

TECHNICAL SPECIFICATION
FOR
NS UNIT 3 HIGH ENERGY PIPING
NON DESTRUCTIVE EXAMINATION
Fall 2021 Outage
PWO 30703344
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1.0 **General**

1.1 **Scope Of Work**

The scope of work is to perform NDE of the welds and components on the NS 3 Main Steam, Hot Reheat, and Cold Reheat, and Extraction Steam to FWH #3 Piping systems and NDE of the NS 3 Hot Reheat Outlet Headers, tube welds, and moment Restraints, and NS3 High Temp Super heater Outlet Header NDE of an existing Indication.

- 1.2 The NDE will be performed during the 45 day NS 3 Outage which starts on 10/28/21 and ends on 12/12/21.

2.0 **Work To Be Provided By Contractor**

The following summarizes the materials and/or work to be provided by the Contractor:

- 2.1 The Contractor shall perform the NDE specified in Sections 4, 5, and 6 of this specification and the attachments.
- 2.2 The Contractor shall provide calibration blocks required for the Phased Array Ultrasonic Testing. JEA does not have Calibration Blocks for the NS 3 High Energy Piping to provide to the NDE Contractor.

3.0 **Work To Be Provided By JEA**

- 3.1 The JEA will provide the 120 Volt power required for tools and inspection equipment.
- 3.2 The JEA's Scaffolding Contractor **Safeway** will furnish and install all of the scaffolding or platforms required to access the piping welds in order to perform the NDE and replications.
- 3.3 The JEA's Insulation Contractor **Unitherm** will remove piping covering and insulation as necessary to allow the Contractor to perform the NDE and replications.
- 3.4 A JEA Mechanical Contractor shall make all surface preparations required to perform the NDE

4.0 **NS-3 Hot Reheat Outlet Header & Tube Weld Inspection**

- 4.1 The Contractor shall take 8 replicas on the NS-3 Hot Reheat Outlet header at locations R32, R34, R35, R37, R39, R45, R46, & R48 as shown on Attachment 8 Reheater Outlet Header Replication Locations.
- 4.2 The Contractor shall inspect the welds on the NS 3 Hot Reheat Outlet Header Moment Restraints using Wet Fluorescent Magnetic Particle methods. The NS 3 Hot Reheat Outlet Header Moment Restraint drawing is shown in Attachment 7.
- 4.3 The Contractor shall inspect the 8 circumferential welds and two tee welds on the NS 3 Reheat Outlet headers which are 26" ID x 2" Min Wall, SA 335 P22 and are shown on Attachment 11.
- 4.4 The NDE Contractor shall take 10 diameter measurements of the NS-3 Hot Reheat Outlet Headers.
- 4.5 The NDE Contractor shall perform Penetrant Testing (PT) and Linear Phased Array UT on the 559 tube welds (7 tubes x 80 elements- 1 failed tube) at Location "Y" as shown on Attachment 9. This tube weld is a dissimilar metal weld: 2"OD x .203" wall SA-213 T22 welded to 2"OD x .203" wall SA213 TP347H.

The 80 Reheater elements are on 9" centerlines which results in only 7" of space between the elements. The vertical centerline distance from the bottom tube to the top tube is 27" as shown in Location Y on Attachment 9. The spacing between the tubes is 2 1/2" This will make access to the upper tubes very difficult and time consuming. The visual portion of the PT will need to be mostly done with mirrors.
- 4.6 The NDE Contractor shall perform magnetic particle testing (MT) where the 559 tubes are welded to the reheat outlet headers, and shall perform Linear Phase Array UT on the 3 1/4' long tube stub welds on all 559 tubes shown in Attachment 9. The reheat tubes are 2" OD x .203" wall SA-213 T22.

5.0 **NS-3 HTSH Outlet Header Inspection**

- 5.1 The HTSH outlet header has four (4) moment restraint plates welded to the header. Each restraint has two welds, one on the east side and one on the west side. The restraint welds are numbered 1 through 8 progressing east to west. A one 1" long linear indication was discovered on HTSH Outlet Header Restraint Weld 5 during fall 2020 Outage and surface grinding did not remove indication. The 1" long indication is to be repaired during the fall 2021 outage by a JEA Weld Repair contractor.

The NDE Contractor shall provide NDE services to assist the JEA Weld Repair Contractor during the grinding out and weld repair of the 1" long linear indication.
- 5.2 The NDE Contractor shall take 10 diameter measurements of the NS-3 HTSH outlet Header.

6.0 NS-3 High Energy Piping NDE

6.1 The Contractor shall perform the NDE Items shown in Attachment 4 NDT Recommended List for the following NS 3 HEP systems:

- Main Steam – NDE Items No. 1 thru 27, with the exception of Items 3, 4, 18, & 19 which were inspected during a Fall 2020 Outage and do not require re-inspection.
- Hot Reheat –NDE Items 1 thru 30
- Cold Reheat- NDE Items 1 thru 22
- Extraction Steam to FW Heater 3- NDE Items 1 thru 9

6.2 The Contractor shall provide calibration blocks required for the Linear Phased Array Ultrasonic Testing. JEA does not have Calibration Blocks for the NS 3 High Energy Piping to provide to the Contractor.

7.0 Evaluation and Report

7.1 The Contractor shall review and evaluate the replications to determine the stage of creep damage and assess the remaining useful life of the components.

7.2 The Final Report shall include UT reports, WFMP reports, Replication Slides and a summary of the inspection findings and recommendations for future action and re-inspection requirements. The Contractor shall provide 2 copies of the final report and submit a digital copy in pdf format.