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1.0 PURPOSE AND SCOPE

1.1 Purpose
This procedure provides instructions for a safe, uniform methods for performing maintenance and inspecting overall equipment condition on Evapco cooling tower 95C-E-1.

1.2 Scope
This procedure applies to semi-annual and annual maintenance as follows:
- Semi-annual: Section 5.1
- Annual: Section 5.2.

Cooling water pump 95C-P-1 is maintained by a separate procedure.

2.0 INFORMATION

2.1 Terms and Definitions
IH – Industrial Hygiene.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety
WARNING - The cooling basin tower is considered a confined space, Confined Space Hazard Identification (CSHID) ETF-CS-049, and failure to have IH evaluate the confined space per DOE-0360 prior to entry may result in personnel injury or death.

3.2 Radiation and Contamination Control
3.2.1 Work in radiological areas will be performed using a radiological work permit following review by Radiological Control per ALARA Work Planning procedure, TFC-ESHQ-RP_RWP-C-03.

3.3 Environmental Compliance
3.3.1 In the event of a spill/leak/release, notify the SOM/FWS and respond per ETF-ERP-85B-003, Emergency Spill or Release at ETF.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Belts for fan, as needed #6/B-144, Power Band, one per fan
- Tools for cleaning pan: scraper, shovel, broom, dust pan, wet and dry shop vac
- Grease and grease gun for fan bearings, Chevron SRI Grease NLGI 2 (MSDS/SDS #074601)
- Manlift to access top of cooling tower
- Sump pump to drain cooling tower, power cord and discharge hose.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- DOE-0336, Hanford Site Lockout/Tagout Procedure
- DOE-0360, Hanford Site Confined Space Procedure (HSCSP)
- ETF-95C-001, Cooling Water System Operation
- ETF-95C-003, Cooling Water Chemical Treatment System.

4.3 Field Preparations

4.3.1 ENSURE Operations personnel have configured system or equipment to allow performance of this procedure.

4.3.2 CONFIRM system has been isolated, hazardous energy released, and authorized worker requirements completed in accordance with DOE-0336.

4.3.3 ENSURE cooling tower sump is emptied per ETF-95C-001 when performing Annual maintenance step 5.2.
5.0 PROCEDURE

Special Instructions

Sections 5.1 and 5.2 may be performed in any logical order to accommodate time-specific maintenance.

Discrepancies found and corrective actions taken must be recorded on work record.

5.1 Semi-Annual Maintenance, for Fan 95C-F-1A or 95C-F-1B

5.1.1 CHECK drive unit for the following:
- Sheave alignment
- Sheave wear
- Belt wear
- Tension.

5.1.1.1 ADJUST/REPLACE unit depending upon wear.

5.1.2 CONFIRM tightness of locking collars on fan bearings.

5.1.3 CHECK fans and air inlet screens for general condition AND REMOVE any debris.

5.1.4 LUBRICATE fan bearings.

5.1.5 LUBRICATE fan motor.

5.1.6 GO TO Section 5.4, Acceptance Testing.
5.2 Annual Maintenance

5.2.1 IF directed by work package, PERFORM semi-annual maintenance (Section 5.1).

5.2.2 ENSURE the following in JB-95C001:

- The wiring is in good condition
- Terminations are tight
- Integrity of the junction box is good.

**WARNING**

The cooling basin tower is considered a confined space, Confined Space Hazard Identification (CSHID) ETF-CS-049, and failure to have IH evaluate the confined space per DOE-0360 prior to entry may result in personnel injury or death.

5.2.3 ENSURE Hanford Confined Space Entry permits are completed prior to entry.

**Pan and Strainers**

5.2.4 CLEAN debris from spray pan.

NOTE - Strainers should be left in place to prevent sediment from re-entering system.

5.2.5 REMOVE scale AND SWEEP pan.

5.2.6 PLACE debris in bucket for inspection by Design Authority.

5.2.7 CLEAN pan strainer.

5.2.8 INSPECT manhole cover gaskets AND RECORD in work package if one or both need to be replaced.

5.2.9 REQUEST Operations refill cooling tower with water only (no chemicals).

5.2.10 CLOSE access doors.
5.2 Annual Maintenance (Cont.)

NOTE - Maintenance on spray nozzles is optional.

Spray Nozzles

5.2.11 IF cooling tower operational characteristics are acceptable, GO TO Section 5.4.

5.2.12 REQUEST Operations remove hazardous energy controls AND START pump 95C-P-1.

5.2.13 CHECK spray nozzles for unobstructed flow.

5.2.14 CHECK spray nozzles for proper spray pattern AND ADJUST instrument return line (Figure 1).

WARNING

The cooling basin tower is considered a confined space, Confined Space Hazard Identification (CSHID) ETF-CS-049, and failure to have IH evaluate the confined space per DOE-0360 prior to entry may result in personnel injury or death.

5.2.15 ENSURE Hanford Confined Space Entry permits are completed prior to entry.

5.2.16 IF nozzles require cleaning or adjustment, PERFORM the following:

5.2.16.1 STOP work.

5.2.16.2 INSTALL scaffolding and/or fall protection to clean/replace nozzles.

5.2.16.3 REQUEST Operations apply hazardous energy controls per DOE-0336.

5.2.16.4 CLEAN nozzles.
5.2 Annual Maintenance (Cont.)

5.2.17 REQUEST Operations remove hazardous energy controls AND START cooling water pump.

5.2.17.1 CONFIRM the following:
- Nozzles flow freely
- Spray pattern is correct.

5.2.17.2 REMOVE any scaffolding and/or fall protection.

5.2.17.3 CLOSE access doors.

5.3 Restoration

5.3.1 RESTORE to as-found conditions.

5.3.2 INFORM SOM test is complete and instrument/equipment/system may be returned to service.

5.3.3 FWS ENSURE all cancelled confined space permit(s) are sent to the WRPS confined space SME.

5.4 Acceptance Testing

5.4.1 REQUEST Operations return system to normal operating conditions and ensure system is functioning properly per ETF-95C-001.

NOTE - Steps 5.4.2 and 5.4.3 may be waived during winter months (October through March) due to lack of heat loading. Fans will not normally be running.

5.4.2 CHECK fans for excessive noise or vibration.

5.4.3 CONFIRM no leakage around access doors when fans and spray are operating.
5.5 Review

5.5.1 INFORM FWS test is complete.

5.5.2 (FWS) REVIEW AND ENSURE the following:
- Comments sections are filled out appropriately
- Work requests needed as a result of this procedure are identified and generated
- Work request number(s) of any work documents generated as a result of this procedure, are recorded in the comments/remarks section of the data sheet.

5.6 Records

This procedure is performed within a work package, as such, the procedure in its entirety will be maintained as a record per the Work Control process.

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
Figure 1 - Spray Nozzle Distribution