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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington DC 20555

Dresden Nuclear Power Station, Unit 2
Facility Operating License No. DPR-19
NRC Docket No. 50-237

Subject: Review of Analytical Evaluation of Reactor Pressure Vessel Closure Flange Weld Indication

Reference: Letter from L. Tilly (GE Hitachi) to B. Testin (Dresden Nuclear Power Station Engineering), "Impact of 10CFR50.55a June 2011 Change on Dresden RPV Flaw Handbooks," dated May 12, 2012

In accordance with the ASME Boiler and Pressure Vessel Code, Section XI, IWB-3134(b), Exelon Generation Company (Exelon) is submitting an analytical evaluation of a flaw identified in the Dresden Nuclear Power Station (DNPS), Unit 2 reactor pressure vessel (RPV) closure flange weld. As discussed in IWB-3610(e), "the evaluation procedures shall be the responsibility of the Owner and shall be subject to approval by the regulatory authority having jurisdiction at the plant site."

As a result of manual Ultrasonic Testing (UT) examinations conducted during the recently concluded refueling outage (D2R22) at DNPS, Unit 2, an ASME Section XI reportable indication was identified in the reactor pressure vessel closure flange weld. This vessel closure weld is Examination Category B-A, Item No. B1.30 welds, as identified in ASME Section XI, 1995 Edition 1996 Addenda. The examination was performed in accordance with ASME Section XI, Appendix VIII, 1995 Edition with the 1996 Addenda, as modified by the Performance Demonstration Initiative (PDI) program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10CFR Part 50 for Category B-A Reactor Pressure Vessel Welds. Analytical evaluation of the reported indications was conducted in accordance with IWB-3600, as allowed by IWB-3132.3.

Scheduled Inservice Inspection (ISI) examinations were performed on the reactor vessel vertical welds and the RPV closure flange weld, 2/1/RPV SHELL/2-SC4-FLG, during D2R22. During the closure flange weld exam, an unacceptable flaw indication was recorded. This indication did not meet the ASME Section XI acceptance standards as specified in Table IWB-3510-1. No other recordable indications were identified during the exams.

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The specific dimensions regarding the unacceptable flaw indication are as follows:

Weld	Flaw Length (in)	Flaw Depth (in)
2/1/RPV SHELL/2-SC4-FLG	8.2	3.8

An analytical evaluation of the indication is based on the Dresden Unit 2 RPV Flaw Evaluation Handbook, GENE-B11-00843-00-01, Rev. 1 dated October 2001, (Proprietary) and Dresden Engineering Change Evaluation 387158. The evaluation has determined that the flaw is within the IWB-3600 limits per Figure D-6, Non-Belt-Line, Vessel Flange Horizontal Weld Subsurface Flaw @ 32 EFPY. The results of this analytical evaluation of the flaw are enclosed as required by IWB-3134 (b).

Please be informed that GE, preparer of the Unit 2 Flaw Evaluation Handbook, has informed Exelon in the above referenced correspondence that the rule change published in Federal Register Vol. 76, No. 119, on June 21, 2011, regarding ferritic material flaw evaluations has no impact on this analytical evaluation.

Should you have any questions regarding this submittal, please contact Mr. John Kish at 815-416-2360.

Respectfully,

Shane M
For

David M. Czufin
Site Vice President
Dresden Nuclear Power Station

Enclosure

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector, Dresden Nuclear Power Station
Project Manager – NRR (Dresden Units 2 and 3)

Enclosure
EC 387158, Rev 0
Evaluation of U2 RPV Head Flange Weld Indication Found In D2R22

EC 387158, Rev 0

Evaluation of U2 RPV Head Flange Weld Indication Found In D2R22

Reason For Evaluation

During D2R22 in-vessel inspections performed by General Electric-Hitachi (GEH), five indications were found in the reactor pressure vessel (RPV) upper shell to flange circumferential weld 2/1/RPV SHELL/2-SC4-FLG. General Electric documented these indications in NDE Report D2R22-093. This exam was performed as part of the scheduled ISI scope for the RPV during D2R22. Four of the indications were acceptable, meaning they met ASME Section XI Table IWB-3510-1 criteria. One did not meet the criteria and was unacceptable. GEH performed an assessment of the unacceptable indication which was documented in GEH letter 0000-0121-6240-RO dated November 4, 2011. This EC documents the Dresden Engineering evaluation of the indication and concurrence with the GEH conclusion that this flaw is acceptable in its current state with no repair or modification required.

Detailed Evaluation

The RPV is designed to contain the reactor core, reactor internals and the reactor core coolant-moderator and to serve as a high-integrity barrier against leakage of radioactive materials to the drywell. To meet these requirements, the vessel is designed as safety-related, Class 1 and seismic component. The weld with the indication is between the top shell of the vessel and the flange that is mated to the top head flange assembly. The unacceptable indication is located ~240 degrees clock wise (0 degrees north) looking down. Its dimensions are 8.2" long (l), .4" thru wall (2a) and 2.6" surface separation (S). It is classified as a subsurface flaw. Based on the values recorded in the GEH report (t = 6.2, a = .2) this indication is unacceptable per ASME Section XI, 1995 Edition 1996 Addenda, Table IWB-3510-1. The allowed a/t is 2.1% per Table IWB-3510-1. The actual a/t is 3.2% which exceeds the allowed 2.1% and therefore the flaw is unacceptable. However, as allowed by IWB-3600 utilizing analytical evaluation, the values from the GEH NDE report and the criteria in the GE Dresden Unit 2 RPV Flaw Evaluation Handbook, Figure D-6 the flaw is within the limit of IWB-3600. The IWB-3600 limit for a flaw at this location is ~2.0 in. Plotting the values from the GEH NDE report for the aspect ratio and flaw depth into the handbook figure the point is below the IWB-3600 limit and thus meets the criteria.

Conclusions

Per review of the above it is concluded that the unacceptable indication identified in GEH NDE Report D2R22-093 is acceptable as is with no repair or modification required. Regarding re-inspection requirements, per IWB-2420(b), this flaw area will need to be examined in the next three inspection periods. The ISI database has been revised to include these three exams. In addition, the entire weld will be examined as part of the ISI 5th Interval schedule during the 3rd period. The flaw is within the limits contained in IWB-3600 and Figure D-6 of the GEH Unit 2 RPV Flaw Evaluation Handbook. Programs Engineering concurs with the conclusions contained in GEH letter 0000-0121-6240-RO dated November 4, 2011.

References

1) GEH NDE Rpt D2R22-093
2) Dresden Unit 2 RPV Flaw Evaluation Handbook
3) ASME Section XI 1995 Edition 1996 Addenda
4) GEH Letter 0000-0121-6240-RO dated November 4, 2011