



**DEPARTMENT OF THE NAVY**  
NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND, HAWAII  
400 MARSHALL ROAD  
JBP HH, HAWAII 96860-3139

J&A No. 21-07

JUSTIFICATION AND APPROVAL  
FOR USE OF OTHER THAN FULL AND OPEN COMPETITION

SOLICITATION WORK ORDER NUMBER (WON) 1610604, RM09-2894 REPLACE LPA SYSTEM  
AT BUILDING 149, PHNSY & IMF, JBP HH, HONOLULU, HAWAII

1. Contracting Activity.

Naval Facilities Engineering Systems Command, Hawaii (NAVFAC HI), Joint Base Pearl Harbor-Hickam, Hawaii.

2. Description of the Action Being Approved.

Request approval for use of Atlas Copco ZR 900 VSD Low Pressure Air Compressor (LPAC), Atlas Copco ND2500 VSD/Water Cooled Adsorption Dryer, and Atlas Copco Optimizer 4.0 Central Controller for Work Order Number 1610604, RM09-2894 Replace LPA System at Building 149, Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility (PHNSY & IMF), Joint Base Pearl Harbor-Hickam (JBP HH), Honolulu, Hawaii.

3. Description of Supplies/Services.

The scope of work is to replace the existing low pressure air (LPA) system at Building 149 (B149). This includes the LPACs, air dryers, cooling towers, pumps, heat exchangers, piping, transformers, switchgear, motor control center, and system controls. This project requires integrating the new equipment and controllers into the existing SCADA system, which connects to Building 641 (B641), P-089 Plant, and Drydock No. 5 LP Plant. The Atlas Copco Optimizer will be the central controller used for all Atlas Copco equipment. Per UFC requirements, the required combined flow demand of B149 and P-089 is 22,950 SCFM with 125 PSI at the outlets, which requires the plants to be set at 150 PSI. The UFC also requires the LPA system to be Grade "D" Breathing Air, which requires ISO 8573-1 Class-0 or "oil-free" construction.

The LPA system at B149 operates 24/7 as the primary plant for Shipyard & IMF. The existing B149 LPA system includes four Atlas Copco ZR7 6,000 SCFM oil-free, screw compressors; an Ingersoll-Rand desiccant dryer; and two Ingersoll-Rand refrigerated dryers for back-up purposes. Due to current electrical constraints, only two LPACs can operate simultaneously, limiting the plant capacity to 12,000 SCFM. The primary desiccant dryer is currently out of service, requiring the facility to utilize the two back-up dryers.

The existing systems will be replaced with five Atlas Copco ZR 900 VSD, with an option to delete one LPAC if the bids are too high, for a total of four Atlas Copco ZR 900 VSD. The Atlas Copco LPAC is the largest capacity, oil-free, VFD-driven, 460V powered, rotary screw compressor, rated at 4,000 SCFM at 150 PSI. This project also upgrades the electrical system, removing the current electrical constraints and allowing all LPACs to operate simultaneously. The Atlas Copco ZR 900 VSD is packaged together with the ND 2500 VSD/Water Cooled Adsorption Dryer. The Atlas

Copco Optimizer 4.0 Central Controller is used to automatically synchronize and control all the LPACs as a single unit with a defined set-point.

4. Statutory Authority Permitting Other Than Full and Open Competition.

This request is submitted pursuant to the authority of Title 10 U.S.C. 2304(c)(1), only one responsible source and no other supplies or services will satisfy agency requirements.

5. Rationale Justifying Use of Cited Statutory Authority.

The Atlas Copco ZR 900 VSD is the only rotary screw compressor currently available in the market that efficiently exceeds the historic LPA demand, and meets UFC requirements, including ISO 8573-1 Class-0 oil-free construction. The Atlas Copco ZR 900 VSD compressor is unique because it is packaged with the Atlas Copco ND2500 VSD/Water Cooled Adsorption Dryer. The compressor and dryer are controlled as a single unit. The Atlas Copco Optimizer 4.0 Central Controller contains propriety software to interface with the compressors and dryers.

NAVFAC Hawaii Public Works Department is requesting that NAVFAC Hawaii replace the LPA system at B149 with Atlas Copco brand name compressors and associated equipment for the following reasons:

- a. Meets UFC and Mission Requirements: The scope of this project was driven by the historical average continuous LPA system demand, which is approximately 3,000 SCFM with the LPA plants set to 100 PSI. Historically, there would be brief excursions to 10,000 SCFM. The current operations do not meet the UFC required flow demand of 22,950 SCFM with 125 PSI at the outlets, which require the plants to be set at 150 PSI. In order to meet UFC requirements, various options on the type and quantity of compressor and air dryers were evaluated, as well as the efficiency of the equipment. The various options included using only centrifugal base-load compressors; using only VFD-driven screw compressors; or using a combination of centrifugal base-loaded compressors and VFD-driven screw compressors. The design requirement determined to be the best option for this project in terms of operating most efficiently and streamlining equipment maintenance, operator training, and spare parts inventory is to utilize five oil free VSD rotary screw compressors that operate at 460V. Centrifugal compressors rely on inlet vanes or inlet throttling valves that limit their overall range and efficiency of operation. Since the compressed air demand at the Shipyard is highly irregular and wide-ranging, two key components of compressor equipment selection are

variable capacity control and flow at minimum-load conditions. Operating air compressors with high levels of inlet throttling and/or while unloaded is inefficient, and frequent start/stop cycles are detrimental to motors and mechanical components of the compressor. Controls must also operate flawlessly to prevent destructive surging of centrifugal compressors. The evaluation indicated that VSD screw compressors are capable of turning down about 40% rated capacity before unloading and/or opening a blowout valve. The equipment that meets all these criteria is the Atlas Copco ZR 900 VSD. By utilizing five Atlas Copco ZR 900 VSD compressors, B149 will deliver 20,000 SCFM. Combined with P-089's 8,000 SCFM, total flow will be 28,000 SCFM, exceeding the required combined flow demand of 22,950 SCFM. If the option to remove one (1) LPAC is exercised, utilizing four LPACs will deliver 16,000 SCFM, and the combined flow with P-089 will be 24,000 SCFM, which will still exceed the required flow demand of 22,950 SCFM.

Using a larger number of smaller centrifugal units, smaller VFD-driven screw compressors or a combination of centrifugal base-load compressors and VFD-driven screw compressors (i.e., hybrid plant) was considered as an alternative to a fleet consisting of only VFD-driven screws to address wide fluctuations in compressed air demand. However, increasing the number of compressors and/or utilizing two types of compressors in a hybrid plant would increase system complexity, increase plant real estate and complicate equipment layout, maintenance, operator training, spare parts inventory as well as sourcing. The system would need to have at least two types of each compressor to support the control sequencing. A larger number of smaller compressors increases the construction cost as there are more components and labor involved. Different compressor brands also significantly increase the cost of control system integration and ability to maintain the compressed air system over the long term.

- b. Reduces Operating Costs: Operating at 460V allows for a greater number of qualified NAVFAC Hawaii personnel to maintain and repair the units, which contributes to lower installation and operating costs. The Atlas Copco Optimizer 4.0 Central Controller interfaces with all Atlas Copco compressors and dryers. This controller will interface with the Atlas Copco equipment in B149, as well as the two (2) existing Atlas Copco LPACs in the P-089 Satellite LPA Plant. As mentioned earlier, B149 is connected to P-089 Satellite LPA Plant. By having all LPACs from B129 and P-089 connected to the Optimizer 4.0 Central Controller, there is increased SCADA functionality and allows for standardization of hardware, software, and spare parts inventory. Functional readiness is also improved through greater efficiency in operating and maintenance personnel, in terms of streamlined operations, standardized maintenance, simplified troubleshooting, and common repair procedures.

The Designer of Record, InSynergy Engineering, Inc., performed a cost analysis to determine the most effective combination of compressors to use in order to meet the required capacity and UFC regulations. Three scenarios were evaluated: 1) using all Atlas Copco compressors; 2) using a combination of 2 different brand controls; and 3) using a combination of 3 different brand controls. The analysis determined that using all compressors of the same brand is the most cost effective. As Atlas Copco compressors are installed in P-089 Satellite LPA Plant, the most cost effective option is to install Atlas Copco compressors in B149 as well. The scenario of utilizing 2 different brands increased the cost by \$1,731,944, and utilizing 3 different brands increased the cost by \$2,155,258.

- c. Decreases Cybersecurity Vulnerabilities: CIO conducts an extensive and expensive evaluation on

each unique controller, gateway, other communication device/software application within the compressed air system, with the cost for evaluation ranging from [REDACTED]. Utilizing the compressed air controls environment provided by Atlas Copco reduces the number of hardware and software attack vectors to potentially gain entry to the SCADA system, which decreases the exposure to cyber threats, and is less costly, less complicated and less time consuming for CIO to analyze and certify.

6. Description of Efforts Made to Solicit Offers from as Many Offerors as Practicable

Other manufacturers that produce LPACs, each with their own unique proprietary systems, are [REDACTED]. However, the only manufacturer that meets the project specifications and design parameters is Atlas Copco.

On 15 April 2021, a sources sought was issued in beta.sam.gov, Contract Opportunities (FBO). The sources sought requested that all interested parties respond within 15 days after date of publication of the synopsis. The sources sought requested interested parties to respond to the requirement to be considered if able to provide compatible products to the Atlas Copco ZR 900 VSD, Atlas Copco ND 2500 VSD/Water Cooled Adsorption Dryer, and the Atlas Copco Optimizer 4.0 Central Controller. By the due date, two responses were received; however, one firm was an office supply firm providing its Statement of Qualifications and the other firm was a safety equipment manufacturer providing its Statement of Qualifications. Both did not provide the requested information. Therefore, it is reasonably assumed that Atlas Copco is the only source that can satisfy agency requirements. We consider the beta.sam.gov synopsis as our market survey.

InSynergy Engineering, Inc., the Designer of Record (DOR), also performed its own market research and provided their findings on 08 October 2020 to the Government. The market research evaluated four compressor types (oil free VSD Screw 2-stage; oil free constant speed Screw; oil free centrifugal 3-stage; and oil free centrifugal) and the various models of the compressors manufactured by Atlas Copco, [REDACTED]. The results indicated that Atlas Copco was the only manufacturer to meet project specifications and design parameters.

7. Determination of Fair and Reasonable Cost.

The Contracting Officer has determined the anticipated cost to the Government of the supplies/services covered by this J&A will be fair and reasonable.

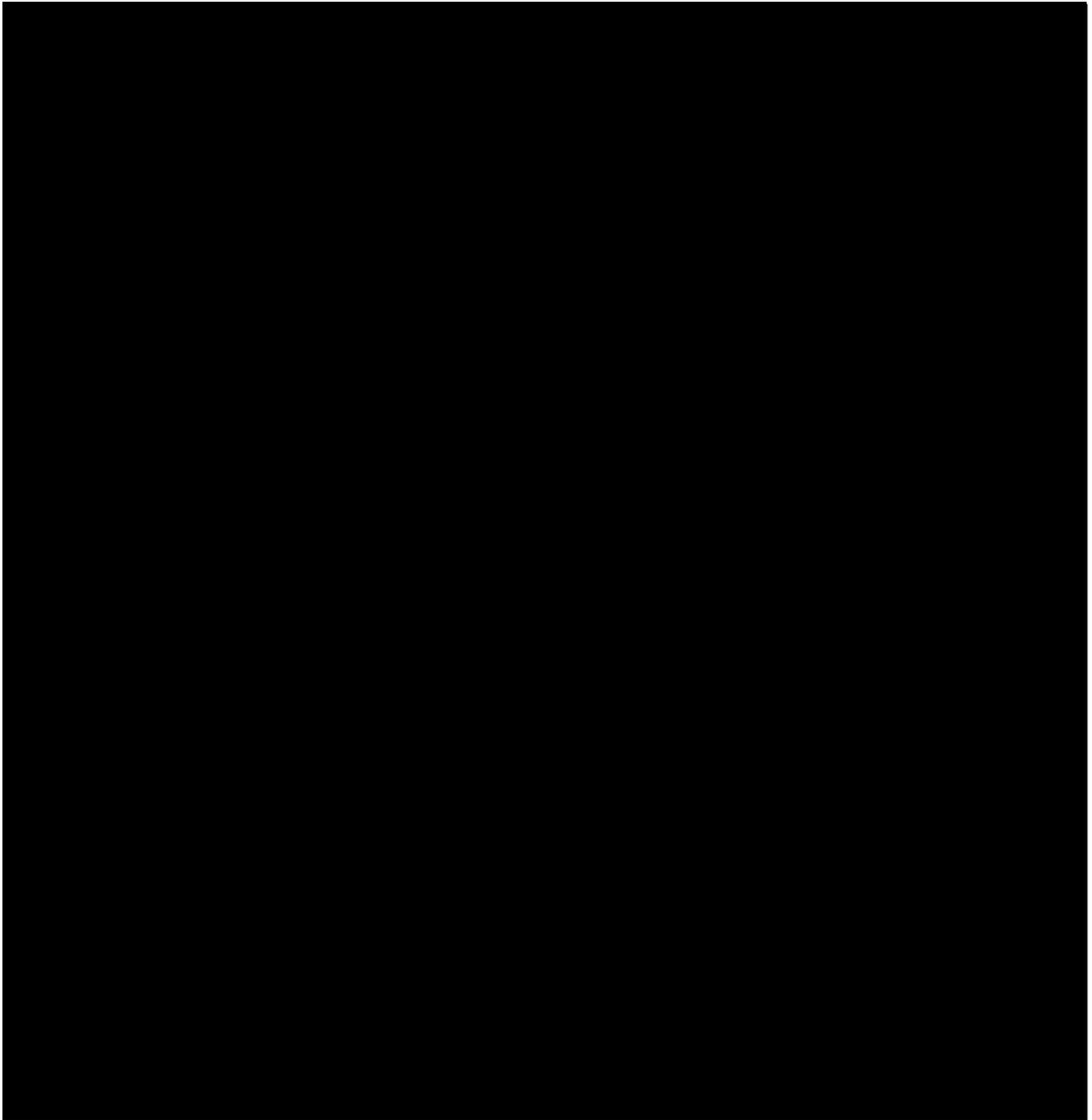
8. Actions taken to remove barriers to future competition.

NAVFAC Hawaii will continue to monitor the LPAC industry to determine if another LPAC system becomes available, and if another potential source emerges, NAVFAC Hawaii will assess whether competition for future requirements is feasible.

CERTIFICATIONS AND APPROVAL

TECHNICAL/REQUIREMENTS CERTIFICATION

I certify that the facts and representations under my cognizance which are included in this Justification and its supporting acquisition planning documents, except as noted herein, are complete and accurate to the best of my knowledge and belief.



CONTRACTING OFFICER CERTIFICATION

