

**STATEMENT OF WORK
FOR
1250 TON TRANE CHILLER #2 REPAIR/REBUILD
VA PITTSBURGH HEALTHCARE SYSTEM**

DESCRIPTION:

Repair/Rebuild 1250 Ton Trane Chiller #2.

PLACE OF PERFORMANCE:

The VA Pittsburgh Healthcare System (VAPHS), University Drive, Building 8, Pittsburgh, PA 15240.

BACKGROUND:

The VA Pittsburgh Healthcare System, University Drive, 1250 Ton Trane Chiller #2 has reached operational hours that require manufacturer recommended maintenance. The #2 chiller is one of three chillers that provide chilled water for HVAC cooling systems throughout the facility.

SCOPE:

The contractor shall provide all labor, supplies, transportation, and equipment to repair/rebuild 1250 Ton Trane Chiller #2 for the VA Pittsburgh Healthcare System, University Drive Campus.

CERTIFIED TECHNICIANS:

Certified technicians are required in the performance of work under this contract. All testing and certifications shall be performed by Trane certified technicians.

PERFORMANCE REQUIREMENTS:

A. 1250 Ton Trane Chiller #2 Overhaul Service:

1. Removal of machine from service
2. Lock out and tagging out of machine
3. Recover refrigerant charge and record amount (recovery holding tanks provided by contractor).
4. Mobilization and setting up rigging for repairs.
5. Dismantling of chiller components and the centrifugal compressor.
 - Contractor shall provide all equipment and labor to remove condenser and evaporator tube sheet end caps.
 - Piping will be removed and reinstalled by VA staff.
6. Perform Eddy Current testing on Condenser and Evaporator (Includes Review results with customer of Eddy Current Analysis Report Reference Sub Part E).
7. Evaporator and Condenser Tube Sheet and End Caps Ceramic Repair and Epoxy Coating (Reference sub part D).
8. Inspection and verification of the inlet guide vane assembly, labyrinth seals, and the impellers compared to Trane specifications.

9. Removal of the compressor motor and on site replacement of the motor bearings and shaft seal.
10. Replace Chiller #2 Motor Core (Reference sub part B)
11. Cleaning and inspection of the lubrication system sump system component replacement including;
 - Oil Charge
 - Oil Filter
 - Oil/refrigerant filter
 - Oil/ refrigerant pump seal
 - Sump Sight Glass
12. Replacement of the economizer and liquid line flanges.
13. Reassembly of the centrifugal compressor, motor, oil sump, purge unit, auxiliary vapor and liquid lines, sight glasses. Provide and install all new Trane gaskets and O-rings.
14. Replacement of the 2nd stage vane bushing, bearings, shims, pins, and snap rings.
15. Rebuilding of the 1st and 2nd stage guide vane operator assemblies.
16. Rebuilding of the purge pump-out compressor.
17. Replace purge filter.
18. Installation of a Trane Rupture Guard Pressure Relief System.
19. Chiller evacuation and leak testing to Trane specifications.
20. Replace unit master control and panel display (Reference sub part A).
21. Charge chiller with recovered refrigerant.
22. Perform Chiller #2 Main Motor Starter Servicing (Reference sub part C).
23. Removal of locks and tags.
24. Start-up and operation check by certified Trane technician.
25. Perform vibration analysis upon completion of overhaul. Provide customer with the results.
26. Verification of operating parameters and adjustment of the chiller as per its original specifications.
27. Place machine back into service.
28. Demobilize and removal of rigging.
29. Required Contractor Reporting (Reference sub part E).

B. Cleanup and Disposal:

1. Housekeeping:
 - a) The contractor shall maintain a clean work environment, keeping surfaces in the area free of dust and debris. Dry sweeping or compressed air for cleanup is not authorized.
 - b) At the end of each work period, the contractor shall use a HEPA vacuum to ensure all dust and debris have been properly collected and contained for disposal.
 - c) If the COR and/or designated representative, finds the area unacceptable, the contractor, at his/her own cost, shall re-clean until acceptance is gained.
2. Disposal of Trash and Hazardous Waste:
 - a) The contractor shall be responsible for the cleanup and removal of all trash and debris from VA property after the Government's final acceptance of work.
 - b) The contractor shall comply with OSHA, EPA, the Department of Transportation (DOT), State, and all other applicable regulations governing the proper handling, disposal, and removal of all waste and debris.

SPECIFIC TECHNICAL REQUIREMENTS:

A. Replacement of Unit Master Control and Panel Display:

Unit control panel display

1. Inspection of chiller to validate operating condition.
 - Record present chiller operating configuration and logged data prior to replacing the Unit Master Control & Panel Display; reference sub part E.
2. Removal and salvage of existing control panel door and door mounted CenTraVac chiller controller.
3. Installation of new control panel door.
 - DynaView CenTraVac UC800 chiller controller, and power supply.
4. Installation of spring loaded mounting arm and AdaptiView color graphic operator display.
5. Use of Trane service tool to reformat existing chiller data into AdaptiView format and download to new chiller control.
6. Provide 4 hours of operator training on usage and features of new control system.

B. Replace Chiller #2 Motor Core:

Replace 1250 Ton Chiller #2's motor core with a remanufactured, exchanged core. The tasks shall include;

1. Disassemble the chiller
2. Remove the motor
3. Prepare the motor for shipping and ship to the factory
4. Replace the motor core with a refurbished core
5. Return the motor to the VA
6. Reinstall
7. Reassemble the chiller
8. Test

C. Chiller #2 Main Motor Starter Servicing:

Perform maintenance, cleaning, testing, and inspections on Trane Chiller #2, main motor starter.

1. Remove starter from service.
2. Lock out and tag
3. Remove contactor assembly from cabinet
4. Clean the contactor and cabinet.
5. Inspect wiring and connections for tightness and signs of overheating and discoloration.
6. Inspect fuses and fuse holders, and lubricate fuse jaw fingers
7. Check condition of the vacuum interrupters bellows
8. Meg ohm test the vacuum interrupters
9. Check vacuum interrupters for contact erosion
10. Inspect contactor operating linkages.
11. Verify operation of mechanical interlocks
 - Door interlock(s)
 - Contactor-to-Isolating Switch
 - Line Stab Insulating Shutter
12. Inspect auxiliary contacts and adjustment.

13. Reinstall contactor assembly back into cabinet
14. Test and verify operation of contactor
15. Place starter back into operation
16. Remove locks and tags
17. Perform Start-up and operational check of chiller

D. Ceramic Alloy Surface Repair and Epoxy Coating:

Prepare and install epoxy protective coating to #2 Chiller tube sheets, water boxes and end caps. To surface repair damaged and corroded tube sheet, prepare surfaces to receive protective epoxy coatings as per specifications.

Contractor will provide all materials, equipment, and labor to properly install product specified Enecon USA – CeramAlloy CP+AC and CeramAlloy CL+AC or equivalent (accepted upon COR review) to perform Ceramic Alloy Surface Repair Cladding Systems (Step 1) and Epoxy Coating (Step 2) as per the following procedure and specifications:

1. Ceramic Alloy and Epoxy Product Procedures:

- a) All tubes, tube sheets and water boxes must be dry prior to ceramic and epoxy coatings.
- b) Install dust collection and containment, and ensure safety requirements are established around all equipment.
 - Ensure all electronic and electrical equipment are protected from sand blasting dust.
- c) Protective rubber blasting plugs will be inserted into each tube end to protect them during abrasive blasting.
- d) Abrasive blast all surfaces being treated to obtain a suitable anchor profile to accept the high performance polymer systems being used.
- e) All rubber plugs will be removed and new coating plugs will be inserted into each tube end.
- f) The tube sheets, water boxes, and cover plates will be coated with Ceramic Alloy and Epoxy to "wet-out" all surfaces, being careful to wet-out the areas around the plugged tubes.
- g) Ceramic Alloy and Epoxy will be applied to all of the interior weld seams of the water boxes.
- h) Ceramic Alloy and Epoxy will be spatula applied to the tube sheets, building up the Alloy over the plugs.
- i) When the Ceramic Alloy is set up, the Alloy will be ground back to expose the plugs, which will then be removed.
- j) Ceramic Alloy Epoxy Coating will then be applied over all previously coated surfaces of tube sheets, water boxes and cover plates.
- k) Final treatment of Epoxy Coating will then be applied over all previously coated surfaces of tube sheets, water boxes and cover plates.
- l) QA & Demobilization

2. Ceramic Alloy Specifications:

A two-component, 100% solids, paste-type polymer with extensive global use for repairing, resurfacing and coating damaged HVAC components.

Typical Values Test Method:

- a) Compressive Strength 1,3500psi 945kg/cm² ASTM D-695
- b) Flexural Strength 8,500psi 595 kg/cm² ASTM D-790
- c) Izod impact Strength 1.3 ft lbs/in 0.69 j/cm ASTM D-256
- d) Hardness - Shore D 86
- e) Tensile Shear Adhesion
- f) Steel 4000psi 280kg/cm² ASTM D-1002
- g) Aluminum 2800psi 196kg/cm² ASTM D-1002
- h) Copper 2500psi 175kg/cm² ASTM D-1002
- i) Stainless Steel 4100psi 287kg/cm² ASTM D-1002

3. Epoxy Coating Specifications:

A two-component, 100% solids, viscous liquid polymer with extensive global use for repairing, resurfacing and coating damaged HVAC components.

Typical Values Test Method:

- a) Compressive Strength 1,3500psi 945kg/cm² ASTM D-695
- b) Flexural Strength 8,000psi 595 kg/cm² ASTM D-790
- c) Izod impact Strength 1.3 ft lbs/in 0.69 j/cm ASTM D-256
- d) Hardness - Shore D 85
- e) Tensile Shear Adhesion
- f) Steel 4000psi 280kg/cm² ASTM D-1002
- g) Aluminum 2500psi 196kg/cm² ASTM D-1002
- h) Copper 3000psi 175kg/cm² ASTM D-1002
- i) Stainless Steel 4100psi 287kg/cm² ASTM D-1002

E. Required Contractor Reporting:

- 1. A full detailed report shall be generated; the contractor shall provide the COR with three (3) hard copies at the conclusion of all performance requirements.
- 2. If there is a need for work to be performed beyond the scope of this contract, the contractor shall provide a written cost estimate for any work or materials at no additional cost to the Government.
 - The contractor shall **not** perform any work or make any purchases beyond the scope without approval from the Contracting Officer.

F. Testing and Acceptance:

- 1. All equipment shall be tested prior to the Government's final acceptance.
- 2. All hard copies of Commissioning, Performance, Testing reports, and all new equipment and control technical manuals, including specification documents, must be provided to the COR, or designated representative prior to the Government's final acceptance.
- 3. All Operator 4 hour training must be completed prior to the Government's acceptance.

EXCLUSIONS PROVIDED BY VAPHS:

- A. VA personnel will perform condenser and evaporator tube cleaning prior to eddy current testing and epoxy coating.
- B. VA personnel will provide the contractor with access to appropriate 110v electrical and water if necessary for the length of the project.
- C. A staging and operation area will be provided to the contractor for the gas/diesel compressor outside, near the building and adjacent to the work site.
 - Exact location will be provided by the COR upon commencement of work.
- D. Ground parking will be available to contractor personnel; limited to two (2) vehicles.

SPECIAL CONTRACTOR PROVISIONS:

A. Medical Screening Requirements:

- 1. The contractor shall ensure that all staff have been screened for tuberculosis (TB) with negative results, and evidence of TB screening have been transmitted to the COR prior to commencing any work on VA property.
- 2. The contractor will remove any staff that has not been screened until screening has been completed and approval has been given by the CO.

B. Training:

Training must be completed prior to the performance of the contract. Proof of training completion will be verified and tracked by the COR.

All contractor personnel must receive Privacy training annually using one of the following methods:

- a) Complete “VA Privacy Training for Personnel without Access to VA Computer Systems or Direct Access to or Use to VA Sensitive Information” training by using VA’s TMS system (<https://www.tms.va.gov/>). Contractors may use the TMS Managed Self Enrollment method to complete the training in TMS. The COR must ensure that all contractors are validated in the PIH domain.
- b) Complete the hard copy version of “VA Privacy Training for Personnel without Access to VA Computer Systems or Direct Access to or Use to VA Sensitive Information”.

C. Security Requirements:

- 1. While on VA property, all contractor personnel shall comply with the rules, regulations procedures governing the conduct of personnel and the operation of the facility.
- 2. Prior to the commencement of any work under this contract, upon arrival to the VA Medical Center, contractor personnel shall first check-in with VA Police to obtain an identification badge.

3. The contractor employee must safeguard the badge and immediately report if the badge is lost, stolen, or destroyed to the VA Police.
4. Contractor personnel shall properly display their identification badge at all times while on VA property so that their name and the company they work for can easily be seen.
5. All contractor personnel shall properly sign out with VA Police upon the completion of this contract.

D. Interference in Performance Requirements:

The following provisions shall be adhered to by contractor personnel throughout the duration of this contract:

1. Contractor may be required to interrupt their work at any time so as not to interfere with the normal functioning of the facility; e.g. utility services, servicing of fire protection systems, and the passage of facility patients/personnel, etc.
2. In the event of an emergency, contractor services may be stopped and rescheduled at no additional cost to the government.
3. Contractor personnel shall inform the COR of the need to gain access to secured areas. If access is required to secure areas, prearranged scheduling will be made by the COR.

E. Warranty:

All performance requirements shall come with a one year warranty (minimum).

F. Contractor Responsibilities:

1. The contractor shall be responsible for the actions of all individuals provided to work for the VA under this contract. In the event that damages arise for work performed by contractor provided personnel, the contractor shall be responsible for all resources necessary to remedy the incident.
2. The Contractor shall be responsible for ensuring all provided personnel are properly licensed to operate a motor vehicle if operating a motor vehicle on VA property is required.

PERIOD OF PERFORMANCE:

A. Performance Duration:

90 Days from Date of Award.

B. Performance Schedule:

All work shall be performed Monday through Friday (except Federal Holidays), 7:00 AM Eastern – 3:30 PM Eastern)

C. Contractor Performance Start:

1. All work will commence within 30 days of Contract Award.
2. If a site visit is required, the contractor shall coordinate a site visit with the COR or a designated representative of the Pittsburgh VA Medical Center Engineering Department.