



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
WASHINGTON, D.C. 20555-0001

July 15, 2015

Mr. Dennis L. Koehl
President and CEO/CNO
STP Nuclear Operating Company
South Texas Project
P.O. Box 289
Wadsworth, TX 77483

**SUBJECT: SOUTH TEXAS PROJECT, UNITS 1 AND 2 – SUMMARY OF ON-SITE AUDIT
ASSOCIATED WITH A RISK-INFORMED SOLUTION TO GENERIC SAFETY
ISSUE 191 (TAC NOS. MF2400 AND MF2401)**

Dear Mr. Koehl:

By letter dated June 19, 2013, as supplemented by letters dated October 3, October 31, November 13, November 21, and December 23, 2013 (two letters); and January 9, February 13, February 27, March 17, March 18, May 15 (two letters), May 22, June 25, and July 15, 2014; and March 10 and March 25, 2015, STP Nuclear Operating Company (STPNOC, the licensee) submitted exemption requests accompanied by a license amendment request for a risk-informed approach to resolve Generic Safety Issue (GSI)-191, "Assessment of Debris Accumulation on PWR [Pressurized-Water Reactor] Sump Performance," at South Texas Project, Units 1 and 2 (STP). The proposed amendment request would implement a risk-informed approach for resolving GSI-191 for STP as the pilot plants for other licensee pursuing a similar approach.

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a regulatory audit at the STP site near Bay City, Texas, on March 31 to April 2, 2015, in order to gain a better understanding of the licensee's approach to implement a risk-informed evaluation of the effects of debris on emergency core cooling systems and the containment spray system operation following a loss-of-coolant accident. A specific goal was to achieve a better understanding of the systems, structures, and components referenced in the application by actual observation, walkdown, and examination of fiber loads and coatings in containment, transport paths, chemical effects sources and sump strainers.

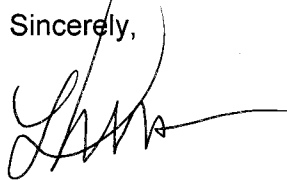
The enclosure to this letter describes the results of the NRC staff's audit and some of the key observations highlighted by the staff during the audit. Several containment pictures were taken by the staff to assist in the staff's observations. These pictures can be found in the Agencywide Documents Access and Management System at Accession No. ML15183A009. The NRC staff and the licensee will continue discussions to resolve remaining technical issues during future interactions.

D. Koehl

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If you have any questions, please contact me at 301-415-1906 or via e-mail at Lisa.Regner@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'Lisa M. Regner', with a long horizontal flourish extending to the right.

Lisa M. Regner, Senior Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure:
Audit Summary

cc w/encl: Distribution via Listserv

AUDIT SUMMARY

REQUEST FOR RISK-INFORMED SOLUTION TO GENERIC SAFETY ISSUE 191

MARCH 31 TO APRIL 2, 2015

STP NUCLEAR OPERATING COMPANY

SOUTH TEXAS PROJECT, UNITS 1 AND 2

DOCKET NOS. 50-498 AND 50-499

By letter dated June 19, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML131750250), as supplemented by letters dated October 3, October 31, November 13, November 21, and December 23, 2013 (two letters); and January 9, February 13, February 27, March 17, March 18, May 15 (two letters), May 22, June 25, and July 15, 2014; and March 10 and March 25, 2015 (ADAMS Accession Nos. ML13295A222, ML13323A673, ML13323A128, ML13338A165, ML14015A312, ML14015A311, ML14029A533, ML14052A053, ML14072A076, ML14086A383, ML14087A126, ML14149A353, ML14149A354, ML14149A434, ML14178A481, ML14202A045, ML15072A092, and ML15091A440, respectively), STP Nuclear Operating Company (STPNOC, the licensee) submitted exemption requests accompanied by a license amendment request for a risk-informed approach to resolve Generic Safety Issue (GSI)-191, "Assessment of Debris Accumulation on PWR [Pressurized-Water Reactor] Sump Performance," at South Texas Project, Units 1 and 2 (STP). The proposed amendment request would implement a risk-informed approach for resolving GSI-191 for STP as the pilot plants for other licensee pursuing a similar approach.

1.0 SCOPE AND PURPOSE

The U.S. Nuclear Regulatory Commission (NRC) staff performed an on-site audit from March 31 to April 2, 2015, at the STP plant related to the risk-informed resolution of GSI-191. The purpose of the audit was to observe and walk down systems, structures, and equipment referenced in the November 13, 2013, STPNOC submittal to improve NRC staff understanding and efficiency during the safety review and development of the safety evaluation report.

The audit was attended by members of the NRC staff and STP employees including:

<u>NRC</u>	<u>STP</u>	
Victor Cusumano	Dave Rencurrel	Wayne Harrison
Stephen Smith	Tim Powell	Wes Schulz
Ashley Guzzetta	Al Capristo	Drew Richards
	Louis Peter	Tim Greaud
	Jim Connolly	Roger Aguilera
	Steve Blossom	Tim Bryant
	Rob Engen	Lance Sterling
	Ernie Kee	

Enclosure

2.0 AUDIT ACTIVITIES

The NRC audit team conducted a tour of containment to identify debris transport paths and weld locations for certain pipe break sizes used in the STP risk analysis evaluations following a loss-of-coolant accident (LOCA). The audit team observed the potential post-LOCA debris flow paths of for three breaks located at weld locations:

1. 12.8-inch pipe diameter break at weld 16-RC-1412-NSS-6
2. 12.8-inch pipe diameter break at weld 16-RC-1412-NSS-9
3. Equivalent 12.8-inch pipe diameter break at weld 29-RC-1401-NSS-2

These postulated weld breaks were chosen based on risk-significance, geometry, and location relative to insulation which is a debris concern. As seen in the figure below, location 1 is on the pressurizer surge line close to the pressurizer, location 2 is on the pressurizer surge line close to the hot leg, and location 3 is on the hot leg. These locations are significant because they are close to the pressurizer and two steam generators (SG) and can generate the largest amounts of debris.



Figure 1: Weld Locations Observed by Audit Team (top view of containment)

The audit team entered containment on the 68-foot elevation. The visual examination of all three welds was completed on the 19-foot elevation. The transport path of debris from these weld locations was traced considering a hypothetical LOCA. The majority of fine and small debris that would be generated from a pipe rupture is initially blown into the upper containment and washed down to lower containment, whereas the large debris is trapped by the walkway gratings and does not leave the elevation in which it was generated. For the breaks observed by the team, small and fine debris remaining in the compartment after blowdown (i.e., not blown

into upper containment) starts on the 19-foot elevation and washes through the grating onto the floor of the 11-foot elevation where the tri-sodium phosphate (TSP) baskets and emergency sump strainers are located. A visual observation by the audit team confirmed that water will not be blocked at any elevation and will ultimately reach the lowest containment elevation. Once on the 11-foot elevation, the debris would be filtered at the sump strainers or be pumped back through the reactor coolant system and re-enter containment through the containment spray ring headers at the top of containment. Various pictures noting weld locations and stages of the transport path can be found at ADAMS Accession No. ML15183A009.

There are several storage racks inside containment where aluminum scaffolding components are stored. This includes piping for scaffolding and other maintenance items. The licensee uses these racks to store items inside containment to reduce the amount of contaminated equipment moving in and out of containment for maintenance and refueling activities. Pictures of these storage racks can be found at ADAMS Accession No. ML15183A009. One of the storage racks is located directly under a concrete floor without openings for dispersion; therefore, the aluminum dissolution from this potential source may be less than assumed in the chemical effects evaluation that STP provided as part of the license amendment request.

The tour ended at the on-site insulation fabrication facility. STP fabricates calcium-silicate and fiberglass insulation to be used on various piping systems outside of containment. The calcium-silicate and fiberglass insulation is enclosed in a gray sheath. When needed, STP will order NUKON insulation from Performance Contracting, Inc., for primary piping inside containment. Other types of insulation used at STP are thermo-wrap to cover the SGs and metal reflective insulation on the reactor head. The observations in the shop and in containment allowed NRC staff to evaluate the construction of the insulation materials installed at STP.

3.0 CONCLUSIONS

Three welds at specific break locations inside containment were visually observed and debris transport paths following a LOCA were viewed by the audit team. The observations assisted the NRC staff in understanding the flowpaths for coolant and debris within containment and to evaluate the extent that conservatism is included in the STP debris generation and transport evaluations. The staff observations also will help inform the review of STP's model and whether it predicts that the most critical break locations are in locations that are physically closest to the largest potential debris sources. These audit activities helped the audit team members understand better the impacts of debris at risk-significant locations at STP and will inform decisions regarding the risk-informed submittal for GSI-191.

D. Koehl

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If you have any questions, please contact me at 301-415-1906 or via e-mail at Lisa.Regner@nrc.gov.

Sincerely,

/RA/

Lisa M. Regner, Senior Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure:
Audit Summary

cc w/encl: Distribution via Listserv

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PUBLIC

LPL4-1 Reading

RidsAcraAcnw_MailCTR Resource

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RidsNrrLAJBurkhardt Resource

RidsRgn4MailCenter Resource

SSmith, NRR/DSS/SSIB

AGuzzetta, NRR/DSS/SSIB

ADAMS Accession Nos. Package ML15183A006, Audit Summary ML15183A007; Photos ML15183A009 *email

OFFICE	NRR/DORL/LPL4-1/PM	NRR/DORL/LPL4-1/LA	NRR/DSS/SSIB/BC	NRR/DORL/LPL4-1/BC	NRR/DORL/LPL4-1/PM
NAME	LRegner	JBurkhardt*	VCusumano	MMarkley (FLoyn for)	LRegner
DATE	7/1/15	7/2/15	4/21/15	7/15/15	7/15/15

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