UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BLVD
ARLINGTON, TEXAS 76011-4511

February 13, 2014

Mr. Thomas J. Palmisano, Vice President
and Chief Nuclear Officer
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 1, 2, 3, AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) INSPECTION REPORT 05000206/2014007, 05000361/2014007, 05000362/2014007, AND 07200041/2014001

Dear Mr. Palmisano:

An inspection was completed of your dry cask storage activities associated with your Independent Spent Fuel Storage Installation (ISFSI) on January 14 - 16, 2014. An exit was conducted with your staff to discuss the findings of the inspection on January 16, 2014. The focus of this inspection was to verify ongoing compliance with the Transnuclear Certificate of Compliance No. 1029 and the associated Technical Specifications, the Transnuclear Standardized Nuclear Horizontal Modular Storage (NUHOMS) System's Final Safety Analysis Report (FSAR), and the regulations in Title 10 of the Code of Federal Regulations (CFR) Part 20 and Part 72.

The inspection reviewed the areas of radiation safety, quality assurance, cask thermal monitoring, corrective action program, safety evaluations, cask maintenance, and how you addressed industry issues that affected your ISFSI program. The inspection reviewed changes made to your ISFSI program since the last U.S. Nuclear Regulatory Commission (NRC) ISFSI inspection. Your ISFSI operations were found to be in compliance with the applicable NRC regulations and requirements and your storage casks were found to be in good physical condition. No violations of the NRC regulations were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure(s), and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact the undersigned at 817-200-1191 or Mr. Lee Brookhart at 817-200-1549.

Sincerely,

/RA/

D. Blair Spitzberg, Ph.D., Chief
Repository & Spent Fuel Safety Branch
Division of Nuclear Materials Safety

Dockets: 50-206, 50-361, 50-362, 72-41
Licenses: DPR-13, NPF-10, NPF-15

Enclosure:
Inspection Report 05000206/2014007;
05000361/2014007; 05000362/2014007; 7200041/2014001
w/attachments:
1. Supplemental Information
2. Loaded Casks at the SONGS ISFSI

cc w/encl: Director, California Radiation
Control Program
R. Sholler, Southern California
Edison Company
W. Mathews III, Esquire, Southern
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R. St. Onge, South California
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E. Park, Esquire, Southern California
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Letter to Mr. Thomas J. Palmisano from D. Blair Spitzberg, dated February 13, 2014.

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 1, 2, 3, AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) INSPECTION REPORT 05000206/2014007, 05000361/2014007, 05000362/2014007, AND 07200041/2014001

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Dockets:	05000206, 05000361, 05000362, 07200041
Licenses:	DPR-13; NPF-10; NPF-15
Report Nos.:	05000206/2014007, 05000361/2014007, 05000362/2014007, and 07200041/2014001
Licensee:	Southern California Edison Co. (SCE)
Facility:	San Onofre Nuclear Generating Station (SONGS) Independent Spent Fuel Storage Installation (ISFSI)
Location:	5000 S. Pacific Coast Hwy San Clemente, California
Dates:	January 14-16, 2014
Inspector:	Lee E. Brookhart, Senior Inspector Repository & Spent Fuel Safety Branch
Accompanying Personnel:	Eric J. Simpson, Inspector-in-Training, Repository & Spent Fuel Safety Branch
Approved By:	D. Blair Spitzberg, Ph.D., Chief Repository & Spent Fuel Safety Branch Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station
NRC Inspection Report 05000206/2014007, 05000361/2014007,
05000362/2014007, and 07200041/2014001

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine inspection of the licensee's programs and activities for safe handling and storage of spent fuel at the San Onofre Nuclear Generating Station (SONGS) Independent Spent Fuel Storage Installation (ISFSI) on January 14 - 16, 2014. Southern California Edison Company (SCE) had placed 51 canisters at their ISFSI. The Nuclear Horizontal Modular Storage (NUHOMS) Advanced Horizontal Modular Storage (AHSM) System, approved by the NRC as Certificate of Compliance 72-1029, was used at the SONGS site to store spent fuel in dry cask storage at a storage pad area adjacent to the dismantled Unit 1 facility. Areva Transnuclear, Inc. is the cask vendor for this system. Spent fuel from all three reactor facilities had been placed in storage at the ISFSI, with the first canister loaded into the ISFSI on October 3, 2003. Greater than Class C (GTCC) waste removed from the internals of the Unit 1 reactor was stored at the ISFSI in one canister. The licensee was currently maintaining the ISFSI under Amendment 1 of Certificate of Compliance 72-1029 and Revision 3 of the Final Safety Analysis Report (FSAR).

The inspection evaluated the current condition of the AHSMs containing the canisters loaded with spent fuel and GTCC waste and reviewed a number of topics to evaluate compliance with the applicable NRC regulations and the provisions of their general license. The NRC routine inspection reviewed documentation relevant to ISFSI activities and operations that have occurred at SONGS since the last ISFSI inspection that was performed in April of 2011. The documentation reviewed included quality assurance, radiological conditions, corrective actions, compliance with technical specifications, the Final Safety Analysis Report requirements, and industry ISFSI issues that affected the site. The casks were being maintained in good physical condition. Radiological dose rates around the ISFSI were low. A review of the environmental monitoring program demonstrated that radiological exposures to offsite locations from the ISFSI were low and within the NRC requirements. The quality assurance program and corrective action program were being effectively implemented to capture and correct issues related to the dry cask storage program. In summary, the licensee was conducting ISFSI activities in compliance with regulatory and license requirements.

Operation of an ISFSI at an Operating Plant (60855.1)

- The licensee was conducting quality assurance audits of the ISFSI program. A review of the audit reports and surveillances performed since the last inspection determined that the quality assurance group was covering risk significant areas within a broad range of topics. Any issues that were identified in the reports were entered into the corrective action program for resolution. (Section 1.2.a)

- Radiation levels around the ISFSI pad were within expected ranges for the site's ISFSI. Radiation data reviewed from the 2011 through 2012 environmental reports determined that radiation levels offsite were not being significantly impacted by the ISFSI. (Section 1.2.b)

- Required records were maintained that described the specific fuel parameters for the spent fuel stored in each of the licensee's loaded casks. Technical Specification requirements related to maximum burn-up, enrichment, and heat load were reviewed against records for selected canisters. All Technical Specification requirements had been met. (Section 1.2.c)

- Selected condition reports were reviewed for the period April 2011 through January 2014. A wide range of issues had been identified and resolved. Resolutions of the condition reports were appropriate for the safety significance of the issue. No adverse trends were identified during the review. (Section 1.2.d)

- Temperature monitoring of the AHSMs was being performed in accordance with Technical Specification 5.2.5. Temperature limits had been established for the temperature monitoring system being used by the licensee consistent with the FSAR requirements. (Section 1.2.e)

- SONGS submitted their ISFSI Decommissioning Funding Plan in compliance with 10 CFR 72.30(b) before the submittal deadline of December 17, 2012. (Section 1.2.f)

- SONGS's response to NRC Information Notice 2012-20 has been adequately captured and documented in their corrective action program. (Section 1.2.g)

Review of 10 CFR 72.212(b) Evaluations (60856.1)

- The licensee was maintaining the 10 CFR 72.212 Evaluation Report current as required. Two changes to the 10 CFR 72.212 report had been made since the last NRC ISFSI inspection in 2011. No issues were found associated with the 72.212 revisions. (Section 2.2)

Review of 10 CFR 72.48 Evaluations (60857)

- All required safety screenings and safety evaluations had been performed in accordance with procedures and 10 CFR 72.48 requirements. All screenings and safety evaluations reviewed were determined to be adequately evaluated. (Section 3.2)

Report Details

Summary of Facility Status

Fifty one concrete AHSMs which housed stainless steel dry shielded canisters (DSCs) were loaded and stored at the SONGS ISFSI. Spent fuel from all three reactors was stored at the ISFSI in 50 of the canisters. Greater than Class C (GTCC) waste from the Unit 1 reactor decommissioning project was stored in one canister. The advanced aspect of the AHSM was developed for use at high seismic sites and provided for additional dose reduction over the standard horizontal storage modules. There were a total of 63 AHSMs on the ISFSI pad. The twelve empty AHSMs will be available for future loading campaigns. The ISFSI pad consisted of two adjacent pad areas designed to hold the AHSMs. The pad was 293 feet in length. The first pad area was 43 feet 6 inches wide and held 31 canisters. The second pad area was 60 feet 6 inches wide and was designed to hold a double row of canisters. The 63 AHSMs currently on the pad were designed for the 24PT1-DSC and 24PT4-DSC canisters, which hold a maximum of 24 spent fuel assemblies. With the 24 assembly canisters, 30 more AHSMs can be added to the current pad for a total of 93 AHSMs.

At the SONGS ISFSI, 17 canisters held 395 fuel assemblies from Unit 1 and one canister contained GTCC waste from Unit 1. A total of 17 canisters contained 408 fuel assemblies from Unit 2 and 16 canisters contained 384 fuel assemblies from Unit 3. Inside the reactors facilities, the Unit 2 spent fuel pool contained 1,318 fuel assemblies and the Unit 3 spent fuel pool contained 1,350 fuel assemblies in wet storage. Each spent fuel pool has the capacity to hold 1,542 assemblies.

At the time of the inspection, SONGS management was in the process of preparing their Post-Shutdown Decommissioning Activities Report for submittal to the NRC. The licensee was in the process of preparing and selecting future ISFSI expansion design ideas with the possibility of selecting a different cask system to store the remaining fuel from wet storage to dry storage. The spent fuel will then remain at the SONGS ISFSI until a federal repository is approved and available to receive the dry storage casks.

1 Operations of an ISFSI at Operating Plants (60855.1)

1.1 Inspection Scope

An inspection of the status of the loaded casks at SONGS was completed to verify compliance with requirements of their general license, their ISFSI's FSAR, and federal regulations. The inspection reviewed a broad range of topics including audits conducted by the licensee, condition reports related to the ISFSI, environmental radiological data collected around the ISFSI for the past several years, review of the annual cask maintenance records, safety evaluations, and review of industry issues that affected the site's ISFSI program. A tour of the ISFSI area was performed during which inspectors observed radiological dose rates measured by the licensee around the perimeter of the ISFSI pad and near the casks.

1.2 Observations and Findings

a. Quality Assurance Audits and Surveillances

The San Onofre Nuclear Generating Station Nuclear Oversight Division (NOD) had issued several audit reports and two assessment documents of SONGS's ISFSI activities since the last NRC inspection in April 2011. The audits covered ISFSI activities related to Design and Configuration Control; Maintenance Program; Radiation and Radioactive Material Control; Procurement and Material Control; Security; and other ISFSI related areas.

At SONGS all audit findings, weaknesses, and recommendations are addressed by the corrective actions program (CAP) through the issuance of nuclear notifications (NNs), which are tracked until the issue is resolved. Additionally, when findings are identified, an apparent cause evaluation (ACE) or direct cause evaluation (DCE) is performed by the impacted office/department. None of the audit reports reviewed produced any ISFSI related findings and no ISFSI related ACEs or DCEs were issued. Some of the audits did identify ISFSI related weaknesses and recommendations. All identified weaknesses and recommendations reviewed by the NRC inspectors had been entered into the SONGS's CAP and were found to be properly resolved.

b. Radiological Conditions Related to Stored Casks

A tour of the ISFSI pad was performed during the inspection. The tour found the 51 loaded Transnuclear AHSM casks to be in good condition. No overt vegetative growth, flammable, or combustible materials were observed inside the ISFSI protected area (PA) fence. A radioactive material boundary, roping, was installed around the front side of the loaded AHSMs. Those boundaries were properly positioned and posted. A recent radiological survey of the ISFSI pad was provided to the NRC inspectors upon their arrival on-site. A radiation protection (RP) technician accompanied the NRC inspectors during the pad tour. A radiological survey was performed by the RP technician with a tissue-equivalent organic scintillator detector for gamma radiation, which provided dose-equivalent readings in micro-rem per hour (µrem/hr). The NRC inspectors had a general purpose Geiger-Mueller detector calibrated to provide gamma exposure readings in micro-Roentgens per hour (µR/hr). Survey measurements were taken at selected locations on the ISFSI pad and at the PA fence south entry location.

General area background readings before reaching the ISFSI were 7-8 µR/hr. The NRC measured 18 µR/hr at the ISFSI PA entry point on the south side of the pad. On the pad, the RP tech measured readings that ranged from 12.5 µrem/hr on the side of a loaded AHSM to 800 µrem/hr at an AHSM air inlet vent location. The radiation control barrier rope boundary varied from 25 to 110 µrem/hr.

Offsite and onsite monitoring data from the SONGS 2011 and 2012 *Annual Radiological Environmental Operating Report* (AREOR) were reviewed. The reports were generated by the SONGS Radiological Environmental Monitoring Program (REMP) which tracked external gamma radiation through the use of 49 environmental thermoluminescent dosimeter (TLD) monitoring locations. This included 3 locations in close proximity to the SONGS ISFSI, TLD #55, TLD #56, and TLD #59.

The REMP has TLDs posted at the site's controlled area boundary (CAB) to demonstrate compliance with the 10 CFR 72.104 (a) standards for radiation dose to the public. Locations TLD #55 and TLD #56 are REMP monitoring locations at or near the CAB in closest proximity to the SONGS ISFSI. For 2011 and 2012, the highest reading for those TLDs was at location TLD #55, which measured a total (background corrected) exposure of 25 mR in 2011. TLD #55 is located along the seawall fencing that is around twenty five feet above sea level. The dose to a member of the public was calculated using a recreational (beach time[1]) occupancy factor of 3.425×10^{-2} based on 300 hours recreational time spent on the beach at that location for the year. That dose was calculated to be < 1 mrem. This dose is well below the regulatory dose requirements of 25 mrem in a calendar year.

The AREORs also included data from 26 TLD monitoring locations installed in support of 10 CFR 72.126 (c) (2) requirements for direct radiation monitoring in and around the ISFSI. These monitoring locations were not included in the REMP analyses for off-site dose. Of those 26 locations, 11 were positioned directly outside of the ISFSI PA fence to measure the direct radiological influence of the ISFSI at those locations. Those 11 TLDs were at PA fence locations that, roughly, encircled the ISFSI. Table 1, below, presents the ISFSI monitoring results from the 2011 and 2012 AREORs.

Table 1, ISFSI Fence Location Annual Gamma Exposures in mR

TLD #	Fence Location	CY 2011	CY 2012
326	North	89.0	128.6
325	Northwest	305.2	360.4
328	West	598.3	636.0
327	West	1172.1	1101.5
324	West	203.9	416.9
323	Southwest	54.5	82.4
322	South	20.5	63.5
312	Southeast	< LLD	< LLD
311	East	14.9	17.9
310	East	17.5	23.9
309	East	19.1	23.4

For 2011 and 2012, the maximum measured onsite dose impacts from the ISFSI were recorded at TLD #327 on the west side of the ISFSI fence. The measured value was 1.2 R (1,172 mR) for the year of 2011. No member of the general public would be able to get to the ISFSI PA fencing. The proper occupancy factor to use for modifying this exposure is the industrial worker occupancy factor of 2.28×10^{-1} to account for 2000 hours per year spent onsite at that location. Using the worker occupancy factor, the measured exposure at that location translates to approximately 274 mrem, which was within NRC occupational dose limits listed in 10 CFR 20.1502(a)(1).

Neutron dose rates from the ISFSI are measured and tracked at SONGS. REMP TLD #55 and ISFSI area monitoring TLDs #311, #324, #325, #326, #327, and #328 all contain neutron dosimeters. Environmental monitoring results from 2011 and 2012 have shown very little neutron dose to areas in close proximity to the ISFSI pad. All neutron TLD results have been less than the dosimeters lower limit of detection (LLD).

[1] See SONGS Offsite Dose Calculation Manual, Revision 36, February 28, 2001 (ML021160150).

c. Cask Records of Fuel Contents

There have been two cask loading campaigns since the last inspection took place in April 2011: A five cask loading campaign of Unit 2 fuel in 2011 and a four cask loading campaign of Unit 3 fuel in 2012. The Units 2 and 3 Combustion Engineering 16x16 pressurized water reactor spent fuel assemblies were loaded into Transnuclear Model 24PT4-DSC Dry Shielded Canisters (DSCs) for both campaigns.

During cask loading operations, a radiological survey was required of the loaded transfer cask by Technical Specification (TS) 5.2.4.(d) to confirm dose rates were consistent with offsite dose analyses. Two limits were established in the TS. The first limit was a 260 mrem/hr dose rate at 3 feet from the centerline of the top of the welder neutron shield prior to wet welding operations, with the shield plug in place, approximately 4 inches of water drained, and the welder with its neutron shield in place. The second limit was a 95 mrem/hr dose rate at 3 feet from the surface of the transfer cask neutron shield at the centerline of the transfer cask prior to wet welding operations. The licensee had established these requirements in Procedure SO23-I-30.9 and performed the required survey in step 6.7.26. The NRC inspectors reviewed one survey at random from each loading campaign of Units 2 and 3.

Concerning the first limit, 260 mrem/hr, the reading obtained from the two canister records reviewed, DSC 43 and DCS 51, was 0.2 and < 0.2 mrem/hr, respectively. For the second limit, 95 mrem/hr, the two canisters came in at 1 and 7 mrem/hr, respectively. The canister with the higher heat load, DSC 51, recorded the higher value, which would be expected. The canisters had heat loads that were 7.81 and 13.16 Kw, respectively. The reviewed values were well within the TS limit.

Permanent records describing the spent fuel stored in SONGS's ISFSI are required by 10 CFR 72.212(b)(12). A review of the SONGS ISFSI records was performed to determine if an adequate description of the spent fuel loaded into casks during both campaigns was documented as a permanent and retrievable record and to verify compliance with TS 2.2, "Fuel to be Stored in the 24PT4-DSC" and associated Tables 2-9 through 2-16.

The 24PT4-DSC spent fuel loading information was provided to the NRC in the form of cask loading calculations. The NRC inspectors reviewed information found in Calculation No. N-1020-007, "Dry Cask Storage 24PT4-DSC Canister Loading Pattern for Unit 2 Fuel Assemblies: 2011 Loading Campaign," December 14, 2010; Calculation No. N-1020-181, "Dry Cask Storage 24PT4-DSC Canister Loading Patterns for Unit 3 Fuel Assemblies: 2012 Loading Campaign," February 24, 2012; Calculation Change Notice, CCN-D0058668, "Dry Cask Storage 24PT4-DSC Canister Loading Pattern for Unit 2 Fuel Assemblies: 2011 Loading Campaign," February 27, 2012; and Calculation Change Notice, CCN-D0058668, "Dry Cask Storage 24PT4-DSC Canister Loading Pattern for Unit 3 Fuel Assemblies: 2012 Loading Campaign," November 15, 2012. Those documents contained fuel assembly identification information, DSC loading patterns and assembly locations, assembly burn up in gigawatt days per metric ton of uranium (GWd/MTU), discharge date, original ^{235}U enrichment percentage, and assembly decay heat in watts. The NRC inspectors reviewed the contents of casks 43 through 51and found that the contents of each cask met the requirements of TS 2.2 and associated tables (see fuel data in Attachment 2).

SONGS has loaded spent fuel at their ISFSI in compliance with the license TS for fuel assembly burn-up. None of the seventeen 24PT1-DSC canisters holding Unit 1 spent fuel contained "high burn-up fuel" (a fuel assembly with a burn-up of greater than 45 GWd/MTU). For ensuring compliance to their license's technical specifications SONGS added a 7 percent uncertainty factor to each fuel assembly's burn-up value as conservatism for storage of that fuel assembly in a canister at the ISFSI. For the Unit 2/Unit 3 spent fuel stored in a 24PT4-DSC canister at the SONGS ISFSI, only three canisters contain a fuel assembly that met the definition of "high burn-up fuel." When adding the 7 percent uncertainty factor, the number of canisters containing such an assembly increased to thirteen. The 24PT4-DSC canister is designed and evaluated to store fuel assemblies with a burn-up of up to 60 GWd/MTU based on enrichment and cooling times in accordance with Tables 2-9 through 2-16 of TS 2.2 (i). The fuel loaded at the SONGS ISFSI was verified to be well below this limit with the added uncertainty factor.

d. Corrective Action Program

A list of condition reports issued since the last NRC inspection in April of 2011 was provided by the licensee for ISFSI activities and for the two overhead cask handling cranes. Issues were processed in accordance with Procedure S0123-XV-50, "Corrective Action Program," Revision 30. When a problem was identified the licensee would document the issue as a condition report in their CAP as a Nuclear Notification (NN) and would assign a NN number to track the issue.

Of the list of condition reports provided relating to the ISFSI and cask handling cranes, approximately 39 NNs were selected by the NRC for further review. The NNs related to a number of different topics including: an evaluation for personnel response actions for a seismic event during crane cask handling operations, ISFSI thermal couple malfunctions, clarification questions raised during fuel loading operations, crane load test recertification, annual crane maintenance inspections, and concerns related to industrial safety identified in a crane & rigging assessment.

The NNs reviewed were well documented and properly categorized based on the significance of the issue. The corrective actions taken were appropriate for the situations. No NRC concerns were identified related to the condition reports reviewed.

e. AHSM Temperature Monitoring Program

Temperature monitoring and visual inspections of AHSM vents were required by TS 5.2.5, "AHSM Thermal Monitoring Program." Technical Specification 5.2.5.(c) required daily visual inspection of the AHSM air vents loaded with 24PT1-DSC canisters. This daily vent inspection requirement did not apply to the 24PT4-DSC canisters. Operating Procedure SO23-3-3.21, "Surveillance Operating Instruction Attachment 1," Revision 36, provided the instructions for the visual inspection of the vents and the thermal monitoring program.

Temperature monitoring of all AHSMs was required by TS 5.2.5.(a). For the AHSMs containing 24PT1-DSC canisters, daily temperature monitoring was required with a 40-hour blocked vent time limit. An 80ºF temperature rise limit and a 225ºF overall temperature limit were established for the AHSMs containing the 24PT1-DSC canisters. The TS limits were established to alert the operator to possible blockage of the air vents.

These limits were based on a single thermocouple monitoring system. The licensee used dual thermocouples. FSAR Section 4.4.2.5, "Monitoring of AHSM Temperatures," and Table 4.4-12, "Technical Specification 5.2.5.(a), Temperature Monitoring Limits for the 24PT1-DSC," established different temperature limits for dual thermocouple systems. The temperature rise was limited to 8ºF when monitoring the canister temperatures on a 24-hour basis. The maximum temperature limit was 175ºF.

For the AHSMs containing the 24PT4-DSC canisters, the TS 5.2.5.(a) temperature rise limit was 30ºF with an overall upper limit of 225ºF. Temperatures were required to be measured twice a day. If these limits were exceeded, the licensee had a 25-hour blocked vent time limit. Since the licensee was using a dual thermocouple monitoring system, these limits were modified to comply with FSAR Section A.4.4.2.4, "Monitoring of AHSM Temperatures," and Table A.4.4-11, "Technical Specification 5.2.5.(a) Temperature Monitoring Limits for the 24PT4-DSC." The temperature rise limit was 5ºF for a 12-hour period with a maximum temperature limit of 200ºF.

Temperature monitoring documentation was reviewed for the months of September 2011, December 2011, February 2012, and July 2013 to verify compliance with the TS. For all four months selected for review, temperature monitoring or vent inspections were performed daily, as required. For all the days of the selected months reviewed, no cask vents were reported as being blocked. There has not been any overheating event at the ISFSI and the licensee has not experienced any occurrences of blockage of the AHSMs vents.

f. Decommission Funding Plan

Federal Register Notice 76FR35512, dated June 17, 2011, included a new rulemaking requirement that affected Part 72 licensees. The Federal Register documented a change to 72.30(b) which required Part 72 licensees to submit to the NRC for review and approval an ISFSI decommissioning funding plan. The final rule made changes to the financial assurance requirements for Part 72 licensees to provide greater consistency with similar decommissioning requirements in the 10 CFR Part 50 regulations. Financial assurances are financial arrangements provided by the licensee to ensure funds for decommissioning will be available when needed. The effective date of the new rule was December 17, 2012. The new rule required all Part 72 licensees to submit a decommissioning funding plan to the NRC by the effective date of the rule. SONGS submitted their ISFSI Decommissioning Funding Plan to the NRC for review and approval on December 14, 2012 (Adams Accession No. ML130420384) in compliance with the new rule.

g. NRC Information Notice 2012-20

The NRC issued Information Notice (IN) 2012-20, "Potential Chloride-Induced Stress Corrosion Cracking (SCC) of Austenitic Stainless Steel and Maintenance of Dry Cask Storage System Canisters," on November 14, 2012. The IN was issued to all holders and applicants for an ISFSI license or Certificate of Compliance (CoC) under 10 CFR 72. The IN alerted licensees and certificate holders that several instances of chloride-induced SCC had occurred in welded and unwelded 304, 304L, and 316L austenitic stainless steel components that were exposed to atmospheric conditions near salt-water bodies. It pointed out examples of SCC found at St. Lucie Nuclear Power Plant, Turkey Point Nuclear Generating Station, Koeberg Nuclear Power Station (South

Africa), and at the SONGS site itself. None of those examples involved ISFSI canisters or components, but the IN served to alert licensees and certificate holders of possible issues that could develop with the types of stainless steel most frequently used in ISFSI components, especially in areas near salt water.

SONGS received the IN and entered it into their corrective action program by issuing NN #202227994 on November 26, 2012, which discussed the specifics of the problem and documents the measures that Transnuclear has taken to evaluate the issue, as well as other industry initiatives to address the potential issue. There is no NRC required action related to the IN. SONGS response to the NRC Information Notice 2012-20 has been adequately documented and was being tracked through their corrective action program.

1.3 Conclusions

The licensee was conducting quality assurance audits of the ISFSI program. A review of the audit reports and surveillances performed since the last inspection determined that the quality assurance group was covering risk significant areas within a broad range of topics. Any issues that were identified in the reports were entered into the corrective action program for resolution.

Radiation levels around the ISFSI pad were within expected ranges for the site's ISFSI. Radiation data reviewed from the 2011 through 2012 environmental reports determined that radiation levels offsite were not being significantly impacted by the ISFSI.

Required records were maintained that described the specific fuel parameters for the spent fuel stored in each of the licensee's loaded casks. Technical Specification requirements related to maximum burn-up, enrichment, and heat load were reviewed against records for selected canisters. All TS requirements had been met.

Selected condition reports were reviewed for the period April 2011 through January 2014. A wide range of issues had been identified and resolved. Resolutions of the condition reports were appropriate for the safety significance of the issue. No adverse trends were identified during the review.

Temperature monitoring of the AHSMs was being performed in accordance with TS 5.2.5. Temperature limits had been established for the temperature monitoring system being used by the licensee consistent with the FSAR requirements.

SONGS submitted their ISFSI Decommissioning Funding Plan in compliance with 10 CFR 72.30(b) before the submittal deadline of December 17, 2012.

SONGS's response to the NRC Information Notice 2012-20 has been adequately captured and documented in their corrective action program.

2 Review of 10 CFR 72.212(b) Evaluations at Operating Plants (60856.1)

2.1 Inspection Scope

The 10 CFR 72.212 Evaluation Report was reviewed to verify site characteristics were still bounded by the Transnuclear NUHOMS System's design basis.

2.2 Observations and Findings

SONGS's 10 CFR 72.212 Evaluation Report was currently Revision 9. Two revisions had been completed to the 72.212 Evaluation Report since the last NRC inspection and were reviewed during this inspection. These were Revision 8 and Revision 9. The 10 CFR 72.48 safety screening performed for each revision was reviewed.

In Revision 8, the licensee made various changes in the report to account for the newly added spent fuel at the ISFSI due to two loading campaigns. The change also updated some of the site's design characteristics. All changes were found to continue to meet the NUHOMS general licensed design basis. In Revision 9, the licensee updated the report to account for another loading campaign which added fuel to the ISFSI from a 2012 Unit 3 loading campaign. No other changes were made in that revision.

2.3 Conclusions

The licensee was maintaining the 10 CFR 72.212 Evaluation Report current as required. Two changes to the 10 CFR 72.212 report had been made since the last NRC ISFSI inspection in 2011. No issues were found associated with the 72.212 revisions.

3 Review of 10 CFR 72.48 Evaluations (60857)

3.1 Inspection Scope

The licensee's 10 CFR 72.48 screenings and evaluations since the 2011 NRC ISFSI inspection were reviewed to determine compliance with regulatory requirements.

3.2 Observations and Findings

A list of modifications to the ISFSI program and cask handling cranes was provided by the licensee. The licensee had reported that they had not made any significant modifications to their ISFSI operations or cask handling cranes since the last inspection. However the licensee had performed one full 72.48 safety evaluation to evaluate some scratches that were identified on the inside surface of their transfer cask after receiving the transfer cask back from Cooper Nuclear Station. The licensee utilized Procedure SO123-XV-44, "10 CFR 50.59 and 72.48 Program," Revision 16 to perform the 10 CFR 72.48/50.59 safety screenings or evaluations.

The one 72.48 safety evaluation that had been performed since the last inspection was related to the site's transfer cask. The safety review contained an appropriate evaluation that was performed by Transnuclear and was accepted by SONGS ISFSI staff. The evaluation was logged in SONGS Vendor Print Log as SO23-207-16-M175. An ultrasonic test and nondestructive examination report demonstrated that the remaining wall thickness at the scratch locations was bounded by a previous evaluation in SO23-207-16-M101. The interior area was found to meet the minimum required wall thickness and the scratches were found to have no effect upon the structural strength of the inner liner or affect thermal or shielding performance. The safety evaluation documented that the proposed change did not require NRC approval.

3.3 Conclusions

All required safety screenings and safety evaluations had been performed in accordance with procedures and 10 CFR 72.48 requirements. All screenings and safety evaluations reviewed were determined to be adequately evaluated.

4 Exit Meeting

The inspectors reviewed the scope and findings of the inspection during an exit conducted on January 16, 2014.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

T. Adler, Manager, DIA Planning Team
C. Ahola, Manager, Radiological Control
E. Avella, Director, Decommissioning Initial Activities
L. Bosch, Manager, Engineering
S. Collins, Radwaste Specialist
J. Davis, Manager, Operations
D. Evans, Manager, Security
K. Flynn, Supervisor, Plant Engineering
T. Gallaher, Supervisor, Corrective Action Program/Performance Improvement
R. Granaas, Senior Nuclear Engineer
J. Madigan, Director, Oversight and Nuclear Safety Concerns
A. Martinez, Manger, Radiation Protection and Chemistry
M. Orewyler, Project Manager, New Fuel Recovery
R. Pettus, Licensing/Compliance Specialist
R. Quam, Manager, Security
M. Shepard, Manager, DIA Projects
B. Sholler, Shutdown Plant Manager
R. St. Onge, Manager, Regulatory Affairs and Emergency Preparedness

INSPECTION PROCEDURES USED

IP 60858	Away-From-Reactor ISFSI Inspection Guidance
IP 60857	Review of 10 CFR 72.48 Evaluations
IP 60856	Review of 10 CFR 72.212(b) Evaluations at Operating Plants

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Discussed

None

Closed

None

LIST OF ACRONYMS

ACE	apparent cause evaluation
ADAMS	Agencywide Documents Access and Management System
AHSM	Advanced Horizontal Modular System
AREOR	Annual Radiological Environmental Operating Report
CAB	controlled area boundary
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
DCE	direct cause evaluation
DNMS	Division of Nuclear Material Safety
DSC	Dry Shielded Canister
FSAR	Final Safety Analysis Report
GTCC	Greater Than Class C
GWd/MTU	gigawatt days/metric ton uranium
IN	Information Notice
ISFSI	Independent Spent Fuel Storage Installation
kW	kilo-watt
LLD	Lower Limit of Detection
mrem	milliRoentgen equivalent man
µrem/hr	micro-rem per hour
µR/hr	micro-Roentgens per hour
NN	nuclear notifications
NOD	Nuclear Oversight Division
NRC	U.S. Nuclear Regulatory Commission
NUHOMS	Nuclear Horizontal Modular Storage
PA	protected area
REMP	Radiological Environmental Monitoring Program
RP	radiation protection
SCC	stress corrosion cracking
SCE	Southern California Edison
SONGS	San Onofre Nuclear Generating Station
TLD	thermoluminescent dosimeter
TS	Technical Specification

ATTACHMENT 2:

LOADED CASKS AT THE SONGS ISFSI

LOADING ORDER	DSC SERIAL No.	AHSM No.	UNIT FUEL	DATE ON PAD	HEAT LOAD (Kw)	BURNUP (GWd/MTU)	MAXIMUM FUEL ENRICHMENT %	PERSON-REM DOSE
1	DSC003	001	Unit 1	10/03/03	9.35	36.0	4.0006	1.366
2	DSC007	002	Unit 1	11/07/03	9.36	37.3	4.0006	0.667
3	DSC005	003	Unit 1	11/19/03	9.31	37.0	4.0006	0.681
4	DSC006	004	Unit 1	12/12/03	8.84	37.6	4.0006	0.673
5	DSC009	005	Unit 1	01/03/04	8.34	34.9	4.0006	0.695
6	DSC008	006	Unit 1	05/23/04	7.50	40.0	4.02	1.021
7	DSC011	007	Unit 1	06/06/04	7.46	37.6	4.02	1.043
8	DSC010	008	Unit 1	06/20/04	8.08	38.5	4.02	0.776
9	DSC012	009	Unit 1	07/03/04	8.44	38.1	4.02	0.734
10	DSC014	010	Unit 1	07/18/04	7.74	36.7	4.02	0.689
11	DSC015	011	Unit 1	07/30/04	7.46	38.8	4.02	0.633
12	DSC013	012	Unit 1	08/16/04	8.45	40.6	4.02	0.545
13	DSC016	013	Unit 1	08/20/04	7.87	40.3	4.02	0.560
14	DSC017	014	Unit 1	08/31/04	7.23	43.2	4.02	0.348
15	DSC018	015	Unit 1 GTCC	09/02/04	N/A	N/A	N/A	0.555
16	DSC002	016	Unit 1	05/29/05	7.37	42.8	4.00	0.570

LOADING ORDER	DSC SERIAL No.	AHSM No.	UNIT FUEL	DATE ON PAD	HEAT LOAD (Kw)	BURNUP (GWd/MTU)	MAXIMUM FUEL ENRICHMENT %	PERSON-REM DOSE
17	DSC004	017	Unit 1	06/10/05	8.15	38.3	4.00	0.431
18	DSC001	018	Unit 1	06/28/05	8.11	41.8	4.00	0.453
19	DSC019	019	Unit 2	03/06/07	11.96	48.3	4.04	0.849
20	DSC020	020	Unit 2	03/19/07	12.05	44.8	3.97	0.819
21	DSC021	021	Unit 2	04/05/07	12.13	44.8	3.97	0.502
22	DSC022	022	Unit 2	04/16/07	10.51	38.5	3.95	0.262
23	DSC023	023	Unit 2	04/30/07	11.89	38.6	3.96	0.308
24	DSC024	024	Unit 2	05/14/07	11.07	41.1	3.97	0.192
25	DSC025	025	Unit 2	05/29/07	9.66	38.3	3.97	0.126
26	DSC026	026	Unit 3	03/05/08	8.29	38.2	3.96	0.149
27	DSC027	027	Unit 3	03/18/08	9.99	38.2	3.96	0.262
28	DSC028	028	Unit 3	04/01/08	9.68	37.1	3.96	0.217
29	DSC029	029	Unit 3	04/23/08	11.14	50.1	3.97	0.275
30	DSC030	030	Unit 3	05/29/08	8.49	36.7	3.96	0.143
31	DSC031	031	Unit 3	06/09/08	7.78	29.5	3.46	0.074
32	DSC032	032	Unit 2	03/19/09	12.37	46.0	4.49	0.328
33	DSC033	033	Unit 2	04/08/09	12.85	42.5	4.49	0.177
34	DSC034	034	Unit 2	04/30/09	13.64	42.9	4.49	0.248
35	DSC035	035	Unit 2	05/13/09	13.0	45.8	4.48	0.180

LOADING ORDER	DSC SERIAL No.	AHSM No.	UNIT FUEL	DATE ON PAD	HEAT LOAD (Kw)	BURNUP (GWd/MTU)	MAXIMUM FUEL ENRICHMENT %	PERSON-REM DOSE
36	DSC036	036	Unit 2	05/30/09	14.71	46.0	4.49	0.220
37	DSC037	037	Unit 3	05/13/10	13.16	48.0	4.6	0.360
38	DSC038	038	Unit 3	05/26/10	14.46	46.0	4.6	0.342
39	DSC039	039	Unit 3	06/09/10	13.16	48.0	4.5	0.278
40	DSC040	040	Unit 3	06/21/10	15.04	47.0	4.6	0.326
41	DSC041	041	Unit 3	07/03/10	15.26	47.0	4.6	0.326
42	DSC042	042	Unit 3	07/13/10	15.39	47.0	4.6	0.288
43	DSC043	043	Unit 2	07/11/11	7.81	44.7	4.45	0.159
44	DSC044	044	Unit 2	07/26/11	8.75	42.8	4.44	0.127
45	DSC045	045	Unit 2	08/08/11	8.76	43.7	4.45	0.107
46	DSC046	046	Unit 2	08/26/11	8.78	43.7	4.44	0.114
47	DSC047	047	Unit 2	09/10/11	8.88	41.8	4.16	0.095
48	DSC048	048	Unit 3	05/23/12	8.06	40.6	3.96	0.131
49	DSC049	049	Unit 3	06/16/12	12.24	45.4	4.25	0.265
50	DSC050	050	Unit 3	06/28/12	12.31	44.6	4.49	0.157
51	DSC051	051	Unit 3	07/08/12	13.16	51.4	4.55	0.175

NOTES:
- Heat load (Kw) is the sum of the heat load values for all spent fuel assemblies in the cask.
- Burn-up is the value for the spent fuel assembly with the highest individual discharge burn-up plus 7% to account for uncertainty.
- Maximum fuel enrichment is for the spent fuel assembly with the highest average initial enrichment per cent of U-235.