From: Jon Hopkins NRR
To: Coffin, Stephanie; Cullen, William, Hiser, Allen, Lee, Andrea, Long, Steven; Wichman, Keith
Date: 9/20/02 12:48PM
Subject: Fwd: Sample Plan Phase 3

CC: Mendiola, Anthony

From: <mkleisure@firstenergycorp.com>
To: <jbh1@nrc gov>
Date: 9/20/02 11:38AM
Subject: Sample Plan Phase 3

Jon-

Here's an electronic copy of the Phase 3 Sample Plan, which I faxed to you last week. I tried to email it to you last week, but it was too large to make it through your email server. I reduced the resolution of the two figures to drastically reduce the size of the file

(See attached file: Sample Phase 3 09-12-02.doc)

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09/12/02 (Supercedes previous revision dated 7/15/02)

Davis-Besse Reactor Head Sample Characterization

Phase 3

The Phase 3 Sample Plan detailed herein reflects.

1. *The discussions held at the June 17, 2002 meeting in Lynchburg, Virginia between the NRC, FENOC, Framatome ANP, and BWXT,*
2. *The telephone conference between NRC, FENOC and Framatome ANP on July 15, 2002; and*
3 *The telephone conference between NRC, FENOC, Framatome ANP, and BWXT on September 11, 2002*

Sample Analyses

Analyses are proposed to be performed on the following Sample IDs:

Sample ID
Nozzle 2
Nozzle 3
Nozzle 3 Corrosion Area

The task sequences for each individual piece are listed below in a logical fashion, however, tasks may be performed in parallel provided that the designated HOLD POINTS are complied with. With the exception of the activities bounded by the HOLD POINTS, no tasks require additional NRC or FENOC personnel concurrence to proceed.

Step 1.Nozzle 2

(a) Perform a visual inspection and document with photographs.

(b) If necessary, decontaminate the nozzle and flange; collect loose corrosion products in a traceable plastic bag(s).

(c) Perform a visual inspection of the nozzle and document with macro photographs.

Step2.Nozzle 3

(a) Perform a visual inspection and document with photographs.

(b) If necessary, decontaminate the nozzle and flange; collect loose corrosion products in a traceable plastic bag(s).

09/12/02 (Supercedes previous revision dated 7/15/02)

(c) Make two transverse cuts through the nozzle at the 1" and 3.5" distances from the bottom of the nozzle (near the J-groove weld end). The remainder of the nozzle is to be stored in the original shipping container. Additional work on the two rings, hereinafter referred to (by length) as the 1" ring and 2.5" ring, is described below.

(d) Document the 2.5" ring with photographs.

NOTE

The shipping of the 2.5" ring to ANL releases it from the Davis-Besse Quarantine List.

(e) Ship the 2.5" ring to Argonne National Laboratory (ANL) for additional testing (shipping information to be provided by NRC personnel). The ANL testing is not part of the work scope described herein.

(f) Perform fluorescent penetrant testing (PT) on the 1" ring.

HOLD POINT

Obtain FENOC and NRC personnel concurrence of the plans for additional analyses of the 1" ring.

(g) Details of further analyses of the 1" ring will be provided in a later revision of this document.

Step 3.Nozzle 3 Corrosion Area

(a) The first mold of the cavity was successfully performed with FENOC and NRC personnel concurrence on June 14, 2002.

(b) The second mold of cavity (intended as a backup) was successfully performed with FENOC and NRC concurrence on June 27, 2002.

(c) A mold of the stainless cladding from the underside (RCS side) of the cavity was successfully performed with FENOC and NRC personnel concurrence on June 27, 2002.

09/12/02 (Supercedes previous revision dated 7/15/02)

(d) Make cuts #1, #2, and #3 as shown on Figure 1. All three cuts will be about 0.5" minimum outside the cavity walls. The resulting four pieces will be designated as Block A, B, C, and D. Block A contains the cavity; Blocks B and C are the "moon" pieces from cuts #1 and #2; Block D is from cut #3 and contains the CRDM Nozzle 11 bore and the remaining J-groove weld.

(e) Perform fluorescent PT on the #1, #2, and #3 cutting faces on the side of Blocks B, C, and D. The objective is to look for de-bonding between the stainless steel cladding and the low alloy steel of the RV head.

(f) Perform microhardness tests on one of the "moon" pieces (Block B or C). The microhardness tests are to traverse across the stainless steel cladding thickness, into the low alloy steel heat affected zone (HAZ), and the unaffected base metal in a line perpendicular to the stainless steel cladding.

NOTE

The shipping of the portion of Block D to ANL releases it from the Davis-Besse Quarantine List.

(g) Make cut #4 approximately 0.5" above the J-groove weld on Block D (containing the CRDM Nozzle 11 bore). Ship the portion of Block D containing the J-groove weld to ANL for additional testing (shipping information to be provided by NRC personnel). The ANL testing is not part of the work scope described herein.

(h) Perform two tension tests on the stainless cladding removed from either "moon" piece (Block B or C). Remove both specimens from the same area, with one specimen being machined from the cladding near the carbon steel interface (top specimen), and the other specimen from the cladding near the surface in contact with RCS (bottom specimen). The cuts for both specimens shall be made perpendicular to the direction of travel of the cladding weld machine. Nominal specimen dimensions in reduced area are 0.080" x 0.200" and are approximately 1.5" to 2.0" long. Perform both tensile tests at 600 °F.

(i) Prepare the CRDM Nozzle 3 J-groove weld surface and perform fluorescent PT of all accessible surfaces of the J-groove weld for cracking.

(j) Make cut #5 on Block A (containing the cavity) at approximately 2" above and parallel to the stainless-steel cladding. After the cut, the lower part

09/12/02 (Supercedes previous revision dated 7/15/02)

(containing the stainless-steel cladding) of Block A is hereinafter designated "Block A2" and the upper part "Block A1". Perform thickness measurements of the exposed stainless steel cladding in a 0.5" grid pattern.

09/12/02 (Supercedes previous revision dated 7/15/02)

(k) PT the underside (RCS side) of Block A2, in the area corresponding to the exposed cladding on the upperside. The purpose of this PT is to look for signs of any cracking on the underside, including any cracks on the upperside that extend to the underside, creating a leak path. Prior to the PT, an attempt will be made to remove the white markings (dots) on the underside of Block A2 with chemical solvent. Mechanical means of removing these dots or surface preparation will not be used.

(l) Make Cut #6 in Block A2 (see Figure 2). This cut line is well outside the corrosion cavity wall. This trimming will facilitate the examination of the exposed cladding surface by stereo microscope (see next step).

(m) Perform a full (to the extent practical) stereovisual inspection of the entire exposed cladding surface area on the upperside of Block A2.

HOLD POINT

Obtain FENOC and NRC personnel concurrence of the plans for additional analyses of Block A2.

(n) Details of further analyses of Block A2 will be provided in a later revision of this document.

(o)

Control of Samples

Currently, the three Sample IDs, i.e., CRDM Nozzle 2, CRDM Nozzle 3 and the Nozzle 3 Corrosion Area cutout (which includes the Nozzle 11 bore), are being stored at BWXT.

Traceability of the Sample IDs, and portions thereof, will be maintained. Each sample will be identified either by a sample identification on the sample itself or a sample identification on a container or a plastic bag. Only one sample will be allowed in a container or in a plastic bag. The inventory of the samples and the specific location of

09/12/02 (Supercedes previous revision dated 7/15/02)

each sample will be documented in a project logbook maintained by the vendor test facility.

09/12/02 (Supercedes previous revision dated 7/15/02)

HOLD POINT

Prior to proceeding with the disposal of samples, the current status will be discussed with the NRC staff.

No samples or materials will be disposed of without FENOC authorization. Samples will be retained until released from quarantine.

Schedule

Upon request, reasonable advance notice will be provided to allow NRC or FENOC personnel to have the opportunity to witness the actual testing (site-specific radiological worker training may be required).

A final report will be provided to FENOC approximately four weeks following completion of the laboratory work. This report will provide a detailed description of the material samples, a detailed description of the analytical techniques utilized, and the results.

09/12/02 (Supercedes previous revision dated 7/15/02)

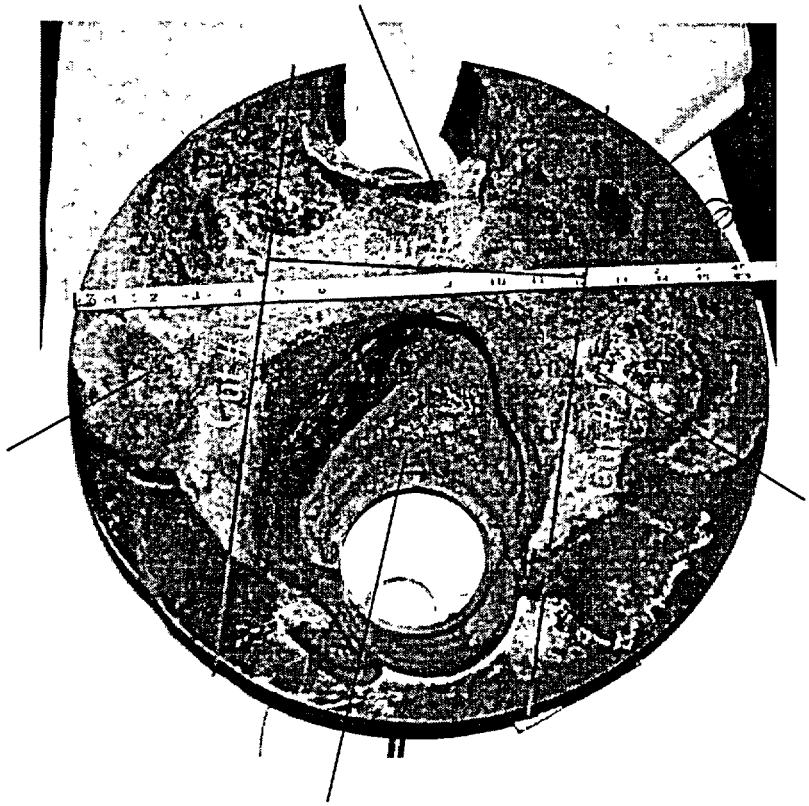

Figure 1. Section Plan for the Nozzle 3 Corrosion Area Cutout

09/12/02 (Supercedes previous revision dated 7/15/02)

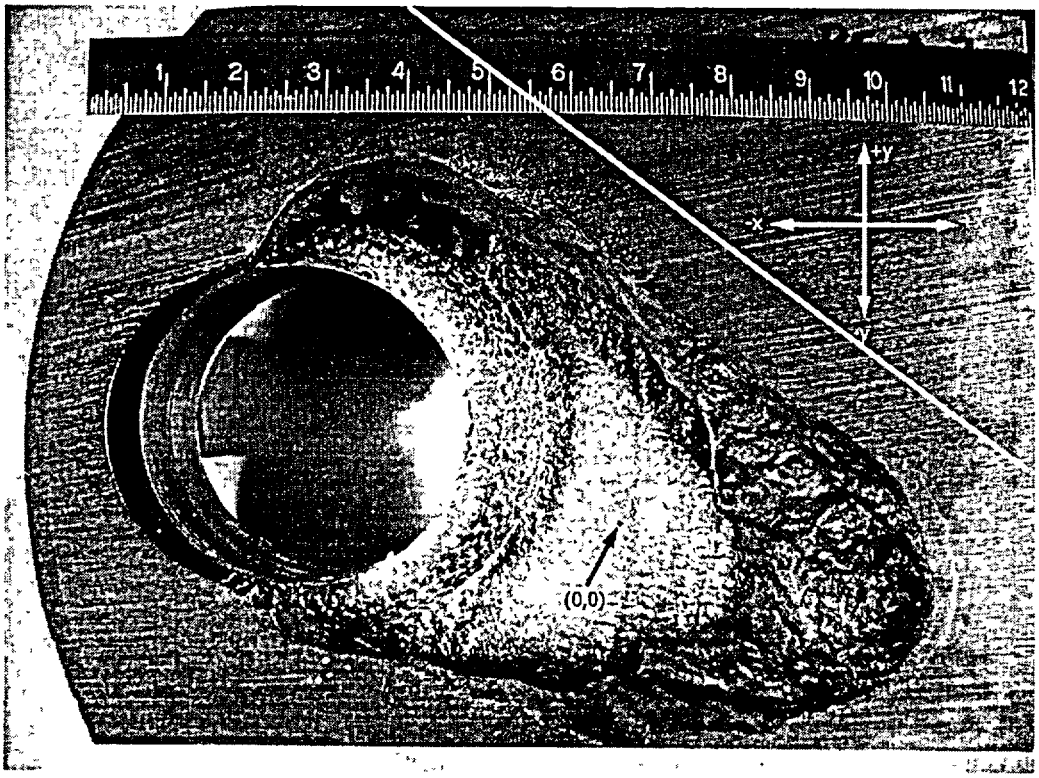

Figure 2. Trimming of Block A2