);

(5) Select agents and toxins covered by part 331 of title 7, Code of Federal Regulations, part 121 of title 9 of such Code, or part 73 of title 42 of such Code; or

(6) Emerging and foundational technologies controlled pursuant to section 1758 of the Export Control Reform Act of 2018 (50 U.S.C. 4817).

Interconnection arrangements means arrangements governing the physical connection of two or more networks to allow the use of another's network to hand off traffic where it is ultimately delivered (e.g., connection of a customer of telephone provider A to a customer of telephone company B) or sharing data and other information resources.

Reasonable inquiry means an inquiry designed to uncover any information in the entity's possession about the identity of the producer or provider of covered telecommunications equipment or services used by the entity that excludes the need to include an internal or third-party audit.

Roaming means cellular communications services (e.g., voice, video, data) received from a visited network when unable to connect to the facilities of the home network either because signal coverage is too weak or because traffic is too high.

Substantial or essential component means any component necessary for the proper function or performance of a piece of equipment, system, or service.

(b) Prohibition.

(1) Section 889(a)(1)(A) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Pub. L. 115-232) prohibits the head of an executive agency on or after August 13, 2019, from procuring or obtaining, or extending or renewing a contract to procure or obtain, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. The Contractor is prohibited from providing to the Government any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system, unless an exception at paragraph (c) of this clause applies or the covered telecommunication equipment or services are covered by a waiver described in FAR 4.2104.

(2) Section 889(a)(1)(B) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Pub. L. 115-232) prohibits the head of an executive agency on or after August 13, 2020, from entering into a contract, or extending or renewing a contract, with an entity that uses any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system, unless an exception at paragraph (c) of this clause applies or the covered telecommunication equipment or services are covered by a waiver described in FAR 4.2104. This prohibition applies to the use of covered telecommunications equipment or services, regardless of whether that use is in performance of work under a Federal contract.

(c) Exceptions. This clause does not prohibit contractors from providing--

(1) A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or

(2) Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(d) Reporting requirement.

(1) In the event the Contractor identifies covered telecommunications equipment or services used as a substantial or essential component of any system, or as critical technology as part of any system, during contract performance, or the Contractor is notified of such by a subcontractor at any tier or by any other source, the Contractor shall report the information in paragraph (d)(2) of this clause to the Contracting Officer, unless elsewhere in this contract are established procedures for reporting the information; in the case of the Department of Defense, the Contractor shall report to the website at https://dibnet.dod.mil. For indefinite delivery contracts, the Contractor shall report to the Contracting Officer for the indefinite delivery contract and the Contracting Officer(s) for any affected order or, in the case of the Department of Defense, identify both the indefinite delivery contract and any affected orders in the report provided at https://dibnet.dod.mil.

(2) The Contractor shall report the following information pursuant to paragraph (d)(1) of this clause:

(i) Within one business day from the date of such identification or notification: The contract number; the order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.

(ii) Within 10 business days of submitting the information in paragraph (d)(2)(i) of this clause: Any further available information about mitigation actions undertaken or recommended. In addition, the Contractor shall describe the efforts it undertook to prevent use or submission of covered telecommunications equipment or services, and any additional efforts that will be incorporated to prevent future use or submission of covered telecommunications equipment or services.

(e) Subcontracts. The Contractor shall insert the substance of this clause, including this paragraph (e) and excluding paragraph (b)(2), in all subcontracts and other contractual instruments, including subcontracts for the acquisition of commercial products or commercial services.

(End Of Clause)

52.204-26 COVERED TELECOMMUNICATIONS EQUIPMENT OR SERVICES--REPRESENTATION (OCT 2020)

(a) Definitions. As used in this provision, "covered telecommunications equipment or services" and "reasonable inquiry'' have the meaning provided in the clause 52.204-25, Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment.

(b) Procedures. The Offeror shall review the list of excluded parties in the System for Award Management (SAM) (https://www.sam.gov) for entities excluded from receiving federal awards for "covered telecommunications equipment or services".

(c) Representations. (1) The Offeror represents that it [ ] does, [ ] does not provide covered telecommunications equipment or services as a part of its offered products or services to the Government in the performance of any contract, subcontract, or other contractual instrument.

(2) After conducting a reasonable inquiry for purposes of this representation, the offeror represents that it [ ] does, [ ] does not use covered telecommunications equipment or services, or any equipment, system, or service that uses covered telecommunications equipment or services.

(End Of Provision)

52.212-3 OFFEROR REPRESENTATIONS AND CERTIFICATIONS--COMMERCIAL PRODUCTS AND COMMERCIAL SERVICES (DEC 2022)

The Offeror shall complete only paragraph (b) of this provision if the Offeror has completed the annual representations and certification electronically in the System for Award Management (SAM) accessed through https://www.sam.gov. If the Offeror has not completed the annual representations and certifications electronically, the Offeror shall complete only paragraphs (c) through (v) of this provision.

(a) Definitions. As used in this provision--

"Covered telecommunications equipment or services" has the meaning provided in the clause 52.204-25, Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment.

"Economically disadvantaged women-owned small business (EDWOSB)concern" means a small business concern that is at least 51 percent directly and unconditionally owned by, and the management and daily business operations of which are controlled by, one or more women who are citizens of the United States and who are economically disadvantaged in accordance with 13 CFR part 127, and the concern is certified by SBA or an approved third-party certifier in accordance with 13 CFR 127.300. It automatically qualifies as a women-owned small business eligible under the WOSB Program.

"Forced or indentured child labor" means all work or service

(1) Exacted from any person under the age of 18 under the menace of any penalty for its nonperformance and for which the worker does not offer himself voluntarily; or

(2) Performed by any person under the age of 18 pursuant to a contract the enforcement of which can be accomplished by process or penalties.

"Highest-level owner" means the entity that owns or controls an immediate owner of the offeror, or that owns or controls one or more entities that control an immediate owner of the offeror. No entity owns or exercises control of the highest level owner.

"Immediate owner" means an entity, other than the offeror, that has direct control of the offeror. Indicators of control include, but are not limited to, one or more of the following: ownership or interlocking management, identity of interests among family members, shared facilities and equipment, and the common use of employees.

"Inverted domestic corporation," means a foreign incorporated entity that meets the definition of an inverted domestic corporation under 6 U.S.C. 395(b), applied in accordance with the rules and definitions of 6 U.S.C. 395(c).

"Manufactured end product" means any end product in product and service codes (PSCs) 1000-9999, except

(1) PSC 5510, Lumber and Related Basic Wood Materials;

(2) Product or Service Group (PSG) 87, Agricultural Supplies;

(3) PSG 88, Live Animals;

(4) PSG 89, Subsistence;

(5) PSC 9410, Crude Grades of Plant Materials;

(6) PSC 9430, Miscellaneous Crude Animal Products, Inedible;

(7) PSC 9440, Miscellaneous Crude Agricultural and Forestry Products;

(8) PSC 9610, Ores;

(9) PSC 9620, Minerals, Natural and Synthetic; and

(10) PSC 9630, Additive Metal Materials.

"Place of manufacture" means the place where an end product is assembled out of components, or otherwise made or processed from raw materials into the finished product that is to be provided to the Government. If a product is disassembled and reassembled, the place of reassembly is not the place of manufacture.

"Predecessor" means an entity that is replaced by a successor and includes any predecessors of the predecessor.

"Reasonable inquiry" has the meaning provided in the clause 52.204-25, Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment.

"Restricted business operations" means business operations in Sudan that include power production activities, mineral extraction activities, oil-related activities, or the production of military equipment, as those terms are defined in the Sudan Accountability and Divestment Act of 2007 (Pub. L. 110-174). Restricted business operations do not include business operations that the person (as that term is defined in Section 2 of the Sudan Accountability and Divestment Act of 2007) conducting the business can demonstrate-

(1) Are conducted under contract directly and exclusively with the regional government of southern Sudan;

(2) Are conducted pursuant to specific authorization from the Office of Foreign Assets Control in the Department of the Treasury, or are expressly exempted under Federal law from the requirement to be conducted under such authorization;

(3) Consist of providing goods or services to marginalized populations of Sudan;

(4) Consist of providing goods or services to an internationally recognized peacekeeping force or humanitarian organization;

(5) Consist of providing goods or services that are used only to promote health or education; or
(6) Have been voluntarily suspended.
"Sensitive technology"
(1) Means hardware, software, telecommunications equipment, or any other technology that is to be used specifically-
(i) To restrict the free flow of unbiased information in Iran; or
(ii) To disrupt, monitor, or otherwise restrict speech of the people of Iran; and
(2) Does not include information or informational materials the export of which the President does not have the authority to regulate or prohibit pursuant to section 203(b)(3) of the International Emergency Economic Powers Act (50 U.S.C. 1702(b)(3)).
"Service-disabled veteran-owned small business concern"
(1) Means a small business concern
(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and
(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.
(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).
"Small business concern"--
(1) Means a concern, including its affiliates, that is independently owned and operated, not dominant in its field of operation, and qualified as a small business under the criteria in 13 CFR part 121 and size standards in this solicitation.
(2) Affiliates, as used in this definition, means business concerns, one of whom directly or indirectly controls or has the power to control the others, or a third party or parties control or have the power to control the others. In determining whether affiliation exists, consideration is given to all appropriate factors including common ownership, common management, and contractual relationships. SBA determines affiliation based on the factors set forth at 13 CFR 121.103.
"Small disadvantaged business concern, consistent with 13 CFR 124.1002," means a small business concern under the size standard applicable to the acquisition, that--
(1) Is at least 51 percent unconditionally and directly owned (as defined at 13 CFR 124.105) by--
(i) One or more socially disadvantaged (as defined at 13 CFR 124.103) and economically disadvantaged (as defined at 13 CFR 124.104) individuals who are citizens of the United States; and
(ii) Each individual claiming economic disadvantage has a net worth not exceeding $750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and
(2) The management and daily business operations of which are controlled (as defined at 13.CFR 124.106) by individuals, who meet the criteria in paragraphs (1)(i) and (ii) of this definition.
"Subsidiary" means an entity in which more than 50 percent of the entity is owned
(1) Directly by a parent corporation; or
(2) Through another subsidiary of a parent corporation.
"Successor" means an entity that has replaced a predecessor by acquiring the assets and carrying out the affairs of the predecessor under a new name (often through acquisition or merger). The term "successor" does not include new offices/divisions of the same company or a company that only changes its name. The extent of the responsibility of the successor for the liabilities of the predecessor may vary, depending on State law and specific circumstances.
"Veteran-owned small business concern" means a small business concern
(1) Not less than 51 percent of which is owned by one or more veterans(as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and
(2) The management and daily business operations of which are controlled by one or more veterans.
"Women-owned small business (WOSB) concern eligible under the WOSB Program (in accordance with 13 CFR part 127)", means a small business concern that is at least 51 percent directly and unconditionally owned by, and the management and daily business operations of which are controlled by, one or more women who are citizens of the United States, and the concern is certified by SBA or an approved third-party certifier in accordance with 13 CFR 127.300.
"Women-owned small business concern" means a small business concern--
(1) That is at least 51 percent owned by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and
(2) Whose management and daily business operations are controlled by one or more women.
(b)(1) Annual Representations and Certifications. Any changes provided by the Offeror in paragraph (b)(2) of this provision do not automatically change the representations and certifications in SAM.
(2) The offeror has completed the annual representations and certifications electronically in SAM accessed through http://www.sam.gov. After reviewing SAM information, the Offeror verifies by submission of this offer that the representations and certifications currently posted electronically at FAR 52.212-3, Offeror Representations and Certifications--Commercial Products and Commercial Services, have been entered or updated in the last 12 months, are current, accurate, complete, and

applicable to this solicitation (including the business size standard(s) applicable to the NAICS code(s) referenced for this solicitation), at the time this offer is submitted and are incorporated in this offer by reference (see FAR 4.1201), except for paragraphs _____.

[Offeror to identify the applicable paragraphs at (c) through (v) of this provision that the offeror has completed for the purposes of this solicitation only, if any.

These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted electronically on SAM.]

(c) Offerors must complete the following representations when the resulting contract is for supplies to be delivered or services to be performed in the United States or its outlying areas, or when the contracting officer has applied part 19 in accordance with 19.000(b)(1)(ii). Check all that apply.

(1) Small business concern. The offeror represents as part of its offer that--

(i) It [_] is, [_] is not a small business concern; or

(ii) It [_] is, [_] is not a small business joint venture that complies with the requirements of 13 CFR 121.103(h) and 13 CFR 125.8(a) and (b). [The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.]

(2) Veteran-owned small business concern. [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.] The offeror represents as part of its offer that it [_] is, [_] is not a veteran-owned small business concern.

(3) Service-disabled veteran-owned small business concern. [Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (c)(2) of this provision.] The offeror represents as part of its offer that--

(i) It [_] is, [_] is not a service-disabled veteran-owned small business concern; or

(ii) It [_] is, [_] is not a joint venture that complies with the requirements of 13 CFR 125.18(b)(1) and (2). [The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.] Each service-disabled veteran-owned small business concern participating in the joint venture shall provide representation of its service-disabled veteran-owned small business concern status.

(4) Small disadvantaged business concern. [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.]The offeror represents that it [_] is, [_] is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(5) Women-owned small business concern. [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.]The offeror represents that it [_] is, [_] is not a women-owned small business concern.

(6) WOSB joint venture eligible under the WOSB Program. The offeror represents that it [_] is, [_] is not a joint venture that complies with the requirements of 13 CFR 127.506(a) through (c). [The offeror shall enter the name and unique entity identifier of each party to the joint venture:__.]

(7) Economically disadvantaged women-owned small business (EDWOSB) joint venture. The offeror represents that it [square] is, [square] is not a joint venture that complies with the requirements of 13 CFR 127.506(a) through (c). [The offeror shall enter the name and unique entity identifier of each party to the joint venture:__.]

(8) Women-owned business concern (other than small business concern). [Complete only if the offeror is a women-owned business concern and did not represent itself as a small business concern in paragraph (c)(1) of this provision.] The offeror represents that it [_] is, a women-owned business concern.

(9) Tie bid priority for labor surplus area concerns. If this is an invitation for bid, small business offerors may identify the labor surplus areas in which costs to be incurred on account of manufacturing or production (by offeror or first-tier subcontractors) amount to more than 50 percent of the contract price:

_____

(10) HUBZone small business concern. [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.] The offeror represents, as part of its offer, that--

(i) It [_] is, [_] is not a HUBZone small business concern listed, on the date of this representation, as having been certified by SBA as a HUBZone small business concern in the Dynamic Small Business Search and SAM, and will attempt to maintain an employment rate of HUBZone residents of 35 percent of its employees during performance of a HUBZone contract (see 13 CFR 126.200(e)(1)); and

(ii) It [_] is, [_] is not a HUBZone joint venture that complies with the requirements of 13 CFR 126.616(a) through (c). [The offeror shall enter the name and unique entity identifier of each party to the joint venture:__.] Each HUBZone small business concern participating in the HUBZone joint venture shall provide representation of its HUBZone status.

(d) Representations required to implement provisions of Executive Order 11246 --

(1) Previous contracts and compliance. The offeror represents that --

(i) It [_] has, [_] has not, participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation; and

(ii) It [_] has, [_] has not, filed all required compliance reports.

(2) Affirmative Action Compliance. The offeror represents that --

(i) It [_] has developed and has on file, [_] has not developed and does not have on file, at each establishment, affirmative action programs required by rules and regulations of the Secretary of Labor(41 CFR parts 60-1 and 60-2), or

(ii) It [_] has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

(e) Certification Regarding Payments to Influence Federal Transactions (31 U.S.C. 1352). (Applies only if the contract is expected to exceed $150,000.) By submission of its offer, the offeror certifies to the best of its knowledge and belief that no Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress or an employee of a Member of Congress on his or her behalf in connection with the award of any resultant contract. If any registrants under the Lobbying Disclosure Act of 1995 have made a lobbying contact on behalf of the offeror with respect to this contract, the offeror shall complete and submit, with its offer, OMB Standard Form LLL, Disclosure of Lobbying Activities, to provide the name of the registrants. The offeror need not report regularly employed officers or employees of the offeror to whom payments of reasonable compensation were made.

(f) Buy American Certificate. (Applies only if the clause at Federal Acquisition Regulation (FAR) 52.225-1, Buy American-Supplies, is included in this solicitation.)

(1) (i) The Offeror certifies that each end product, except those listed in paragraph (f)(2) of this provision, is a domestic end product and that each domestic end product listed in paragraph (f)(3) of this provision contains a critical component.

(ii) The Offeror shall list as foreign end products those end products manufactured in the United States that do not qualify as domestic end products. For those foreign end products that do not consist wholly or predominantly of iron or steel or a combination of both, the Offeror shall also indicate whether these foreign end products exceed 55 percent domestic content, except for those that are COTS items. If the percentage of the domestic content is unknown, select "no".

(iii) The Offeror shall separately list the line item numbers of domestic end products that contain a critical component (see FAR 25.105).

(iv) The terms "commercially available off-the-shelf (COTS) item," "critical component," "domestic end product," "end product," "foreign end product," and "United States" are defined in the clause of this solicitation entitled "Buy American-Supplies."

(2) Foreign End Products:

Line item No.	Country of origin	Exceeds 55% domestic content (yes/no)

[List as necessary]

(3) Domestic end products containing a critical component:

Line Item No. ___

(4) The Government will evaluate offers in accordance with the policies and procedures of FAR part 25.

(g)

(1) Buy American -- Free Trade Agreements -- Israeli Trade Act Certificate. (Applies only if the clause at FAR 52.225-3, Buy American -- Free Trade Agreements -- Israeli Trade Act, is included in this solicitation.)

(i) (A) The Offeror certifies that each end product, except those listed in paragraph (g)(1)(ii) or (iii) of this provision, is a domestic end product and that each domestic end product listed in paragraph (g)(1)(iv) of this provision contains a critical component.

(B) The terms "Bahrainian, Moroccan, Omani, Panamanian, or "Peruvian end product," "commercially available off-the-shelf (COTS) item," "critical component," "domestic end product," "end product," "foreign end product," "Free Trade Agreement country," "Free Trade Agreement country end product," "Israeli end product," and "United States" are defined in the clause of this solicitation entitled "Buy American--Free Trade Agreements--Israeli Trade Act."

(ii) The Offeror certifies that the following supplies are Free Trade Agreement country end products (other than Bahrainian, Moroccan, Omani, Panamanian, or Peruvian end products) or Israeli end products as defined in the clause of this solicitation entitled "Buy American--Free Trade Agreements--Israeli Trade Act."

Line item No.	Country of origin

[List as necessary]

(iii) The Offeror shall list those supplies that are foreign end products (other than those listed in paragraph (g)(1)(ii) of this provision) as defined in the clause of this solicitation entitled "Buy American--Free Trade Agreements--Israeli Trade Act." The Offeror shall list as other foreign end products those end products manufactured in the United States that do not qualify as domestic end products. For those foreign end products that do not consist wholly or predominantly of iron or steel or a combination of both, the Offeror shall also indicate whether these foreign end products exceed 55 percent domestic content, except for those that are COTS items. If the percentage of the domestic content is unknown, select "no".

Other Foreign End Products:

Line item No.	Country of origin	Exceeds 55% domestic content (yes/no)

[List as necessary]

(iv) The Offeror shall list the line item numbers of domestic end products that contain a critical component (see FAR 25.105).

Line Item No. ___

(v) The Government will evaluate offers in accordance with the policies and procedures of FAR part 25.

(2) Buy American--Free Trade Agreements--Israeli Trade Act Certificate, Alternate II. If Alternate II to the clause at FAR 52.225-3 is included in this solicitation, substitute the following paragraph (g)(1)(ii) for paragraph (g)(1)(ii) of the basic provision:

(g)(1)(ii) The offeror certifies that the following supplies are Israeli end products as defined in the clause of this solicitation entitled "Buy American--Free Trade Agreements--Israeli Trade Act":

Israeli End Products:

Line item No.

[List as necessary]

(3) Buy American-Free Trade Agreements-Israeli Trade Act Certificate, Alternate III. If Alternate III to the clause at 52.225-3 is included in this solicitation, substitute the following paragraph (g)(1)(ii) for paragraph (g)(1)(ii) of the basic provision:

(g)(1)(ii) The offeror certifies that the following supplies are Free Trade Agreement country end products (other than Bahrainian, Korean, Moroccan, Omani, Panamanian, or Peruvian end products) or Israeli end products as defined in the clause of this solicitation entitled "Buy American-Free Trade Agreements-Israeli Trade Act": Free Trade Agreement Country End Products (Other than Bahrainian, Korean, Moroccan, Omani, Panamanian, or Peruvian End Products) or Israeli End Products:

Line Item No. Country of Origin

Line item No.	Country of origin

[List as necessary]

(4) Trade Agreements Certificate. (Applies only if the clause at FAR 52.225-5, Trade Agreements, is included in this solicitation.)

(i) The offeror certifies that each end product, except those listed in paragraph (g)(5)(ii) of this provision, is a U.S.-made or designated country end product as defined in the clause of this solicitation entitled "Trade Agreements."

(ii) The offeror shall list as other end products those end products that are not U.S.-made or designated country end products.

Other End Products:

Line item No.	Country of origin

[List as necessary]

(iii) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25. For line items covered by the WTO GPA, the Government will evaluate offers of U.S.-made or designated country end products without regard to the restrictions of the Buy American statute. The Government will consider for award only offers of U.S.-made or designated country end products unless the Contracting Officer determines that there are no offers for such products or that the offers for such products are insufficient to fulfill the requirements of the solicitation.

(h) Certification Regarding Responsibility Matters (Executive Order 12689). (Applies only if the contract value is expected to exceed the simplified acquisition threshold.) The offeror certifies, to the best of its knowledge and belief, that the offeror and/or any of its principals--

(1) [_] Are, [_] are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(2) [_] Have, [_] have not, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a Federal, state or local government contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, violating Federal criminal tax laws, or receiving stolen property; and

(3) [_] Are, [_] are not presently indicted for, or otherwise criminally or civilly charged by a Government entity with, commission of any of these offenses enumerated in paragraph (h)(2) of this clause; and

(4) [_] Have, [_] have not, within a three-year period preceding this offer, been notified of any delinquent Federal taxes in an amount that exceeds the threshold at 9.104-5(a)(2) for which the liability remains unsatisfied.

(i) Taxes are considered delinquent if both of the following criteria apply:

(A) The tax liability is finally determined. The liability is finally determined if it has been assessed. A liability is not finally determined if there is a pending administrative or judicial challenge. In the case of a judicial challenge to the liability, the liability is not finally determined until all judicial appeal rights have been exhausted.

(B) The taxpayer is delinquent in making payment. A taxpayer is delinquent if the taxpayer has failed to pay the tax liability when full payment was due and required. A taxpayer is not delinquent in cases where enforced collection action is precluded.

(ii) Examples.

(A) The taxpayer has received a statutory notice of deficiency, under I.R.C. 6212, which entitles the taxpayer to seek Tax Court review of a proposed tax deficiency. This is not a delinquent tax because it is not a final tax liability. Should the taxpayer seek Tax Court review, this will not be a final tax liability until the taxpayer has exercised all judicial appeal rights.

(B) The IRS has filed a notice of Federal tax lien with respect to an assessed tax liability, and the taxpayer has been issued a notice under I.R.C. 6320 entitling the taxpayer to request a hearing with the IRS Office of Appeals contesting the lien filing, and to further appeal to the Tax Court if the IRS determines to sustain the lien filing. In the course of the hearing, the taxpayer is entitled to contest the underlying tax liability because the taxpayer has had no prior opportunity to contest the liability. This is not a delinquent tax because it is not a final tax liability. Should the taxpayer seek tax court review, this will not be a final tax liability until the taxpayer has exercised all judicial appeal rights.

(C) The taxpayer has entered into an installment agreement pursuant to I.R.C. 6159. The taxpayer is making timely payments and is in full compliance with the agreement terms. The taxpayer is not delinquent because the taxpayer is not currently required to make full payment.

(D) The taxpayer has filed for bankruptcy protection. The taxpayer is not delinquent because enforced collection action is stayed under 11 U.S.C. 362 (the Bankruptcy Code).

(i) Certification Regarding Knowledge of Child Labor for Listed End Products (Executive Order 13126). [The Contracting Officer must list in paragraph (i)(1) any end products being acquired under this solicitation that are included in the List of Products Requiring Contractor Certification as to Forced or Indentured Child Labor, unless excluded at 22.1503(b).]

(1) Listed End Product

Line item No.	Listed Countries of origin

[List as necessary]

(2) Certification. [If the Contracting Officer has identified end products and countries of origin in paragraph (i)(1) of this provision, then the offeror must certify to either (i)(2)(i) or (i)(2)(ii) by checking the appropriate block.]

[_] (i) The offeror will not supply any end product listed in paragraph (i)(1) of this provision that was mined, produced, or manufactured in the corresponding country as listed for that product.

[_] (ii) The offeror may supply an end product listed in paragraph (i)(1) of this provision that was mined, produced, or manufactured in the corresponding country as listed for that product. The offeror certifies that is has made a good faith effort to determine whether forced or indentured child labor was used to mine, produce, or manufacture any such end product furnished under this contract. On the basis of those efforts, the offeror certifies that it is not aware of any such use of child labor.

(j) Place of manufacture. (Does not apply unless the solicitation is predominantly for the acquisition of manufactured end products.) For statistical purposes only, the offeror shall indicate whether the place of manufacture of the end products it expects to provide in response to this solicitation is predominantly-

(1) [_] In the United States (Check this box if the total anticipated price of offered end products manufactured in the United States exceeds the total anticipated price of offered end products manufactured outside the United States); or

(2) [_] Outside the United States.

(k) Certificates regarding exemptions from the application of the Service Contract Labor Standards. (Certification by the offeror as to its compliance with respect to the contract also constitutes its certification as to compliance by its subcontractor if it subcontracts out the exempt services.) [The contracting officer is to check a box to indicate if paragraph (k)(1) or (k)(2) applies.]

(1) [_] Maintenance, calibration, or repair of certain equipment as described in FAR 22.1003-4(c)(1). The offeror [_] does [_] does not certify that-

(i) The items of equipment to be serviced under this contract are used regularly for other than Governmental purposes and are sold or traded by the offeror (or subcontractor in the case of an exempt subcontract) in substantial quantities to the general public in the course of normal business operations;

(ii) The services will be furnished at prices which are, or are based on, established catalog or market prices (see FAR 22.1003-4(c)(2)(ii)) for the maintenance, calibration, or repair of such equipment; and

(iii) The compensation (wage and fringe benefits) plan for all service employees performing work under the contract will be the same as that used for these employees and equivalent employees servicing the same equipment of commercial customers.

(2) [_] Certain services as described in FAR 22.1003-4(d)(1). The offeror [_] does [_] does not certify that-

(i) The services under the contract are offered and sold regularly to non-Governmental customers, and are provided by the offeror (or subcontractor in the case of an exempt subcontract) to the general public in substantial quantities in the course of normal business operations;

(ii) The contract services will be furnished at prices that are, or are based on, established catalog or market prices (see FAR 22.1003-4(d)(2)(iii));

(iii) Each service employee who will perform the services under the contract will spend only a small portion of his or her time (a monthly average of less than 20 percent of the available hours on an annualized basis, or less than 20 percent of available hours during the contract period if the contract period is less than a month)servicing the Government contract; and

(iv) The compensation (wage and fringe benefits) plan for all service employees performing work under the contract is the same as that used for these employees and equivalent employees servicing commercial customers.

(3) If paragraph (k)(1) or (k)(2) of this clause applies-

(i) If the offeror does not certify to the conditions in paragraph (k)(1) or (k)(2) and the Contracting Officer did not attach a Service Contract Labor Standards wage determination to the solicitation, the offeror shall notify the Contracting Officer as soon as possible; and

(ii) The Contracting Officer may not make an award to the offeror if the offeror fails to execute the certification in paragraph (k)(1) or (k)(2) of this clause or to contact the Contracting Officer as required in paragraph (k)(3)(i) of this clause.

(l) Taxpayer identification number (TIN) (26 U.S.C. 6109, 31 U.S.C.7701). (Not applicable if the offeror is required to provide this information to the SAM to be eligible for award.)

(1) All offerors must submit the information required in paragraphs (l)(3) through (l)(5) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the Internal Revenue Service (IRS).

(2) The TIN may be used by the government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(3) Taxpayer Identification Number (TIN).

[_] TIN:_____.

[_] TIN has been applied for.

[_] TIN is not required because:

[_] Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

[_] Offeror is an agency or instrumentality of a foreign government;

[_] Offeror is an agency or instrumentality of the Federal Government;

(4) Type of organization.

[_] Sole proprietorship;

[_] Partnership;

[_] Corporate entity (not tax-exempt);

[_] Corporate entity (tax-exempt);

[_] Government entity (Federal, State, or local);

[_] Foreign government;

[_] International organization per 26 CFR 1.6049-4;

[_] Other _____.

(5) Common parent.

[_] Offeror is not owned or controlled by a common parent:

[_] Name and TIN of common parent:

Name _____

TIN _____

(m) Restricted business operations in Sudan. By submission of its offer, the offeror certifies that the offeror does not conduct any restricted business operations in Sudan.

(n) Prohibition on Contracting with Inverted Domestic Corporations-

(1) Government agencies are not permitted to use appropriated (or otherwise made available) funds for contracts with either an inverted domestic corporation, or a subsidiary of an inverted domestic corporation, unless the exception at 9.108-2(b) applies or the requirement is waived in accordance with the procedures at 9.108-4.

(2) Representation. The Offeror represents that--

(i) It [] is, [] is not an inverted domestic corporation; and

(ii) It [] is, [] is not a subsidiary of an inverted domestic corporation.

(o) Prohibition on contracting with entities engaging in certain activities or transactions relating to Iran.

(1) The offeror shall email questions concerning sensitive technology to the Department of State at CISADA106@state.gov.

(2) Representation and Certifications. Unless a waiver is granted or an exception applies as provided in paragraph (o)(3) of this provision, by submission of its offer, the offeror-

(i) Represents, to the best of its knowledge and belief, that the offeror does not export any sensitive technology to the government of Iran or any entities or individuals owned or controlled by, or acting on behalf or at the direction of, the government of Iran;

(ii) Certifies that the offeror, or any person owned or controlled by the offeror, does not engage in any activities for which sanctions may be imposed under section 5 of the Iran Sanctions Act; and

(iii) Certifies that the offeror, and any person owned or controlled by the offeror, does not knowingly engage in any transaction that exceeds the threshold at FAR 25.703-2(a)(2) with Iran's Revolutionary Guard Corps or any of its officials, agents, or affiliates, the property and interests in property of which are blocked pursuant to the International Emergency Economic Powers Act (et seq.) (see OFAC's Specially Designated Nationals and Blocked Persons List at https://www.treasury.gov/resource-center/sanctions/SDN-List/Pages/default.aspx).

(3) The representation and certification requirements of paragraph (o)(2) of this provision do not apply if-

(i) This solicitation includes a trade agreements certification(e.g., 52.212-3(g) or a comparable agency provision); and

(ii) The offeror has certified that all the offered products to be supplied are designated country end products.

(p) Ownership or Control of Offeror. (Applies in all solicitations when there is a requirement to be registered in SAM or a requirement to have a unique entity identifier in the solicitation.

(1) The Offeror represents that it [ ] has or [ ] does not have an immediate owner. If the Offeror has more than one immediate owner (such as a joint venture), then the Offeror shall respond to paragraph (2) and if applicable, paragraph (3) of this provision for each participant in the joint venture.

(2) If the Offeror indicates "has" in paragraph (p)(1) of this provision, enter the following information:

Immediate owner CAGE code:_____

Immediate owner legal name:_____

(Do not use a "doing business as" name)

Is the immediate owner owned or controlled by another entity:

[ ] Yes or [ ] No.

(3) If the Offeror indicates "yes" in paragraph (p)(2) of this provision, indicating that the immediate owner is owned or controlled by another entity, then enter the following information:

Highest level owner CAGE code:_____

Highest level owner legal name:_____

(Do not use a "doing business as" name)

(q) Representation by Corporations Regarding Delinquent Tax Liability or a Felony Conviction under any Federal Law.

(1) As required by sections 744 and 745 of Division E of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235), and similar provisions, if contained in subsequent appropriations acts, the Government will not enter into a contract with any corporation that -

(i) Has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, where the awarding agency is aware of the unpaid tax liability, unless and agency has considered suspension or debarment of the corporation and made a determination that suspension or debarment is not necessary to protect the interests of the Government; or

(ii) Was convicted of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless an agency has considered suspension or debarment of the corporation and made a determination that this action is not necessary to protect the interests of the Government.

(2) The Offeror represents that--

(i) It is [ ] is not [ ] a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability; and

(ii) It [ ] is not [ ] a corporation that was convicted of a felony criminal violation under a Federal law within the preceding 24 months.

(r) Predecessor of Offeror. (Applies in all solicitations that include the provision at 52.204-16, Commercial and Government Entity Code Reporting.)

(1) The Offeror represents that it [ ] is or [ ] is not a successor to a predecessor that held a Federal contract or grant within the last three years.

(2) If the Offeror has indicated "is" in paragraph (r)(1) of this provision, enter the following information for all predecessors that held a Federal contract or grant within the last three years(if more than one predecessor, list in reverse chronological order):

Predecessor CAGE code: _____ (or mark "Unknown").

Predecessor legal name: _____.

(Do not use a "doing business as" name).

(t) Public Disclosure of Greenhouse Gas Emissions and Reduction Goals. Applies in all solicitations that require offerors to register in SAM (12.301(d)(1)).

(1) This representation shall be completed if the Offeror received $7.5 million or more in contract awards in the prior Federal fiscal year. The representation is optional if the Offeror received less than $7.5 million in Federal contract awards in the prior Federal fiscal year.

(2) Representation. [Offeror to check applicable block(s) in paragraph (t)(2)(i) and (ii)].

(i) The Offeror (itself or through its immediate owner or highest-level owner) [ ] does, [ ] does not publicly disclose greenhouse gas emissions, i.e., makes available on a publicly accessible website the results of a greenhouse gas inventory, performed in accordance with an accounting standard with publicly available and consistently applied criteria, such as the Greenhouse Gas Protocol Corporate Standard.

(ii) The Offeror (itself or through its immediate owner or highest-level owner) [ ] does, [ ] does not publicly disclose a quantitative greenhouse gas emissions reduction goal, i.e., make available on a publicly accessible website a target to reduce absolute emissions or emissions intensity by a specific quantity or percentage.

(iii) A publicly accessible website includes the Offeror's own website or a recognized, third-party greenhouse gas emissions reporting program.

(3) If the Offeror checked "does" in paragraphs (t)(2)(i) or (t)(2)(ii) of this provision, respectively, the Offeror shall provide the publicly accessible website(s) where greenhouse gas emissions and/or reduction goals are reported:_____.

(u)(1) In accordance with section 743 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235) and its successor provisions in subsequent appropriations acts (and as extended in continuing resolutions), Government agencies are not permitted to use appropriated (or otherwise made available) funds for contracts with an entity that requires employees or subcontractors of such entity seeking to report waste, fraud, or abuse to sign internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or subcontractors from lawfully reporting such waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(2) The prohibition in paragraph (u)(1) of this provision does not contravene requirements applicable to Standard Form 312 (Classified Information Nondisclosure Agreement), Form 4414 (Sensitive Compartmented Information Nondisclosure Agreement), or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

(3) Representation. By submission of its offer, the Offeror represents that it will not require its employees or subcontractors to sign or comply with internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or subcontractors from lawfully reporting waste, fraud, or abuse related to the performance of a Government contract to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information (e.g., agency Office of the Inspector General).

(v) Covered Telecommunications Equipment or Services--Representation. Section 889(a)(1)(A) and section 889 (a)(1)(B) of Public Law 115-232.

(1) The Offeror shall review the list of excluded parties in the System for Award Management (SAM) (https://www.sam.gov) for entities excluded from receiving federal awards for "covered telecommunications equipment or services".

(2) The Offeror represents that--

(i) It [ ] does, [ ] does not provide covered telecommunications equipment or services as a part of its offered products or services to the Government in the performance of any contract, subcontract, or other contractual instrument.

(ii) After conducting a reasonable inquiry for purposes of this representation, that it [ ] does, [ ] does not use covered telecommunications equipment or services, or any equipment, system, or service that uses covered telecommunications equipment or services.

(End Of Provision)

52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS--COMMERCIAL PRODUCTS AND COMMERCIAL SERVICES (MAR 2023)

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses, which are incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial products and commercial services:

(1) 52.203-19, Prohibition on Requiring Certain Internal Confidentiality Agreements or Statements (JAN 2017) (section 743 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235) and its successor provisions in subsequent appropriations acts (and as extended in continuing resolutions)).

(2) 52.204-23, Prohibition on Contracting for Hardware, Software, and Services Developed or Provided by Kaspersky Lab and Other Covered Entities (NOV 2021) (Section 1634 of Pub. L. 115-91).

(3) 52.204-25, Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment. (NOV 2021) (Section 889(a)(1)(A) of Pub. L. 115-232).

(4) 52.209-10, Prohibition on Contracting with Inverted Domestic Corporations (NOV 2015).

(5) 52.232-40, Providing Accelerated Payments to Small Business Subcontractors (MAR 2023) (31 U.S.C. 3903 and 10 U.S.C. 3801).

(6) 52.233-3, Protest After Award (AUG 1996) (31 U.S.C. 3553).

(7) 52.233-4, Applicable Law for Breach of Contract Claim (OCT 2004)(Public Laws 108-77 and 108-78 (19 U.S.C. 3805 note)).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial products and commercial services:

[Contracting Officer check as appropriate.]

(1) 52.203-6, Restrictions on Subcontractor Sales to the Government (JUN 2020), with Alternate I (NOV 2021)(41 U.S.C. 4704 and 10 U.S.C. 4655).

(2) 52.203-13, Contractor Code of Business Ethics and Conduct (NOV 2021) (41 U.S.C. 3509).

X (3) 52.203-15, Whistleblower Protections under the American Recovery and Reinvestment Act of 2009 (JUN 2010) (Section 1553 of Pub. L. 111-5). (Applies to contracts funded by the American Recovery and Reinvestment Act of 2009.)

(4) 52.204-10, Reporting Executive Compensation and First-Tier Subcontract Awards (JUN 2020) (Pub. L. 109-282) (31 U.S.C. 6101 note).

(5) [Reserved]

(6) 52.204-14, Service Contract Reporting Requirements (OCT 2016) (Pub. L. 111-117, section 743 of Div. C).

(7) 52.204-15, Service Contract Reporting Requirements for Indefinite-Delivery Contracts (OCT 2016) (Pub. L. 111-117, section 743 of Div. C).

(8) 52.209-6, Protecting the Government's Interest When Subcontracting with Contractors Debarred, Suspended, or Proposed for Debarment. (NOV 2021) (31 U.S.C. 6101 note).

(9) 52.209-9, Updates of Publicly Available Information Regarding Responsibility Matters (OCT 2018) (41 U.S.C. 2313).

(10) [Reserved]

(11) 52.219-3, Notice of HUBZone Set-Aside or Sole-Source Award (OCT 2022) (15 U.S.C. 657a).

(12) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (OCT 2022) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a).

(13) [Reserved]

X (14)(i) 52.219-6, Notice of Total Small Business Set-Aside (NOV 2020)) (15 U.S.C. 644).

(ii) Alternate I (MAR 2020) of 52.219-6.

(iii) Alternate II (NOV 2011) of 52.219-6.

(15)(i) 52.219-7, Notice of Partial Small Business Set-Aside (NOV 2020)) (15 U.S.C. 644).

(ii) Alternate I (MAR 2020)) of 52.219-7.

(iii) Alternate II (MAR 2004) of 52.219-7.

X (16) 52.219-8, Utilization of Small Business Concerns (OCT 2022) (15 U.S.C. 637(d)(2) and (3)).

(17)(i) 52.219-9, Small Business Subcontracting Plan (OCT 2022) (15 U.S.C. 637(d)(4)).

(ii) Alternate I (JAN 2017) of 52.219-9.

(iii) Alternate II (NOV 2016) of 52.219-9.

(iv) Alternate III (JUN 2020) of 52.219-9.

(v) Alternate IV (SEP 2021) of 52.219-9.

(18) (i) 52.219-13, Notice of Set-Aside of Orders (MAR 2020) (15 U.S.C. 644(r)).

(ii) Alternate I (MAR 2020) of 52.219-13.

X (19) 52.219-14, Limitations on Subcontracting (OCT 2022) (15 U.S.C. 657s).

(20) 52.219-16, Liquidated Damages-Subcontracting Plan (SEP 2021) (15 U.S.C. 637(d)(4)(F)(i)).

(21) 52.219-27, Notice of Service-Disabled Veteran-Owned Small Business Set-Aside (OCT 2022) (15 U.S.C. 657f).

X (22) (i) 52.219-28, Post Award Small Business Program Rerepresentation (MAR 2023) (15 U.S.C. 632(a)(2)).

(ii) Alternate I (MAR 2020) of 52.219-28.

(23) 52.219-29, Notice of Set-Aside for, or Sole Source Award to, Economically Disadvantaged Women-Owned Small Business Concerns (OCT 2022) (15 U.S.C. 637(m)).

(24) 52.219-30, Notice of Set-Aside for, or Sole Source Award to, Women-Owned Small Business Concerns Eligible Under the Women-Owned Small Business Program (OCT 2022) (15 U.S.C. 637(m)).

(25) 52.219-32, Orders Issued Directly Under Small Business Reserves (MAR 2020) (15 U.S.C. 644(r)).

(26) 52.219-33, Nonmanufacturer Rule (SEP 2021) (15 U.S.C. 637(a)(17)).

X (27) 52.222-3, Convict Labor (JUN 2003) (E.O. 11755).

X (28) 52.222-19, Child Labor--Cooperation with Authorities and Remedies (DEC 2022) (E.O. 13126).

X (29) 52.222-21, Prohibition of Segregated Facilities (APR 2015).

X (30) (i) 52.222-26, Equal Opportunity (SEP 2016) (E.O. 11246).

(ii) Alternate I (FEB 1999) of 52.222-26.

X (31) (i) 52.222-35, Equal Opportunity for Veterans (JUN 2020)(38 U.S.C. 4212).

(ii) Alternate I (JUL 2014) of 52.222-35.

X (32) (i) 52.222-36, Equal Opportunity for Workers with Disabilities (JUN 2020) (29 U.S.C. 793).

(ii) Alternate I (JUL 2014) of 52.222-36.

X (33) 52.222-37, Employment Reports on Veterans (JUN 2020) (38 U.S.C. 4212).

X (34) 52.222-40, Notification of Employee Rights Under the National Labor Relations Act (DEC 2010) (E.O. 13496).

X (35)(i) 52.222-50, Combating Trafficking in Persons (NOV 2021) (22 U.S.C. chapter 78 and E.O. 13627).

(ii) Alternate I (MAR 2015) of 52.222-50 (22 U.S.C. chapter 78 and E.O. 13627).

X (36) 52.222-54, Employment Eligibility Verification (MAY 2022). (E. O. 12989). (Not applicable to the acquisition of commercially available off-the-shelf items or certain other types of commercial products or commercial services as prescribed in FAR 22.1803.)

(37) (i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Items (MAY 2008) (42 U.S.C.6962(c)(3)(A)(ii)). (Not applicable to the acquisition of commercially available off-the-shelf items.)

(ii) Alternate I (MAY 2008) of 52.223-9 (42 U.S.C. 6962(i)(2)(C)). (Not applicable to the acquisition of commercially available off-the-shelf items.)

(38) 52.223-11, Ozone-Depleting Substances and High Global Warming Potential Hydrofluorocarbons (JUN, 2016) (E.O. 13693).

(39) 52.223-12, Maintenance, Service, Repair, or Disposal of Refrigeration Equipment and Air Conditioners (JUN, 2016) (E.O. 13693).

(40) (i) 52.223-13, Acquisition of EPEAT(R) -Registered Imaging Equipment(JUN 2014) (E.O.s 13423 and 13514).

(ii) Alternate I (OCT 2015) of 52.223-13.

(41) (i) 52.223-14, Acquisition of EPEAT(R) -Registered Television (JUN 2014) (E.O.s 13423 and 13514).

(ii) Alternate I (JUN 2014) of 52.223-14.

(42) 52.223-15, Energy Efficiency in Energy-Consuming Products(MAY 2020) (42 U.S.C. 8259b).

(43) (i) 52.223-16, Acquisition of EPEAT(R)-Registered Personal Computer Products (OCT 2015) (E.O.s 13423 and 13514).

(ii) Alternate I (JUN 2014) of 52.223-16.

X (44) 52.223-18, Encouraging Contractor Policies to Ban Text Messaging While Driving (JUN 2020) (E.O. 13513).

(45) 52.223-20, Aerosols (JUN, 2016) (E.O. 13693).

(46) 52.223-21, Foams (JUN, 2016) (E.O. 13693).

(47) (i) 52.224-3, Privacy Training (JAN 2017) (5 U.S.C. 552a).

(ii) Alternate I (JAN 2017) of 52.224-3.

(48) (i) 52.225-1, Buy American--Supplies (OCT 2022) (41 U.S.C. chapter 83).

(ii) Alternate I (OCT 2022) of 52.225-1.

(49) (i) 52.225-3, Buy American--Free Trade Agreements--Israeli Trade Act (DEC 2022) (19 U.S.C. 3301 note, 19 U.S.C. 2112 note, 19 U.S.C. 3805 note, 19 U.S.C. 4001 note, 19 U.S.C. chapter 29 (sections 4501-4732), Public Law 103-182, 108-77, 108-78, 108-286, 108-302, 109-53, 109-169, 109-283, 110-138, 112-41, 112-42, and 112-43.

(ii) Alternate I [Reserved].

(iii) Alternate II (DEC 2022) of 52.225-3.

(iv) Alternate III (JAN 2021) of 52.225-3.

(v) Alternate IV (OCT 2022) of 52.225-3.

(50) 52.225-5, Trade Agreements (DEC 2022) (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note).

X (51) 52.225-13, Restrictions on Certain Foreign Purchases (FEB 2021) (E.O.'s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).

(52) 52.225-26, Contractors Performing Private Security Functions Outside the United States (OCT 2016) (Section 862, as amended, of the National Defense Authorization Act for Fiscal Year 2008; 10 U.S.C. Subtitle A, Part V, Subpart G Note).

(53) 52.226-4, Notice of Disaster or Emergency Area Set-Aside (NOV 2007) (42 U.S.C. 5150).

(54) 52.226-5, Restrictions on Subcontracting Outside Disaster or Emergency Area (NOV 2007) (42 U.S.C. 5150).

(55) 52.229-12, Tax on Certain Foreign Procurements (FEB 2021).

(56) 52.232-29, Terms for Financing of Purchases of Commercial Products and Commercial Services (NOV 2021) (41 U.S.C.4505, 10 U.S.C. 3805).

(57) 52.232-30, Installment Payments for Commercial Products and Commercial Services (NOV 2021) (41 U.S.C. 4505, 10 U.S.C. 3805).

(58) 52.232-33, Payment by Electronic Funds Transfer--System for Award Management (OCT 2018) (31 U.S.C. 3332).

(59) 52.232-34, Payment by Electronic Funds Transfer - Other Than System for Award Management (JUL 2013) (31 U.S.C. 3332).

(60) 52.232-36, Payment by Third Party (MAY 2014) (31 U.S.C. 3332).

(61) 52.239-1, Privacy or Security Safeguards (AUG 1996) (5 U.S.C. 552a).

(62) 52.242-5, Payments to Small Business Subcontractors (JAN 2017)(15 U.S.C. 637(d)(13)).

(63)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (NOV 2021) (46 U.S.C. 55305 and 10 U.S.C. 2631).

(ii) Alternate I (APR 2003) of 52.247-64.

(iii) Alternate II (NOV 2021) of 52.247-64.

(c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial products and commercial services:

[Contracting Officer check as appropriate.]

(1) 52.222-41, Service Contract Labor Standards (AUG 2018) (41 U.S.C. chapter 67).

(2) 52.222-42, Statement of Equivalent Rates for Federal Hires(MAY 2014) (29 U.S.C. 206 and 41 U.S.C. chapter 67).

(3) 52.222-43, Fair Labor Standards Act and Service Contract Labor Standards -Price Adjustment (Multiple Year and Option Contracts) (AUG 2018)(29 U.S.C. 206 and 41 U.S.C. chapter 67).

(4)52.222-44, Fair Labor Standards Act and Service Contract Labor Standards--Price Adjustment (MAY 2014) (29 U.S.C 206 and 41 U.S.C. chapter 67).

(5)52.222-51, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Requirements (MAY 2014) (41 U.S.C. chapter 67).

(6) 52.222-53, Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services--Requirements (MAY 2014) (41 U.S.C. chapter 67).

(7) 52.222-55, Minimum Wages for Contractor Workers Under Executive Order 14026 (JAN 2022).

(8) 52.222-62, Paid Sick Leave Under Executive Order 13706 (JAN 2022) (E.O. 13706).

(9) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations (JUN 2020) (42 U.S.C. 1792).

(d) Comptroller General Examination of Record. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, as defined in FAR 2.101, on the date of award of this contract, and does not contain the clause at 52.215-2, Audit and Records-Negotiation.

(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor?s directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e)

(1) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c), and (d) of this clause, the Contractor is not required to flow down any FAR clause, other than those in this paragraph (e)(1), in a subcontract for commercial products or commercial services. Unless otherwise indicated below, the extent of the flow down shall be as required by the clause-

(i) 52.203-13, Contractor Code of Business Ethics and Conduct (Nov 2021) (41 U.S.C. 3509).

(ii) 52.203-19, Prohibition on Requiring Certain Internal Confidentiality Agreements or Statements (Jan 2017) (section 743 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235) and its successor provisions in subsequent appropriations acts (and as extended in continuing resolutions)).

(iii) 52.204-23, Prohibition on Contracting for Hardware, Software, and Services Developed or Provided by Kaspersky Lab and Other Covered Entities (Nov 2021) (Section 1634 of Pub. L. 115-91).

(iv) 52.204-25, Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment. (Nov 2021) (Section 889(a)(1)(A) of Pub. L. 115-232).

(v) 52.219-8, Utilization of Small Business Concerns (Oct 2022) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds the applicable threshold specified in FAR 19.702(a) on the date of subcontract award, the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(vi) 52.222-21, Prohibition of Segregated Facilities (Apr 2015).

(vii) 52.222-26, Equal Opportunity (Sep 2015) (E.O.11246).

(viii) 52.222-35, Equal Opportunity for Veterans (Jun 2020) (38 U.S.C. 4212).

(ix) 52.222-36, Equal Opportunity for Workers with Disabilities (Jun 2020) (29 U.S.C. 793).

(x) 52.222-37, Employment Reports on Veterans (Jun 2020) (38 U.S.C. 4212).

(xi) 52.222-40, Notification of Employee Rights Under the National Labor Relations Act (Dec 2010) (E.O. 13496). Flow down required in accordance with paragraph (f) of FAR clause 52.222-40.

(xii) 52.222-41, Service Contract Labor Standards (Aug 2018) (41 U.S.C. chapter 67).

(xiii)

(A) 52.222-50, Combating Trafficking in Persons (Nov 2021) (22 U.S.C. chapter 78 and E.O 13627).

(B) Alternate I (Mar 2015) of 52.222-50 (22 U.S.C. chapter 78 and E.O. 13627).

(xiv) 52.222-51, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment-Requirements (May 2014) (41 U.S.C. chapter 67).

(xv) 52.222-53, Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services-Requirements (May 2014) (41 U.S.C. chapter 67).

(xvi) 52.222-54, Employment Eligibility Verification (May 2022) (E.O. 12989).

(xvii) 52.222-55, Minimum Wages for Contractor Workers Under Executive Order 14026 (Jan 2022).

(xviii) 52.222-62, Paid Sick Leave Under Executive Order 13706 (Jan 2022) (E.O. 13706).

(xix)

(A) 52.224-3, Privacy Training (Jan 2017) (5 U.S.C. 552a).

(B) Alternate I (Jan 2017) of 52.224-3.

(xx) 52.225-26, Contractors Performing Private Security Functions Outside the United States (Oct 2016) (Section 862, as amended, of the National Defense Authorization Act for Fiscal Year 2008; 10 U.S.C. 2302 Note).

(xxi) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations (Jun 2020) (42 U.S.C. 1792). Flow down required in accordance with paragraph (e) of FAR clause 52.226-6.

(xxii) 52.232-40, Providing Accelerated Payments to Small Business Subcontractors (MAR 2023) (31 U.S.C. 3903 and 10 U.S.C. 3801). Flow down required in accordance with paragraph (c) of 52.232-40.

(xxiii) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (Nov 2021) (46 U.S.C. 55305 and 10 U.S.C. 2631). Flow down required in accordance with paragraph (d) of FAR clause 52.247-64.

(2) While not required, the Contractor may include in its subcontracts for commercial products and commercial services a minimal number of additional clauses necessary to satisfy its contractual obligations.

(End Of Clause)

52.216-24 LIMITATION OF GOVERNMENT LIABILITY (APR 1984)

(a) In performing this contract, the Contractor is not authorized to make expenditures or incur obligations exceeding the total contract value.

(b) The maximum amount for which the Government shall be liable if this contract is terminated is the total contract value.

(End of Clause)

52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (MAR 2023)

(a) Definitions. As used in this provision--

Economically disadvantaged women-owned small business (EDWOSB) concern means a small business concern that is at least 51 percent directly and unconditionally owned by, and the management and daily business operations of which are controlled by, one or more women who are citizens of the United States and who are economically disadvantaged in accordance with 13 CFR part 127, and the concern is certified by SBA or an approved third-party certifier in accordance with 13 CFR 127.300. It automatically qualifies as a women-owned small business concern eligible under the WOSB Program.

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

Small business concern--

(1) Means a concern, including its affiliates, that is independently owned and operated, not dominant in its field of operation, and qualified as a small business under the criteria in 13 CFR part 121 and the size standard in paragraph (b) of this provision.

(2) Affiliates, as used in this definition, means business concerns, one of whom directly or indirectly controls or has the power to control the others, or a third party or parties control or have the power to control the others. In determining whether affiliation exists, consideration is given to all appropriate factors including common ownership, common management, and contractual relationships. SBA determines affiliation based on the factors set forth at 13 CFR 121.103.

Small disadvantaged business concern, consistent with 13 CFR 124.1002, means a small business concern under the size standard applicable to the acquisition, that--

(1) Is at least 51 percent unconditionally and directly owned (as defined at 13 CFR 124.105) by--

(i) One or more socially disadvantaged (as defined at 13 CFR 124.103) and economically disadvantaged (as defined at 13 CFR 124.104) individuals who are citizens of the United States, and

(ii) Each individual claiming economic disadvantage has a net worth not exceeding $750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(2) The management and daily business operations of which are controlled (as defined at 13 CFR 124.106) by individuals who meet the criteria in paragraphs (1)(i) and (ii) of this definition.

Veteran-owned small business concern means a small business concern--

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

Women-owned small business concern means a small business concern--

(1) That is at least 51 percent owned by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

Women-owned small business (WOSB) concern eligible under the WOSB Program (in accordance with 13 CFR part 127) means a small business concern that is at least 51 percent directly and unconditionally owned by, and the management and daily business operations of which are controlled by, one or more women who are citizens of the United States, and the concern is certified by SBA or an approved third-party certifier in accordance with 13 CFR 127.300.

(b)(1) The North American Industry Classification System (NAICS) code for this acquisition is 541350 .

(2) The small business size standard is $11.5M .

(3) The small business size standard for a concern that submits an offer, other than on a construction or service acquisition, but proposes to furnish an end item that it did not itself manufacture, process, or produce (i.e., nonmanufacturer), is 500 employees, or 150 employees for information technology value-added resellers under NAICS code 541519, if the acquisition--

(i) Is set aside for small business and has a value above the simplified acquisition threshold;

(ii) Uses the HUBZone price evaluation preference regardless of dollar value, unless the offeror waives the price evaluation preference; or

(iii) Is an 8(a), HUBZone, service-disabled veteran-owned, economically disadvantaged women-owned, or women-owned small business set-aside or sole-source award regardless of dollar value.

(c) Representations. (1) The offeror represents as part of its offer that--

(i) It [ ] is, [ ] is not a small business concern; or

(ii) It [ ] is, [ ] is not a small business joint venture that complies with the requirements of 13 CFR 121.103(h) and 13 CFR 125.8(a) and (b). [The offeror shall enter the name and unique entity identifier of each party to the joint venture:__.]

(2) [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.] The offeror represents that it [ ] is, [ ] is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.] The offeror represents as part of its offer that it [ ] is, [ ] is not a women-owned small business concern.

(4)Women-owned small business (WOSB) joint venture eligible under the WOSB Program. The offeror represents as part of its offer that it [ ] is, [ ] is not a joint venture that complies with the requirements of 13 CFR 127.506(a) through (c). [The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.]

(5) Economically disadvantaged women-owned small business (EDWOSB) joint venture. The offeror represents as part of its offer that it [ ] is, [ ] is not a joint venture that complies with the requirements of 13 CFR 127.506(a) through (c). [The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.]

(ii) It [ ] is, [ ] is not a joint venture that complies with the requirements of 13 CFR 127.506(a) through (c). [The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.] Each EDWOSB concern participating in the joint venture shall provide representation of its EDWOSB status.

(6) The offeror represents as part of its offer that it [ ] is, [ ] is not a veteran-owned small business concern.

(7) [Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (c)(6) of this provision.] The offeror represents as part of its offer that--

(i) It [ ] is, [ ] is not a service-disabled veteran-owned small business concern; or

(ii) It [ ] is, [ ] is not a service-disabled veteran-owned joint venture that complies with the requirements of 13 CFR 125.18(b)(1) and (2). [The offeror shall enter the name and unique entity identifier of each party to the joint venture:__.] Each service-disabled veteran-owned small business concern participating in the joint venture shall provide representation of its service-disabled veteran-owned small business concern status.

(8) The offeror represents, as part of its offer, that--

(i) It [ ] is, [ ] is not a HUBZone small business concern listed, on the date of this representation, as having been certified by SBA as a HUBZone small business concern in the Dynamic Small Business Search and SAM, and will attempt to maintain an employment rate of HUBZone residents of 35 percent of its employees during performance of a HUBZone contract (see 13 CFR 126.200(e)(1)); and

(ii) It [ ] is, [ ] is not a HUBZone joint venture that complies with the requirements of 13 CFR 126.616(a) through (c). [The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.] Each HUBZone small business concern participating in the HUBZone joint venture shall provide representation of its HUBZone status.

(d) Notice. Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a business concern that is small, HUBZone small, small disadvantaged, service-disabled veteran-owned small, economically disadvantaged women-owned small, or women-owned small eligible under the WOSB Program in order to obtain a contract to be awarded under the preference programs established pursuant to section 8, 9, 15, 31, and 36 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall--

(1) Be punished by imposition of fine, imprisonment, or both;

(2) Be subject to administrative remedies, including suspension and debarment; and

(3) Be ineligible for participation in programs conducted under the authority of the Act.

(End Of Provision)

52.225-25 PROHIBITION ON CONTRACTING WITH ENTITIES ENGAGING IN CERTAIN ACTIVITIES OR TRANSACTIONS RELATING TO IRAN--REPRESENTATION AND CERTIFICATIONS (JUN 2020)

(a) Definitions.

"Person"--

(1) Means--

(i) A natural person;

(ii) A corporation, business association, partnership, society, trust, financial institution, insurer, underwriter, guarantor, and any other business organization, any other nongovernmental entity, organization, or group, and any governmental entity operating as a business enterprise; and

(iii) Any successor to any entity described in paragraph (1)(ii) of this definition; and

(2) Does not include a government or governmental entity that is not operating as a business enterprise.

"Sensitive technology"--

(1) Means hardware, software, telecommunications equipment, or any other technology that is to be used specifically--

(i) To restrict the free flow of unbiased information in Iran; or

(ii) To disrupt, monitor, or otherwise restrict speech of the people of Iran; and

(2) Does not include information or informational materials the export of which the President does not have the authority to regulate or prohibit pursuant to section 203(b)(3) of the International Emergency Economic Powers Act (50 U.S.C. 1702(b)(3)).

(b) The offeror shall e-mail questions concerning sensitive technology to the Department of State at CISADA106@state.gov.

(c) Except as provided in paragraph (d) of this provision or if a waiver has been granted in accordance with Federal Acquisition Regulation (FAR) 25.703-4, by submission of its offer, the offeror--

(1) Represents, to the best of its knowledge and belief, that the offeror does not export any sensitive technology to the government of Iran or any entities or individuals owned or controlled by, or acting on behalf or at the direction of, the government of Iran;

(2) Certifies that the offeror, or any person owned or controlled by the offeror, does not engage in any activities for which sanctions may be imposed under section 5 of the Iran Sanctions Act. These sanctioned activities are in the areas of development of the petroleum resources of Iran, production of refined petroleum products in Iran, sale and provision of refined petroleum products to Iran, and contributing to Iran's ability to acquire or develop certain weapons or technologies; and

(3) Certifies that the offeror, and any person owned or controlled by the offeror, does not knowingly engage in any transaction that exceeds the threshold at FAR 25.703-2(a)(2) with Iran's Revolutionary Guard Corps or any of its officials, agents, or affiliates, the property and interests in property of which are blocked pursuant to the International Emergency Economic Powers Act (50 U.S.C. 1701 et seq.) (see OFAC's Specially Designated Nationals and Blocked Persons List at https://www.treasury.gov/resource-center/sanctions/SDN-List/Pages/default.aspx).

(d) Exception for trade agreements. The representation requirement of paragraph (c)(1) and the certification requirements of paragraphs (c)(2) and (c)(3) of this provision do not apply if--

(1) This solicitation includes a trade agreements notice or certification (e.g., 52.225-4, 52.225-6, 52.225-12, 52.225-24, or comparable agency provision); and

(2) The offeror has certified that all the offered products to be supplied are designated country end products or designated country construction material.

(End Of Provision)

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

https://www.acquisition.gov/browse/index/far
https://www.acquisition.gov/car

(End of Provision)

52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

https://www.acquisition.gov/browse/index/far
https://www.acquisition.gov/car

(End of Clause)

1352.201-72 CONTRACTING OFFICER`S REPRESENTATIVE (COR) (APR 2010)

(a) Ken Bishop is hereby designated as the Contracting Officer`s Representative (COR). The COR may be changed at any time by the Government without prior notice to the contractor by a unilateral modification to the contract. The COR is located at:

Ken Bishop
Phone Number: 301-975-6952
Email: Kenneth.bishop@nist.gov

(b) The responsibilities and limitations of the COR are as follows:
(1) The COR is responsible for the technical aspects of the contract and serves as technical liaison with the contractor. The COR is also responsible for the final inspection and acceptance of all deliverables and such other responsibilities as may be specified in the contract.
(2) The COR is not authorized to make any commitments or otherwise obligate the Government or authorize any changes which affect the contract price, terms or conditions. Any contractor request for changes shall be referred to the Contracting Officer directly or through the COR. No such changes shall be made without the express written prior authorization of the Contracting Officer. The Contracting Officer may designate assistant or alternate COR(s) to act for the COR by naming such assistant/alternate(s) in writing and transmitting a copy of such designation to the contractor.

(End of clause)

NIST LOCAL-53 CONTRACT PERFORMANCE DURING CHANGES IN NIST OPERATING STATUS
All contractors performing work on active contracts at the U.S. Department of Commerce(DOC), National Institute of Standards and Technology (NIST) campuses and/or working in NIST workspaces should go to the www.nist.gov website and under the "About NIST" tab click on "Visit". This site includes information about campus access and security information; identification requirements; parking information and more.

Contractor personnel are required to check the appropriate campus operating status and personnel requirements at https://www.nist.gov/campus-status daily prior to arriving on site. All personnel must adhere to the requirements set forth in the operating status.

Unless otherwise stated in the contract terms and conditions, normal days of business operation are Monday through Friday, excluding Federal Holidays. However, throughout the contract period of performance, there may be circumstances beyond the control of NIST that will impact normal days of business operation such as inclement weather, power outages, etc. In circumstances such as these, the Contractor must call the appropriate NIST campus status line to verify the operating status:

Gaithersburg Campus Operating Status Line:
(301) 975-8000
(800) 437-4385 x8000 (toll free)

Boulder Campus Operating Status Line:
(303) 497-4000
(303) 497-3000 option 2

In the event of a lapse in appropriation, access to Government facilities and resources, including equipment and systems will be limited to excepted personnel for both Federal employees and contractor personnel. If performance of the contract is onsite and/or requires Government interaction, unless the contractor has been, or is notified that it is required to work under an excepted status, the contractor must stop work. The work stoppage shall remain in effect until the lapse is resolved and notification is provided via the NIST website at www.nist.gov (banner on front page) and/or the NIST operating status line(s). Additionally, contractors are encouraged to monitor public broadcasts or the Office of Personnel Management's website at www.opm.gov for the Federal Government operating status.

NIST will provide notification to all contractors that are determined to have excepted status. All excepted contractors are required to continue performance and communicate with the appointed Contracting Officer's Representative (COR) for further guidance, or NIST Contracting Officer if a COR is not appointed.

Contractors with active supply or service contracts that are fully funded at the time of contract award and do not require access to Government facilities, resources, or active administration by

Government personnel in a manner that would not cause the Government to incur additional obligations during the lapse in appropriation may continue performance.

Please note that in all circumstances that impact operations on the NIST campuses, contractors are expected to follow all direction and guidance provided by NIST authorities.

NIST LOCAL-54 ELECTRONIC BILLING INSTRUCTIONS
NIST requires that Invoice/Voucher submissions are sent electronically via email to INVOICE@NIST.GOV. Each Invoice or Voucher submitted shall include the following:
(1) Contract number;
(2) Contractor name and address;
(3) Unique entity identifier (see www.sam.gov for the designated entity for establishing unique entity identifiers);
(4) Date of invoice;
(5) Invoice number;
(6) Amount of invoice and cumulative amount invoiced to-date;
(7) Contract Line Item Number (CLIN);
(8) Description, quantity, unit of measure, unit price, and extended price of supplies/services delivered;
(9) Prompt payment discount terms, if offered; and
(10) Any other information or documentation required by the contract.

NIST LOCAL-56 INVOICING PROCESSING PLATFORM-ALTERNATE I (DEC 2022)
Upon written notice from the contracting officer the following supersedes all other instructions for the submission of payment requests. Accordingly, following written notice payment requests must be submitted electronically through the U.S. Department of the Treasury's Invoice Processing Platform System (IPP).

"Payment request" means any request for contract financing payment or invoice payment by the Contractor. To constitute a proper invoice, the payment request must comply with the requirements identified in the applicable payment request or invoicing instructions, Prompt Payment clause included in the contract, or the clause 52.212-4 Contract Terms and Conditions - Commercial Items included in commercial item contracts. The IPP website address is https://www.ipp.gov.

Under this contract, the following documents are required to be submitted as an attachment to the IPP invoice:

The Contractor must use the IPP website to register, access, and use IPP for submitting payment requests. If not already enrolled, the Contractor Government Business Point of Contact (as listed in SAM) will receive enrollment instructions via email within three to five business days of the addition of the contract award to IPP. Contractor assistance with enrollment can be obtained by contacting the IPP Production Helpdesk via email: IPPCustomerSupport@fiscal.treasury.gov or phone (866) 973-3131.

If the Contractor is unable to comply with the requirement to use IPP for submitting payment requests, the Contractor must submit a waiver request in writing to the Contracting Officer with its proposal or quotation. Contact the contracting officer for more information on submitting a waiver request.

Instructions to Quoters

Quotes shall be prepared on standard 8-1/2" by 11" paper, single-spaced at 1 with spacing before and after paragraphs set at –0– and left aligned paragraphs. Pages shall have a one-inch margin. The font shall be Times New Roman with a font size of 12 throughout the document. The Technical Quotation shall not contain any reference to price. Quotes should be written so that government personnel evaluating the quote can arrive at a sound determination as to whether the quote meets the requirements of this solicitation. The Quoter's company name, the solicitation number and the date of the quote shall appear at the top of each page.

Quotes shall be submitted electronically to the contract specialist via email within the response date established.

Technical Quotation

(A) General

(1) The technical quotation must clearly indicate your company's capabilities and the means that will be used to satisfy the requirements of the Statement of Work. The technical quotation must be written in plain language, be straightforward and concise, yet sufficiently detailed to address all areas below, necessary to evaluate the quotation in accordance with the evaluation criteria.

(2) In order that the technical quotation may be evaluated strictly on the merit of the material submitted, no price information shall be included in the technical quotation.

(3) Repeating the statement of work and/or listing capabilities without sufficient elaboration will not be acceptable.

(4) The quotation must not exceed 20 pages, single spaced, exclusive of submissions for experience and past performance evaluation factors.

The quoter's technical quotation shall include the following:

1. **QEI Certification:** Quoter shall provide copies of current QEI certifications.

2. **Experience:** Quoter shall provide sufficient information that demonstrates the quoter's knowledge and experience in successfully performing similar projects in scope. Submit a listing of up to five (5) references of similar scope, magnitude and complexity of the requirement. Performance of such projects is preferred to have been completed within the last three (3) years. At a minimum, the following information shall be provided:
    a. Name of project
    b. Name and complete address of business or company
    c. Name of the contact person, email address, and current phone number
    d. The date started and the date completed.
    e. Contract value
    f. A brief description of the project objectives or scope.
    g. The name and contact information of at least one individual outside the Quoter's organization or the quoted team as a reference who can comment on the Quoter's performance on the project.

3. **Key Personnel:** The quoter shall demonstrate that the quoted Program Manager and Field Supervisor have successfully performed similar projects and have current QEI certifications.

4. **Past Performance:** The past performance evaluation factor assesses the degree of confidence the Government has in a Quoter's ability to supply products and services that meet users' needs, based on a demonstrated record of performance.

The quote shall list up to five (5) relevant contracts performed within the last 3 years, including Federal, State and Local Government and private sector contracts.

For evaluation of Past Performance, the Government may use information from any sources available to it including, but not limited to, CPARS and FAPIIS. The Government may review relevant past performance information from other sources or through the use of questionnaires. Quoters should provide relevant past performance information for similar or related work that has taken place during the last three years. Each Quoter has the opportunity to provide in its quote any information regarding its past performance of contracts similar to the Government's requirement that it would like the Government to consider. This includes information that the Quoter considers essential to the Government's evaluation or explanatory information of poor performance.

Quoters should provide the following information:

1. Contract Number
2. Customer/Agency
3. Contracting Officer /Technical Point of Contact/POC (names and telephone numbers)
4. Brief description of the scope of work
5. Award Price
6. Period of Performance

To obtain information, the Government may contact the points of contact listed, however, the Government is not required to do so. The Government may contact references other than those provided by the Quoter to evaluate past performance.
Quoter's shall ensure that all references and their contact information is current and correct prior to quoting the references in the quote.

If the quoter has no relevant past performance it should include a statement to that effect in its quote. The government reserves the right to consider data obtained from sources other than those described by the quoter in its quote.

PRICE QUOTATION

The quoter shall provide a total firm, fixed-price for all line items for the completion of the services described herein. The quoter shall provide documentation to support the quoted price to include a price breakdown.

The Government anticipates competition under this solicitation. However, in order to determine the prices are fair and reasonable, the Government reserves the right to request the quoter provide further breakdown to support quoted prices.

EVALUATION/BASIS OF AWARD

The Government will award a contract resulting from this solicitation to the responsible quoter whose quote is most advantageous to the Government under the selection criteria set forth below using a Tradeoff source selection process. This process allows for a tradeoff between technical factors and price, and allows the Government to accept other than the lowest priced quote or other than the highest technically rated quote to achieve a best value to the Government. The basis for award of a contract as a result of this RFQ will be an integrated assessment by the Contracting Officer of the results of the evaluation based on the evaluation factors and their importance as indicated below. The integrated assessment will include consideration of the strengths and weaknesses of the quotes. The Government reserves such right of flexibility in conducting the evaluation as is necessary to assure placement of a contract in the Government's best interest. Accordingly, the Government may award to other than the lowest priced Quoter, or other than the Quoter with the highest evaluation rating.

RELATIVE IMPORTANCE OF EVALUATION FACTORS

FACTOR 1: QEI Certification
FACTOR 2: Experience
FACTOR 3: Key Personnel
FACTOR 4: Past Performance
FACTOR 5: Pricr

Factor (1) QEI Certification is a pass/fail criteria. If the quoter fails to provide its certifications, this will result in an Unacceptable rating. Factor (2) Experience, Factor (3) Key Personnel, and Factor (4) Past Performance are of equal importance. All evaluation factors other than Price, when combined, are more important than Price. However, when the technical factors are rated more equally between Quoters, Price becomes more of a deciding factor in making the best value determination.

Evaluation of Technical Quotations

Factor 1 QEI Certification: NIST will evaluate the extent to which the quoter’s quote demonstrates experience by reviewing submitted QEI certifications and that same are current at time of award.

Factor 2 Experience: Quotes will be evaluated based upon a comparison of the Quoter’s demonstrated experience to the scope of work described in the Statement of Work in the solicitation. Consideration will be given to the similarity of scope and magnitude of the demonstrated experience relative to the services to be furnished under the present solicitation.

Factor 3 Key Personnel: Personnel will be evaluated in terms of meeting the minimum requirements as applicable for the labor categories listed in the Instructions to Quoters.

Factor 4 Past Performance: The Past Performance Evaluation is an assessment of the Quoter’s probability of meeting the solicitation requirements.

There are (3) three aspects to the past performance evaluation: Recency, relevancy (including context of data), and quality (including general trends in Contractor performance and source of information). The first is to evaluate the recency of the Quoter’s past performance. Recency is considered work performed within the past (3) three years. The second is to determine how relevant a recent effort accomplished by the Quoter is to the effort to be acquired through the source selection. Common aspects of relevancy include, but are not limited to, the following: similarity of product/service/support, complexity, dollar value, contract type, use of key personnel (for services), and extent of subcontracting/teaming. With

respect to relevancy, past performance of greater relevancy will typically be a stronger predictor of future success and have more influence on the past performance confidence assessment than past performance of lesser relevance. The third aspect of the past performance evaluation is to establish the overall quality of the Quoter's past performance. These are combined to establish one performance confidence assessment rating for each quoter. The past performance evaluation conducted in support of a current source selection does not establish, create, or change the existing record and history of the Quoter's past performance on past contracts; rather, the past performance evaluation process gathers information from customers on how well the Quoter performed those past contracts.

Factor (1) QEI Certification is a pass/fail criteria. If the quoter fails to provide its certifications, this will result in an Unacceptable rating.

Factors (2) Experience and (3) Key Personnel will be evaluated using the following adjectival ratings:

Adjectival Rating	Description
Excellent	The quote demonstrates a superior understanding of the requirements and an approach that includes strengths that will significantly benefit the Government. No significant weakness identified. Normal contractor effort and normal government monitoring will be sufficient to minimize risk.
Good	The quote demonstrates a considerable understanding of the requirements and an approach that includes strengths that will benefit the Government. Any identified weakness has little potential to cause disruption of schedule or degradation of performance. Strengths outweigh weaknesses. Normal contractor effort and normal government monitoring will probably be able to overcome difficulties.
Satisfactory	The quote demonstrates an adequate understanding of the requirements and an approach that meets the Governments requirements. The quote has no deficiencies but may include some weakness that can potentially cause disruption of schedules or degradation of performance. Special contractor emphasis and close government monitoring will minimize any risk.
Marginal	The quote demonstrates a marginal understanding of the requirements and the approach marginally meets the requirements. The quote contains omissions or inadequate details to assure the evaluators that the quoter has an understanding of the requirements. The quote presents an unacceptable risk and cannot meet the requirements without revisions.
Unacceptable	The quote fails to demonstrate a basic understanding of the requirements and the approach fails to meet the requirements. The quote has major omissions or inadequate details to assure the evaluators that the quoter has an understanding of the requirements. The quote presents an unacceptable risk and cannot meet the requirements without major revisions.

Factor (4) Past Performance will be evaluated using the following adjectival ratings:

Past Performance Relevancy	
Rating	**Description**
Very Relevant	Present/past performance effort involved essentially the same scope and magnitude of effort and complexities this solicitation requires.
Relevant	Present/past performance effort involved similar scope and magnitude of effort and complexities this solicitation requires.

Somewhat Relevant	Present/past performance effort involved some of the scope and magnitude of effort and complexities this solicitation requires.
Not Relevant	Present/past performance effort involved little or none of the scope and magnitude of effort and complexities this solicitation requires.

Past Performance Confidence Assessments	
Rating	**Description**
Substantial Confidence	Based on the Quoter's recent/relevant performance record, the Government has a high expectation that the Quoter will successfully perform the required effort.
Satisfactory Confidence	Based on the Quoter's recent/relevant performance record, the Government has a reasonable expectation that the Quoter will successfully perform the required effort.
Neutral Confidence	No recent/relevant performance record is available or the Quoter's performance record is so sparse that no meaningful confidence assessment rating can be reasonably assigned. The Quoter may not be evaluated favorably or unfavorably on the factor of past performance.
Limited Confidence	Based on the Quoter's recent/relevant performance record, the Government has a low expectation that the Quoter will successfully perform the required effort.
No Confidence	Based on the Quoter's recent/relevant performance record, the Government has no expectation that the Quoter will be able to successfully perform the required effort.

The Government intends to evaluate quotes and award a contract without discussions with Quoters using FAR Part 13. Therefore, the Quoter's initial quote should contain the Quoter's best terms from a price and technical standpoint. However, the Government reserves the right to enter into communications with Quoters if it is determined by the Contracting Officer to be in the Government's best interest.

Each quote will be evaluated against the evaluation criteria set forth in the solicitation. Quotes will not be compared to each other or to criteria which are not identified in the solicitation; similarly, each quote will be evaluated for every factor identified.

Price

The quotes will be evaluated for price reasonableness in accordance with FAR 13.106-3. The price evaluation will determine whether the quoted prices are complete and fair and reasonable in accordance with solicitation requirements. Quoted prices must be entirely compatible with the technical quotation. The quoted total contract value will be utilized a lowest price technically acceptable decision.