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Michael J. Colomb  
Site Executive Officer

October 18, 2000  
JAFP-00-0243

United States Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Station P1-137  
Washington, DC 20555

**SUBJECT: James A. FitzPatrick Nuclear Power Plant  
Docket No. 50-333  
Basis For Not Expanding Weld Inspections During Refuel Outage 14**

Dear Sir:

During James A. FitzPatrick Refuel Outage (RO) 14, weld inspections conducted in accordance with the plant's Inservice Inspection (ISI) Program identified indications of Intergranular Stress Corrosion Cracking (IGSCC) on the Control Rod Drive (CRD) nozzle cap. The Authority has reviewed the requirements for weld examination sample expansion delineated in the Safety Evaluation Report (SER) for the BWRVIP-75 as well as the requirements in Generic Letter 88-01.

Based on this review, the Authority does not believe an expanded weld examination sample is required. The technical basis for this conclusion is presented in Attachment I.

Very Truly yours,

A handwritten signature in black ink, appearing to read 'M. J. Colomb'.

Michael J. Colomb

STATE OF NEW YORK  
COUNTY OF OSWEGO

Subscribed and sworn to before me  
this 18<sup>th</sup> day of October 2000.

MJC:MA:las

Cc: next page

MARY LU MORIARTY #4965820  
Notary Public, State of New York  
Qualified in Oswego County  
Commission Expires April 30, 2002

A047

**Cc: Regional Administrator  
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**REFERENCES:**

1. Engineering report JAF-RPT-MULT-01120, Revision 3
2. NRC SER to BWRVIP-75 dated 9/15/00
3. JAF-ICD-MULTI-04187, "IGSCC weld inspections using the NRC SER on BERVIP-14 for refueling outage 14".
4. NRC Generic Letter 88-01 and Supplement 1

**CATEGORY D WELD INSPECTIONS**

The IGSCC inspection plan for category D welds during refueling outage 14 (current outage) that includes the CRD Cap (N9-C1) is based on the NRC SER to BWRVIP-75 dated 9/15/00. Within the JAF IGSCC program (Engineering report JAF-RPT-MULT-01120, Revision 3) there is a total of 28 Category D welds. Prior to issuance of the NRC SER on BWRVIP-75, the JAF IGSCC inspection program scheduled the examination of these welds in accordance with NUREG 0313 and NRC GL 88-01, which required an inspection frequency of 100% every 2 refueling outages or 4 years.

Fourteen of these twenty eight welds were inspected in the previous refueling outage, R13 which occurred in the Fall of 1998.

**R14 INSPECTIONS USING BWRVIP-75**

The SER for BWRVIP-75, allows JAF to change the frequency of inspection from 100% every 2 refueling outages to 100% every 3 refueling outages. This resulted in a reduction of 7 weld inspections from the originally planned IGSCC inspection scope of 14 for refuel outage R14. It should be noted that no credit was taken for Hydrogen Water Chemistry (HWC) or Noble Metal Chemical Addition (NMCA) in this evaluation for the inspection schedule being conducted during R14.

**CRD CAP INSPECTION RESULTS**

The CRD cap (N9-C1) was inspected as part of the Category D inspection scope for this outage. This inspection identified IGSCC indications. This weld is a RPV nozzle to an Inconel 600 cap with Inconel 182/82-weld material. This material is susceptible to IGSCC. In addition, moderate hydrogen water chemistry or NMCA does not protect this weld due to its location in the Reactor Pressure Vessel. The cap was installed via a plant modification in 1983 as a result of IGSCC cracking in the CRD return line.

**PROGRAM EXPANSION REQUIRED BY NRC SER FOR BWRVIP-75**

Page 8 of the NRC SER for BWRVIP-75 requires that program expansion be performed in accordance with NRC GL 88-01. BWRVIP-75 SER Appendix A, page 4 details the sample expansion, which reads as follows: *This additional sample should be similar in distribution (according to pipe size, system, and location) to the original sample, unless it is determined that there is a technical reason to select a different distribution.*"

NRC Generic Letter 88-01, Supplement 1, discusses the expansion of Category D welds. The following is an excerpt from Generic Letter 88-01 Supplement 1; *Sample expansion is required if Category D welds are examined on a sampling basis each inspection and cracking is identified during examination. With adequate justification the sample expansion for Category D welds may be limited to the piping system where cracking was found.*

**EVALUATION**

A review of the Category D welds show that 26 of the 28 welds are in the following systems, which receive protection from HWC and NMCA. JAF has been on low hydrogen water chemistry since January 1989 and applied NMCA in November 1999.

Welds partially protected by hydrogen water chemistry

- 12 Safe end to nozzle welds on the Reactor Recirculation System.
- 8 Jet Pump Instrument (JPI) nozzle and assembly welds, which are protected by hydrogen water chemistry via injection through the drain line.
- RHR welds (3 on each loop) which are open to the Reactor Recirculation system via a TEE configuration due to leakage through the RHR check valves which allows mixing with a stagnant flow area.

Welds not protected by hydrogen water chemistry

- N9-C1 (CRD cap – Inconel 600 cap with Inconel 182/82 weldment). This is the only weld in this system.
- N-5A-SE (Core Spray A safe end). This is the only weld in the Core Spray system that contains Inconel 182 weld metal.

Note: The "B" Core Spray safe end has been replaced with resistant materials in the safe end and welding material. This is a category A weld.

Welds N9-C1 and N-5A-SE were selected for inspection this outage as the welds are not protected by HWC or NMCA.

## R14 INSPECTIONS

Seven welds were deferred from refueling outage based on the NRC SER to BWRVIP-75. These are 3 RHR welds (B loop), 3 Jet Pump Instrument (JPI) A loop welds and the safe end N-2F-SE. These were all inspected in R12 and are currently scheduled for R15. JPI welds on the B loop and RHR A loop were inspected in R13 with no IGSCC indications. All of these welds receive some protection from hydrogen water chemistry.

As part of this outage scope, 5 Reactor Vessel safe end to nozzle weld inspections (4-12" and 1-28") were completed with no IGSCC indications.

The Core Spray "A" safe end was inspected on 10/18 and the data is currently being reviewed.

The CRD nozzle inspections conducted during the R14 refueling outage utilized improved equipment, to enhance the inspection parameters applied versus the equipment used in past examinations. These techniques were not used in the previous examination during R12 (fall 1996). The enhancements in equipment included radius fitted probes for the longitudinal wave circumferential and axial scans of the small-bore nozzle/cap configuration (5 ¼" OD diameter). One very important observation made during the performance of the initial and subsequent evaluations conducted was the fact that the longitudinal wave probes without radius shoes could not discriminate the flaw at the weld metal interface.

## TECHNICAL JUSTIFICATION

Based on a review on the SER on BWRVIP-75 and NRC GL 88-01 no sample expansion is required. The following is the justification:

- The CRD cap is the only weld in this system that falls under the IGSCC *program and the only weld in the IGSCC program that contains Inconel 600 (cap material)*. Note that no cracking was found in the Inconel 182/82 weld metal.
- The Core Spray "A" safe end is the only other Category D weld that does not receive some protection from hydrogen water chemistry due to its location in the vessel. This weld has been inspected and the data is being evaluated this refueling outage.
- All other welds in the Category D population were inspected at least once in refueling outage 12 (1996) and refueling outage 13 (1998).
- Of the seven welds in during the current refueling outage (R14), only one exhibited IGSCC cracking.
- It is noteworthy that 5 safe end to nozzle welds were inspected this outage with no cracking noted in the Inconel 182 weldments. These welds are receiving some protection from H<sub>2</sub>WC.