

2.2 The Purposes and Advantages of a Central Utility Plant

The purpose of the Central Utility Plant (CUP) at NIST is to provide steam, chilled water, and compressed air for hot and cold water, warm and cool air (heating and air conditioning), clean air quality, and adequate ventilation to indoor areas of the campus. Steam and compressed air may also be used in laboratories for experimental or research purposes. Compressed air is further used to run and regulate pneumatic building controls. Chilled water is used for cooling air (for air conditioning) and supplying cold water to buildings.

The advantages of locating chillers, boilers, and compressors in a CUP are four:

1. Enable their inspection, adjustment, maintenance, and repair by a crew of qualified mechanics and stationary engineers who can manage power machines more easily if they are located in one building
2. Give customers a central location to call for help in correcting malfunctions or inadequacy of supply in the surrounding customer locations.
3. A centralized utility plant can contain larger machines and coordinate (or combine) their functions with greater energy efficiency than small, building-specific boiler rooms can
4. A centralized plant can also provide more advanced flue gas cleaning for cleaner air in the plant vicinity than can small scale utilities located in each campus building

2.2.2 Specific Conditions at the Boulder NIST CUP

Steam produced by boilers is measured in units of pounds per hour and pounds per square inch (psi) of pressure. [Name of Proposed Contracting Company] understands that the Boulder NIST boilers produce 20,600 pounds of steam per hour (a small amount) but that the plant's capacity for chilled water is fairly large at 2,800 tons per hour at full maximum load for cooling.

The boiler capacity in plants that [Name of Proposed Contracting Company] now manages tend to be much larger than the stated capacity of boilers at the NIST CUP, and our personnel have experience (see resumes) with chillers and compressors (1450 ton chillers and 150 psi air compressors).

2.3 Management of the Project as Defined by the SOW

The expected end result of professional management of a utility plant is the smooth and continuous flow of required power supplied by well-maintained boilers, chillers, cooling towers, electrical systems, entails the inspection and test (and logging results) of equipment, any maintenance adjustments or ordinary part replacements required on a regular basis (identified in the warranty handbooks supplied by equipment manufacturers).

2.3.1 Maintenance

Maintenance testing is performed to identify equipment problems, diagnose equipment problems, or confirm that repair measures have been effective. It can be performed at either the system level (e.g., the HVAC system), the equipment level (e.g., the blower in a HVAC line), or the component level (e.g., a control chip in the control box for the blower in the HVAC line).

Since boilers, chillers, and air compressors are machines that use materials (air and water) under pressure, mechanics must check the pressure levels within them and operate relief valves or other instruments to adjust pressure to levels tolerated by the specific machine according to manufacturer directions.

2.3.1.1 Boiler Maintenance

[Name of Proposed Contracting Company Owner] has extensive knowledge of Reliable Controls on boilers ([Name of Proposed Contracting Company] is a

licensed dealer) and understands that this is the brand of controls used with boilers in the Boulder NIST CUP.

Personnel employed by our company have the experience, training, and certifications required to inspect and adjust, if necessary, all pressure valves, pumps, bottom blowdown valves, clack valves, steam traps, pressure gauges, plugs, pipes, and other equipment associated with the operation of boilers including boiler water levels and chemistry.

If the [Name of Proposed Contracting Company] staff at the CUP notices the need for larger repairs or adjustments than what would be deemed routine, they will notify the COTR who will determine the necessity and provider of the repair and award this work under separate contract.

2.3.1.2 Preventive Maintenance and Schedule

The proposed contractor anticipates the COTR will supply manufacturer's operations and maintenance (O&M) warranty manuals for each piece of equipment to be serviced at the CUP and will study the manuals to determine needed maintenance details, such as

- Specific duties required to inspect, adjust, replace filters, calibrate, test, and assess the operational condition of each piece of plant equipment
- Desired frequency of inspection, adjustment, calibration, test, or part replacement
- Part brands, if any, suggested for replacement and brands of oil/grease to use for lubrication
- Chemical brands, if any are specifically suggested, to add to boiler water
- Other machine-specific maintenance requirements

[Name of Proposed Contracting Company Owner] will use the maintenance duties and suggested schedule supplied in these manuals and by MAXIMO, the Government maintenance management system, as well as any intervals of inspection, testing, and adjustment the COTR suggests for each machine to create the maintenance schedule his staff must follow.

We also anticipate the COTR will communicate his or her desired maintenance customizations to the on-site project manager (PM) or the alternate PM at the commencement of work and at on-site COTR visits throughout the duration of the project.

2.3.1.3 Maximo

After implementing the maintenance requirements given by Maximo, the Government maintenance management system for machines in the CUP, and after working in the Boulder NIST CUP environment for a period of time, [Name of Proposed Contracting Company Owner] and/or qualified members of his staff will provide feedback on Maximo's preventive maintenance requirements (within a month of commencement of work).

If indicated repair or maintenance requires a piece of equipment to be shut down, the proposed contractor will notify the COTR 72 hours in advance of shutting down the machine so the COTR can inform all affected parties on the NIST campus and give them time to prepare for temporarily limited service.

2.3.1.4 Log Books

The proposed contractor's employees will keep log books on the results of inspections, testing, adjustment, and calibration for each machine in the CUP and make log book records available to the COTR on request.

2.3.1.5 Replacement Parts

The proposed contractor is a full-time professional utility plant manager and always carries on-hand minor replacement parts for maintenance of plant machinery from the many other plant maintenance and repair contracts he manages locally. [Name of Proposed Contracting Company Owner] has also had 41 years of experience maintaining utility plant machinery (his alternate has 20 years) and is accustomed to the need for minor part replacement of a wide variety and range of utility plant machinery.

2.3.1.6 Chiller and Cooling Tower Maintenance

To control the chemical makeup of cooling tower water so that mineral solids remain in solution and do not cause tank scaling or corrosion, or heat exchange problems, [Name of Proposed Contracting Company] will regularly test the cooling tower water and add biocides and other chemicals to adjust the water pH and minimize fouling and formation of algae.

The proposed contractor understands that the Government wishes a professional firm specializing in chillers to perform any indicated chiller (and associated equipment) maintenance and/or repair. Therefore, outside of cleaning the condenser and performing ordinary cleaning and maintenance of the cooling tower water by adding appropriate chemicals, [Name of Proposed Contracting Company] has retained a subcontractor that specializes in chiller maintenance and repair: [Name of Chiller Maintenance Company, Inc. (located at XXXX; Address; City, State and ZIP code)]. Our subcontractor will perform cleaning, maintenance, and repair on the evaporator side of the chiller.

2.3.1.7 Electrical Repairs

The proposed contractor can perform electrical adjustments and repairs on system controls in the CUP, and members of our staff have job experience with

a wide range of manufacturers' devices from Siemens, Carrier, Trane, and Staefa, to name a few. [Name of Proposed Contracting Company Owner] will ask only employees who have experience with a specific brand of electrical control to make the required adjustments or repairs on that brand. Because [Name of Proposed Contracting Company Owner] is a dealer for Reliable Controls, he can also provide expert and licensed training on any electrical repairs or adjustments needed for that brand.

2.3.1.8 Annual Repairs

On an annual basis, the proposed contractor will open boilers for the COTR to inspect, tune burners and submit tuning documentation, clean firesides and watersides on all operating boilers (the proposed contractor employs several staff with experience cleaning boilers), and clean the D.A./surge tank. [Name of Proposed Subcontractor] will clean the condenser side of operating chillers and the operating water cooling towers. The proposed contractor anticipates Government will inspect the work to accept or reject the completed annual repairs.

The [Name of Proposed Contracting Company] staffing plan for performing project implementation is addressed in the succeeding proposal section.

2.4 Contractor Staffing Plan

[Name of Proposed Contracting Company Owner] will be the project manager (PM). [Name of Proposed Alternate Project Manager] will be the alternate project manager. [Name of Proposed Human Resources Manager] will manage the Human Resources department and attend to the administrative requirements of the project.

The proposed contractor has arranged to staff the CUP with a minimum of two men per shift in addition to a third man—after regular business hours and on weekends and holidays—so that one mechanic will be available to leave the utility building during evening and graveyard shifts in order to answer service calls. This plan will leave two men inside the CUP at all times according to RFP requirements, one of them being the stationary engineer. The proposed contractor assumes that during the regular business hours of 8 a.m. to 5 p.m., Government staff will attend to customer service calls. Therefore, during the day shift, the proposed contractor will assign only two employees to work in the CUP and neither will ever leave the building. However, throughout 24 hours per day for 365 days per year, [Name of Proposed Contracting Company] will staff the CUP with qualified employees for the duration of the contract.

The project organization chart at the end of this section illustrates our staffing plan for this contract, including the role of our subcontractor.

2.41 Resumes and Certifications

The resumes and stationary engineer licenses of all proposed project personnel are provided in Appendix A. The [Name of Proposed Contracting Company Owner] has also provided a copy of his resume and stationary engineer license issued by the City and County of Denver.

2.4.2 Proposed Shift Breakdown

On all three shifts (8 a.m. to 5 p.m., 5 p.m. to 1 a.m., and 1 a.m. to 8 a.m.) on weekdays, the CUP will contain a licensed stationary engineer. During the first shift (8 a.m. to 5 p.m.), the CUP will hold two workers: a stationary engineer, acting as shift supervisor, and a mechanic. During the second shift (5 p.m. to 1 a.m.), the CUP will contain three workers: a stationary engineer, to act as shift supervisor, a mechanic, and a helper. Similarly, during the third shift (1 a.m.

to 8 a.m.) the CUP will also hold three workers: a stationary engineer, acting as shift supervisor, a mechanic, and a helper.

The proposed contractor employs three additional licensed stationary engineers [Names of Three Additional Contracting Company Stationary Engineers], and [Name of Proposed Contracting Company Owner] is also a licensed stationary engineer. These engineers will act as alternates to the stationary engineers who regularly work during the three shifts previously defined. They will also take turns working as shift supervisors in the CUP on weekends and holidays and will be compensated with overtime pay.

In addition to the proposed contracting company's mechanics who regularly occupy the CUP from 5 p.m. to 1 a.m. and 1 a.m. to 8 a.m., the proposed contractor employs two additional mechanics, [Names of Additional Mechanics]. These additional mechanics will serve as alternates to the regularly assigned mechanics and will also take turns working weekends and holidays. The proposing company's extra stationary engineers can also substitute for the required mechanics, if none are available during a particular shift, so that the CUP will retain a full complement of proposed contractor personnel at each shift.

The project organization chart at the end of this section illustrates our shift breakdown.

2.4.3 Maintenance Schedule

The maintenance schedule has been addressed in Section 2.3.1.2 as follows: [Name of Proposed Contracting Company Owner] will use the maintenance duties supplied in the maintenance warranty manuals of each machine in the Boulder NIST CUP and by Maximo, the Government maintenance management

system, as well as the suggested intervals of inspection, testing, and adjustment for each machine to create the maintenance schedule his staff will follow.

The proposed contractor also expects the COTR to communicate to the project manager (PM) or alternate PM any customizations of maintenance and scheduling the Government deems necessary at the commencement of work and at on-site visits throughout the duration of the project.

2.4.4 Chemical Testing Schedule

[Name of Proposed Contracting Company] customarily tests water in boilers and cooling towers once per shift, or every eight hours, and adds chemicals as needed to adjust the pH of the water.

2.4.6 Plant Equipment Systems Monitoring Plan

Unless otherwise specified by Maximo's maintenance schedule, manufacturer's warranty recommendations for individual machines, or special requests of the COTR, CUP plant equipment will be monitored daily during the course of routine inspection, testing, and maintenance to see if any adjustments, replacements, or calibrations are needed. The results will be logged and made available for Government inspection on a regular basis or at COTR request.