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NL-12-2224

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Vogtle Electric Generating Plant – Unit 1
Proposed Alternative VEGP-ISI-ALT-08
in Accordance with 10 CFR 50.55a(a)(3)(ii)
Response to Request for Additional Information

Ladies and Gentlemen:

By letter NL-12-2110, dated October 25, 2012, Southern Nuclear Operating Company (SNC) requested NRC approval of a proposed alternative to the specified ASME Boiler and Pressure Vessel Code Section XI requirements in order to stop a pinhole leak in a seal weld on a valve in the Unit 1 Chemical and Volume Control System (CVCS).

Subsequent discussion with the Nuclear Regulatory Commission (NRC) resulted in NRC requests for additional information on October 29, 2012. The enclosure to this letter provides responses to the requests for additional information.

This letter contains no NRC commitments. If you have any questions, please contact Doug McKinney at (205) 992-5982.

Respectfully submitted,

Mark J. Ajluni

M. J. Ajluni
Nuclear Licensing Director

MJA/DWD

Enclosure: Response to Request for Additional Information

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
Mr. T. E. Tynan, Vice President – Vogtle
Mr. B. L. Ivey, Vice President – Regulatory Affairs
Mr. B. J. Adams, Vice President – Fleet Operations
RType: CVC7000

U. S. Nuclear Regulatory Commission
Mr. V. M. McCree, Regional Administrator
Mr. R. E. Martin, NRR Senior Project Manager - Fleet
Mr. L. M. Cain, Senior Resident Inspector – Vogtle

Vogtle Electric Generating Plant – Unit 1
Proposed Alternative VEGP-ISI-ALT-08
in Accordance with 10 CFR 50.55a(a)(3)(ii)

Enclosure

Response to Request for Additional Information

Request for Additional Information (RAI) - 1

The alternative is proposed in accordance with 10 CFR 50.55a(a)(3)(ii) i.e. compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. On page E3 of your October 25, 2012 submittal In the second paragraph you state that, "It was determined that the cycling of plant equipment and personnel to go to Mode 5 presented a hardship without a compensating increase in the level of quality or safety." Could you elaborate on the hardship involved? Typically the difficulty or hardship is described in terms of plant or personnel safety, ALARA concerns, increased numbers of cycles on plant equipment, equipment availability, etc.

SNC Response to RAI 1

In addition to the inherent risk associated with a shutdown transient (e.g., maneuvering the plant to Mode 5), going to Mode 5 for repair of this non-pressure boundary leak would subject plant equipment to an extra cycle of thermal and pressure stresses and cause an extra 400 – 500 mR dose to personnel through such shutdown and startup activities as depressurizing the Reactor Coolant System (RCS), crud burst and cleanup, venting the Emergency Core Cooling System (ECCS), placing the Residual Heat Removal (RHR) system into service and performing visual inspections of the RCS and reactor head. These work activities also present otherwise unnecessary challenges to personnel safety.

RAI 2

In the October 25, 2012 submittal you indicate the steam leak was stopped by installation of a mechanical clamp and leak sealant injection on October 13, 2012. However, after additional system heatup the leakage reoccurred on October 16, 2012 and October 22, 2012. (1) Is there industry Operating Experience (OE) that indicates this method can effectively contain the steam leak? If so, please provide some examples. (2) Discuss why the leakage reoccurred after the mechanical clamp was installed. (3) Discuss your corrective actions should the leakage reoccur in the near future.

SNC Response to RAI 2

(1) Per the vendor, this type of clamp with sealant injection has been used in the industry for similar leakage situations. Although a response was received from only one user in the short time frame available, and in that case the leakage was not stopped completely, use of the clamp and sealant was reported to have resulted in a reduction of leakage.

(2) As briefly discussed in the October 25, 2012 submittal on page E3, leakage reoccurred from the mechanical clamp due to the initial injection temperature of the sealant. The sealant used, "2x," was designed to work at temperatures of 350°F and above. With the initial injections occurring at a skin temperature of 140°F, the sealant was not able to properly cure. This sealant uses a liquid to help transport the resin throughout the clamp with the intention that the liquid portion of the sealant be evaporated quickly, allowing the resin to fill a greater portion of the area between the clamp and the valve. With injection of the sealant occurring at a lower temperature, the liquid portion of the sealant did not

fully evaporate before the resin hardened. When the plant systems heated up and the liquid evaporated off, voids, also referred to as honeycombs, were left in the hardened sealant in place of the liquid, thereby resulting in steam leakage.

The second injection failed to fully stop the leak since the re-application of sealant was not able to fill all the voids in the hardened sealant that were incurred due to the original injection at a lower temperature. Despite the fact that leakage was not stopped completely, the original clamp application clearly improved the situation.

(3) Leakage would continue to be monitored if (1) leakage was to reoccur and the new leakage does not result in a boric acid corrosion concern to adjacent or surrounding components and (2) if the new leakage does not hinder the identification of or mask new leaks inside containment.

If leakage occurs, it will be measured and categorized as unidentified leakage, with a Technical Specifications limit of 1 gpm. Currently, leakage is not detectable by performance of the RCS leak rate calculations, the method used for Technical Specification compliance. The current total unidentified leakage for Unit 1 is 0.02 gpm. Should the leakage interfere with the required RCS leakage detection systems, these systems will be declared inoperable as appropriate, and the required Technical Specification actions will be performed, including unit shutdown, if necessary.

RAI 3

Is the mechanical clamp sealing method proposed in the alternative different from the current configuration in any way other than the sealant injection temperature and the injection port location?

SNC Response to RAI 3

The mechanical clamp sealing method that is proposed in the Alternative to be installed in place of the current configuration does not differ from the first mechanical clamp installed except as noted in the question (i.e. sealant injection temperature and injection port location). The sealant will be initially injected at Normal Operating Temperature, i.e., 400°F, rather than at 140°F, and one of the injection ports will be moved to a location on the outer periphery of the clamp that is closer to the actual defect, i.e., pinhole, in the seal weld.

RAI 4

In the October 25, 2012 submittal on page E6 you indicate monitoring of the mechanical clamp for leakage will include weekly monitoring by installing a camera and VT-2 examination every 30 days via containment entry. If the leak reoccurs after installation of the clamp proposed in the alternative the staff believes the monitoring plan should

include provisions for increased monitoring. Discuss your monitoring plan if the leakage reoccurs after clamp installation.

SNC Response to RAI 4

Daily inspections are to be performed after installation to verify adequacy of the proposed alternative. Seven days after alternative installation, if no leakage is observed, the proposed long-term monitoring frequency (7 day visual and 30 day VT-2 inspection) will be implemented. If leakage reoccurs after installation, daily monitoring via remote camera will be performed in addition to the 30 day VT-2 inspection.

RAI 5

Discuss the sensitivity and capability of the reactor coolant system leakage detection system if the leakage reoccurs. Include in the discussion, clarification of how many hours after a leak occurs and at what leak rate would the operator be notified.

SNC Response to RAI 5

The leak detection systems are designed in accordance with the requirements of 10 CFR 50 and the general design criterion 30 to provide a means of detecting and, to the extent practical, identifying the source of the reactor coolant leakage. The systems conform with Regulatory Guide 1.45. Main systems that monitor the environmental condition of the containment include the sump level monitoring system, the airborne particulate radioactivity monitoring systems, and the containment fan cooler condensate measuring system. In addition to the above systems, the humidity, temperature, pressure, and radiogas monitors provide indirect indication of leakage to the containment.

The RCS leakage detection system is designed to detect a 1 gpm increase in unidentified leakage within 1 hour. In addition, control room annunciation is available for Containment activity radiation monitors, normal sump levels and containment cooler leakage detection. Operating history has demonstrated that the operator would be able to detect leak rates as low as 0.1 gpm by performance of an RCS inventory balance. Technical Specifications require the RCS inventory balance to be performed every 72 hours (SR 3.4.13.1); however, the Operations daily surveillance procedure requires an RCS inventory balance to be performed once every 24 hours.

Therefore, if leakage were to reoccur after installation, an increase in leakage as low as 0.1 gpm would be detected within 24 hours and if the leakage is of significant magnitude (i.e. 1 gpm or more), it is expected that RCS leakage detection instrumentation would identify the increase in leakage within 1 hour.