

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

William M. Dean, Director

In the Matter of)	Docket Nos. 50-361 and 50-362
)	
SOUTHERN CALIFORNIA EDISON)	License Nos. NPF-10 and NPF-15
)	
San Onofre Nuclear Generating Station, Units 2 and 3)	

REVISED DIRECTOR'S DECISION UNDER 10 CFR 2.206

I. Introduction

By letter dated June 18, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12171A409), Friends of the Earth (the petitioner) filed an intervention petition and hearing request, as well as a request for a stay of any decision to authorize restart of San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, following the steam generator (SG) tube leak that led to the rapid shutdown of Unit 3 in January 2012. As part of its filing, the petitioner argued that the licensee violated Title 10 of the *Code of Federal Regulations* (10 CFR) 50.59, "Changes, tests, and experiments," when the SGs for SONGS, Units 2 and 3, were replaced in 2010 and 2011 without a license amendment.

In its November 8, 2012, Memorandum and Order CLI-12-20 on this matter (ADAMS Accession No. ML12313A118), the U.S. Nuclear Regulatory Commission (NRC or the Commission) referred the portion of the June 18, 2012, petition that concerns the asserted

10 CFR 50.59 violation to the NRC's Office of the Executive Director for Operations for consideration as a petition under 10 CFR 2.206, "Request for action under this subpart."

The petition was supplemented by letters dated November 16, 2012, and February 6, 2013 (ADAMS Accession Nos. ML12325A748 and ML13109A075, respectively).

Actions Requested

Based on the Commission referral in CLI-12-20, the NRC staff reviewed the June 18, 2012, petition and November 16, 2012, supplement to identify the petitioner's requested enforcement-related actions applicable to the asserted 10 CFR 50.59 violation. The staff determined that the petitioner requested the NRC to order Southern California Edison (SCE or the licensee) to submit a license amendment application for the design and installation of the SONGS, Units 2 and 3, replacement SGs. As the basis for the petition request, the petitioner stated that the licensee violated 10 CFR 50.59 when it replaced its SGs in 2010 and 2011 without first obtaining NRC approval of the design changes through a license amendment.

On January 16, 2013, the petitioner met with the NRC's Petition Review Board (PRB) to clarify the bases for the petition. During the PRB meeting, the petitioner requested an additional enforcement action that the NRC suspend SCE's licenses until they are amended.

The NRC treated the transcript of the PRB meeting (ADAMS Accession No. ML13029A643) as a supplement to the petition. The transcript is available for inspection at the NRC's Public Document Room (PDR), located at One White Flint North (O1F21), 11555 Rockville Pike (first floor), Rockville, MD 20852. Publicly available documents created or received at the NRC are accessible electronically through ADAMS in the NRC library at <http://www.nrc.gov/reading-rm/adams.html>. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC's PDR reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail to pdr.resource@nrc.gov.

The NRC's acknowledgment letter to the petitioner, dated April 30, 2013 (ADAMS Accession No. ML13106A193), addressed the original June 18, 2012, petition referred to the NRC staff in CLI-12-20, as supplemented by letter dated November 16, 2012; comments made during the January 16, 2013, PRB meeting; and by letter dated February 6, 2013. The November 16, 2012, and February 6, 2013, supplements did not request additional actions but did provide supporting information. In the acknowledgment letter, the NRC informed the petitioner that the petition had been accepted for review under the 10 CFR 2.206 process. In this letter, the NRC stated that it would also consider the safety significance and complexity of the information submitted on April 4, 2013 (ADAMS Accession No. ML13116A266), and that it would determine whether the new information should be consolidated with the existing petition. The April 4, 2013, letter included several assertions related to SCE's ". . . [prior] knowledge regarding the defects in the RSG [replacement steam generator] design at the time it conducted its 50.59 evaluations." The letter requested no additional actions.

On February 27, 2015, the NRC issued the proposed director's decision for comment to the petitioner and the licensee (ADAMS Accession Nos. ML15020A121 and ML15020A165, respectively). The petitioner provided comments in a response dated March 27, 2015 (ADAMS Accession No. ML15103A027). The NRC staff's evaluation of these comments is provided as an attachment to this director's decision. In addition, the NRC forwarded the petitioner's March 27, 2015, letter to the NRC's Office of the Inspector General (OIG), because it contained assertions of NRC staff wrongdoing.

By letter dated March 25, 2015 (ADAMS Accession No. ML15089A045), the licensee stated that it had no comments on the proposed director's decision. By letter dated April 3, 2015 (ADAMS Accession No. ML15097A011), the licensee provided a response to the petitioner's comments on the proposed director's decision. The NRC staff reviewed the response from the licensee and determined that because the licensee's comments are direct

rebuttals to the petitioner's comments and raised no concerns with the proposed director's decision, no changes to the director's decision are required as a result of these comments.

On July 28, 2015, the NRC issued a director's decision (ADAMS Accession No. ML15183A164). Subsequently, the NRC identified portions of the director's decision that required clarification regarding the scope of the petition and the decision. Accordingly, Section I is revised to clarify that the scope of the petition referred to the staff in CLI-12-20 includes the underlying question of whether the licensee violated 10 CFR 50.59 when it replaced the SGs at SONGS, Units 2 and 3, without first obtaining a license amendment; Section II addresses the NRC staff's resolution of this underlying question; and the conclusion in Section III is updated to reflect the resolution of this underlying question. Section II is also revised to clarify additional staff activities associated with the SONGS SG event that support the staff's conclusion regarding whether the licensee violated 10 CFR 50.59 by replacing the SGs without a license amendment.

II. Discussion

Disposition of the June 18, 2012, Petition

Under 10 CFR 2.206(b), the director of the NRC office with responsibility for the subject matter shall either institute the requested proceeding or shall advise the person who made the request in writing that no proceeding will be instituted, in whole or in part, with respect to the request and the reason for the decision. Accordingly, the decision of the Director of the Office of Nuclear Reactor Regulation (NRR) is provided below.

As stated previously, the NRC accepted for review the petition requests for the NRC to order the licensee to submit a license amendment application for the design and installation of the SONGS, Units 2 and 3, replacement SGs and to suspend SCE's licenses until they are amended. The SONGS, Units 2 and 3, reactors have been shut down since January 9, 2012,

and January 31, 2012, respectively. On June 7, 2013, the licensee verbally notified the NRC of its decision not to seek restart of SONGS, Units 2 and 3.

On June 12, 2013 (ADAMS Accession No. ML131640201), the licensee provided the certifications required by 10 CFR 50.82(a)(1)(i) to the NRC staff that SONGS, Units 2 and 3, had permanently ceased power operations. On June 28, 2013, and July 22, 2013 (ADAMS Accession Nos. ML13183A391 and ML13204A304, respectively), the licensee provided certifications required by 10 CFR 50.82(a)(1)(ii) that all fuel had been permanently removed from the SONGS, Units 3 and 2, reactors, respectively. In accordance with 10 CFR 50.82(a)(2), upon docketing of these two certifications, the licensee's 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," licenses no longer authorize operation of the SONGS reactors or placement or retention of fuel into the reactor vessels. Accordingly, the licensee is prohibited by regulation from restarting SONGS, Units 2 and 3, or loading fuel into the reactor vessels. Since the licensee is prohibited from operating the reactors by 10 CFR 50.82(a)(2), there is no longer an open question whether action is needed to require the SONGS licenses to be amended to allow continued operation of the reactors with the replacement SGs. In addition, requiring the SONGS licenses to be amended for the replacement SGs would have no effect on the safe operation of the permanently shutdown and defueled facility. Thus, the petitioner's request for the NRC to order the licensee to submit a license amendment application for the design and installation of the SONGS, Units 2 and 3, replacement SGs and to suspend SCE's licenses until they are amended is moot.

Notwithstanding the determination that the petitioner's requested enforcement actions are moot, the NRC staff evaluated the underlying question referred by the Commission in CLI-12-20 concerning whether the licensee violated 10 CFR 50.59 when it replaced its SGs in 2010 and 2011 without first obtaining NRC approval of the design changes through a license amendment. The NRC performed several inspections following the January 2012 SG leak at

SONGS, including the review of the licensee's 10 CFR 50.59 evaluations related to replacing the SGs.

On March 10, 2012, the NRC initiated an Augmented Inspection Team (AIT) reactive inspection, which assessed the circumstances surrounding the primary-to-secondary leak and unexpected wear of tubes in the replacement SGs, and also assessed whether the licensee appropriately reviewed the design changes in accordance with the requirements of 10 CFR 50.59. The AIT reviewed, in part, all of the design changes associated with the replacement SGs to determine whether the changes to the facility or procedures, as described in the updated final safety analysis report (UFSAR) had been reviewed and documented in accordance with 10 CFR 50.59 requirements. As documented in AIT Report 05000361/2012007 and 05000362/2012007, dated July 18, 2012 (ADAMS Accession No. ML12188A748), the AIT concluded that the SG major design changes were reviewed in accordance with the 10 CFR 50.59 requirements. However, the AIT identified ten unresolved items that warranted additional inspection and review to determine if performance deficiencies existed or if the issues constituted violations of NRC requirements, including one item associated with a change in the method of evaluation used for the SG stress analysis calculations.

A followup inspection of the unresolved issues identified by the AIT was conducted from August 20 to September 28, 2012. The AIT followup inspection report, dated November 9, 2012 (ADAMS Accession No. ML12318A342), closed eight of the ten unresolved items, including the item associated with a change in the method of evaluation as described in the UFSAR. The NRC determined that the 10 CFR 50.59 written evaluation for this change did not demonstrate that the new method had been approved by NRC for the intended application. The failure to provide an appropriate basis for the determination that the change in the method of evaluation did not require a license amendment prior to implementing the change constituted a violation of

10 CFR 50.59(d)(1). However, because the licensee demonstrated that the method had been previously approved by the NRC for the intended application, the change did not require the licensee to obtain a license amendment prior to implementing the change. The AIT followup inspection report concluded that because there was no reasonable likelihood that the change would have required NRC approval (i.e., a license amendment), the change was a minor violation of 10 CFR 50.59(d)(1).

Furthermore, since the petition was referred to the NRC staff in CLI-12-20, the staff and the NRC OIG have carried out additional activities related to the SONGS SG tube degradation event that addressed concerns similar to those raised by the petitioner and other stakeholders on the NRC's response to the SONGS event, as well as with applicable NRC procedures and regulations. The PRB reviewed the findings and outcomes of each of these activities to determine their applicability to the concerns and actions requested in this petition.

In 2012, the NRC's Office of Investigations (OI) initiated an investigation (OI 4-2012-038) to determine if an SCE employee at SONGS willfully failed to provide complete and accurate information concerning the SONGS SG replacement to NRC inspectors. Based on the evidence developed during the investigation, the allegation was not substantiated. The investigation was closed in May 2014. During the investigation, OI also developed and probed additional information related to SCE's reviews under 10 CFR 50.59. Subsequently, OI requested a technical review of the licensee's 10 CFR 50.59 screenings and evaluations, which did not identify specific indications of wrongdoing. The PRB determined that the investigation and technical review did not identify any specific indications of wrongdoing related to 10 CFR 50.59 violations or determine that a license amendment was needed before SCE replaced the SONGS SGs.

In 2013, the NRC OIG initiated an event inquiry in response to concerns regarding the NRC's oversight of the replacement SGs at SONGS. The event inquiry examined the NRC's

oversight of SCE's application of the 10 CFR 50.59 process for the replacement SGs at SONGS, Units 2 and 3. The OIG also sought to ascertain from NRC officials whether SONGS required a license amendment for the SG replacements and whether the problems at SONGS could have been identified through the NRC's license amendment review process. The OIG event inquiry report, "NRC Oversight of Licensee's Use of 10 CFR 50.59 Process to Replace SONGS' Steam Generators," dated October 2, 2014 (ADAMS Accession No. ML14276A478), included several findings related to the SONGS 10 CFR 50.59 evaluations. The PRB reviewed the OIG event inquiry report and determined that it identified 10 CFR 50.59 documentation shortcomings. Based on the NRC staff's assessment of the potential shortcomings, the PRB concluded that additional staff actions were not warranted to conclusively determine if the issues represented additional examples of 10 CFR 50.59 violations or would have required a license amendment prior to SCE replacing the SGs. The NRC staff is addressing the issues in the OIG report as part of the SONGS lessons learned effort discussed below.

On September 20, 2013, the NRC staff issued NRC Inspection Report 05000361/2012009 and 05000362/2012009 (ADAMS Accession No. ML13263A271), which documented the inspection of and findings associated with the staff's review of SCE's confirmatory action letter response (ADAMS Accession No. ML12285A263) for Unit 2, dated October 3, 2012, and the two remaining open unresolved items identified in AIT Report 05000361/2012007 and 05000362/2012007. The inspection was conducted December 3, 2012, through June 7, 2013, and identified, in part, performance deficiencies for the failure to verify the adequacy of the thermal-hydraulic and flow-induced vibration design of the replacement SGs for SONGS, Units 2 and 3, that occurred on January 28, 2008, and April 2, 2008, during the design phase of the replacement SGs. For Unit 2, the finding was determined to be of very low safety significance, because the Unit 2 SG tubes did not leak and continued to meet the required structural integrity criterion. The Unit 2 finding was dispositioned

as Green and associated with a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control."

On December 23, 2013, the NRC issued the Final Significance Determination of White Finding and Notice of Violation (ADAMS Accession No. ML13357A058) for the licensee's failure to verify the adequacy of the thermal-hydraulic and flow-induced vibration design of the Unit 3 replacement SGs, a violation of 10 CFR 50, Appendix B, Criterion III, with an associated violation of Technical Specification 5.5.2.11, "Steam Generator (SG) Program," because of the loss of tube integrity on a Unit 3 SG. The NRC determined that the SONGS, Unit 3, SG tube leak and subsequent shutdown on January 31, 2012, were the result of this violation. In accordance with the NRC Enforcement Policy, this violation is considered an escalated enforcement action because it is associated with a White finding.

The PRB concluded that the inspection did not show that these or any other identified violations indicated that a license amendment was needed before SCE replaced the SONGS SGs.

On March 6, 2015, the NRC staff issued a report, "Review of Lessons Learned from the San Onofre Steam Generator Tube Degradation Event" (ADAMS Accession No. ML15062A125), along with an accompanying White Paper, "10 CFR 50.59; the Process, Application to Substantial Modifications to Licensee Facilities, and NRC Staff Assessment of Licensee Implementation," dated February 25, 2015 (ADAMS Accession No. ML13066A237). The lessons learned effort and the White Paper considered the 10 CFR Part 50, Appendix B, Criterion III, violations discussed above as part of an assessment of whether the 10 CFR 50.59 rule continues to be adequate for major or complex component replacements. Consistent with the September 20, 2013, inspection report, the lessons learned report indicated that the SG tube degradation occurred as a result of issues introduced during the design phase that were unrecognized and, thus, were not considered in the licensee's 10 CFR 50.59 evaluation. The

lessons learned report also noted that 10 CFR 50.59 is not a process for verifying design adequacy and that the required design control measures for verifying the adequacy of design are expected to be implemented before entering the 10 CFR 50.59 process. The report concludes that:

The 10 CFR 50.59 rule . . . and the results of the San Onofre 10 CFR 50.59 evaluation did not have any bearing on the underlying, unrecognized design control issue that actually caused the San Onofre steam generator tube leak event.

The lessons learned effort also considered the 10 CFR 50.59 minor violation identified in the November 9, 2012, AIT followup inspection report, and the October 2, 2014, OIG event inquiry report, as part of an assessment of whether the NRC needs to provide additional 10 CFR 50.59 guidance and information. Although the lessons learned report was issued after the proposed director's decision, the PRB reviewed the report and determined that it did not provide any additional information or support for the petition that had not already been considered.

III. Conclusion

The petitioner raised concerns about the validity of SCE's 10 CFR 50.59 evaluations for the SGs at SONGS, Units 2 and 3. The NRC evaluated the petitioner's concerns, including the comments received from the petitioner on the proposed director's decision.

Since the submittal of the initial petition and the subsequent supplements, SCE has submitted written certifications to the NRC in accordance with 10 CFR 50.82, "Termination of License," that it has permanently ceased power operations at SONGS, Units 2 and 3, and that fuel has been permanently removed from the reactor vessels. In accordance with 10 CFR 50.82, upon docketing these certifications, SCE is prohibited by regulation 10 CFR 50.82(a)(2) from operating SONGS, Units 2 and 3, or loading fuel into the reactor

vessels. Thus, there is no longer a potential for the SONGS, Units 2 and 3, SGs to be operated, and the petitioner's request for the NRC to order the licensee to submit a license amendment application for the design and installation of the replacement SGs and to suspend SCE's licenses until they are amended is moot. In addition, the NRC staff evaluated the underlying question referred by the Commission in CLI-12-20 concerning whether the licensee violated 10 CFR 50.59 when it replaced its SGs without first obtaining NRC approval of the design changes through a license amendment. The staff determined that the licensee's conclusion that no license amendment was required was consistent with the requirements of 10 CFR 50.59. Based on the above, the Director of NRR will not be instituting the proceeding requested by the petitioner, either in whole or in part.

As provided in 10 CFR 2.206(c), a copy of this director's decision will be filed with the Secretary of the Commission for the Commission to review. As provided for by this regulation, the decision will constitute the final action of the Commission 25 days after the date of the decision unless the Commission, on its own motion, institutes a review of the decision within that time.

Dated at Rockville, Maryland, this 2 day of October 2015.

For the Nuclear Regulatory Commission.

/RA/

William M. Dean, Director,
Office of Nuclear Reactor Regulation.

Attachment:
Resolution of Petitioner's Comments

COMMENTS RECEIVED FROM THE PETITIONER
ON THE PROPOSED DIRECTOR'S DECISION
DATED FEBRUARY 27, 2015

The U.S. Nuclear Regulatory Commission (NRC) sent a copy of the proposed director's decision to Mr. Richard Ayres, representing Friends of the Earth (the petitioner), for comment on February 27, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15020A167). The petitioner responded with comments by letter from Mr. Damon Moglen dated March 27, 2015 (ADAMS Accession No. ML15103A027). The NRC's response to the comments received is provided below:

Comment 1 (summarized)

The petitioner made several comments asserting that, in its proposed director's decision, the NRC did not address the original concerns of the petition, including (1) how such an abdication of responsibility was allowed to occur, and (2) what will be done in response? The petitioner also commented that the statement that the issue is "moot" is insufficient, as is the proposed conclusion that the agency will not take action to address the problems with the Title 10 of the *Code of Federal Regulations* (10 CFR) 50.59, "Changes, tests, and experiments," and 10 CFR 2.206, "Requests for action under this subpart," processes. The petitioner also commented that the NRC did not explain why closure of the reactors was sufficient instead of investigating and reforming the 50.59 process.

Response:

The fundamental issue in this case revolved around whether Southern California Edison's (SCE's) replacement of its steam generators (SGs) in 2010 and 2011, under 10 CFR 50.59, and subsequent operation until January 2012, without first obtaining NRC approval through a license amendment, was in violation of NRC regulations. As stated in Section I of the director's decision, the petitioner requested that the NRC take enforcement action against SCE in the form of an NRC order that requires the licensee to submit a license amendment application for the design and installation of the San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, replacement SGs and suspend SCE's licenses until they are amended. Because SONGS is now permanently shut down—and will not restart—there is no reasonable expectation that the asserted violation will recur.

The regulation in 10 CFR 50.59(c)(2) requires a licensee to obtain a license amendment under 10 CFR 50.90, "Application for Amendment of License, Construction Permit, or Early Site Permit," before implementing a proposed change that meets any of the criteria in 10 CFR 50.59(c)(2)(i)-(viii). The effect of the relief requested by the petitioner in the 2.206 petition would have been that SCE would not restart the SONGS, Units 2 or 3, reactors and operate the replacement SGs without undergoing a review and subsequent approval of a license amendment by the NRC staff. The permanent shutdown of Units 2 and 3 has eliminated any potential for additional effects of the asserted violation, as the reactors and the replacement SGs are prohibited from being operated. The effect of the permanent shutdown is the same result sought by the petitioner.

In addition, requiring SCE's licenses to be amended regarding the replacement SGs would have no impact on the safe operation of the permanently shutdown and defueled facility. Thus, the director's decision concludes that the petitioner's request for the NRC to order the licensee to submit a license amendment application for the design and installation of the replacement SGs and to suspend SCE's licenses until they are amended is moot.

In response to these comments, the director's decision has been revised to more clearly indicate the reasons why the requested actions are moot, and that related issues raised by the petitioner and others that are not appropriate for review through the 2.206 petition process, such as concerns related to NRC procedures or regulations, are addressed through other processes or programs. The director's decision includes a summary of several of these other activities, some of which were still in progress when the proposed director's decision was issued, and indicates where additional information on these activities can be obtained.

Comment 2 (summarized)

The petitioner commented that when SCE sought bidders for the replacement steam generators (RSGs), it specified that the SGs should be designed and constructed such that no license amendment would be required under 10 CFR 50.59. The licensee asked the supplier to, "guarantee in writing that the RSG design is licensable and provide all support necessary to achieve that end." A design specification for the second SG required the supplier to provide "an engineering evaluation ...justifying that the RSGs can be replaced under the provision of 10 CFR 50.59 (without prior NRC approval)."

Response:

Following the January 2012 SONGS SG tube degradation event, there was public concern expressed about whether the licensee decided to design the new SGs so that they could be replaced under 10 CFR 50.59 to avoid scrutiny provided by NRC staff review of a license amendment. In the March 6, 2015, "Review of Lessons Learned from the San Onofre Steam Generator Tube Degradation Event" (lessons learned report) (ADAMS Accession No. ML15062A125), the NRC staff evaluated whether it is acceptable for a licensee to intentionally design a facility change such that it could be implemented under 10 CFR 50.59 without the need for prior NRC approval. The report concludes that such an approach does not represent a safety concern or a compliance concern. Page 16 of the report states, in part:

A change that conforms to the 10 CFR 50.59 criteria demonstrates the continued adequate protection of public health and safety due to the fact that it does not result in a more than minimal increase in the frequency or consequences of an accident or a system failure, does not affect fission product barrier limits, and does not involve a departure from the method of evaluation. The NRC-approved 10 CFR 50.59 guidance of NEI [Nuclear Energy Institute] 96-07, Revision 1 ["Guidelines for 10 CFR 50.59 Implementation," dated November 17, 2000 (ADAMS Accession No. ML003771157)], Section 4.5, "Disposition of 10 CFR 50.59 Evaluations," states that if a licensee determines that a proposed activity would require prior NRC approval, it has the option to "[r]edesign the proposed activity so that it may proceed without prior NRC approval."

A licensee's decision to design RSGs so that they can be replaced without prior NRC approval would not avoid NRC oversight. The NRC provides oversight of plant modifications through the inspection process, regardless of whether a licensee's evaluation under 10 CFR 50.59 determines that prior NRC approval is required for the change. The NRC also periodically inspects licensee implementation of the 10 CFR 50.59 process, as well as design and configuration control processes. The March 6, 2015, lessons learned report discusses the NRC inspection activities and results associated with the replacement of the SONGS SGs and following the January 2012 SG tube degradation event. On June 27, 2008, SCE requested amendments to the SONGS, Units 2 and 3, licenses (NPF-10 and NPF-15, respectively) to support the replacement of its SGs. The NRC completed its review and approved the amendments on June 25, 2009, which modified the Units 2 and 3 technical specifications to reflect revised SG inspection and repair criteria and revised peak containment post-accident pressures resulting from the planned installation of the replacement SGs.

No changes were made to the director's decision as a result of this comment.

Comment 3 (summarized)

The petitioner commented that both the NRC augmented inspection and SCE's investigation of the tube degradation at SONGS, Units 2 and 3, identified fluid elastic instability as the immediate cause of the excessive tube wear but that neither determined the root cause of the premature and extensive tube degradation of the RSGs. The petitioner further asserted that the NRC permitted the licensee to design, construct, install, and operate defective SGs, and the NRC only came to recognize that there was a problem after there had been the release of radiation.

Response:

As the comment indicated, the NRC Augmented Inspection Team (AIT) that was established following the January 2012 event initially identified design control issues associated with the thermal-hydraulic modeling of the SGs as the probable cause of the SG tube degradation. Followup inspections of the unresolved issues identified by the AIT identified violations of 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Criterion III, "Design Control," for the failure to verify the adequacy of certain design features of the RSGs, which resulted in excessive and unexpected SG tube wear after one cycle of operation. Following the event, both SCE and the manufacturer of the RSGs (Mitsubishi Heavy Industries) initiated efforts to identify the root and contributing causes of the tube-to-tube wear that led to the event. Pages 24 and 25 of the March 6, 2015, lessons learned report provide the following summary of their findings:

Southern California Edison (SCE) and the vendor (Mitsubishi Heavy Industries) determined [(ADAMS Accession No. ML12285A265)] that the mechanistic cause of the Unit 3 tube-to-tube wear was U-bend in-plane fluid-elastic instability associated with adverse thermal-hydraulic conditions in the steam generator, combined with a lack of effective in-plane tube support for the U-bends. Mitsubishi determined that the tube-to-anti-vibration bar contact forces used in the replacement steam generators were not high enough to prevent the in-plane motion, given the thermal-hydraulic conditions in the secondary side of the steam generators. Mitsubishi also found that its design models had not appropriately calculated the secondary side flow conditions for the design configuration of the

San Onofre steam generators. As a result, there was significantly less margin to fluid-elastic instability in the actual steam generators than anticipated by the models.

Mitsubishi identified the root cause of the in-plane fluid-elastic instability of the tubes to be insufficient programmatic requirements for ensuring effective anti-vibration bar support that would prevent the in-plane fluid-elastic instability. The susceptibility to fluid-elastic instability was caused by the thermal-hydraulic conditions that existed in certain parts of the San Onofre replacement steam generators during full power operations.

The NRC staff reviewed the root and contributing causes and concluded that they were programmatically and technically reasonable.

The petitioner's assertion that the NRC regulations allowed SCE to design, construct, install, and operate its RSGs without prior NRC approval, and that the NRC only became aware of the design issue after one of the Unit 3 SGs developed a leak that was detected by plant radiation alarms due to a release of radiation, is factually correct. However, before the January 2012 leak, the NRC had no reason to believe that the RSGs were defective or would fail prematurely. Regardless, these issues are outside the scope of the petition, and the NRC is otherwise taking actions to address these issues. The NRC staff assessed the NRC's response to the event and potential enhancements to NRC processes and programs based on lessons learned from the event, and documented its recommendations in the March 6, 2015, lessons learned report.

Specifically, the report states, in part:

At San Onofre, the NRC identified violations of 10 CFR Part 50, Appendix B, Criterion III, for the failure to verify the adequacy of the thermal-hydraulic and flow-induced vibration design of the San Onofre replacement steam generators, resulting in excessive and unexpected steam generator tube wear after one cycle of operation. The 10 CFR 50.59 rule, NEI 96-07, Revision 1, and the results of the San Onofre 10 CFR 50.59 evaluation did not have any bearing on the underlying, unrecognized design control issue that actually caused the San Onofre steam generator tube leak event.

In addition, Topic 3, "Steam Generator Technical Review," and Topic 8, "Vendor Inspection," of the report look at the technical aspects of the event and describe, in part, ongoing actions related to working with the nuclear industry and professional organizations to update standards and guidelines based on the experience at SONGS. The report also explores potential updates to the Reactor Oversight Process inspection procedures to flag major plant modifications that might require review and inspection by technical experts before operation.

As discussed in the response to Comment 1, the director's decision has been revised to more clearly identify the related issues that are outside of the scope of this petition, including the enforcement action associated with the RSGs described above.

Comment 4 (summarized)

The petitioner commented that the proposed director's decision ignores the conclusions in the NRC's Office of Inspector General (OIG) October 2, 2014, event inquiry report, "NRC Oversight of the Licensee's Use of 10 CFR 50.59 Process to Replace SONGS' Steam Generators," the

majority of which led to 10 CFR 50.59 flaws and the need for a license amendment, and did not address the issue of whether SCE needed a license amendment to replace the SGs at SONGS, Units 2 and 3. In addition, the petitioner noted that the OIG stated that a former NRC deputy regional administrator said that the licensee should have applied for a license amendment because if it had, the RSGs would not have been approved. The petitioner also stated that there was no conclusion reached on a violation despite evidence suggesting some staff felt there should have been.

Response:

The March 6, 2015, lessons learned report describes the results of NRC inspections of SCE's 10 CFR 50.59 evaluation and whether SCE needed a license amendment to replace the SGs at SONGS, Units 2 and 3, as follows:

In 2010 and 2011, Southern California Edison (SCE) installed replacement steam generators at San Onofre Units 2 and 3, respectively, following a 10 CFR 50.59 evaluation that concluded no license amendment would be required . . . except for the relevant technical specification changes related to steam generator inspection and tube repair criteria and changes to the peak containment post-accident pressure. In preparation for the steam generator replacements, the NRC inspectors reviewed the 10 CFR 50.59 evaluation performed on Unit 2 by SCE as part of a baseline inspection of plant modifications and as part of the focused steam generator replacement inspection [(ADAMS Accession Nos. ML093100051 and ML111300448)]. The inspection did not identify any issues with the licensee's 10 CFR 50.59 evaluation.

Following the January 2012 steam generator tube leak event, the NRC conducted additional inspections [(ADAMS Accession Nos. ML12188A748 and ML12318A342)] at San Onofre, including a review of the event, a review of the steam generator replacement process, and another review of the 10 CFR 50.59 evaluations. As part of this additional inspection and technical review, several issues were raised, including some specific to the San Onofre 10 CFR 50.59 evaluation. ...

OIG Issue #2 noted that the 2012 AIT review of the licensee's 10 CFR 50.59 evaluation did not document the answer to the question of whether a license amendment was required. The AIT review considered many issues, among which was whether or not the licensee correctly concluded that a license amendment was not required. The AIT and its followup inspections reviewed the licensee's 10 CFR 50.59 evaluations related to replacing the steam generators and determined that the licensee's conclusion that no license amendment was required was consistent with the requirements of 10 CFR 50.59.

The issues identified in the OIG report, including issues associated with NRC's oversight of the 10 CFR 50.59 process at SONGS, were incorporated into the lessons learned activity for appropriate response actions. The lessons learned report also discussed the NRC staff's consideration of varying NRC perspectives about the 10 CFR 50.59 process that OIG also highlighted in its report. To respond to this issue, the lessons learned report identified actions to enhance training on the 10 CFR 50.59 process (e.g., the determination of whether a license

amendment is required). Therefore, although not specifically identified in the lessons learned report, the NRC staff considered the perspectives of the former deputy regional administrator.

No changes were made to the director's decision as a result of this comment.

Comment 5 (summarized)

The petitioner stated that it would continue to work with Senator Barbara Boxer and Senator Dianne Feinstein, who it said are concerned about the NRC's role in the "plant's demise" to ensure that this will not happen in the future.

Response:

The NRC shares the concerns of the petitioner and is taking steps to prevent a similar event from occurring in the future. As indicated in the March 6, 2015, lessons learned report, the NRC Executive Director for Operations issued a March 20, 2014, tasking memorandum that directed the NRC staff to evaluate the lessons learned from this event, apply appropriate process improvements, and clearly communicate the outcomes to all NRC stakeholders to improve NRC regulatory effectiveness and efficiency and meet the NRC's safety and security mission. The report identified 17 actions across the 8 topic areas identified in the tasking memorandum, and the NRC staff is taking steps to implement these actions. The most substantial of these actions are in the technical areas related to the cause of the tube degradation and in the area of external communications. As discussed in the response to Comment 3, the report identified actions related to working with the nuclear industry and professional organizations to update standards and guidelines based on the experience at SONGS. In addition, several actions are

focused on improving the communications related to complex, technical subjects to the public and other stakeholders.

No changes were made to the director's decision as a result of this comment.

Comment 6 (summarized)

The petitioner provided several comments about the 2.206 review process, including the timeliness of the NRC's 2.206 review, the number of petition managers assigned to the petition over the course of the petition review, and the NRC management's ownership of the proposed director's decision. The petitioner also asked that the draft director's decision be rejected, proposing that the NRC rule on the information provided by the petitioner and in accordance with the information in the OIG report.

Response:

The issues associated with the SONGS SG tube degradation event were highly complex, requiring the involvement of individuals with expertise in multiple technical and regulatory disciplines. The NRC expended significant effort to assess the issues following the event, including immediately initiating an AIT reactive inspection to assess the circumstances surrounding the event, establishing dedicated teams of technical experts and inspectors to evaluate the licensee's response to the event and corrective actions, and establishing a team to assess lessons learned from the NRC's response to the event. The effort also included NRC's Office of Investigations and OIG activities, as well as multiple public meetings conducted both near SONGS and at the NRC headquarters. Although the requested actions accepted for review under this 2.206 petition by the Petition Review Board (PRB) were only one part of the

overall effort, the petitioner raised some issues that touched on multiple aspects of the overall effort. The PRB did not complete its recommendations for the director's decision until after it was able to give due consideration to the information obtained from these other related activities. The final director's decision considered all available information, including the OIG report.

As recognized in the March 6, 2015, lessons learned report, the NRC agrees that there are some improvements that can be made to NRC processes and programs based on lessons learned from the response to the SONGS event. The NRC is committed to addressing the recommendations and actions in this report, and to continue to improve its programs and processes to enhance its ability to carry out its safety mission.

To ensure the concerns related to the staff's actions involving this 2.206 petition are given proper consideration, the NRC has also forwarded the petitioner's comments to the OIG.

No changes were made to the director's decision as a result of this comment.