

From: Vaidya, Bhalchandra
Sent: Monday, March 7, 2022 9:34 AM
To: Taken, Jason C:(Constellation Nuclear); Lueshen, Kevin:(Constellation Nuclear)
Cc: Mitchell, Matthew; Wiebe, Joel; Salgado, Nancy
Subject: VERBAL AUTHORIZATION - EPID-L-2022-LLR-0028, LaSalle Unit 1 Request for Alternative Examination for Repairs of Flow Control Valves 1B33-F060A and 1B33-F060B
Attachments: Final Verbal Script for LaSalle I4R-13.docx

SUBJECT: LASALLE UNITS 1 AND 2 –Relief Request I4R-13 Relief from Code Examinations for 1B33-F060A and 1B33-F060B Repairs (EPID-L-2022-LLR-0028)

Jason and Kevin,

Attached is the Verbal Authorization regarding the Relief Request for Alternative Examination for Repairs of Flow Control Valves 1B33-F060A and 1B33-F060B.
The US NRC provided the verbal authorization in the telephone call on March 7, 2022.

Please contact me, if you have any questions.

Bhalchandra K. Vaidya
US Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Operating Reactor Licensing
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VERBAL AUTHORIZATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
FOR PROPOSED ALTERNATIVE NUMBER I4R-13
ALTERNATIVE EXAMINATION REQUIREMENTS FOR
REPAIR OF REACTOR RECIRCULATION FLOW CONTROL VALVES
CONSTELLATION ENERGY GENERATION, LLC
LASALLE COUNTY STATION, UNIT 1
DOCKET NO. 50-373
March 7, 2022

Technical Evaluation read by Matthew Mitchell, Chief of the Piping and Head Penetrations Branch, Office of Nuclear Reactor Regulation

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated March 2, 2022, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22061A000), as supplemented by letters dated March 3, 2022, (ADAMS Accession No. ML22062B658) and March 4, 2022 (ADAMS Accession No. ML22063B176), Constellation Energy Generation, LLC (the licensee) proposed an alternative to certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section III, "Rules for Construction of Nuclear Facility Components," and Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," related to the repair of degraded Reactor Recirculation Flow Control Valves 1B33-F060A (Valve A) and 1B33-F060B (Valve B) at LaSalle County Station, Unit 1 (LaSalle, Unit 1). The licensee submitted proposed alternative I4R-13 for the use of Enhanced Visual Testing (EVT-1) examination requirements in lieu of the ASME Code-required Penetrant Testing (PT) and Radiographic Examination (RT) for the repairs.

The licensee requested authorization for this alternative in accordance with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(z)(2) on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

During refueling outage L1R19 in February 2022, inspections of Valves A and B discovered wear damage to each valve's internals and lower body. An analysis of plant operations has determined that periods of operation at high pump speed with the flow control valves at less than 70% open contributed to the degradation discovered during the current LaSalle, Unit 1 refueling outage. Corrective actions have been implemented to limit plant operation in this low flow operation condition.

The worn areas of Valve A require machining and welding to restore valve body dimensions and tolerances that support internal components. As part of the repair, additional weld material will be applied to Valve A and machined to approximately 0.157 inches above minimum wall in the area. The worn areas in Valve B require machining to restore valve body to dimensions and tolerances that support internal components. While no additional weld material buildup is currently planned, welding may be required in the final repair plan. The final configuration of Valve B would leave the valve 0.200 inches above the required minimum wall thickness.

To enhance design and performance of Valves A and B, the licensee is installing modified 316 stainless steel, Stellite-overlaid lower plug guides. The modified lower plug guide design includes an anti-rotation segment similar to the original design. The material of the anti-rotation segment is specified as 304L stainless steel material. The anti-rotation segment will be fillet

welded or partial penetration welded along its entire outer curved edge on the top face with an appropriately qualified and suitable material for the design of the weld joint.

These welds must meet the requirements of ASME Code, Section XI, IWA-4411, "Welding, Brazing, Fabrication, and Installation," which require that the welds be performed in accordance with the construction code. ASME Code, Section III, NB-2570, "Repair of Statically and Centrifugally Cast Products," requires that the internal surface be examined using magnetic particle testing (MT) or PT after machining. Additionally, ASME Code, Section III, NB-2539.4 requires an RT on repair welds over 3/8 of an inch or 10 percent of the section thickness. The welds will be performed using a gas tungsten arc welding (GTAW) process that have been qualified in accordance with ASME Code, Section IX "Welding, Brazing and Fusing Qualifications."

The licensee is proposing to use EVT-1 examinations in lieu of PT examinations for the various stages of the repair. EVT-1 is an examination technique that uses remote camera equipment to perform visual inspections of components. While EVT-1 is not considered to be equivalent to PT, as EVT-1 is more sensitive to issues such as lighting angle, viewing angle, and surface scratches, any of which can hide small cracks, given this application the potential to leave small cracks would not significantly impact the functionality of a component subject to wear.

The licensee is also proposing to not perform the RT examination if any weld buildups are greater than 3/8 of an inch or 10 percent of the section thickness. As with the PT examinations, not performing the RT examinations would also increase the probability that weld defects such as small cracks, porosity, or slag will remain in the repair. As noted before, when the primary damage mechanism in the repaired area is wear, the presence of small cracks or weld defects such as porosity and slag would not significantly increase risk of structural failure of the repaired areas. Therefore, the staff concludes that, given the nature of the subject repair, EVT-1 is sufficient to provide reasonable assurance of the structural integrity of the repaired valves.

To ensure wear does not challenge the minimum wall thickness due to the internal design change, wear rate calculations have been performed. These calculations determined an expected wear rate of 0.00015 inches per operating cycle for the flow control components of Valves A and B. Uncertainties in the calculations were addressed through conservative assumptions described in the licensee's letter dated March 3, 2022. This expected wear rate is sufficiently low to support operation with the new design in Valves A and B to end of plant life.

Performing the required PT examinations would result in an additional radiological dose of 2.326 person-Rem and performing the required RT would result in an additional radiological dose of approximately 0.906 person-Rem. The staff finds that, relative to the increase in quality and safety associated with following ASME Code for the repairs, this additional radiological dose represents a hardship to the licensee consistent with the provisions of 10 CFR 50.55a(z)(2).

Therefore, based on the above, the NRC staff finds that (1) there is reasonable assurance that the licensee's proposed alternative has a minimal impact on safety; and (2) the licensee's hardship justification is acceptable.

NRC Staff Conclusion read by Joel Wiebe Acting for Nancy Salgado, Branch Chief, Plant Licensing Branch III, Office of Nuclear Reactor Regulation

As Chief of the Plant Licensing Branch III, Office of Nuclear Reactor Regulation, I agree with the conclusions of the Piping and Head Penetrations Branch.

The NRC staff concludes that the proposed alternative I4R-13, to use EVT-1 in lieu of PT and to not perform RT at LaSalle, Unit 1 will provide reasonable assurance of adequate safety for the subject valve repairs. The NRC staff finds that complying with the inspection requirements of the ASME Code, Section III and ASME Code, Section XI, as mandated by 10 CFR 50.55a, would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2).

Therefore, effective March 7, 2022, the NRC authorizes the use of the proposed alternative I4R-13, at LaSalle, Unit 1 for the repairs of Valves 1B33-F060A and 1B33-F060B.

All other requirements in ASME Code, Section III and Section XI for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

This verbal authorization does not preclude the NRC staff from asking additional questions and clarifications regarding proposed alternative I4R-13, while preparing the subsequent written safety evaluation.