Inspect Quik Water Heater for Calcification

Tank Farm Maintenance Procedure

USQ # Routine Maintenance

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for inspecting and cleaning of the Quik Water heater for calcification.

1.2 Scope

This procedure involves the inspecting and cleaning of the Quik Water heater tank.

2.0 INFORMATION

2.1 General Information

None
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Job-specific protective equipment requirements should be addressed during the pre-job brief and be in accordance with TFC-ESHQ-S_IS-C-02.

3.1.2 Follow electrical safety practices outlined in the Lockout/Tagout Program.

3.1.3 If a lock and tag is required during the performance of this procedure, comply with the Lockout/Tagout Program.

3.2 Radiation and Contamination Control

Work in radiological areas will be performed using a Radiological Work Permit following review by Radiological Control per the ALARA Work Planning procedure TFC-ESHQ-RP_RWP-C-03.

3.3 Environmental Protection

In accordance with TFC-ESHQ-ENV_RM-C-04, Water Discharge in Tank Farms, routine maintenance activities and operation activities may result in small incidental discharge of raw water as long as the below listed limits and conditions are met. Refer to TFC-ESHQ-ENV_RM-C-04, Table 2, for the listing of approved incidental discharges.

- Appropriate best management practices shall be implemented to prevent unnecessary discharges.
- During performance of the work, all measures to limit ponding and/or erosion will be implemented.
- Each discharge must be less than 150 gpm instantaneously, except industrial storm water and water line flushing.
- Minimize discharged solids with strategically placed filters (e.g., screen) if appropriate. Filtering the wastewater is one BMP that should be evaluated by the responsible person. This BMP might or might not be appropriate. If the wastewater quality can be moderately increased with minimal effort, such as filtering, the appropriate BMPs should be implemented.
4.0 PREREQUISITES

4.1 Special Tools, Equipment and Supplies
- U-tube manometer/Low pressure gauge
- Other tools, equipment and supplies as identified by Shift Manager/OE/FWS/User.

4.2 Performance Documents

The following documents may be needed to perform this procedure:
- Quik Water Installation and Operation of Quik Water Heaters User’s Manual, IOM_VERSION 1.07
- Quik Water Heater Maintenance, User’s Manual

4.3 Field Preparation

4.3.1 REQUEST operations configure system to allow performance of this procedure.
5.0 PROCEDURE

5.1 Back Pressure Inspection

5.1.1 CONNECT manometer/low pressure gauge to fitting located just above the flange of the vertical tower. (See Figure 1)

5.1.2 CHECK back pressure with heater running AND RECORD observed back pressure value in "As-Found" column of Data Sheet.

5.1.3 IF “As-Found” observed back pressure readings were within tolerance, GO TO Restoration, Section 5.3,

OR

IF “As-Found” observed back pressure readings were out of tolerance, GO TO Calcium Build-Up Inspection, Section 5.2.
5.2 Calcium Build-Up Inspection

5.2.1 ALLOW heater to cool below 100°F by verifying reading on local temperature display.

5.2.2 SHUT OFF electrical main disconnect AND LOCK AND TAGOUT disconnect.

5.2.3 DISCONNECT manometer/low pressure gauge from fitting.

5.2.4 OPEN the lower access port on the vertical tower. (See Figure 2)

5.2.5 CHECK for calcium build-up on thermal transfer (packing) rings. (See Figure 2)

5.2.6 RECORD observed calcium build-up on “Comments” section of Data Sheet.

5.2.7 INSPECT stainless steel packing rings at least 4” in from the outside layer for calcium build-up. (Calcium build-up may not be evident on the outside layer).
5.2 Calcium Build-Up Inspection (Cont.)

5.2.8 RECORD observed calcium build-up on “Comments” section of Data Sheet.

5.2.9 REMOVE some stainless steel packing rings closest to access port AND EXAMINE packing rings closest to the center for calcium build-up.

5.2.10 RECORD observed calcium build-up on “Comments” section of Data Sheet.

5.2.11 REPLACE stainless steel packing rings.

5.2.12 OPEN the upper access port on vertical tower. (See Figure 2)

5.2.13 INSPECT the bottom side of the mist eliminator (mesh pad) for calcium build-up (Located below stack opening). (See Figure 2)

5.2.13.1 INSPECT mist eliminator (mesh pad) for calcium build up.

5.2.13.2 REMOVE AND CLEAN mist eliminator (mesh pad) at system engineer request.

5.2.13.3 RE-INSTALL mist eliminator (mesh pad).

5.2.14 LOOK in the cleaning port on the firing chamber for calcium build-up.

5.2.15 EXAMINE lower spray nozzles through port on vertical tower or access port on tank to for the following:

5.2.15.1 CHECK lower spray nozzles for calcium build-up.

5.2.15.2 CHECK lower spray nozzles for metal corrosion.

5.2.16 RECORD observed calcium build-up on “Comments” section of Data Sheet.

5.2.17 EXAMINE upper spray nozzles through port on vertical tower or access port on tank to for the following:

5.2.17.1 CHECK upper spray nozzles for calcium build-up.

5.2.17.2 CHECK upper spray nozzles for metal corrosion.

5.2.18 RECORD observed calcium build-up on “Comments” section of Data Sheet.
5.2 Calcium Build-Up Inspection (Cont.)

5.2.19 REMOVE access cover to water tank.

5.2.20 CLEAN access cover.

5.2.21 INSPECT the bottom of water tank for excessive signs of sediment.

5.2.22 RECORD observed sediment build-up on “Comments” section of Data Sheet.

5.2.23 INSPECT upper and lower level probes inside water tank for signs of calcium build-up.

5.2.24 RECORD observed calcium build-up on “Comments” section of Data Sheet.

5.2.25 IF inspection reveals calcium deposits on any components that deem it unsatisfactory, RECORD findings on “Comments” section of Data Sheet AND

REPORT findings to System Engineer.

5.2.26 IF inspection reveals there is not enough calcification on any components to require cleaning, RECORD findings on “Comments” section of Data Sheet AND

GO TO Restoration, Section 5.3.
5.3 Restoration

5.3.1 **IF** any problems were encountered performing inspection, **INFORM** FWS.

5.3.2 **CLOSE** the following:
- access ports on vertical tower
- water tank access cover.

5.3.3 **CHECK** equipment restoration by observing indications are consistent with expected conditions.

5.3.4 **NOTIFY** operations that testing is complete and system may be returned to desired configuration.

5.4 Acceptance Criteria

Acceptance Criteria has been met when steps in this procedure have been satisfactorily performed and As-Left values meet the specifications and tolerance(s) per the Data Sheet.

5.5 Review

5.5.1 **INFORM** FWS test is complete.

5.5.2 FWS **REVIEW AND ENSURE** the following:
- Completed Data Sheets meet the acceptance criteria
- 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

The performance of this procedure generates no records. However, PM Data Sheets associated with the procedure, are records and are maintained in the work package as record material.

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-C-02 or other applicable requirements.
Inspect Quik Water Heater for Calcification

Figure 1 - Quik Water Test Port

Manometer Test Port

Tank Access Cover

Water Tank
Inspect Quik Water Heater for Calcification

Figure 2 - Quik Water Model 2500 General Arrangement Diagram

- Vertical Tower
- Upper
- Packing Access Ports
- Lower
- Rear Lower Drain
- Mist Eliminator-Mist Pad (Below Stack Opening)
- Upper Spray Nozzle
- Stack Opening
- Thermal Transfer (Packing) Rings
- Lower Spray Nozzle
- Firing Chamber
- Water Tank
- Level Probes
- Transfer Pump
- Recirculation Pump