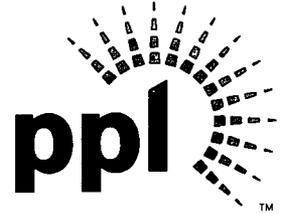


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APR 20 2010

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station OP1-17
Washington, DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION
REQUESTED REPORTS ON STEAM DRYER
INSPECTION FOR SUSQUEHANNA SES UNIT 1
PLA-6612**

Docket No. 50-387

The purpose of this letter is to provide the requested information on the Susquehanna SES Unit 1 steam dryer indications. The information included herein contains in Enclosure 1 the proprietary version of the GE Hitachi (GEH) Nuclear Energy Engineering Report entitled "Steam Dryer Inspections 45° Tee Crack Indication Evaluation." A non-proprietary version will not be included since the entire report is proprietary. Enclosure 2 contains PPL's "Disposition of Steam Dryer IGSCC Indications" evaluation, which is non-proprietary.

The information contained in Enclosure 1 is proprietary as defined in 10 CFR 2.390. GEH as the owner of the proprietary information, has executed the enclosed affidavit, which identifies that the enclosed proprietary information has been handled and classified as proprietary, is customarily held in confidence, and has been withheld from public disclosure. The proprietary information was provided to PPL in a GEH transmittal. The proprietary information has been faithfully reproduced in the enclosed information such that the affidavit remains applicable. PPL hereby requests that the enclosed GEH proprietary information be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17.

The header of each page in Enclosure 1 carries the notation "GEH Proprietary Information ⁽³⁾" where the superscript notation (3) refers to Paragraph (3) of the GEH affidavit, which provides the basis for the proprietary determination. The entire document is considered proprietary; therefore, a non-proprietary version is not enclosed.

Should you have any questions, please contact Cornelius T. Coddington at (610) 774-4019.

A001
LRR

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 4-20-10

Richard D. Pogodin for T.S. Rausch

T. S. Rausch

Enclosure 1 - Proprietary Version – “Engineering Report – Steam Dryer Inspections 45°
Tee Crack Indication Evaluation”

Enclosure 2 - “Disposition of Steam Dryer IGSCC Indications”

Copy: NRC Region I
Mr. P. W. Finney, Sr. NRC Resident Inspector
Mr. R. R. Janati, DEP/BRP
Mr. B. K. Vaidya, NRC Project Manager

ENCLOSURE 2 TO PLA-6612

**“DISPOSITION OF STEAM DRYER IGSCC
INDICATIONS”**



ENGINEERING CHANGE COVERSHEET

1. EC #	1249619	EC Subtype	UAI	2. AAR Required	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, EWR #
3. UNIT APPLICABILITY	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3					
4. QUALITY CLASS: N				5. SAFEGUARDS	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
6. AFFECTED SYSTEMS:	162/262					
7. CHANGE TYPE:	<input checked="" type="checkbox"/> Equivalent Change	<input type="checkbox"/> Design Change		<input checked="" type="checkbox"/> Permanent	<input type="checkbox"/> Temporary	
8. 50.59 SCREEN / 50.59 EVALUATION / FPP SCREEN NUMBER:	N/A					

9. TITLE
Disposition of Steam Dryer IGSCC Indications.

10. DESCRIPTION / ACTION / JUSTIFICATION

This EC Use-As-Is may be applied to IGSCC indications on the steam dryer that are within the length restrictions presented in BWRVIP - 139. The length restrictions vary for different dryer weld locations. From Figure 6-1 in BWRVIP - 139, IGSCC indications in the support ring, skirt or drain channel must be less than 8 inches in length. As a conservative measure, new indications will be inspected at the next RIO (2 years) regardless if there is a recent or planned plant power change. From Figure 6-2 in BRWVIP - 139, IGSCC indications in the end (outer) bank location must be less than 8 inches in length. As a conservative measure, new indications will be inspected at the next RIO (2 years) regardless if there is a recent or planned plant power change. From Figure 6-3 in BWRVIP - 139, IGSCC indications in the tie bar heat affected zone (HAZ) must have 2.8 inches of uncracked ligament (this includes growth of 0.8 inches of growth from each crack tip, see BWRVIP - 139 specified growth rate of 5.0E-05 in/hr) and re-inspected in two years. This use-as-is must be accompanied by a specific evaluation addressing the IGSCC indications if a recent or future power increase is to occur. All indications require documentation of the cracking mode (IGSCC or fatigue) and must document the structural adequacy of the indication and the affected area. IGSCC indications typically do not have substantial depth. When the evaluation to determine the cracking mode is performed, the depth of the indication will be evaluated. Once the determination is made that the indication is IGSCC in nature then no limit is placed on the depth of the indication. IGSCC indications exhibit characteristics such as being located in the heat affected zone (HAZ), branched characteristic, linear indication for weld stop/start location due to the higher tensile residual stresses and evidence of cold work in the area. IGSCC indications will typically not propagate significantly since the cold work is usually only performed on the surface of the material and typically the cold work is limited to a relatively small area. IGSCC indications follow residual stress lines located in the cold work. Based on this information the IGSCC indications will not significantly propagate during the next cycle. Based on the operating experience presented in BWRVIP - 139, the IGSCC indications will not impact the structural capability of the weld. BWRVIP - 139 has been approved by the NRC. Indications within the bounds of this UAI are considered to be "with full documentation" per BWRVIP - 139 once it is demonstrated through re-inspection that the indication has stabilized.

11. INSTALLATION INSTRUCTIONS
N/A

12. AFFECTED PROCEDURES/ROUTINE TASKS/ENGINEERING CHANGES
N/A

13. AFFECTED CALCULATIONS/EQARs (include revision levels)
N/A

14. TESTING REQUIRED
N/A

15. TRAINING REQUIRED (LIST AFFECTED GROUPS)
N/A

16. REVISION NO. 0
REASON FOR REVISION: PLANNED UNPLANNED: Brief Explanation:
REVISION SCOPE: N/A

APPROVALS

EC coversheet Approvals for this revision signify that all revised documents have received the same review, verification, and approval as required for the original documents. This Revision has been reviewed to assure that it does NOT adversely affect any portions of the Design that have not been revised.



EQUIVALENT CHANGE EVALUATION

EC#: 1249619

TITLE: Disposition of Steam Dryer IGSCC Indications

QUALITY CLASS: N

Component Criticality: N/A

CPE

OCPE

SCOPE OF WORK: (include the basic functions of affected structures, systems, and components)

This EC Use-As-Is may be applied to IGSCC indications on the steam dryer that are within the length restrictions presented in BWRVIP - 139. The length restrictions vary for different dryer weld locations. From Figure 6-1 in BWRVIP - 139, IGSCC indications in the support ring, skirt or drain channel must be less than 8 inches in length. As a conservative measure, new indications will be inspected at the next RIO (2 years) regardless if there is a recent or planned plant power change. From Figure 6-2 in BRWVIP - 139, IGSCC indications in the end (outer) bank location must be less than 8 inches in length. As a conservative measure, new indications will be inspected at the next RIO (2 years) regardless if there is a recent or planned plant power change. From Figure 6-3 in BWRVIP - 139, IGSCC indications in the tie bar heat affected zone (HAZ) must have 2.8 inches of uncracked ligament (this includes growth of 0.8 inches of growth from each crack tip, see BWRVIP - 139 specified growth rate of 5.0E-05 in/hr) and re-inspected in two years. This use-as-is must be accompanied by a specific evaluation addressing the IGSCC indications if a recent or future power increase is to occur. All indications require documentation of the cracking mode (IGSCC or fatigue) and must document the structural adequacy of the indication and the affected area. IGSCC indications typically do not have substantial depth. When the evaluation to determine the cracking mode is performed, the depth of the indication will be evaluated. Once the determination is made that the indication is IGSCC in nature then no limit is placed on the depth of the indication. IGSCC indications exhibit characteristics such as being located in the heat affected zone (HAZ), branched characteristic, linear indication for weld stop/start location due to the higher tensile residual stresses and evidence of cold work in the area. The basic function of the steam dryer is included in the Equivalency Evaluation.

EQUIVALENT CHANGE EVALUATION:

N/A

A 50.59 Screen is not required if the change is determined to be an Equivalent Change.

Equivalency Screen: (A "Yes" answer to any of the following questions means the change is not an Equivalent Change.)

- Does the change involve any change to a design basis limit for fission product barriers? Yes No
- Does the change involve a change to a procedure that affects how FSAR described design functions are performed or controlled? Yes No
- Does the change require a change in the Technical Specifications or Operating License? Yes No
- Does the change result in a change to the design basis, function or method of performing the function of any SSC? Yes No
- Does the change add or delete an automatic or manual feature of the SSC? Yes No
- Does the change convert a feature that was automatic to manual or vice versa? Yes No
- Does the change introduce an unwanted or previously unreviewed system interaction? Yes No
- Does the change affect the seismic or environmental qualification classification of the SSC? Yes No
- Does the change add or delete a function, as opposed to replace an existing function? Yes No
- Does the change cause a system to operate differently or change the operational characteristic of an SSC? Yes No

Equivalency Evaluation:

Based upon a review of various FSAR sections listed in the section below, it is concluded that the dryer's only design function is to remove the residual moisture from the steam generated in the nuclear boiler, prior to exiting the vessel. The dryer also has a passive safety function to maintain integrity so that other safety related components will not be impacted. Additionally, during a postulated main steam line break, the lifting rod and lifting eye act as a compressively loaded column bearing against the steam dryer hold down brackets in the reactor vessel head. This evaluation does not cover any indication on the lifting eye or lifting rod dryer components. This UAI is based on the flaw evaluation criteria stated in BWRVIP - 139 which includes an NRC SER accepting its use. Identified IGSCC indications within the bounds set by this UAI do not provide a bypass flow-path, and hence, do not affect the dryer's ability to remove moisture from the steam.



EQUIVALENT CHANGE EVALUATION

Further, they do not have any affect on any dryer operational parameters such as differential pressure, steam flow, exit steam quality, etc. Hence, the dryer's design basis function, as described in the FSAR, is unaffected. In addition, the condition does not threaten the Reactor Coolant Pressure Boundary (RCPB), nor safe shutdown capability of the plant. Further, the generation of loose parts will not occur since sufficient base material exists to maintain integrity of the component. Thus, the condition has no impact on the safe operation of the plant.

The BWRVIP - 139 is focused on dryers made with 304 stainless steel which is very susceptible to IGSCC given the BWR environment. The new SSES steam dryers are made of L grade materials which are more resistant to IGSCC. Unfortunately, during construction of the dryer, certain cold work was not precisely controlled (e.g., grinding). These areas will still be susceptible to IGSCC and once IGSCC occurs its behavior will be as described in the BWRVIP.

With respect to the structural integrity of the non-safety-related dryer itself, the IGSCC indication is located in the heat affected zone (HAZ) of the weld. A finite element analysis was performed for the dryer and is documented in calculation EC-062-1135. A review of EC-062-1135 Attachment 7 Table 7 determined that there is fatigue margin. It is concluded that IGSCC indications within the size criteria stated in the UAI are not of sufficient size or depth to threaten the structural integrity of any dryer component to its next inspection. IGSCC indications typically do not have substantial depth. During the evaluation to determine the cracking mode is performed, the depth of the indication will be evaluated. Once the determination is made that the indication is IGSCC in nature then no limit is placed on the depth of the indication. The indications exhibit IGSCC characteristics and no fatigue like characteristics are exhibited at the crack tips. Based on this information, the indications do not impact the structural capability of the weld and the weld will maintain the structural integrity of the dryer.

DOCUMENTS TO SUPPORT CONCLUSION:

FSAR Sections 3.8, 3.9, 4.1, 4.4, 4.5, 5.3 and 9.1, Technical Specification Section 5.5.6

BWRVIP -139 "Steam Dryer Inspection and Flaw Evaluation Guidelines"

BWRVIP -14 "Evaluation of Crack Growth in BWR Stainless Steel RPV Internals"

GE Report 0000-0115-4403-R0 "Steam Dryer Inspections 45° Tee Crack Indication Evaluation (DRF 0000-0064-1726)"

¹ EG772 Required or EG934 (for EC/REP (through 8/31/2010 only) or EC/UAI only) and EG912 Required

² Per NEPM-QA-0241