

DOCKET**11-IEP-1J**

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Southern California Edison
IEPR 11-IEPR**DATA REQUEST SET 11-IEP-1J CEC-SCE-001****To:** CEC**Prepared by:** Jose Luis Perez**Title:** Manager, Strategic Generation Projects**Dated:** 04/25/2011

Question A.01:

Please report on the overall plans, schedule and progress for completing the recommendations in the AB 1632 Report/2008 IEPR Report (pp. 78-81), the 2009 IEPR (pp. 238-240), and the California Public Utilities Commission's (CPUC) letters of June 2009 to PG&E and SCE; please indicate when PG&E and SCE plan to report to the Energy Commission and the CPUC on the findings from these studies. How do the schedule and plans for completing these recommendations compare to the schedule and plans for license renewal? (Diablo Canyon, SONGS)

Response to Question A.01:

On February 2, 2011, Southern California Edison (SCE) submitted its response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 report, located at:

(
http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf).

SCE indicated in this report that further evaluation of the offshore discharge conduits (pipes) is required to assess the conduit's seismic capacity for non-safety related reliability purposes. SCE anticipates that the results of this evaluation will be submitted to the CPUC and CEC by early July, 2011.

SCE submitted its application for its ongoing seismic program and new seismic research projects and analyses on April 15, 2011. SCE requested a CPUC decision no later than October 1, 2011 so that SCE can continue this important work and complete the seismic projects. That work, depending on the ultimate scope required, is anticipated to be completed by 2015 and reporting will likely occur both during the period and subsequently, however, specific timing cannot be established at this time. SCE continues to assess options for the timing of CPUC and NRC license renewal filings.

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To: CEC
Prepared by: Paul Klapka
Title: Project Manager
Dated: 04/25/2011

Question A.02:

The *AB 1632 Report* recommended that PG&E and SCE use three-dimensional (3-D) geophysical seismic reflection mapping and other advanced technologies to explore fault zones near the plants. Please provide a detailed description of the study plans, including plans for obtaining the necessary permits, as identified in the Request for Proposal. What are the major milestones and schedule for completing these studies including the expected start and completion date for the onshore and offshore 3-D seismic imaging survey and the entire 3-D imaging analysis? When will the findings and conclusions from these studies be provided to the Energy Commission, CPUC, and the California Coastal Commission? (Diablo Canyon, SONGS)

Response to Question A.02:

SCE's efforts regarding seismic activities at SONGS are discussed in the testimony filed in SCE's Application (A.)11-04-006 at the CPUC that requests funding for seismic efforts. A.11-04-006 can be found at:

[www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/\\$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf](http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf)

SCE has requested a decision from the CPUC approving the funding for the above activities by October 1, 2011. A specific schedule for work completion and reporting cannot be established at this time.

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To: CEC
Prepared by: Paul Klapka
Title: Project Manager
Dated: 04/25/2011

Question A.03:

The *AB 1632 Report* noted that updated seismic hazard analyses incorporating the USGS National Seismic Hazard Mapping Project models and the UCERF-2 data base would provide additional information for regulators and the public regarding the seismic hazard at the plant sites. Please discuss the relevance of these models and the revised UCERF database for the studies that might be required as part of the license renewal feasibility assessments for the plant. (Diablo Canyon, SONGS)

Response to Question A.03:

While the referenced studies may provide additional information for regulators and the public, they are not required to support NRC license renewal at SONGS.

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To: CEC

Prepared by: Paul Klapka

Title: Project Manager

Dated: 04/25/2011

Question A.04:

Please report on efforts to develop an active seismic hazards research program for SONGS, similar to PG&E's Long-Term Seismic Program (LTSP), to assess whether there are sufficient design margins at the plant to avoid major power disruptions and withstand a major seismic/tsunami event. (SONGS)

Response to Question A.04:

The seismic hazards research program for SONGS is discussed in the testimony SCE filed in Application (A.) 11-04-006 at the California Public Utilities Commission (CPUC). The application requests funding for seismic efforts for SONGS. A.11-04-006 can be found at:

[http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/\\$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf](http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf).

SCE's seismic program will enable it to respond to the NRC's Generic Letter. The Nuclear Regulatory Commission (NRC) is developing a Generic Letter to request information from all U.S. nuclear plants regarding seismic hazards. The NRC expects to issue the Generic Letter near the time when new seismic models will become available. These new seismic models are being developed by NRC, the U.S. Department of Energy, and the Electric Power Research Institute and will be reviewed by the United States Geologic Survey. The NRC expects to receive information responding to the Generic Letter from all operating reactors and will review this information to determine whether any plant improvements are needed (see <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/fs-seismic-issues.html>). On May 18, 2011, the NRC held a public workshop on seismic risk evaluations (see attached slides). At the meeting, the NRC outlined the information needs for the proposed Generic Letter including updated site specific hazard curves and response spectra; fragility information; contributions to seismic risk; and identification of potential plant-specific improvements.

On February 2, 2011, Southern California Edison (SCE) submitted its response to the CPUC's direction to address certain topics (including major power disruptions) regarding SONGS as recommended by the California Energy Commission's (CEC) 2008 AB 1632 report. SCE's submittal is located at:

http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632

Report Recommendations.pdf

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To: CEC

Prepared by: Paul Klapka

Title: Project Manager

Dated: 04/25/2011

Question A.05:

Please report on progress in efforts to prioritize and include further investigations into the seismic setting at SONGS and assess whether recent or current seismic, geologic or ground motion research in the vicinity of SONGS has implications for the long-term seismic vulnerability of the plant. (SONGS)

Response to Question A.05:

The investigation into the seismic setting at SONGS is discussed in the testimony SCE filed in Application (A.) 11-04-006 at the CPUC. The application requests funding for seismic efforts for SONGS. A.11-04-006 can be found at:

[http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/\\$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf](http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf)

SCE's seismic program will enable it to respond to the NRC's Generic Letter. The Nuclear Regulatory Commission (NRC) is developing a Generic Letter to request information from all U.S. nuclear plants regarding seismic hazards. The NRC expects to issue the Generic Letter near the time when new seismic models will become available. These new seismic models are being developed by NRC, the U.S. Department of Energy, and the Electric Power Research Institute and will be reviewed by the United States Geologic Survey. The NRC expects to receive information responding to the Generic Letter from all operating reactors and will review this information to determine whether any plant improvements are needed (see <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/fs-seismic-issues.html>). On May 18, 2011, the NRC held a public workshop on seismic risk evaluations (see attached slides). At the meeting, the NRC outlined the information needs for the proposed Generic Letter including updated site specific hazard curves and response spectra; fragility information; contributions to seismic risk; and identification of potential plant-specific improvements.

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To: CEC
Prepared by: Paul Klapka
Title: Project Manager
Dated: 04/25/2011

Question A.07:

Please report on the status of and findings from PG&E's and SCE's assessments regarding to what extent their plants' non-safety related systems, structures and components (SSCs) comply with current building codes and seismic design standards for non-nuclear power plants. (Diablo Canyon, SONGS)

Response to Question A.07:

On February 2, 2011, Southern California Edison (SCE) submitted its response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 AB 1632 report, located at:

http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf

SCE evaluated changes to seismic design standards and compliance with current building codes and the results indicated that the SONGS 2 & 3 non-safety-related SSC designs are comparable to the current building codes and applicable seismic design standards. (See Appendix 5 of SCE's February 2, 2011 submittal -- "Building Codes and Seismic Design Standards.")

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To: CEC

Prepared by: Paul Klapka

Title: Project Manager

Dated: 04/25/2011

Question A.08:

Please report on the status and findings from PG&E's and SCE's evaluation of the seismic vulnerability and plant reliability implications for the non-safety related SSCs from changes to seismic design standards that have occurred since the plants were designed and built and any retrofits, focusing on systems or components whose failure could lead to extended outages. Please consider the changes to seismic design standards since the plants were built including the International Atomic Energy Agency Standards (IAEA) and Safety Reports (Diablo Canyon, SONGS)

Response to Question A.08:

On February 2, 2011, Southern California Edison (SCE) submitted "Southern California Edison's Evaluation of California Energy Commission AB 1632 Report Recommendations," in response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 AB 1632 report, located at:

http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf.

As indicated in SCE's submittal, SCE completed a study to identify any important-to-reliability, non-safety-related structures, systems, and components (SSCs) that could be the cause of a prolonged outage due to a seismic event. The study evaluated the non-safety-related SSCs that are required for power generation; these non-safety-related SSCs are considered important-to-reliability. Additionally, SCE evaluated the SONGS non-power block buildings that are needed to support power generation. SCE determined that further evaluation of the offshore discharge conduits is required to assess the conduits' seismic capacity. All other important-to-reliability, non-safety related SSCs would not be the cause of a prolonged outage following a seismic event. Two non-power block buildings were identified as important-to-reliability, and would not be the cause of a prolonged outage following a seismic event. (See Appendix 5 of SCE's February 2, 2011 submittal -- "Building Codes and Seismic Design Standards.")

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To: CEC

Prepared by: Robin Mainardy

Title: Project Manager

Dated: 04/25/2011

Question A.09:

Please describe the plant component repair/replacement plans including initial estimates of time needed to repair or replace key plant systems or components that could cause a prolonged plant outage or compromise plant safety as a result of being damaged from an earthquake. This should consider the fragility of components both in their operating positions and when relocated for refueling or plant maintenance. (Diablo Canyon, SONGS)

Response to Question A.09:

"Southern California Edison's Evaluation of California Energy Commission AB 1632 Report Recommendations," which was submitted to the CPUC and CEC on February 2, 2011, included a section on "Seismic Reliability Evaluation" with an appendix providing the study entitled "Seismic Reliability Study of San Onofre Generating Station Non-Safety-Related Structures, Systems, and Components."

SCE completed this study to identify any important-to-reliability, non-safety-related structures, systems, and components (SSCs) that could be the cause of a prolonged outage due to a seismic event. The study (attached) evaluated the non-safety-related SSCs that are required for power generation; these non-safety-related SSCs are considered important to reliability. Additionally, SCE evaluated the SONGS non-power block buildings that are needed to support power generation.

SCE determined that further evaluation of the offshore discharge conduits is required to assess the conduits' seismic capacity. All other important-to-reliability, non-safety-related SSCs would not be the cause of a prolonged outage following a seismic event. Two non-power block buildings were identified as important-to-reliability, and would not be the cause of a prolonged outage following a seismic event.

SCE has not performed studies of the fragility of non-safety-related SSCs when relocated for refueling or plant maintenance. The evaluations were performed for plant operating conditions, not refueling outage conditions. The reasoning is that the time duration that equipment is disassembled in a refueling outage is short compared to the operating time and the configuration of what is disassembled from outage to outage varies. Also, in a refueling outage, Balance of Plant (BOP) equipment is not rotating, weighs less because it is empty and is cold and depressurized.

All of these increase the seismic load capacity of the BOP equipment.

Similarly, as to safety-related equipment, as stated in the referenced CEC assessment, for a seismic event within the design basis, no damage is expected to occur, and therefore, no plant component repair or replacement plans are necessary.

As stated in CEC's "An Assessment of California's Nuclear Power Plants: AB 1632 Report" (see page 10 - Vulnerability of Power Plant Buildings and Structures):

"The safety-related systems, structures, and components (SSCs) of Diablo Canyon and SONGS are designed to remain safe during earthquakes of magnitude 7.5 on the Hosgri Fault and 7.0 on the South Coast Offshore Fault Zone, respectively. Earthquakes of these magnitudes are the plants' "safe shutdown earthquakes," which are defined by the Nuclear Regulatory Commission as the maximum earthquake potential for the respective plant sites based on the regional and local geology and seismology and the local subsurface material. In other words, these earthquakes are expected to be the largest magnitude earthquakes that could impact the plants given what is currently known about the geology of local faults. Notably, the largest earthquakes experienced at SONGS and Diablo Canyon have been significantly less than the plants' safe shutdown earthquakes."

1 attachment



Seismic Reliability Study.pdf

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To: CEC
Prepared by: Robin Mainardy
Title: Project Manager
Dated: 04/25/2011

Question A.10:

The National Academies in 2006 reported on the risk of fire from overheated spent fuel rods in spent fuel pools. Fires were reported in the spent fuel pools at the Fukushima Daiichi plant. Please report on the progress in returning the spent fuel pools to open racking arrangements, as recommended in the 2008 IEPR,

Response to Question A.10:

SCE is currently evaluating whether the rate at which used fuel is moved from the used fuel pools into dry cask storage should be modified. The original storage capacity for SONGS 2 & 3 was 1,600 used fuel assemblies. Re-racking is not required to store only 1,600 used fuel assemblies in the existing racks. Replacement of existing used fuel racks would result in unnecessary production of low level radioactive waste and additional unnecessary cost.

"Southern California Edison's Evaluation of California Energy Commission AB 1632 Report Recommendations," which was submitted to the CPUC and CEC on February 2, 2011, includes SCE's plan for the safe and secure storage of used fuel. SCE's submittal can be found at:

http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf Refer to the section entitled "Used Fuel Management."

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DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Geetha Eva Shanmugasundaram

Title: Project Manager

Dated: 04/25/2011

Question A.11:

Please report on the status of any reassessments of whether emergency plans and access roads to the plants and surrounding roads are adequate for allowing emergency response personnel to reach the plants and local communities and plant workers to evacuate following a major seismic event/ plant emergency to protect the public, workers and plant assets and allow for timely evacuation following such an event. Please take into account changes to the local population and traffic density/congestion since the plants were constructed and the possible loss of some of the roads due to a major seismic event or other plant emergency. (Diablo Canyon, SONGS)

Response to Question A.11:

On February 2, 2011, Southern California Edison (SCE) submitted its response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 AB 1632 report. In this report on pages 3-4 and 17-25, SCE provided an information response to the question. For ease of reference, the relevant sections of the SCE submittal are provided below.

Executive Summary

In the event of an emergency at SONGS, SCE's highest responsibility is safeguarding the surrounding communities and plant workers. SCE periodically reassesses the access roads and surrounding roadways near SONGS and confirms that they are adequate for allowing emergency personnel to reach SONGS and local communities and non-essential plant workers to evacuate when appropriate in the event of an emergency. Further, SONGS' Emergency Preparedness Program is approved by the NRC and implemented pursuant to NRC and FEMA regulations. SCE and federal, state, and local authorities have successfully conducted periodic emergency-preparedness training drills for SONGS overseen by the NRC and FEMA. The results of these drills demonstrate the effectiveness of the emergency plans and coordination between SONGS and federal, state, and local agencies in implementing those plans.

Detailed Analysis and Discussion

1. Introduction

This section addresses the AB 1632 Report recommendation that SCE should reassess the

adequacy of access roads and surrounding roadways for allowing: (1) emergency personnel to reach SCE's nuclear generating plant, and (2) local communities and non-essential plant workers to evacuate in the event of an emergency.²⁸

2. Requirements/Regulatory Guidance Summary

As the operating agent for SONGS 2 & 3, SCE is required to meet or exceed the emergency planning regulations established for nuclear facilities by the NRC and the Federal Emergency Management Agency (FEMA). The NRC is the jurisdictional regulatory authority for the safe operation of all U.S. nuclear facilities, and in that role is responsible for the oversight of emergency preparedness activities. FEMA is responsible for the oversight of emergency preparedness activities of the offsite agencies that respond to certain emergencies at a nuclear facility.

²⁸ CPUC June 25, 2009 Letter to SCE; AB 1632 Report, p. 16.

The NRC requires each licensee to have approved, integrated emergency plans for inside and outside the nuclear facility's boundary (i.e., onsite and offsite).²⁹ As part of these requirements, SCE is required to conduct drills and exercises to evaluate all major portions of emergency response capabilities during a six-year drill cycle.³⁰

The NRC-approved emergency plan for SONGS meets these requirements. Every two years, SCE conducts an exercise to assess the level of preparedness of local responders (e.g., police, firefighters, etc.) to react to a simulated emergency at SONGS, pursuant to FEMA policies and guidance concerning the exercise of state and local Radiological Emergency Preparedness plans and procedures. Participants in the exercise include SONGS employees, local agencies, other governmental agencies, and some members of the private sector.

In connection with the approved emergency plan, the NRC requires each licensee to address an Evacuation Time Estimate (ETE) study³¹ for the site and surrounding areas. The ETE is used for pre-planning protective action recommendations.³² The ETE addresses potential challenges to efficient evacuation, such as weather and earthquake damage, allowing mitigative measures to be preplanned.

SCE completed an ETE for SONGS in 2007,³³ in accordance with this guidance. The ETE assesses the time needed to evacuate the public³⁴ from a potential exposure pathway (Emergency Planning Zone or EPZ)³⁵ during a general emergency. The results provide both SCE and offsite agencies information to support protective action decisions, including whether evacuation or shelter in place is the appropriate response to the emergency.

²⁹ NUREG-0654 FEMA-REP 1, Rev. 1, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*.

³⁰ NUREG-0654 Part II.N and 10 CFR § 50.47 (b) (14).

³¹ NUREG-CR-6863.

32 Protection Action Recommendation: recommendations made by plant personnel, based on plant conditions, to state and local government agencies on actions that could be taken to protect the population in the Emergency Planning Zone (EPZ) from exposure to radiation or radioactive materials. Based on the recommendation and independent assessment of other local factors, the state or local government agencies are responsible for making decisions on the actions necessary to protect the public and for relaying the decisions to the public.

33 Appendix 6, "San Onofre Nuclear Generating Station Evacuation Time Evaluation Final Report."

34 The public also includes non-essential SONGS 2 & 3 personnel once they leave the plant.

35 Emergency Planning Zone (EPZ): an area around a nuclear power plant that is defined as part of the pre-planned strategy for protective actions during an emergency.

3. Overview of Evacuation Plan

In the event of an emergency at SONGS, SCE's highest responsibility is safeguarding the surrounding communities and plant workers. To meet the responsibility in an emergency at SONGS and to evacuate the public and non-essential workers, SCE (1) has proven methods to inform workers, communities, and local agencies of emergency conditions; (2) actively partners with local, state, and federal agencies to coordinate evacuation activities; and (3) validates the ability to evacuate plant workers.

a) Overview of Evacuation Plan for the Public

SCE maintains a system of electronic sirens (Community Alert Siren System or CASS) strategically located in communities within the Emergency Planning Zone surrounding SONGS 2 & 3. Community officials for local jurisdictions are responsible for activating the CASS in the event of a nuclear emergency requiring public action. Sounding the sirens will alert area residents to turn on a broadcast news station or radio for public safety information. Annually, a highly publicized siren test is conducted by the offsite agencies to familiarize the public with the distinctive sound of the sirens.³⁶

Additionally, local community emergency responders have the ability to use AlertOC (Alert Orange County), which is a free, regional, county-wide mass notification system. AlertOC can send emergency voice messages from public safety officials to the home, cell, or business phone of nearby residents. Text messages also can be sent to email accounts, and receiving devices for the hearing impaired. AlertOC complements other emergency notification systems such as CASS, Emergency Alert System, or roving public address systems. SCE also has an ongoing public outreach effort to educate local residents and businesses on the actions they should take in the event of an emergency, including the actions they should take when responding to the CASS. This outreach effort includes public meetings with local schools, communities, and residential groups; informational mailings to residents and businesses; and information booths at safety expos and other public venues.

Local jurisdictions' and SONGS' emergency plans provide for precautionary and planned actions, for example:

- Closure of California State Parks, as deemed appropriate by California State Parks personnel, prior to an announcement of a General Emergency.
- Relocation of students and faculty in the Capistrano Unified School District,

as deemed appropriate by District personnel,
prior to an announcement of a General Emergency.

³⁶ In the event of an inadvertent siren actuation, a process has been developed and includes a range of responses based on the circumstances (e.g. length of siren activation, time of day, etc.). The offsite agencies will determine the most suitable method of notifying their communities of an inadvertent siren actuation.

- Closure of I-5 Northbound at SR-78 in Oceanside and I-5 Southbound at the 5/405 El Toro intersection by CHP in a General Emergency.

An interjurisdictional planning committee (IPC) was established in 1982 to “promote nuclear power preparedness through agency coordination and integration of emergency plans.”³⁷ To achieve this mission, the IPC collaborates and drills on emergency plans and procedures designed to protect the public health and safety during a declared emergency. The IPC includes community officials from the following local jurisdictions:³⁸

- City of Dana Point
- City of San Clemente
- City of San Juan Capistrano
- Orange County
- San Diego County
- California State Parks
- Marine Corps Base Camp Pendleton
- Southern California Edison

IPC associate members (support jurisdictions) are:

- Capistrano Unified School District
- Oceanside Fire Department
- Orange County Fire Authority
- Mission Regional Medical Center
- California Highway Patrol
- California Emergency Management Agency
- Federal Emergency Management Agency
- Nuclear Regulatory Commission

b) Overview of Evacuation Plan for Non-Essential Workers

All SONGS employees are trained to respond to emergencies, and participate in periodic emergency preparedness drills. SONGS communication methods include public address (PA) announcements, sirens, beacons, and announcements at assembly areas.

³⁷ <http://www.nrc.gov/reading-rm/doc-collections/commission/slides/2006/20060502/rose-slides.pdf>, p. 6.

³⁸ The IPC complies with the California Health & Safety Code § 114650(a).

SONGS 2 & 3 emergency procedures call for the evacuation of nonessential personnel when the emergency classification level is “Site Area Emergency.”³⁹ Site drills have confirmed SCE’s ability to assemble and evacuate non-essential personnel during accident scenarios.

4. Overview of Plan for Plant Access for Essential Plant Workers

Essential members of the Emergency Response Organization (ERO) at SONGS are assigned a pager. In the event of a declared emergency, ERO pagers are activated, and personnel report to one of the Emergency Response Facilities on the plant site, or at staging areas, when I-5 has been closed. Communication arrangements have been made for ERO personnel to communicate with the plant and, if necessary, obtain a California Highway Patrol (CHP) escort to the plant.

5. Experience

a) Experience with Evacuation Plans for the Public

The biennial Radiological Emergency Preparedness exercise for SONGS was conducted in 2009. The exercise, held in accordance with FEMA policies and guidance, assessed the level of preparedness of local responders to react to a simulated emergency at SONGS. SONGS employees, local agencies, other governmental agencies, and private sector organizations who participated in the exercise, demonstrated knowledge of the emergency response plans and procedures, and the ability to execute those plans. There were no deficiencies identified during the course of the exercise.

SCE’s emergency-response coordination with local agencies was also demonstrated during the week of October 2007, when several large brush fires burned in Orange, Riverside, and San Diego counties. The event did not endanger the SONGS site, but the severity of the fires caused mandatory evacuations of many communities in southern California, forced the closure of the I-5 freeway used to access the plant, and required an evacuation of the SONGS Mesa facility. SONGS employees and the local agencies that were involved appropriately responded to this event, demonstrating effective coordination between SCE and local agencies.

³⁹ There are four emergency classification levels defined by the Emergency Plan. In order of increasing severity the classifications are: 1) Unusual Event, 2) Alert, 3) Site Area Emergency, and 4) General Emergency. These are described in an SCE publication entitled, “*A Guide to San Onofre Nuclear Generating Station for Visitors and Newcomers*,” p. 6.

b) Experience with Station Personnel Response

As stated above, SCE routinely trains on the assembly and evacuation of station personnel for an emergency at SONGS. Pursuant to 10 CFR § 50.47 (b) (10) and NUREG-0654 Part II.J, SCE is required to maintain provisions for the evacuation of non-essential personnel from the site in the event of a Site Area

Emergency or General Emergency. Pursuant to 10 CFR § 50.47 (b) (14) and NUREG- 0654 Part II.N, SCE is required to conduct drills and exercises to evaluate all major portions of emergency response capabilities during a six-year drill cycle. In accordance with these requirements, SCE tests the evacuation of non-essential personnel during a site evacuation drill. The last site evacuation drill was conducted on July 18, 2007. The results for the drill were successful. SCE also implemented improvements, which included: (1) the process for assembly and evacuation was enhanced to provide for evacuation at the Site Area Emergency level as soon as personnel in Assembly Areas have been provided necessary information regarding evacuation routes, safe area meeting locations, etc.; (2) a telecommunications bridge was established to allow for more efficient communication between the Assembly Areas and Administrative Leader relaying the directions from the Emergency Coordinator; and (3) additional training was conducted to ensure adequate Health Physics personnel and equipment resources are properly deployed to ensure proper radiological monitoring of all evacuated personnel. In addition to training drills, the October 2007 fires in Orange, Riverside, and San Diego counties caused an emergency evacuation of the SONGS Mesa facility. The SONGS Mesa evacuation was successfully completed without incident. Additionally, offsite ERO personnel successfully exercised the escort arrangements with the CHP to gain access to the site during this event.

6. Modeling of Evacuations

As discussed above, NUREG-CR-6863 recommends that an ETE study should be updated as local conditions change. ETE modeling provides a tool for developing comprehensive evacuation planning studies, including estimating evacuation times, developing traffic management and control strategies, and identifying routes, traffic control points, and other elements of an evacuation plan.

The NRC recommends that ETE studies be performed when the possibility exists that ETE would change significantly.⁴⁰ The June 12, 2007 ETE study⁴¹ was conducted using DYNASMART-P, a state-of-the-art dynamic route assignment model sponsored by the Federal Highway Administration and developed at the University of Maryland. This software package provides a blend of four-step regional models and corridor level micro-simulation models. This software dynamically models individual driver behavior in selecting available evacuation routes, and driving in gridlock conditions. Input data for this report includes:

⁴⁰ NUREG-CR-6863, p. 26.

⁴¹ Appendix 6, "San Onofre Nuclear Generating Station Evacuation Time Evaluation Final Report."

- Geographic Information System (GIS) database of the study area
- Identification of resident and transient population within the study area
- Identification of existing institutions requiring special evacuation assistance, as well as known new institutions planned for construction
- Review of Emergency Response Plans for jurisdictions and agencies in the EPZ

- Inventory of existing highway facilities, including roadway facility type, number of lanes, operating speeds, and traffic controls
- Caltrans (California Department of Transportation) identified nonearthquake-retrofitted bridges, and locations for potential landslides in the area in the event of an earthquake
- Inventory of available demographic data, employment data, recreational facility usage and forecast usage.

The ETE models various scenarios to determine evacuation times as listed below:

- Summer weekday evacuation – Assumed the evacuation occurred during business hours with many residents working outside the EPZ, a significant number of non-resident workers in the EPZ, and a moderately heavy number of beach visitors.
- Summer weekend evacuation – Assumed the evacuation occurred during a summer weekend, with significant portions of the population consisting of non-resident workers in the EPZ, as well as recreational visitors. Assumed a large number of beach visitors (based on July 4th holiday) had to be evacuated in this scenario.
- Night Evacuation – Assumed the evacuation occurs during a night scenario in which the maximum number of residents, and the minimum number of non-residents were in the EPZ. Other scenario variations considered were:
 - Adverse weather – Assumed a slower evacuation rate out of the EPZ, than in non-adverse weather scenarios.
 - Earthquake – Assumed the evacuation from the EPZ took place after an earthquake which resulted in landslides restricting available lanes of traffic along the ocean and adjacent cliffs, as well as failure of nonearthquake-retrofitted bridges that blocked egress by the population.

The ETE study states that ETE estimates range from 1.5 hours for the least populated areas under the most favorable of circumstances, to 18 hours for the most densely populated areas under earthquake conditions. It should be noted that evacuation is only part of an effective emergency plan, and shelter in place is at times a more appropriate option. The range of uncertainty for evacuation of the EPZ is plus or minus 2 hours.⁴² Annual reviews re-evaluate the key factors that impact the ETE. Most recently, for example, SCE evaluated population changes (increases in population, changes in age demographics, etc.) and roadway capacity (improvements, constraints, traffic flow, etc).

⁴² Appendix 6, "San Onofre Nuclear Generating Station Evacuation Time Evaluation Final Report," p. E-2.

The 2010 updated evaluation concluded that there have been no significant changes in the SONGS EPZ that would adversely affect the information contained in the June 12, 2007, ETE study.⁴³ The next ETE study will be conducted when the 2010 census information is released.

7. Conclusion

SCE periodically reassesses the access roads and surrounding roadways near SONGS and confirms that they are adequate for allowing (1) emergency personnel to reach SONGS, and (2) local communities and non-essential plant workers to evacuate when appropriate in the event of an emergency. SONGS' Emergency Preparedness Program is approved by the NRC and implemented pursuant to NRC and FEMA regulations. Based on the results of drills, overseen by the NRC and FEMA, as well as actual events that have caused local area evacuations, the emergency plans for SONGS have demonstrated their effectiveness.

43 Appendix 7, "Annual Assessment of the San Onofre Nuclear Generating Station Evacuation Time Evaluation," dated August 23, 2010.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Geetha Eva Shanmugasundaram

Title: Project Manager

Dated: 04/25/2011

Question A.12:

Please provide information on the plans and estimated costs for storing and/or disposing of low-level nuclear waste and spent nuclear fuel that would be generated through a 20-year license extension and plant decommissioning. (Diablo Canyon, SONGS)

Response to Question A.12:

On February 2, 2011, Southern California Edison (SCE) submitted its response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 AB 1632 report. In this report on pages 4 and 26-36, SCE provided an information response to the question. For ease of reference, the relevant sections of the SCE submittal are provided below.

Executive Summary of Low Level Radioactive Waste

SONGS has adequate plans for the disposal of, and sufficient space on-site for the interim storage of all classes and types of LLW, including through the period of extended operation and subsequent decommissioning period in the event the NRC grants license renewal for SONGS 2 & 3.6 SCE provides its forecasts for the volumes and disposal costs for LLW in Section III.C.

Detailed Analysis and Discussion

1. Introduction

This section addresses the following AB 1632 Report recommendations regarding Low Level Radioactive Waste (LLW):⁴⁴

- During the upcoming CPUC proceeding on decommissioning costs, SCE should provide estimates of the amounts of LLW to be generated and ultimately disposed of during plant operation and decommissioning and the cost of this disposal based on current and projected market prices.
- As part of license renewal feasibility studies, SCE should assess the costs of disposing of LLW that will be generated during a 20-year license extension. The assessments should include the cost to dispose of LLW that would be generated from major capital projects that might

be required over this period. SCE should also provide information on their plans for storage and disposal of LLW and spent fuel through plant decommissioning.

During the CPUC Nuclear Decommissioning Cost Triennial Proceeding (NDCTP), SCE updates its estimates of the volumes of LLW to be generated and disposed of during decommissioning and the cost of this disposal based on current and projected market prices. Most recently, SCE submitted an updated estimate on April 3, 2009.⁴⁵

This section discusses the projected quantities, disposal options, and transportation and disposal costs for LLW generated at SONGS 2 & 3 during the remainder of the current licensed period, the period of extended operation, and the decommissioning period. The assumed volumes and costs for LLW from the SONGS Independent Spent Fuel Storage Installation (ISFSI) are included in the assumptions for the decommissioning period.

⁴⁴ CPUC June 25, 2009 Letter to SCE; AB 1632 Report p. 28.

⁴⁵ Application (A.) 09-04-009, Nuclear Decommissioning Cost Triennial Proceeding

a) Class A, Class B, and Class C LLW

10 CFR § 61.55 divides LLW into three different classifications:

Class A, Class B, and Class C. Class A contains the lowest concentrations of radioactivity, and Class C contains the highest. Class A waste includes materials such as slightly contaminated tools or plant components. Class B and C waste includes materials such as primary system (i.e., reactor coolant system) filters and ion exchange resins.

b) Mixed LLW

Some waste generated during nuclear power operations contains both radioactive and hazardous waste constituents.⁴⁶ Such waste is known as mixed lowlevel radioactive waste (mixed waste). Examples of the hazardous constituents of mixed wastes include: (1) petroleum-based oils, (2) flammables and chlorofluorocarbons, and (3) solids (e.g., asbestos, lead, and electrical waste (e-waste) materials).

2. Onsite Interim Storage, Offsite Disposal, and Disposal Costs of SONGS 2 & 3 LLW

This section will discuss the projected quantities, disposal plans, and disposal costs for Class A, B, and C LLW, and mixed waste, generated at SONGS 2 & 3 during the remainder of the current licensed period, the period of extended operation, and the decommissioning period.

The licensed LLW disposal facility operated by EnergySolutions at Clive, Utah, is expected to be available to accept Class A waste from SONGS 2 & 3 throughout the remainder of the current SONGS 2 & 3 licensed period, the 20-year period of extended operation, and the decommissioning period. The EnergySolutions disposal facility at Barnwell, South Carolina, was available to accept Class A, Class B, and Class C waste from SONGS 2 & 3 until June 30, 2008. As of July 1, 2008, that facility stopped

accepting LLW from waste generators in California and all other states outside the Atlantic Coast LLW Compact, as mandated by South Carolina state law.⁴⁷ The nuclear industry is working to license new disposal facilities, and is working with the NRC to develop alternative disposal methods for these types of materials. Current licensed waste disposal companies are also looking to expand their licenses to receive Class B and Class C waste. SCE will ship Class B and Class C waste when a disposal facility becomes available. Until such time, SCE has sufficient on-site interim storage capacity to accommodate all Class B and Class C waste generated during the current licensed period and the period of extended operation.

⁴⁶ Hazardous wastes are defined in Subtitle C of the Resource Conservation and Recovery Act (RCRA). Reference <http://www.epa.gov/rpdweb00/mixed-waste/guidance-identification-llmw.html>.

⁴⁷ S. C. Code Ann. § 48-46, Atlantic Interstate Low-Level Radioactive Waste Compact Implementation Act.

Table III-1 below provides the disposal rates published in a recent industry study to project the cost of LLW disposal:⁴⁸

Table III-1
LLW Disposal Rates from 2008 NEWEX Study
(2011 \$, 100% Level)

Bulk Class A LLW⁴⁹ \$74.83 per cubic foot
General Class A LLW⁵⁰ \$307.02 per cubic foot
Class B and C LLW \$3,565.65 per cubic foot

Mixed waste must be disposed of separately from LLW. Mixed waste with different hazardous constituents is subject to different disposal requirements.⁵¹ Licensed disposal facilities are currently available for each type of mixed waste, and are projected to be available throughout the remainder of the current licensed period, the period of extended operation, and the decommissioning period.⁵²

a) Remainder of Current Licensed Period

Based on historical volumes, SCE projects that SONGS 2 & 3 will dispose of 7,500 cubic feet of Class A waste, on average, in each remaining year of the current licensed period (through 2022).⁵³ SCE also projects that it will dispose of an additional 27,000 cubic feet of Class A waste in 2011-2012 from the steam generator replacement project. In addition, SCE projects that 5,000 cubic feet of Class A waste from the SONGS 2 & 3 reactor vessel head replacement project will require disposal in 2012-2013. If SONGS 2 & 3 is permanently shut down at the end of the current licensed period, disposal costs for Class A LLW will be approximately \$14.8 million (2011 \$, 100% level) during the current licensed period.⁵⁴

⁴⁸ Reference "Establishing an Appropriate Disposal Rate for Low-level Radioactive Waste During Decommissioning," dated July 2008, by Robert Snyder, NEWEX. SCE assumes these LLW disposal

rates will escalate by approximately 7 percent per year.

49 “Bulk” Class A LLW includes materials such as crushed concrete rubble and scrap metal.

50 “General” Class A LLW includes materials such as containerized waste, high density or oversized packages, and large components (e.g., steam generators).

51 Each mixed waste disposal or treatment facility must possess not only a license from the NRC or NRC Agreement state, but also a permit from the EPA or EPA Authorized state.

52 All mixed waste generated to-date at SONGS have contained Class A radioactivity concentrations, for which disposal facilities are currently available. Licensed disposal facilities are not currently available for mixed wastes that contain Class B or Class C radioactivity levels. SCE does not anticipate generating any mixed waste Class B or Class C mixed waste during the remainder of the current licensed period, the period of extended operation, or decommissioning.

53 Projections of annual Class A, Class B, and Class C LLW volumes from routine nuclear power operations are based roughly on the corresponding quantities of materials shipped to licensed LLW disposal facilities recorded during the 2001-2009 period, as reported to the Southwestern Low-level Radioactive Waste Compact Commission.

54 For estimating purposes, SCE assumes that 80% of Class A LLW will be Bulk Class A material, and 20% will be General Class A material

SCE projects that SONGS 2 & 3 will generate, on average, 100 cubic feet of Class B and Class C waste from routine plant operations in each remaining year in the current licensed period (through 2022).⁵⁵ For purposes of this report, SCE assumes that Class B and Class C waste will remain in onsite interim storage until decommissioning. Therefore, SCE has included the disposal costs for all Class B and Class C waste projected to be generated during the remaining years of the current licensed period with the LLW disposal costs projected during the decommissioning period, discussed in section (c) below.

The volumes and hazardous constituents of mixed waste generated at SONGS 2 & 3 vary from year to year. SCE generates, on average, 550 cubic feet of mixed waste per year, at an annual disposal cost of approximately \$340,000 (2011 \$, 100% level). SCE projects that it will continue to generate similar mixed waste volumes and incur similar mixed waste disposal costs throughout the remaining years of the current licensed period. The projected cost for mixed waste disposal during the remainder of the current licensed period is \$4.1 million (2011 \$, 100% level). the current licensed period is \$4.1 million (2011 \$, 100% level).

b) Period of Extended Operations

SCE projects that SONGS 2 & 3 will dispose of 7,500 cubic feet of Class A LLW, on average, in each year during the 20-year period of extended operation (2023-2042).⁵⁶ During the 20-year period of extended operation, disposal costs for Class A waste will be approximately \$18.2 million (2011 \$, 100% level).

In addition, SCE projects that it will generate, but not dispose of, 100 cubic feet of Class B and Class C LLW in each year during this extended period.⁵⁷ For purposes of this report, SCE assumes that Class B and Class C waste will remain on-site in interim storage until decommissioning. At this time, SCE has not identified any onetime projects that would require disposal of additional quantities of Class A, Class B, or Class C waste during the period of extended operation. SCE has included the disposal

costs for all Class B and Class C waste generated throughout the period of extended operation with the LLW disposal costs projected during the decommissioning period, discussed in section (c) below.

⁵⁵ Projections of annual Class A, Class B, and Class C LLW volumes from routine nuclear power operations are based roughly on the corresponding quantities of materials shipped to licensed LLW disposal facilities recorded during the 2001-2009 period, as reported to the Southwestern Low-level Radioactive Waste Compact Commission.

⁵⁶ *Id.*

⁵⁷ *Id.*

SCE generates, on average, 550 cubic feet of mixed waste, at an annual disposal cost of approximately \$340,000 (2011 \$, 100% level). SCE projects that it will continue to generate similar mixed waste volumes and incur similar mixed waste disposal costs throughout the period of extended operation. The projected cost for mixed waste disposal during the period of extended operation is \$6.8 million (2011 \$, 100% level).

c) Decommissioning Period

If SONGS 2 & 3 commences decommissioning in 2023, SCE projects that the decommissioning of SONGS 2 & 3 would require disposal of approximately 1.5 million cubic feet of Class A waste; approximately 6,100 cubic feet of Class B waste; and approximately 1,400 cubic feet of Class C waste.⁵⁸ These quantities include all Class B and Class C waste that is projected to be generated during the current licensed period. The total LLW disposal cost during the decommissioning period is projected to be \$208.6 million (2011 \$, 100% level).

Alternatively, if SONGS 2 & 3 commences decommissioning in 2043, SCE projects that the decommissioning of SONGS 2 & 3 would require disposal of approximately 1.5 million cubic feet of Class A waste, 7,300 cubic feet of Class B waste, and 2,200 cubic feet of Class C waste.⁵⁹ These quantities include all Class B and Class C waste that is projected to be generated during both the remainder of the current licensed period and the period of extended operation.⁶⁰ The total LLW disposal cost during the decommissioning period is projected to be \$215.8 million (2011 \$, 100% level).

⁵⁸ Projected quantities of Class B and Class C waste include volumes generated during the remaining years of the current operating licensed period plus projected volumes contained in San Onofre Nuclear Generating Station Units 2 and 3 Decommissioning Cost Estimate, prepared for Southern California Edison Company by ABZ, Incorporated, February 2009, Unit 2 Volume, Appendix A, p. 3, and Unit 3 Volume, Appendix A, p. 3.

⁵⁹ Projected quantities of Class B and Class C waste include volumes generated during the remaining years of the current operating licensed period and the period of extended operation, and the projected volumes contained in "San Onofre Nuclear Generating Station Units 2 and 3 Decommissioning Cost Estimate," prepared for Southern California Edison Company by ABZ, Incorporated, February 2009, Unit 2 Volume, Appendix A, p. 3, and Unit 3 Volume, Appendix A, p. 3.

⁶⁰ Because SCE has not identified any one-time projects that would require disposal of additional quantities of Class A waste during the period of extended operation, the projected volumes of Class A

LLW that will require disposal during decommissioning remain the same whether decommissioning occurs at the end of the current operating license expires or after the period of extended operation.

SCE projects that it will generate approximately 13,000 cubic feet of mixed waste annually during decommissioning. The projected cost of disposal for mixed waste during decommissioning is \$14.1 million (2011 \$, 100% level).⁶¹ SCE projects that it will generate the same amount of mixed waste during decommissioning, regardless of whether SONGS 2 & 3 is permanently shut down at the end of the current licensed period or after the period of extended operation.

3. Transportation of LLW to Licensed Disposal Facilities

Transportation of Class A waste from SONGS 2 & 3 to the licensed disposal facility at Clive, Utah, during the current licensed period and the period of extended operation, are projected to be 99% by truck and 1% by rail. Transportation costs are projected to be \$12.23 (2011 \$, 100% level) per cubic foot for truck shipments, and \$6.11 (2011 \$, 100% level) per cubic foot for rail shipments. Truck shipments will be used predominantly during plant operations due to the relatively small volumes of materials expected to be shipped, except for large, heavy shipments for which rail shipment is warranted. During decommissioning, however, shipments of Class A waste are projected to be 90% by rail and 10% by truck. This is because the shipping volumes will be much greater during decommissioning. Shipments of Class B and Class C waste are assumed to be by truck at a projected cost of \$489.06 (2011 \$, 100% level) per cubic foot. LLW transportation costs are projected to be \$1.5 million (2011 \$, 100% level) during the remaining years of the current licensed period and \$1.8 million (2011 \$, 100% level) during the period of extended operation. LLW transportation costs during decommissioning are projected to be approximately \$13.7 million (2011 \$, 100% level) if decommissioning commences at the end of the current licensed period and approximately \$14.7 million (2011 \$, 100% level) if decommissioning commences after the period of extended operation.

⁶¹ "San Onofre Nuclear Generating Station Units 2 and 3 Decommissioning Cost Estimate," prepared for Southern California Edison Company by ABZ, Incorporated, February 2009, Unit 2 Volume, Appendix E, p. 31.

Each type of mixed waste is shipped to a different disposal facility. Transportation costs for mixed wastes to each disposal facility are approximately \$10,000 per shipment (2011 \$, 100% level), regardless of the number of container in the shipment. SCE projects that it will make one shipment of each mixed waste type per year during the remainder of the current licensed period and during the period of extended operations. This would result in mixed waste transportation costs of \$360,000 (2011 \$, 100% level) throughout the remainder of the current licensed period and \$600,000 (2011 \$, 100% level) throughout the period of extended operation. SCE projects that it will

make, on average, six mixed waste shipments per year during the decommissioning period. The cost to transport all mixed waste generated during decommissioning will be approximately \$900,000 (2011 \$, 100% level).

4. Conclusion

SONGS 2 & 3 has adequate plans for storage and disposal of LLW and has estimated the costs for LLW disposal as provided in Table III-2 below:

Table III-2
SONGS 2 & 3 LLW and Mixed Waste
Disposal and Transportation Costs
(2011 \$ in Millions, 100% Level)

	Class A LLW Disposal	Class B & C LLW Disposal	LLW Transportation	Mixed Waste Disposal	Mixed Waste Transportation
Remaining Licensed Period	\$14.8	N/A	\$1.5	\$4.1	\$0.4
Period of Extended Operations	\$18.2	N/A	\$1.8	\$6.8	\$0.6
Decommissioning (begin in 2023)	\$181.9	\$26.7	\$13.7	\$14.1	\$0.9
Decommissioning (begin in 2043)	\$181.9	\$33.9	\$14.7	\$14.1	\$0.9

Executive Summary for Used Fuel Management

SCE complies with all NRC requirements for used fuel storage. SCE will continue to adhere to its current used fuel management plan in which used fuel for SONGS 2 & 3 is stored in used fuel pools or dry cask storage containers. SCE transfers used fuel from the SONGS 2 & 3 used fuel pools to the dry cask storage (otherwise known as the Independent Spent Fuel Storage Installation or ISFSI) as necessary to maintain full core offload capability in the used fuel pools. SCE's used fuel management plan provides for the safe and secure storage of used fuel, until the U.S. Department of Energy (DOE) meets its acknowledged contractual obligations to remove the used fuel from the site.

Detailed Analysis and Discussion

1. Introduction

This section describes SCE's plan for the safe and secure storage of used fuel.⁶²

2. Used Fuel Management Plan

SCE complies with NRC requirements for used fuel storage. SCE will continue to adhere to its current used fuel management plan in which used fuel for SONGS 2 & 3 is stored in used fuel pools or dry cask storage containers. Both configurations are safe and have measures in place to protect the public. SCE transfers used fuel from SONGS 2 & 3 used fuel pools to dry cask storage (otherwise known as the Independent Spent Fuel Storage Installation or ISFSI) as necessary to maintain full core offload capability, in accordance with NRC requirements. SCE intends to periodically increase the amount of dry cask storage containers to accommodate (1) maintaining full core offload capability within the used fuel pool during operations, and (2) storing all used fuel in the ISFSI approximately 5 to 12 years after SONGS 2 & 3 is permanently shut down. SCE plans to continue safely storing used fuel at SONGS pursuant to this plan until the Department of Energy (DOE) fulfills its contractual obligations to remove all used fuel at SONGS for permanent disposition. This plan is consistent with the NRC's position on used fuel storage, as outlined in the recently approved Waste Confidence Decision.⁶³ The NRC issued a revision to 10 CFR § 51.23, which specifies that used fuel can be safely stored for at least 60 years beyond the licensed life of a nuclear power plant including license renewal.⁶⁴ SCE plans to safely store its used fuel onsite in the ISFSI and in its used fuel storage pools, as necessary, until the DOE fulfills its contractual obligations to remove the used fuel from the site. The technology exists to evaluate, refurbish, and repair or replace used fuel dry cask storage system components, for as long as it is necessary to extend the life of the used fuel dry cask storage facility.

⁶² CPUC June 25, 2009 Letter to SCE; AB 1632 Report, p. 34.

⁶³ SECY-09-0090 – Final Update of the Commission's Waste Confidence Decision.

⁶⁴ "Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation; Waste Confidence Decision Update; Final Rules," 75 Fed. Reg. 81,032-81,706 (Dec. 23, 2010) (to be codified at 10 CFR pt. 51).

3. Used Fuel Storage Costs

The capital costs associated with used fuel storage are addressed in SCE's 2012 General Rate Case (GRC).⁶⁵ The costs associated with SONGS used fuel storage are also components of the costs included in SCE's cost-effectiveness analysis that SCE will submit in a separate license renewal funding application to the CPUC. Cost estimates for decommissioning the ISFSI have been included in the NDCTP. The incremental costs for decommissioning the dry cask storage modules due to an additional 20 years of operation if SONGS 2 & 3 operating licenses are renewed, will be included in a future NDCTP proceeding, as appropriate. These additional costs have a negligible impact on the cost-effectiveness analysis that will be included with SCE's license renewal funding application. In addition to the costs identified above, SCE customers contribute 1 mil per kWh for electricity produced from nuclear fuel to the federal government for the Nuclear

Waste Fund to pay for all costs incurred by DOE in fulfilling its contractual obligations to remove and permanently disposition all used fuel from SONGS.

4. Used Fuel Storage Systems

a) Used Fuel Pool

The NRC has approved the use of engineered pools to store used fuel. These pools provide cooling, prevent criticality, and protect the fuel assemblies from excess mechanical or thermal loading. Used fuel is stored underwater in the pools in storage racks. Used fuel assemblies are maintained in a safe configuration by several design aspects of the used fuel storage racks including: (1) the pattern of the fuel assemblies in the racks, and (2) the design of the racks which limit fuel assembly interaction. Design of the used fuel pools ensures adequate convective cooling for the removal of decay heat. The used fuel pools are located in a secured area at SONGS 2 & 3, with one pool for each unit. Cooling and system integrity monitoring and maintenance are performed as part of routine operation and maintenance programs.

As indicated above, the NRC requires that sufficient space in each used fuel pool be available to allow off-loading of a full core of each reactor. SCE adheres to this requirement.

65 A.10-11-015, SCE-02, Volume 2.

b) Independent Spent Fuel Storage Installation

The NRC has approved the use of dry cask storage to store used fuel once it has cooled to acceptable levels in a used fuel pool. SONGS 2 & 3 used fuel requires 5 to 12 years of cooling in pools before it can be transferred to dry cask storage. Transfers from SONGS 2 & 3 used fuel pools to dry cask storage in the ISFSI are scheduled as necessary to maintain the capability to offload a full core of used fuel. The ISFSI is located in a secured area at SONGS, dedicated to the dry cask storage of SONGS used fuel. The ISFSI (the dry cask storage system) consists of reinforced concrete modules, in which the sealed steel canisters containing used fuel are stored. The size of the ISFSI is expanded as necessary to accommodate used fuel from SONGS 2 & 3 operations. There is sufficient space to store in the ISFSI, all used fuel generated from SONGS 2 & 3 operations, through the period of extended operation if SONGS 2 & 3 operating licenses are renewed, until the DOE removes the used fuel from the site.

5. Conclusion

SCE continues to follow its used fuel management plan, transferring used

fuel from SONGS 2 & 3 used fuel pools to ISFSI dry cask storage as needed to maintain the full core offload capability required by the NRC. SCE's used fuel management plan provides safe and secure storage of used fuel, until the DOE meets its acknowledged obligations to remove the used fuel from the site.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robin Mainardy
Title: Project Manager
Dated: 04/25/2011

Question A.13:

Please describe any studies underway or to be completed for as part of license renewal feasibility studies that: (a) quantify the local economic impacts of shutting down the plants compared with alternate uses of the site and (b) assess the reliability, economic and environmental impacts of replacement power options for the plants. Please provide copies of any assessments conducted since 2008. (Diablo Canyon, SONGS)

Response to Question A.13:

(a) SCE has not conducted studies that quantify the local economic impacts of shutting down the plant compared with alternate uses of the site. However, SCE retained IHS Global Insight to study the operational benefits of SONGS 2 & 3 for the period 2010-2014. "Southern California Edison's Evaluation of California Energy Commission AB 1632 Report Recommendations," which was submitted to the CPUC and CEC on February 2, 2011, includes a section discussing the results of the IHS Global Insight study, with an associated appendix containing the actual report "Economic Impacts of the San Onofre Nuclear Generating Station on the California Economy" (see attached). The text of the appendix is provided below for ease of reference. SCE's February 2, 2011 submittal is located at::

http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf

(b) SCE is not assessing the reliability, economic, and environmental impacts of replacement power options for the plant. SCE continues to develop a cost-effectiveness analysis of alternative power generation that will be included with the SONGS 2 & 3 License Renewal application to the CPUC (the timing of which has not been established).

Economic Impact

Executive Summary:

SCE studied the economic impact of SONGS 2 & 3 operations. The study showed that SONGS 2 & 3 operations affect a large number of sectors within the California economy. Overall, SONGS 2 & 3 operations directly and indirectly support approximately 9,400 jobs, and impact the

California economy by more than \$3.3 billion per year.

SCE cannot assess or compare the economic impact of alternate uses of the SONGS site because SCE leases the land for SONGS from the Department of the Navy under long-term agreements that specify SCE's use of the land. The future alternate uses of the land would be at the discretion of the Department of the Navy. At this time, SCE has no information regarding the alternate uses the Department of the Navy may consider once SONGS 2 & 3 is permanently shut down and decommissioned.

Detailed Analysis and Discussion:

SCE retained IHS Global Insight to study the economic impacts of SONGS 2 & 3. IHS Global Insight is a leading economic forecasting and consulting company (both the Commission and SCE have used IHS Global Insight's macroeconomic projections for over three decades). IHS Global Insight used the IMPLAN input/output (I/O) model to estimate the total economic impacts of SONGS 2 & 3 on the California economy. The IMPLAN model computes a set of multipliers that produce estimates of the total regional increases in output (the value of production by industry for a given time period), value added (payments made by industry to workers, interest, profits, and indirect business taxes), employment, and income produced by direct spending. The IMPLAN model uses inter-industry purchasing relationships to derive sector-specific multipliers that are unique to the regional economy being analyzed (California). The sizes of the multipliers are determined by the production functions in the affected final demand sectors, or by the number and types of industries that supply inputs to the directly affected sectors. The multipliers are used to derive indirect effects (result from direct suppliers purchasing additional inputs from other regional suppliers, such as a concrete contractor purchasing sand and gravel from a local quarry) and induced effects (result from the increase in local spending of disposable income by the newly hired workers; e.g., a newly hired contractor spending their earnings at a local restaurant, gas station, or grocery store), which are then added to the direct effects to obtain the total change in regional economic activity.

IHS Global Insight prepared a study to assess the economic impact over a 5-year period (2010-2014), using SONGS 2 & 3 expenditure estimates provided by SCE. The study first discusses the wage, employment, and expenditure estimates used in the study. Next, the study provides estimates of the indirect and induced effects on other economic sectors in California. The results of the study provide a macroeconomic estimate of wages, total output, taxes, and value added activity generated in the California economy due to the direct, indirect, and induced impacts of SONGS 2 & 3.

Specifically, the operation of SONGS 2 & 3 affects a large number of sectors within the California economy. The study indicates that the operation of SONGS 2 & 3 supports about 9,400 jobs and impacts the California economy by more than \$3.3 billion per year. The type of employment at SONGS 2 & 3 also has significant impacts. In California, average annual wages in 2010 totaled \$56,000 and value added per employee is measured at about \$135,000. In comparison, SONGS 2 & 3 average annual wages in 2010 were \$84,000 and the value added per employee was over \$243,000 per year, which were both substantially more than the state average.

Employment and economic impacts were as follows:

Employment impacts:

- 3,751 jobs, on average, are directly supported per year (direct employment includes SCE employees, contractors and services employees)
- 9,451 jobs, on average, are directly and indirectly supported per year
- The value added per employee is \$243,000 per year

Economic impacts:

- SONGS 2 & 3 total impact on the California economy on average is over \$3.3 billion annually, or \$16.5 billion over the 5-year study period
- State Tax Revenue is estimated to be \$246 million annually, or \$1.2 billion over the 5-year period
- During the study period, each dollar spent on SONGS 2 & 3 generates a total of \$4.30 in output in the California economy
- During the study period, each dollar spent on SONGS 2 & 3 generates a total of \$3.00 in value added in the California economy
- During the study period, each dollar spent on SONGS 2 & 3 produces \$1.35 of labor earnings

As the IHS Global Insight study demonstrates, operations of SONGS 2 & 3 will provide broad economic benefits to the California economy.

1 attachment



11-IEP-1J-CEC-SCE-001 Q.A.13 Attachment - IHS Global Insight.pdf

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Geetha Eva Shanmugasundaram

Title: Project Manager

Dated: 04/25/2011

Question A.14:

Please describe any safety culture issues at the plants that have arisen since 2008, efforts to improve the safety culture and maintain major safety-related equipment, e.g., related to emergency back-up power and cooling systems, and NRC's evaluation of these efforts and the plants' overall performance. (Diablo Canyon, SONGS)

Response to Question A.14:

On February 2, 2011, Southern California Edison (SCE) submitted its response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 AB 1632 report. In this report on pages 5 and 40-47, SCE provided an information response to the question. For ease of reference, the relevant sections of the SCE submittal are provided below.

Executive Summary

SCE is committed to preserving and improving a strong nuclear safety culture at SONGS. SCE is committed to ensuring an atmosphere exists that encourages workers to raise nuclear safety concerns. SCE has taken a number of actions to improve the nuclear safety culture including strengthening communications regarding nuclear safety culture and Safety Conscious Work Environment (SCWE); training station employees on nuclear safety culture, SCWE and the methods for raising nuclear safety concerns; and establishing mechanisms to monitor and assess nuclear safety culture, including the effectiveness of the aforementioned actions. SCE will continue to identify, through systematic reviews, actions to strengthen the SONGS nuclear safety culture.

The NRC continues to monitor SCE's nuclear safety culture efforts and overall plant performance through the NRC's Reactor Oversight Process (ROP). In their 2010 annual assessment letter, the NRC continued to affirm that SONGS has been operated in a manner that preserved public health and safety and fully met all cornerstone objectives. In December 2010, the NRC indicated that, while more improvement is needed, measurable progress has been made in addressing the SONGS performance issues. SCE concurs with this conclusion and continues to take actions to resolve remaining open issues and to achieve a stronger nuclear safety culture

at SONGS.

Detailed Analysis and Discussion

1. Introduction

This section addresses the AB 1632 Report recommendation that SCE report on its progress in addressing nuclear safety culture issues at SONGS,⁷⁴ and includes a summary of the NRC's evaluation of these efforts and of overall performance at SONGS.⁷⁵ In particular, this section outlines SCE's:

⁷⁴ CPUC June 25, 2009 Letter to SCE; AB 1632 Report, p. 19.

⁷⁵ CPUC June 25, 2009 Letter to SCE

- Overall commitment to a strong nuclear safety culture;
- Actions to strengthen the nuclear safety culture;
- Actions to preserve and improve the environment in which all personnel are encouraged and able to raise concerns by multiple pathways; and
- Monitoring and progress in achieving a strong plant nuclear safety culture.

2. SCE's Commitment to a Strong Nuclear Safety Culture

Nuclear safety culture refers to an organization's values and behaviors modeled by its leaders and internalized by its members that make nuclear safety the overriding priority for the organization. In an organization with a strong nuclear safety culture, personnel feel personally responsible for nuclear safety and act in ways that demonstrate their commitment to keeping nuclear safety the highest priority.

At SONGS, a strong nuclear safety culture is the foundational principle, ensuring that safety is always the top priority. SCE is committed to cultivating an open, collaborative culture, where:

- Everyone is personally responsible for nuclear safety;
- Leaders demonstrate commitment to safety;
- Trust permeates the organization;
- Decision-making reflects safety first;
- Nuclear technology is recognized as special and unique;
- A questioning attitude is cultivated;
- Organizational learning is embraced;
- Nuclear safety undergoes constant examination; and
- Leadership establishes and maintains a healthy safety conscious work environment where individuals are free to raise concerns without fear of retaliation.

SCE is committed to conducting business every day in a manner consistent with these

standards and principles. Site management consistently and clearly communicates nuclear safety messages, including that (1) safety is the first priority; (2) site personnel are expected to identify and report potential safety concerns; (3) site personnel must comply with regulatory requirements and SONGS procedures and programs, and stop when uncertain on how to implement requirements; and (4) retaliation against those who raise safety concerns is not permitted and will not be tolerated.

SCE is responsible day-to-day for ensuring that SONGS 2 & 3 is operated safely. In addition, the NRC has increasingly focused its oversight on nuclear safety culture in the nuclear power industry. The NRC continues to strengthen its rules, update its guidance, and enhance its inspection and enforcement programs to meet the agency's mission to ensure public health and safety. The NRC's evaluation and regulation of nuclear safety culture⁷⁶ provides further assurance that safety is always the top priority at SONGS.

3. Nuclear Safety Culture Action Plan

To preserve and strengthen the nuclear safety culture at SONGS, SCE completed the following actions as part of SONGS Nuclear Safety Culture Action Plan:⁷⁷

- Developed mechanisms to monitor nuclear safety culture progress and effectiveness, including designating a project manager to track progress;
- Strengthened on-going communications to site personnel to improve understanding of nuclear safety culture and Safety Conscious Work Environment;
- Developed and continue to align station personnel to the SONGS Excellence model, which includes overall site and nuclear safety culture standards;
- Conducted leadership seminars for station managers and supervisors to improve understanding and alignment around nuclear safety; and
- Established and is implementing a Leadership Academy to strengthen management alignment and demonstration of their role in enhancing nuclear safety culture.

⁷⁶ NRC Inspection Manual Chapter 0310, Components Within The Cross-Cutting Areas, describes the components of nuclear safety culture. The safety culture components are described as the human performance, problem identification and resolution, and safety conscious work environment crosscutting area components, and other components (accountability, continuous learning environment, organizational change management, and safety policies). The cross-cutting area components are evaluated during the conduct of both baseline and supplemental inspection programs, while the other components are evaluated during the conduct of the supplemental inspection program.

⁷⁷ SCE letter to the NRC, dated October 29, 2009, regarding the independent safety culture assessment results and action plans.

4. SCE's Response to NRC Letter Regarding Work Environment Issues at SONGS

SCE identified actions to improve the SONGS Safety Conscious Work Environment (SCWE) – an environment in which everyone is encouraged to raise concerns, and those concerns are addressed, without fear of retaliation. SCWE is a subset of nuclear safety culture.

In March 2010, the NRC issued a letter to SCE identifying a potential chilling effect regarding work environment issues. Although surveys and interviews indicated that most (95% or more) site personnel felt comfortable raising safety concerns, NRC inspection results and SCE's own reviews indicated there were areas for improvement that require action to ensure a strong SCWE among all work groups at SONGS. SCE leadership is committed to fostering an environment in which all personnel are encouraged and able to raise concerns using multiple paths. To ensure an approach that is consistent with industry best practices for resolving SCWE issues, SCE adopted the following "Four Pillar" model as the framework for development of actions to strengthen the SCWE at SONGS:

- **Pillar 1** – Employees Raise Concerns Without Fear of Retaliation
- **Pillar 2** – Effective Normal Problem Resolution Processes
- **Pillar 3** – Effective Alternate Resolution Processes
- **Pillar 4** – Effective Methods to Detect and Prevent Retaliation

The Four Pillar model, supported by organizational structures and formal processes, is now the basis for SCWE improvement actions at SONGS. Action⁷⁸ areas included:

- **Communications** – SCE continues to provide numerous site-wide communications to reinforce SCE's SCWE expectations and policies, and to encourage workers to raise concerns to their supervisors, by writing a Nuclear Notification,⁷⁹ by contacting the Employee Concerns Program or by informing the NRC. An important part of this effort includes senior site management meeting with smaller groups of employees throughout the site to hear personnel's issues and concerns;

⁷⁸ SCE letter to the NRC, dated March 31, 2010, regarding actions associated with work environment issues.

⁷⁹ A Nuclear Notification is a document that captures a problem or concern and allows for the formal evaluation and resolution of the problem

- **Training** – SCE has provided training to managers and supervisors on SCWE principles and behaviors to ensure that their behavior encourages workers to raise concerns without the fear of retaliation; SCE has provided training to SONGS employees and contractors on SCWE policies and principles, and avenues to raise concerns, including via management, through the Corrective Action Program, through alternate processes such as the Employee Concerns Program and to the NRC

without fear of retaliation;

- **Employee Concerns Program (ECP)** – SCE made this program more accessible and responsive to SONGS employees and contractors, and increased face-to-face contact between Employee Concerns Program personnel and members of the workforce.
- **Corrective Action Program (CAP)** – SCE made the CAP – the program used to identify and track resolution of issues at SONGS – easily accessible to SONGS employees and contractors for reporting concerns, and ensured that concerns can be reported anonymously, and that personnel readily obtain feedback on how their concerns were addressed.
- **Management Engagement and Oversight**—SCE improved the processes for monitoring, management engagement and taking prompt action to address SCWE issues as they emerge. This includes additional surveys, meeting with groups of employees, and the Employee Concerns Program personnel contacting workers to facilitate identification and prompt resolution of SCWE issues.

5. SCE's Nuclear Safety Culture Monitoring and Progress

SCE initiated monitoring processes to track the progress and effectiveness of actions associated with strengthening SONGS nuclear safety culture, including SCWE. These processes include:

- Monthly review of performance metrics for nuclear safety culture and SCWE;
- Quarterly review for effectiveness of the nuclear safety culture and SCWE improvement actions by an Effectiveness Review Challenge Board; during reviews, this board identifies any “check and adjust” actions deemed necessary to meet improvement goals; and
- Conducting follow-up effectiveness reviews through periodic assessments and surveys.

An effectiveness review was completed in June 2010 by a team of five individuals independent of SCE with experience in assessing and improving SCWE. This team interviewed over 400 personnel, with ninety-two percent being non-management personnel. Additionally, another effectiveness review was completed in August where over 1200 employees were surveyed regarding several SCWE areas including their willingness to raise concerns. The conclusions from these effectiveness reviews⁸⁰ were:

- SONGS personnel were willing to raise safety, compliance and quality issues, and were encouraged to do so by their management.
- Additional work is needed to ensure that individuals feel comfortable challenging what they consider a non-conservative decision, and to ensure their understanding that the SONGS culture supports raising nuclear safety and quality concerns. The continuation of the senior site management meetings with smaller groups of SONGS personnel and the subsequently completed management, supervision and employee training is expected to

improve the willingness of SONGS personnel to challenge decisions and improve their understanding of and compliance with SCE's expectation for SONGS personnel to raise nuclear safety and quality concerns.

- SONGS has improved accessibility of the CAP, and personnel agreed that SONGS management at all levels reinforces the use of the CAP and the Nuclear Notification process.

- Virtually every person interviewed exhibited a general awareness of the alternative avenues for raising concerns. An overwhelming majority of those interviewed indicated no fear of retaliation if they or someone they knew raised a safety concern to the NRC.

Interviewees were aware of recent programmatic changes to the ECP. Based on the survey results, additional work is needed to improve workers' confidence in the results of the ECP investigations and findings. The implementation of the enhanced Employee Concerns Program is expected to improve worker's confidence in ECP investigations and findings.

- Personnel were aware that any type of harassment, intimidation, retaliation or discrimination against anyone for raising concerns is expressly prohibited. SCE has reinforced this standard through various ongoing communications and training regarding SCWE and related issues.

80 SCE letter to NRC, dated August 31, 2010, regarding status of action associated with work environment issues

Based on the effectiveness reviews, performance measures, and other survey tools, actions to strengthen the nuclear safety culture, including SCWE, are showing progress. SCE recognizes that additional improvement is needed and continues to adjust its programs as necessary to achieve a strong nuclear safety culture.

The NRC continues to monitor SCE's nuclear safety culture efforts and overall plant performance through the NRC's Reactor Oversight Process⁸¹ (ROP). When implementing the ROP, the NRC conducts inspections and may identify findings. During 2009 and 2010, the NRC's findings were of very low safety significance. In their 2010 annual assessment letter, the NRC continued to affirm that SONGS has been operated in a manner that preserved public health and safety and fully met all cornerstone⁸² objectives. In December 2010, the NRC informed SCE that the White Finding⁸³ is closed and that the performance at SONGS 2 had improved, allowing SONGS 2 to be in the Licensee Response Column (Column 1) of the ROP Action Matrix, improved from the Regulatory Response Column (Column 2).⁸⁴ Additionally, in their December Inspection of the substantive cross cutting issues, the NRC concluded there was measurable progress toward closing two of the CAP cross cutting issues. SCE concurs with this conclusion and continues take actions to resolve remaining open NRC

substantive cross-cutting issues and to achieve a stronger nuclear safety culture at SONGS.

6. Conclusion

SCE is committed to preserving and improving a strong nuclear safety culture at SONGS. SCE is committed to ensuring an atmosphere exists that encourages workers to raise nuclear safety concerns. SCE will not tolerate retaliation against workers who identify nuclear safety or other concerns. SCE has taken actions to improve the nuclear safety culture at SONGS. SCE will continue to identify, through systematic reviews, actions to strengthen the SONGS nuclear safety culture.

81 The Reactor Oversight Process (ROP) provides a framework for the NRC to monitor performance in three broad areas -- reactor safety; radiation safety for both plant workers and the public during routine operations; and protection of the plant against sabotage or other security threats. The ROP also features three "cross-cutting" elements, so named because they affect and are therefore part of each of the cornerstones: human performance, problem identification and resolution, and safety-conscious work environment.

82 The seven cornerstones are: initiating events, mitigating systems, barrier integrity, emergency preparedness, public radiation safety, occupational radiation safety, and physical protection. Satisfactory licensee performance in the cornerstones provides reasonable assurance of safe facility operation and that the NRC's safety mission is being accomplished. Each cornerstone contains inspection procedures and performance indicators to ensure that their objectives are being met.

83 Reference NRC Inspection Report Inspection Report 2009003 in Section 4OA2.3 for information related to the White Finding issued on Dec 11, 2008, for the "Failure to Establish Appropriate Instructions."

84 Reference NRC Letter to SCE, December 22, 2010, NRC Inspection Procedure 95001 Supplemental Inspection Report.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Geetha Eva Shanmugasundaram

Title: Project Manager

Dated: 04/25/2011

Question A.15:

Please provide copies of plant evaluations conducted by the Institute of Nuclear Power Operation (INPO) and any INPO Performance Index for the facility from 2009-2011. As for other areas, confidentiality protection will be provided for proprietary information as needed upon identification by the respondent. (Diablo Canyon, SONGS)

Response to Question A.15:

From SCE's response to Data Request SCE 09-IEP/CEC-SCE-SONGS-01, Question I.08:

The Institute for Nuclear Power Operations (INPO) is an industry organization established after the accident at Three-Mile Island (TMI) in 1978 to provide nuclear power operators with critical evaluations of their performance compared to subjective qualitative standards of excellence. The purpose of INPO is to assess nuclear power plant operators in improving performance by providing confidential critical analysis. SCE as a nuclear power plant operator agrees to hold INPO performance evaluation in confidence. INPO also holds a copyright on its information and limits distribution to the plant operators. The reason for these confidentiality standards is to minimize nuclear power plant operator concerns about divulging information to INPO for fear that the information will later be used against a nuclear power plant operator. The U.S Court of Appeals for the District of Columbia Circuit has upheld the position that INPO's overall plant evaluation assessments are confidential, Critical Mass Energy Project v. Nuclear Regulatory Commission, 830 F. 2d 278, 282 (1987) . This decision was upheld on subsequent appeal holding that INPO performance evaluations are exempt from disclosure under Freedom of Information Act. 975 F. 2d 871 (D.C. Cir. 1992) (en banc). For these reasons, SCE cannot provide copies of INPO plant evaluations to a third party.

In order to facilitate the CEC's review of nuclear power operations at SONGS, SCE is willing to make available copies of INPO plant evaluations for SONGS from 2009 - 2011 at its Sacramento offices for review by CEC personnel, as done in the 2009 IEPR. SCE cannot allow copies to be made or notes to be taken.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Geetha Eva Shanmugasundaram

Title: Project Manager

Dated: 04/25/2011

Question A.16:

Please provide updated assessments of the options and costs for complying with the State Water Resources Control Board's once-through cooling policy and plans for how these options and estimated costs will be included in the cost-benefit assessments for the plants' license renewal feasibility studies. (Diablo Canyon, SONGS)

Response to Question A.16:

On February 2, 2011, Southern California Edison (SCE) submitted its response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 AB 1632 report. In this report on pages 6 and 57-60, SCE provided an information response to the question. For ease of reference, the relevant sections of the SCE submittal are provided below.

Executive Summary

On May 4, 2010 the State Water Resources Control Board (SWRCB) adopted a policy on the use of coastal and estuarine waters for power plant cooling. In this submittal, SCE describes the policy requirements, which became effective October 1, 2010, and the need to proceed with SONGS license renewal activities as SCE addresses the implementation of this policy, as applicable to SONGS.

Consistent with the directives of the California Coastal Commission (CCC), SCE has fully mitigated for the impact of SONGS 2 & 3 on the marine environment. In addition, cooling towers are not feasible at SONGS 2 & 3 and an alternative means of compliance will be required to allow SONGS 2 & 3 to enter a period of extended operation in the event the NRC grants license renewal for SONGS 2 & 3.

Detailed Analysis and Discussion

1. Introduction

This section addresses the AB 1632 Report recommendation that the California Independent System Operator (CAISO) address the Stakeholder Study of Aging Power Plants

and Once-Through Cooling Mitigation as quickly as feasible and that the review determine the extent supplemental studies are needed.⁹⁷ SCE's review of the once through cooling (OTC) policy, as it relates to SONGS 2 & 3 and its environmental mitigation status, is included below.

On May 4, 2010 the State Water Resources Control Board (SWRCB) adopted a policy⁹⁸ on the use of coastal and estuarine waters for power plant cooling. The policy, which became effective October 1, 2010, includes a schedule for implementation, including milestones for thermal fossil plants using OTC technology to retrofit using alternative cooling technologies, such as cooling towers, or to shut down no later than the end of 2020.

⁹⁷ AB 1632 Report, p. 24.

⁹⁸ Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (Policy), Resolution No. 2010-0020; adopted by SWRCB May 4, 2010; effective October 1, 2010.

The OTC policy also established separate requirements for the state's nuclear-fueled power plants, such as SONGS 2 & 3, because of these plants' positive environmental benefits and importance to the reliability of the electric grid. The requirements include: (1) installing large organism exclusion devices around the SONGS 2 & 3 intake structures within one year after the effective date of the policy (i.e., by October 1, 2011); (2) conducting and providing to the SWRCB within three years after the effective date of the policy (i.e., by October 1, 2013) a special study of alternatives for SONGS 2 & 3 to meet the policy's objectives, including costs for the alternatives;⁹⁹ and (3) achieving full compliance with the policy by implementing alternative cooling technologies such as a closed cycle cooling system (i.e., cooling towers) at SONGS 2 & 3 or shut down by December 31, 2022.

The relevance of the OTC policy requirements to SONGS 2 & 3 is discussed below.

2. SCE Has Fully Mitigated For the Impact of SONGS 2 & 3 on the Marine Environment¹⁰⁰

SONGS 2 & 3 employs state-of-the-art engineering and operational measures to minimize impingement and entrainment of marine organisms. These include velocity caps on the mid-water depth offshore intakes,¹⁰¹ an in-plant fish handling system (diversionary louvers, rescue elevators, and return lines), and customized outfall heat treatment procedures to maximize fish handling system effectiveness. In addition to the design engineering and operational measures described above, SCE has performed mitigation measures that include: (1) restoring wetlands in San Dieguito; (2) constructing the largest artificial giant kelp reef in California, the 174-acre Wheeler North Reef; (3) funding the Hubbs white sea bass hatchery in Carlsbad; and (4) funding ongoing independent monitoring of the mitigation measures. Independent verification monitoring of SCE's environmental mitigation efforts show substantial enhancement of habitat resources, even before the mitigation projects are physically complete. For example, the San

Dieguito wetlands project created over 160 acres of new wetlands (including 100 acres of tidal salt marsh land) and restored tidal flows, natural habitats, and vegetation to a former wetland area, resulting in measurable increases of fish and wildlife in the project area.¹⁰² Additionally, the Wheeler North Reef is a significant new marine kelp habitat on the southern California coast that produces and nourishes as many as 50 varieties of fish and invertebrates and the 174- acre kelp forest ecosystem that supports them.

99 The special study to assess alternatives for nuclear-fueled power plants must be conducted by an

independent third party under the oversight of a Review Committee; reference Policy, § 3(D).

100 Appendix 9, Letter from Peter Douglas, Executive Director, California Coastal Commission, dated

February 4, 2010.

101 Mid-water location of the intakes is a design feature intended to minimize fish entrainment.

102 UCSB SONGS Mitigation Monitoring website: <http://marinemitigation.msi.ucsb.edu/>.

3. SCE Will Install Large Marine Organism Exclusion Devices at SONGS 2 & 3 If Feasible

The requirement for SONGS 2 & 3 to install large marine organism exclusion barriers around the circulating water intake velocity caps within one year after the effective date of the policy is not achievable. Such a barrier requires time to design and requires a detailed review to ensure that conditions of the NRC operating license will continue to be satisfied. If an exclusion device is determined to be feasible, a considerable amount of time would be required to install the modifications while the units are off-line. SCE is currently identifying options for meeting this policy requirement, and is working with the SWRCB regarding this policy.

4. Cooling Towers Are Not Feasible

The SWRCB OTC policy requires plants utilizing OTC to reduce their intake of cooling water by installing closed-cycle wet cooling systems or by reducing intake to a comparable level by alternative means. Installing a closed-cycle wet cooling system (i.e., cooling towers or the equivalent) has been evaluated and is not feasible at SONGS 2 & 3. A retrofit with a closed-cycle cooling system at SONGS 2 & 3 would face unparalleled engineering challenges, insuperable permitting obstacles, and adverse environmental impacts likely greater than those associated with OTC.

5. Possible Exceptions to the SWRCB OTC Policy

The OTC policy requires completion of special studies conducted by an independent third party within three years of the effective date of the policy. These studies are to assess alternatives for the nuclear-fueled power plants to meet OTC policy requirements. Pursuant to the policy, the SWRCB must consider the study results in evaluating whether to modify the compliance requirements for nuclear-fueled power

plants. The SWRCB staff is in the initial phases of selecting the contractor for the nuclear plant special studies and has appointed the oversight committee. The date for SONGS 2 & 3 to comply with the OTC policy is December 31, 2022, but this date could be adjusted by the SWRCB based on written notification from the CAISO that the plant is needed to maintain reliability of the electric system; however, SONGS 2 & 3 cannot operate beyond 2022 unless the NRC grants license renewal.

6. Conclusion

Consistent with the directives of the California Coastal Commission (CCC), SCE has fully mitigated for the impact of SONGS 2 & 3 on the marine environment. Cooling towers are not feasible at SONGS 2 & 3. The estimated costs for cooling towers will not be included in the cost benefit assessments due to it not being feasible. Alternative means of compliance will be required to allow SONGS 2 & 3 to enter a period of extended operation; however, SONGS 2 & 3 cannot operate beyond 2022, even if the CAISO determines it would be necessary, unless NRC license renewal had been obtained.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Paul Klapka
Title: Project Manager
Dated: 04/25/2011

Question A.17:

Please describe progress in providing greater representation on the SONGS' Seismic Advisory Board from independent seismic experts, such as university or government scientists and/or engineers with no current or prior employment with the plant owners or their consultants. (SONGS)

Response to Question A.17:

The SONGS Seismic Technical Advisory Board (STAB) has members selected by SCE whose expertise is necessary to suit SONGS' current needs. If new situations make it necessary for SCE to select different STAB members, SCE will select new members based on the needs at that time.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Lindsay Anderson

Title: Manager, Project

Dated: 04/25/2011

Question B.01:

Please describe the studies that are underway or planned to examine the significant events at the Fukushima Daiichi Nuclear Plant following the March 11, 2011 earthquake/tsunami and the implications for California's operating plants. Please report on any seismic/tsunami and plant seismic vulnerability analyses that are planned or in progress related to these events. What are the preliminary findings from these assessments regarding the design safety margins for the plant including back-up power, emergency cooling, spent fuel pools and ISFSI (Diablo Canyon, SONGS, Humboldt Bay)

Response to Question B.01:

Please describe the studies that are underway or planned to examine the significant events at the Fukushima Daiichi Nuclear Plant following the March 11, 2011 earthquake/tsunami and the implications for California's operating plants.

Following the events in Japan, on March 23, 2011, the U.S. Nuclear Regulatory Commission (NRC) established a senior level agency task force to conduct a methodical and systematic review of NRC processes and regulations to determine whether the agency should make additional improvements to its regulatory system and make recommendations to the Commission for its policy direction. The task force identified the objectives for near and longer term reviews of the events at the Fukushima Daiichi nuclear power plant complex.

The near term objectives include evaluating available technical and operational information from the events, in order to identify potential or preliminary near term/immediate operational or regulatory issues affecting domestic operating reactors of all designs, including their spent fuel pools. Following the review, recommendations will be developed, as appropriate, for potential changes to inspection procedures and licensing review guidance, and it will be determined if generic communications, orders or other regulatory requirements be needed.

The longer term review will begin as soon as the NRC has sufficient technical information on the events in Japan, and will include evaluating all technical and policy issues related to the events, in order to identify potential research or generic issues, and the need for any changes to the reactor oversight process, rulemaking, or adjustments to the regulatory framework.

On May 12, 2011, the task force briefed the NRC on the progress of its reviews. To date, the

task force has not identified any issues that undermine its confidence in the continued safety and emergency planning of U.S. plants.

The most recent information from the NRC can be found at:

<http://www.nrc.gov/japan/japan-info.html>.

Additionally, since the Fukushima Daiichi Nuclear Plant event involved response to a beyond design basis event, SCE along with the other nuclear utilities, validated the ability to implement the processes to address severe accidents and maintain the nuclear fuel safe following large explosions or fires. The NRC conducted a follow-up inspection assessing SCE's review using Temporary Instruction (TI) 2515/183. The NRC also conducted an evaluation of the implementation of the voluntary severe accident mitigation guidelines process. The inspection results from the TIs will be used to evaluate the industry's readiness for a similar event and to aid in determining whether additional regulatory actions by the U.S. Nuclear Regulatory Commission are warranted. Therefore, the intent of the TIs is to be a high-level look at the industry's preparedness for events that may exceed the design basis for a plant. The results related to SONGS are attached. The information is essentially the same as that provided in the INPO event reports concerning these issues.

The NRC also issued Bulletin 2011-01, Mitigating Strategies. Following the terrorist events of September 11, 2001, the readiness of NRC-regulated facilities to manage challenges to core cooling, containment and spent fuel pool cooling following large explosions or fires was enhanced through a series of orders and imposition of license conditions. These requirements were formalized in the rulemaking of March 27, 2009, resulting in 10 CFR 50.54(hh)(2). The events in Japan highlight the importance and potential versatility of these mitigating strategies. Therefore, the NRC is seeking a comprehensive confirmation that licensees are maintaining equipment and strategies to satisfy 10 CFR 50.54(hh)(2). SCE is preparing its response as per the NRC Bulletin.

Please report on any seismic/tsunami and plant seismic vulnerability analyses that are planned or in progress related to these events.

The implications of the Fukushima Daiichi Nuclear Plant event for San Onofre Nuclear Generating Station (SONGS) will be assessed by Southern California Edison (SCE) once the relevant facts become known.

What are the preliminary findings from these assessments regarding the design safety margins for the plant including back-up power, emergency cooling, spent fuel pools and ISFSI.

No preliminary findings are available because the NRC evaluation of the Fukushima Daiichi Nuclear Plant event is still underway.

2 attachments



ML111470264.pdf



NRC_TI183_Inspection_Results.pdf

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Lindsay Anderson
Title: Manager, Project
Dated: 04/25/2011

Question B.02:

Please summarize any lessons learned from events at Fukushima and provide copies of any reports provided to the Nuclear Regulatory Commission (NRC) , IAEA, or other organizations describing these events, lessons learned, and any implications for California's plants. Please include whether any additional equipment or mitigation measures may be needed to prevent or minimize the risk of similar events at Diablo Canyon and SONGS, e.g., station blackout, hydrogen explosions, breach of containment, spent fuel pool overheating/fires, and loss or failure of back-up cooling systems. (Diablo Canyon, SONGS).

Response to Question B.02:

On June 1, 2011, the IAEA issued "IAEA INTERNATIONAL FACT FINDING EXPERT MISSION OF THE NUCLEAR ACCIDENT FOLLOWING THE GREAT EAST JAPAN EARTHQUAKE AND TSUNAMI (Preliminary Summary)," dated 24 May-1 June 2011 (see attached). However, the lessons learned from the events at the Fukushima Daiichi Nuclear Plant are still under development by the various oversight groups, including the NRC and IAEA.

While not specifically a lessons learned from the events at Fukushima, the NRC requires nuclear utilities to have equipment and strategies in place for dealing with severe accidents and maintaining the nuclear fuel safe following large explosions or fires. These requirements are based on lessons learned from previous events including the September 11, 2001 event. The NRC did conduct a follow-up inspection using Temporary Instruction 2515/183 to assess SCE's processes for dealing with severe accidents and maintaining the nuclear fuel safe following large explosions or fires (B.5.b). Additionally, SCE will be submitting confirmation that equipment and strategies are maintained to satisfy B.5.b requirements. Reference B.01 for additional details.

1 attachment



IAEA mission summary June 01 2011.pdf

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Lindsay Anderson
Title: Manager, Project
Dated: 04/25/2011

Question B.03:

A problem at Fukushima was that monitors were not available during the emergency to indicate spent fuel pool conditions (e.g., water levels and temperature) as problems unfolded. Do the spent fuel pools have monitors or instrumentation that would be available and reliable under severe accident conditions? (Diablo Canyon, SONGS)

Response to Question B.03:

Under severe accident conditions, the used fuel pool monitors or instrumentation may not be available and reliable, but operators could be deployed to confirm level and temperature, provided the used fuel pool level is maintained such that radiological conditions support entry into the used fuel pool building.

The NRC will include in its evaluation consideration of enhancements to the used fuel pool water level and temperature instrumentation. On May 12, the NRC briefed the Commission on the progress of the task force review of NRC processes and regulations following the events in Japan, emphasizing key stakeholder input during the process.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Lindsay Anderson
Title: Manager, Project
Dated: 04/25/2011

Question B.04:

Please discuss plans and preparation for an extended station blackout and/or loss of emergency cooling, including spent fuel pool cooling that exceed planning assumptions for the plant. Please explain the reliability of the emergency back-up water supply system and how emergency water would be provided in the event of the loss of emergency back-up cooling systems, storage tank rupture or the failure or loss of the infrastructure necessary to access the backup water for cooling. (Diablo Canyon, SONGS)

Response to Question B.04:

Please discuss plans and preparations for an extended station blackout and/or loss of emergency cooling, including spent fuel pool cooling that exceed planning assumptions for the plant.

On March 23, 2011, the U.S. Nuclear Regulatory Commission (NRC) established a senior level agency task force to conduct a methodical and systematic review of NRC processes and regulations to determine whether the agency should make additional improvements to its regulatory system. Initially, the NRC task force will identify potential near-term actions that affect U.S. power reactors, including their used fuel pools. Areas to be reviewed include station blackout (loss of all A/C power for a reactor), external events that could lead to a prolonged loss of cooling, and plant capabilities for preventing or dealing with such circumstances. SCE's plans and preparations for addressing an extended station blackout and/or loss of emergency cooling, including used fuel pool cooling that exceed planning assumptions for the plant, are under review and will be informed by the work of the NRC task force.

Please explain the reliability of the emergency back-up water supply system and how emergency water would be provided in the event of the loss of emergency back-up cooling systems, storage tank rupture or the failure or loss of the infrastructure necessary to access the backup water for cooling.

SONGS has a total of 5.3 million gallons of water available for use in case of emergency. Out of this volume, 3 million gallons are stored in seismically qualified tanks. Diverse means exist to transfer this water from the storage tanks to where it is needed to provide emergency cooling following seismic, tsunami, flooding or fire events. Diverse means

include stationary and portable pumps that are engineered to withstand seismic events and are independent of station or offsite power.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Paul Klapka

Title: Project Manager

Dated: 04/25/2011

Question B.05:

The earthquake experienced on March 11, 2011 at the Fukushima-Daiichi plant was a 9.0 magnitude earthquake, although the plant was designed to withstand a 7.9 earthquake. Please explain the discrepancy and why predicting large-scale seismic and tsunami events is so difficult and uncertain. (Diablo Canyon, SONGS)

Response to Question B.05:

SCE has no specific knowledge of the process used for determining the design basis of Fukushima-Daiichi and therefore cannot comment.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Tony Llorens
Title: Project Manager
Dated: 04/25/2011

Question B.06:

Given the lessons learned from the Fukushima plant in Japan and overheating problems in spent fuel pools, what are the estimated costs and potential risks of relying indefinitely upon onsite interim storage facilities? Please provide a copy of any cost/benefit study on the costs and risks of long-term or indefinite onsite spent fuel storage in pools and dry cask storage. (Diablo Canyon; SONGS; Humboldt Bay)

Response to Question B.06:

SCE cannot comment on lessons learned from Fukushima, since accurate information surrounding the events at Fukushima has not yet been adequately identified and appropriately evaluated. This will be done by the NRC, with public and industry participation and input.

On February 2, 2011, Southern California Edison (SCE) submitted its response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 report. SCE's submittal is located at:

http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf

SCE's submittal addressed SCE's plans for the storage and management of used fuel in the SONGS 2 & 3 used fuel pools and Independent Spent Fuel Storage Installation. These plans are consistent with the NRC's position that used fuel can be safely stored for at least 60 years beyond the operating license (which may include license extension) in a used fuel pool or dry cask storage system. Refer to the response to question A.10, for the discussion on Used Fuel Management plans.

SCE has not estimated the costs for relying indefinitely upon onsite storage facilities. See the response to D.13 for used fuel storage costs at the ISFSI. No cost/benefit study on the costs and risks of long-term or indefinite onsite used fuel storage exists. In the absence of Yucca Mountain or any other off-site used fuel repository, a cost/benefit study can not be done.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question C.01:

Please update the following Table 12 from the *AB 1632 Assessment of California's Operating Nuclear Plants: Final Report*, October 2008 (CEC-100-2008-005-F, page 213).

Table 12: Waste Generated at Diablo Canyon (Units 1 and 2) and SONGS (Unit 1 and Unit 3)

		Spent Fuel		Low-Level Waste	
		(No. of assemblies)	(Metric tons of Uranium)	Class C (ft ³)	GTCC (ft ³)
Diablo Canyon	Total generated through 2011				
	2011 through end of Initial License				
	License Extension				
	Decommissioning				
	Total				
SONGS	Generated through 2011				
	2011 through end of Initial License				
	License Extension				
	Decommissioning				
	Total				

Response to Question C.01:

An update to the version of Table 12 that SCE submitted in its July 2009 response to a data request pertaining to California Energy Commission's 2008 AB 1632 report, October 2008 (CEC-100-2008-005-F) is provided below.

Table 12: Waste Generated at SONGS (Unit 1, 2, and 3)					
To Be Reported in 2011 DR		Used Fuel		Low-Level Waste	
		No. of Assemblies	Metric Tons of Uranium	Class C (ft3)	GTCC (ft3)
SONGS 1, 2, and 3	Total Generated Through May 2011	3691*	1519*	302** ('01-'10)	Unknown
	May 2011 Through End of Initial License	1,946	853	451	Unknown
	License Extension	2,808	1,231	820	Unknown
	Decommissioning	None	None	952	Approx. 2,700
	Total**	8,445	3,603	2,525	Approx. 2,700
* Includes 665 fuel assemblies generated at SONGS Unit 1.					
** SONGS Units 2 & 3 totals are estimated for years 2001-2008. Post-2008 Class C volumes are estimated because SONGS does not currently have access to a licensed disposal facility for them.					

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question C.02:

For each of the years 2008-2011, how much spent nuclear fuel was generated by each unit and what is the anticipated average annual spent fuel generation rate for each unit over the lifetime of the plant? (Diablo Canyon, SONGS)

Response to Question C.02:

For SONGS 2 & 3, the following is provided:

- In 2008, neither SONGS 2 nor SONGS 3 generated any used fuel assemblies.
- In 2009, SONGS 2 generated 108 used fuel assemblies and SONGS 3 generated zero used fuel assemblies.
- In 2010, SONGS 2 generated zero used fuel assemblies and SONGS 3 generated 108 used fuel assemblies

Average annual SONGS 2 & 3 used fuel generation from inception of operations through 2010: 114 assemblies per year (3026 assemblies / 26.5 Years, excludes 434 assemblies currently in reactor cores).

Average annual SONGS 2 & 3 used fuel generation from 2011 through 2022: 126 assemblies per year (1512 assemblies, excludes 434 assemblies that will be discharged at end of license / 12 Years).

At end of license, 434 assemblies will be discharged from the SONGS 2 & 3 reactors.

**Southern California Edison
IEPR 11-IEPR**

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question D.01:

Please provide current updates to Table 14 from page 217 of the *AB 1632 Assessment of California's Operating Nuclear Plants: Final Report*, October 2008 (CEC-100-2008-005-F): Please also provide the information in metric tons of uranium.

Response to Question D.01:

An update to the version of Table 14 that SCE submitted in its July 2009 response to a data request pertaining to California Energy Commission's 2008 AB 1632 report, October 2008 (CEC-100-2008-005-F) is provided below.

Table 14: On-Site Spent Fuel Capacities (Number of Assemblies)*****	
	SONGS 2 & 3
ISFSI Capacity (as of June 2011)	888*
Planned Expansion	1,280
Total Planned ISFSI Capacity	2,168
Spent Fuel Pool Capacity	3,084**
Total On-Site Storage Capacity	4,972***
Assemblies Generated During Current Licensed Period	4,972****
Spent Fuel Pool Original Design (Before Re-Racking)	1,600

* 576 Units 2 & 3 assemblies transferred through July 2010, plus installed modules available to accept 312 additional assemblies.

** Each pool has 1,542 spaces, however, during plant operation, administrative controls limit the number of assemblies that can be stored in the pool.

*** The planned capacity of the ISFSI can be expanded to hold all assemblies generated during the current license period.

**** Assumes 18-month operating cycles beginning in 2011 with 108 assembly off-loads beginning in 2008.

***** Table is based on current license only.

SCE is unable to provide the physical location of metric tons of uranium because this type of information is classified as security-sensitive information. Security-sensitive information includes information about "material control and accounting program for special nuclear material not otherwise designated as Safeguards Information" which includes information about the amount of used nuclear fuel at SONGS. If provided in any type of public forum, this type of

information could potentially be used by people seeking to compromise the security of SCE's nuclear facility. Nuclear Regulatory Commission (NRC) regulations, at 10 CFR 2.390(d)(1), and other NRC direction preclude SCE from releasing this type of information in the interest of national defense.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question D.02:

What is the current total amount of spent fuel (number of assemblies and metric tons of uranium) stored in storage pools? How does this compare to the original storage capacity when the plant was originally designed (i.e., how many times more spent fuel is currently being stored, and planned for storage, compared to the original plant design for the spent fuel pool)? (Diablo Canyon, SONGS)

Table 14: On-Site Spent Fuel Storage Capacity (number of assemblies)

	Diablo Canyon	SONGS Units 2 & 3	Humboldt Bay
ISFSI Capacity	1,280	312	NA
Planned Expansions	3,136	1,488	
Total Planned ISFSI Capacity	4,416	1,800	
Spent Fuel Pool Current Capacity	2,648	3,084	
Total On-site Storage Capacity	7,064	4,884	
Assemblies Generated during Current Licensing period	4,310	4,972	
Spent Fuel Pool Original Design Capacity (Before re-racking)			

Response to Question D.02:

There are currently 2,450 used fuel assemblies stored in the SONGS 2 & 3 used fuel pools, which have a combined capacity of 3,084 assemblies (including 434 cells that are held available at all times for full-core offload reserve requirements). The SONGS 2 & 3 used fuel pools had an original storage capacity of 1,600 assemblies before re-racking.

SCE is unable to provide the physical location of metric tons of uranium because this type of information is classified as security-sensitive information. Security-sensitive information includes information about "material control and accounting program for special nuclear material not otherwise designated as Safeguards Information" which includes information about the amount of used nuclear fuel at SONGS. If provided in any type of public forum, this type of information could potentially be used by people seeking to compromise the security of SCE's nuclear facility. Nuclear Regulatory Commission (NRC) regulations, at 10 CFR 2.390(d)(1), and other NRC direction preclude SCE from releasing this type of information in the interest of

national defense.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Tony Llorens
Title: Project manager
Dated: 04/25/2011

Question D.03:

How many times has the spent fuel pool been re-racked? What are the plans for storing spent fuel in pools through the end of the operating license and through a 20-year license extension? (Diablo Canyon, SONGS)

Response to Question D.03:

The used fuel pools at SONGS Units 2 & 3 have been re-racked once. On February 2, 2011, Southern California Edison (SCE) submitted its response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 report. SCE's submittal is located at:

http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf

SCE's submittal addressed SCE's plans for the storage and management of used fuel in the SONGS 2 & 3 used fuel pools and Independent Spent Fuel Storage Installation. Refer to the response to question A.10 for the discussion on Used Fuel Management plans.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Tony Llorens
Title: Project Manager
Dated: 04/25/2011

Question D.04:

What is the estimated time/costs to return the spent fuel pools to their original storage configuration (as originally designed), for example, by moving some spent fuel from the pools into dry cask storage (Diablo Canyon, SONGS)

Response to Question D.04:

SCE has no estimate of time/costs to return the used fuel pools to their original storage configuration. SCE is currently evaluating whether to modify the rate at which used fuel is moved from the used fuel pools into dry cask storage. The original storage capacity for SONGS 2 & 3 was 1600 used fuel assemblies. Re-racking is not required to store only 1600 used fuel assemblies in the existing racks.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Tony Llorens
Title: Project Manager
Dated: 04/25/2011

Question D.05:

What are the annual spent fuel pool operating and maintenance costs? Are any major capital investment projects planned and/or anticipated for the spent fuel pools, particularly in light of events at the Fukushima Daiichi plant? If so, what are the anticipated costs? (Diablo Canyon, SONGS)

Response to Question D.05:

SCE's accounting system does not separately identify operations and maintenance (O&M) costs for the SONGS 2 & 3 used fuel pools. These costs are embedded in the annual SONGS 2 & 3 Base O&M expenses.

No major capital investment projects are anticipated for the used fuel pools at this time. Modifications to the used fuel pool as a result of the events at Fukushima would only be determined following the evaluation of relevant information from the events at Fukushima.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question D.06:

What is the current status of the Interim Spent Fuel Storage Installation (ISFSI) and projected schedule for transfer of spent fuel to the ISFSI during the operating license period and through a 20-year license extension? What are the current estimated costs for constructing new dry cask storage facilities onsite? (Diablo Canyon, SONGS)

Response to Question D.06:

Pads 1 and 2 of the SONGS Independent Spent Fuel Storage Installation (ISFSI) have been constructed. As of July 2010, the following number of used fuel assemblies from each unit were transferred to the ISFSI:

SONGS 1 -- 395
SONGS 2 -- 288
SONGS 3 -- 288

As shown in SCE's response to Question C.01, SCE projects that 4,972 used fuel assemblies from SONGS 2 & 3 will be generated through the current license period and an additional 2,808 used fuel assemblies will be generated through a 20-year extended operating period, absent any changes in plant operating assumptions. SCE plans to ultimately store all used fuel assemblies in the SONGS ISFSI within 13 years of the permanent shutdown of SONGS 2 & 3.

The following tables depict SCE's current projected rate of SONGS 2 & 3 fuel assembly generation and the rate of transfer to the ISFSI including emptying the used fuel pools based on plant operation through 2022 and through a 20-year period of extended operation. SCE is currently evaluating whether to modify the rate at which used fuel is moved from the used fuel pools into dry cask storage.

Used Fuel Off-Load - 18 Month Fuel Cycles - Operation through 2022					
DSCs Transferred	Year	#SFAs Transferred	#SFAs in ISFSI	#SFAs Added to Pool	#SFAs in Pools
13	2008	312	312	212	2498
5	2009	120	432	108	2486
6	2010	144	576	108	2450
6	2011	144	720	108	2414
6	2012	144	864	108	2378
9	2013	216	1080	216	2378
3	2014	96	1176	108	2390
3	2015	96	1272	108	2402
7	2016	224	1496	216	2394
3	2017	96	1592	108	2406
4	2018	128	1720	108	2386
6	2019	192	1912	216	2410
4	2020	128	2040	108	2390
4	2021	128	2168	108	2370
8	2022	256	2424	434	2548
8	2023	256	2680	0	2292
8	2024	256	2936	0	2036
8	2025	256	3192	0	1780
8	2026	256	3448	0	1524
8	2027	256	3704	0	1268
8	2028	256	3960	0	1012
8	2029	256	4216	0	756
8	2030	256	4472	0	500
8	2031	256	4728	0	244
1	2032	32	4760	0	212
4	2033	128	4888	0	84
3	2034	67	4955	0	17
1	2035	17	4972	0	0
2034 1 DSC from Unit 2 with only 3 assemblies					
2035 1 DSC from Unit 3 with only 17 assemblies					

Used Fuel Off-Load - 18 Month Fuel Cycles - Operation through 2042

# DSCs Transferred	Year	#SFAs Transferred	#SFAs in ISFSI	#SFAs Added to Pool	#SFAs in Pools
13	2008	312	312	212	2498
5	2009	120	432	108	2486
6	2010	144	576	108	2450
6	2011	144	720	108	2414
6	2012	144	864	108	2378
9	2013	216	1080	216	2378
3	2014	96	1176	108	2390
3	2015	96	1272	108	2402
7	2016	224	1496	216	2394
3	2017	96	1592	108	2406
4	2018	128	1720	108	2386
6	2019	192	1912	216	2410
4	2020	128	2040	108	2390
4	2021	128	2168	108	2370
7	2022	224	2392	108	2254
3	2023	96	2488	216	2374
3	2024	96	2584	108	2386
7	2025	224	2808	108	2270
4	2026	128	2936	216	2358
3	2027	96	3032	108	2370
6	2028	192	3224	108	2286
3	2029	96	3320	216	2406
4	2030	128	3448	108	2386
7	2031	224	3672	108	2270
3	2032	96	3768	216	2390
4	2033	128	3896	108	2370
6	2034	192	4088	108	2286
4	2035	128	4216	216	2374
3	2036	96	4312	108	2386
7	2037	224	4536	108	2270
4	2038	128	4664	216	2358
4	2039	128	4792	108	2338
7	2040	224	5016	108	2222
0	2041	0	5016	108	2330
6	2042	192	5208	434	2572
8	2043	256	5464	0	2316
8	2044	256	5720	0	2060
8	2045	256	5976	0	1804
0	2046	256	6232	0	1548

0	2040	250	0252	0	1040
8	2047	256	6488	0	1292
8	2048	256	6744	0	1036
8	2049	256	7000	0	780
8	2050	256	7256	0	524
8	2051	256	7512	0	268
5	2052	160	7672	0	108
2	2053	64	7736	0	44
2	2054	44	7780	0	0
2054 has 1 DSC from Unit 2 with 31 assemblies and 1 DSC from Unit 3 with 13 assemblies					
Two less DSC's are required for pool offload for license renewal					

The current estimated cost (using a unit cost estimate) to construct new dry cask storage facilities onsite is provided in the response to Question No. D.12.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question D.07:

What is the current amount of spent fuel being stored and planned for storage (number of assemblies and metric tons of uranium) in the ISFS through the end of the operating license as well as through a 20-year license extension? What are the plans for increasing onsite storage capacity to accommodate all of the spent fuel generated during the current operating license and through a 20-year license extension? (Diablo Canyon, SONGS)

Response to Question D.07:

The number of fuel assemblies currently stored and planned for storage in the SONGS ISFSI during the operating license period and through a 20-year license renewal is provided in the response to Question D.06. Sufficient space exists to construct all of the pads required to accommodate all of the used fuel generated through the end of the operating license and through a 20-year license renewal. SCE plans to construct the onsite storage capacity of the ISFSI on an incremental, as-needed basis.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Tony Llorens
Title: Project Manager
Dated: 04/25/2011

Question D.08:

Given that the Yucca Mountain program has been terminated (except for the license application proceeding), what are the current plans and costs for indefinite onsite storage of spent fuel? (Diablo Canyon, SONGS, Humboldt Bay)

Response to Question D.08:

Regardless of the outcome of the Yucca Mountain repository program and the federal government's effort to pursue alternatives to Yucca Mountain, the Nuclear Waste Policy Act of 1982 (NWPA) obligates the U.S. government to accept and store SCE's used nuclear fuel and it remains the law. Further, SCE has an active enforceable contract with the DOE to store SCE's used fuel pursuant to the NWPA. The DOE, in a June 1, 2009 letter to Senator James H. Inhofe, affirmed its commitment to meet its obligations for managing and ultimately disposing of used nuclear fuel and high level waste. Therefore, SCE plans to safely store its used fuel onsite in the Independent Spent Fuel Storage Installation (ISFSI) and in its used fuel storage pools, as necessary, until DOE meets its acknowledged obligations to remove the used fuel from the site. SCE has not estimated the costs for indefinite onsite storage of used fuel. See the response to question D.13 for used fuel storage costs at the ISFSI.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question D.09:

How long is the spent fuel upon removal from the reactor core currently cooled in the spent fuel pools before being transferred to the ISFSI? (Diablo Canyon, SONGS 2 and 3)

Response to Question D.09:

Transfers from the SONGS 2 & 3 used fuel pools to the ISFSI are scheduled as needed to maintain full core offload capability as required by the NRC. Based upon current fuel enrichment, burn-up, and ISFSI canister design, discharged used fuel would require five (5) to twelve (12) years of cooling in the used fuel pools before being transferred to the ISFSI.

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IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question D.10:

Please provide updated information on the amount and status of any damaged spent fuel that is being stored at the plant and any spent fuel generated at the plant that is unaccounted for by the plant owner. Please describe any special considerations or requirements for long-term storage of damaged spent fuel in the pools or ISFSI or for transport of damaged spent fuel offsite. (Diablo Canyon, SONGS, Humboldt Bay)

Response to Question D.10:

To date, SCE has identified 104 damaged fuel assemblies from the SONGS units, including 27 from Unit 1; 51 from Unit 2; and 26 from Unit 3. Currently, 94 of those assemblies are stored in the SONGS ISFSI in specially configured cells in dry storage canisters that also contain un-damaged fuel assemblies. These specially configured cells are sleeves inside the fuel storage canisters that have screen-type bottoms and bolted lids to ensure the retention of any fuel fragments. Five of the remaining damaged assemblies are stored in the Unit 2 used fuel pool, and the remaining five are stored in the Unit 3 used fuel pool.

In SCE's response in the 09-IEP, data request CEC-SCE-SONGS-01, Question C.10, SCE indicated that there were a total of 107 damaged fuel assemblies. During the Cycle 16 refueling outages in 2009-2011 One Unit 2 assembly and two Unit 3 fuel assemblies were reconstituted and are no longer classified as damaged assemblies.

SCE's existing used fuel management procedures provide for the safe, long-term storage of damaged assemblies in the used fuel pools and in the ISFSI.

There is no used fuel unaccounted for at SONGS. Enclosed is the 'reconciliation page' of our most recent Special Nuclear Material (SNM) inventory showing that all fuel has been accounted for since the last inventory. Inventories are performed annually per 10 CFR 74.19.

SCE does not know if there will be special requirements for shipment of used fuel offsite.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question D.11:

What are the most recent estimates for how long spent fuel can be safely stored in the ISFSIs without repackaging or refurbishing any ISFSI components? For ISFSI components with design lives of less than 50 years, please specify the design life for each component and describe: (a) what steps would be needed in order to continue to store spent fuel in the ISFSI beyond that design life, (b) the cost of these steps, and (c) the new design life of the component after these steps are taken. (Diablo Canyon, SONGS, Humboldt Bay)

Response to Question D.11:

On February 2, 2011, Southern California Edison (SCE) submitted its response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 report. SCE's submittal is located at:

http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf

SCE's submittal addressed SCE's plans for the storage and management of used fuel in the SONGS 2 & 3 used fuel pools and Independent Spent Fuel Storage Installation. These plans are consistent with the NRC's position that used fuel can be safely stored for at least 60 years beyond the operating license (which may include license extension) in a used fuel pool or dry cask storage system. Refer to the response to question A.10, for the discussion on Used Fuel Management plans.

The design life for ISFSI components is 100 years for the storage modules and 55 years for the dry storage canisters. Before the design life of the components is reached, a review of the material condition (i.e., inspection of the components for physical degradation) will be conducted to assess how much life remains with adequate safety margins, and what actions are required, if any. The cost will depend upon what actions are needed as determined from the inspection and assessment of the materials.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question D.12:

What are the current estimated total costs to construct and fill the Diablo Canyon and SONGS ISFSIs with all the spent fuel expected to be generated through the current operating license? What would be the estimated total cost to construct and fill the ISFSIs with all the spent fuel that is expected to be generated through a 20-year license extension? (Diablo Canyon, SONGS)

Response to Question D.12:

The projected cost (using a unit cost estimate) to construct and fill the SONGS ISFSI with all used fuel expected to be generated from inception of operations through the current operating license period is \$550 million (100% share, 2010 \$). The additional cost to construct and fill the SONGS ISFSI with the incremental used fuel expected to be generated by SONGS 2 & 3 during a 20-year period of extended operation is \$300 million (100% share, 2010 \$). Both cost projections include corporate overheads which had not been previously included.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Robert Bledsoe
Title: Project Manager
Dated: 04/25/2011

Question D.13:

What are the current annual and total estimated costs for the maintenance, operation, and security for the ISFSI? What are the estimated costs for storing spent fuel in the ISFSIs through the end of the plant's current operating licenses? What would be the additional operations, maintenance, and security costs resulting from delays in shipment to offsite storage lasting up to 25 years (for example, through the year 2034)? (Diablo Canyon, SONGS, Humboldt Bay)

Response to Question D.13:

SCE's budgeting system does not separately identify operating and maintenance (O&M) costs for the SONGS ISFSI. These costs are embedded in the annual SONGS 2 & 3 Base O&M expenses. SCE has not developed an estimate of such costs resulting from delays in shipment to offsite storage through the end of the current operating license or through a period of extended operation.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Paul Klapka
Title: Project Manager
Dated: 04/25/2011

Question E.02:

What refinements, if any, have been achieved or are being conducted in ground motion models to account for ground motion near an earthquake rupture and what are the implications of these refinements for the design and reliable operation of Diablo Canyon and SONGS considering both safety-related and non safety-related systems, structures and components (SSCs) of the plant? What are the estimated outage times to repair/replace these non-safety related SSCs and what are the repair/replacement plans to minimize plant outage time? (Diablo Canyon, SONGS)

Response to Question E.02:

On February 2, 2011, Southern California Edison (SCE) submitted "Southern California Edison's Evaluation of California Energy Commission AB 1632 Report Recommendations," in response to the California Public Utilities Commission's (CPUC) direction to address certain topics (including non-safety related SSCs) regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 AB 1632 report. SCE's submittal is the most recent review of seismic efforts at SONGS, and can be found at:

http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf

As discussed in the testimony filed by SCE at the CPUC in Application (A.) 11-04-006 requesting funding for seismic efforts, SCE has requested \$64 million (100% share) for the on-going SONGS seismic program and new seismic research projects and analyses. The testimony can be found at:

[http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/\\$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf](http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf)

SCE's seismic program may provide information that will be used in responding to a Generic Letter to be issued by the Nuclear Regulatory Commission (NRC). The NRC is developing a Generic Letter to request information from all U.S. nuclear plants regarding seismic hazards. The NRC expects to issue the Generic Letter near the time when new seismic models will become available. These new seismic models are being developed by NRC, the U.S. Department of Energy, and the Electric Power Research Institute and will be reviewed by the United States

Geologic Survey. The NRC expects to receive information responding to the Generic Letter from all operating reactors and will review this information to determine whether any plant improvements are needed (see <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/fs-seismic-issues.html>). On May 18, 2011, the NRC held a public workshop on seismic risk evaluations (see attached slides). At the meeting, the NRC outlined the information needs for the proposed Generic Letter including updated site specific hazard curves and response spectra; fragility information; contributions to seismic risk; and identification of potential plant-specific improvements.

1 attachment



Public Workshop on Seismic Risk Evaluations 05 18 2011 slides.ppt

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Paul Klapka
Title: Project Manager
Dated: 04/25/2011

Question E.03:

Recent high resolution seismic reflection data relevant to SONGS was collected by the USGS (spring 2008) that revealed a previously unknown but apparently active fault zone between the San Diego Trough fault zone (SDTFZ) and the San Pedro Basin fault (SPBF). The interpretation of this data is that the new fault connects the SDTFZ and the SPBF, forming a combined fault zone about 250 km in length and that the new combined fault zone may pose more significant seismic hazard than previously recognized. Has SCE assessed whether this research has implications for the long-term seismic/tsunami vulnerability of both safety-related and non safety-related systems and components of SONGS? If so, what are the results of the assessment? (SONGS)

Response to Question E.03:

These faults were included as fault sources in the SCE (1995, 2001) Probabilistic Seismic Hazards Analysis (PSHA) for SONGS, and the results of these studies showed that neither of the faults contribute significantly to the hazard at SONGS; thus these faults were not included in the SONGS 2010 PSHA.

On February 2, 2011, Southern California Edison (SCE) submitted "Southern California Edison's Evaluation of California Energy Commission AB 1632 Report Recommendations," in response to the California Public Utilities Commission's (CPUC) direction to address certain topics regarding the San Onofre Nuclear Generating Station Unit Nos 2 & 3 and as recommended by the California Energy Commission's (CEC) 2008 AB 1632 report. SCE's submittal is located at:

http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf

The fault analysis for non-safety-related, important-to-reliability structures, systems, and components (SSCs) is included in Appendix 1 of SCE's submittal.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Paul Klapka
Title: Project Manager
Dated: 04/25/2011

Question E.04:

What efforts are planned, in progress or have been completed to install a permanent GPS array for helping to resolve seismic uncertainties in the vicinity of the plants? (Diablo Canyon, SONGS)

Response to Question E.04:

SCE's efforts regarding seismic activities at SONGS are discussed in the testimony filed by SCE at the CPUC in Application (A.) 11-04-006 requesting funding for seismic efforts. The testimony can be found at:

[http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/\\$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf](http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf)

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Paul Klapka
Title: Project Manager
Dated: 04/25/2011

Question E.05:

What efforts are planned to assess tsunami hazards using new data from NOAA, given the recent devastating tsunami in Japan, and any revised tsunami run-up maps from the University of Southern California (USC)? Please provide the results of any recent tsunami hazard studies for the site that have been conducted and their implications for plant vulnerability and reliability (since SCE's February 2, 2011 report). (Diablo Canyon, SONGS, Humboldt Bay)

Response to Question E.05:

SCE's efforts regarding tsunami activities at SONGS are discussed in the testimony filed by SCE at the CPUC in Application (A.) 11-04-006, requesting funding for seismic efforts. The testimony can be found at:

[http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/\\$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf](http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf)).

The PTHA continues to be prepared. SCE will be determining whether or not the PTHA results could be used to assess plant vulnerability and reliability.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Paul Klapka
Title: Project Manager
Dated: 04/25/2011

Question E.06:

Significant global warming issues for coastal nuclear power plants include sea level rise and increased storm activity. Please describe any studies planned, underway or completed regarding global warming phenomena and their effects on the plant. (Diablo Canyon, SONGS, Humboldt Bay)

Response to Question E.06:

No studies on the effects of global climate change on SONGS are planned, underway, or completed.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Jose Luis Perez

Title: Manager, Generation Strategic Projects

Dated: 04/25/2011

Question E.07:

Please provide a copy of any testimony, scientific papers, reports or formal comments on seismic and tsunami issues related to Diablo Canyon, SONGS, and Humboldt Bay since 2008. (Diablo Canyon, SONGS, Humboldt Bay)

Response to Question E.07:

SCE objects to this request on the ground that it is vague, ambiguous, and overbroad. SCE further objects to the request to the extent it seeks information that is publicly available. Without waiving these objections, SCE responds as follows:

Reports responsive to the request are identified below.

Referenced reports:

1. March 24, 2011 California Coastal Commission presentation (attached)
2. May 13, 2011 NRC inspection report (attached)
3. April 14, 2011 presentations to the California State Senate -- Energy, Utilities, and Communications Committee informational hearing (attached)
4. Southern California Edison's Evaluation of California Energy Commission AB 1632 Report Recommendations and appendices, located at:
http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB_1632_Report_Recommendations.pdf
and
http://www.energy.ca.gov/ab1632/documents/status-reports/SCE/SCE_Evaluation_of_AB1632_Report_Recommendations-appendices.pdf
5. Presentations from a September 8-9, 2010 NRC seismic workshop held in San Luis Obispo, located at:
<http://www.nrc.gov/public-involve/conference-symposia/seismic-info-workshop.html>

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Lindsay Anderson
Title: Manager, Project
Dated: 04/25/2011

Question E.11:

What are the most recent estimated maximum credible earthquake magnitudes for all the major Southern California faults (onshore and offshore) that could impact SONGS? To what extent have these numbers increased since the plant was built? (SONGS)

Response to Question E.11:

SONGS currently meets all seismic design requirements set forth by the NRC for safe operation of the plant. SONGS seismic design is based on a "design basis earthquake," which is a ground motion specified for the site, rather than specified earthquakes on identified faults. The design basis earthquake is defined by a site-specific ground motion with a peak ground acceleration of 0.67g. This site-specific ground motion conservatively envelops the site ground motion potential of all major faults within 200 miles of SONGS.

The design basis earthquake for SONGS has not increased since the plant was built. Although increased earthquake magnitudes have been postulated for certain southern California fault systems, no increase in the design basis earthquake has been required.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Paul Klapka

Title: Project Manager

Dated: 04/25/2011

Question E.12:

A recent California Coastal Commission staff report dated March 24, 2011, entitled “*The Tohoku Earthquake of March 11, 2011: A Preliminary Report on Implications for Coastal California*”, noted that, “Tsunami run up and inundation were considered by the SCE and NRC for permitting of the SONGS facility. However, more recent examinations indicate that a larger earthquake or a large submarine landslide could generate a tsunami larger than that considered by SCE or NRC.” Reference was made to the Coastal Commission’s findings for the ISFSI permit which concluded that, “these studies suggest that large local-source tsunamis could be generated by mechanisms other than those considered during licensing for SONGS 2 and 3, the basis for the 1995 SCE report. However, there have been no local run-up studies based on this mechanism that are widely agreed upon, and certainly none for the SONGS site itself.” What are SCE’s plans for additional tsunami hazard studies at SONGS and plans to address tsunami hazard concerns for the plant? (SONGS)

Response to Question E.12:

SCE’s efforts regarding tsunami activities at SONGS are discussed in the testimony filed by SCE at the CPUC in Application (A.) 11-04-006, requesting funding for seismic efforts. The testimony can be found at:

[http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/\\$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf](http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf).

The PTHA continues to be prepared. SCE will be determining whether or not the PTHA results could be used to assess plant vulnerability and reliability.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Paul Klapka
Title: Project Manager
Dated: 04/25/2011

Question E.13:

What are PG&E's and SCE's plans for tsunami hazard studies/updates in light of the devastating tsunami that occurred on March 11 that greatly exceeded the tsunami hazard estimates for the Fukushima Daiichi plant? Land subsidence on the coast of Japan of approximately 2 meters reportedly contributed to the severe impacts from the March 11 tsunami. What are the planned studies and possible implications for California's plants from the combination of a tsunami and coastal land subsidence? (Diablo Canyon, SONGS, Humboldt Bay)

Response to Question E.13:

SCE's efforts regarding tsunami activities at SONGS are discussed in the testimony filed by SCE at the CPUC in Application (A.) 11-04-006, requesting funding for seismic efforts. The testimony can be found at:

[http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/\\$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf](http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/DB102F12D426936988257877008313DD/$FILE/A.11-04-006+SCE+Seismic+Application+Testimony.pdf)).

The PTHA continues to be prepared. SCE will be determining whether or not the PTHA results could be used to assess plant vulnerability and reliability.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Mark Minick

Title: Manager of Resource Planning

Dated: 04/25/2011

Question F.01:

Please provide any studies or reports that describe the characteristics of the resources that might be needed to replace the plant in the 2020s (when current operating licenses for the plants are scheduled to expire) in terms of baseload capacity and energy, ancillary services, transmission support, grid stability, and local reliability. (Diablo Canyon, SONGS)

Response to Question F.01:

No studies or reports have been issued that describe the characteristics of the resources needed to replace the plant in the 2020s. However, SCE has considered this issue in its planning and has determined the following, as presented by SCE at the April 14, 2011 California State Senate, Energy, Utilities and Communications Committee informational hearing:

Summary

- ♦ There will be challenges in devising transmission fixes that are required to meet the existing grid reliability standards
- ♦ There will be substantial adverse environmental impacts which will significantly affect the State's goals
- ♦ There will be rate increases needed to reflect the impact of more costly replacement power resources and transmission
- ♦ There is an immediate need to start planning and permitting of replacement generation and transmission facilities if SONGS 2 & 3 does not operate beyond 2022

Description

- ♦ Without SONGS operating beyond 2022
 - The southern CA grid loses voltage support, stability support and import capability.
 - To mitigate the above condition, in-basin generation and additional transmission will be needed to maintain the import capability and this allows the import of renewables into the grid.
- ♦ Assumed Replacement Generation:
 - Combined Cycle Gas Turbines 2,150 MW (new and out of the basin)
- ♦ Transmission:
 - New transmission will be needed to
 - Interconnect the new generation

- Upgrade the existing grid
- ♦ Simultaneously siting and licensing the replacement generation facilities and needed transmission will be challenging
- ♦ There is currently no means to assure timely acquisition of necessary air pollution credits for replacement generation
- ♦ Siting high voltage transmission lines and 230/500 kV substations in Los Angeles basin will be challenging and time consuming (may require condemning property, will likely impact several communities)
- ♦ Approximate time period required to modify and/or fix the grid infrastructure is at least 10 years
- ♦ Fuel price and deliverability effects:
 - Natural gas prices will likely rise due to substantially increased demand
 - Gas deliverability on peak days will be impacted due to increased demand and natural gas and/or power curtailment to residential customers on peak days could occur
 - Potential natural gas infrastructure upgrades 2 – 4 years (est)
- ♦ Electric energy prices are expected to be higher as the least cost source of supply is not available
- ♦ Incremental Emissions without SONGS:
 - 6-10 Million Metric tons (CO₂ equivalent) per year
 - Equivalent to removing 1.2 – 2.0 Million passenger cars/year
 - Risking California's ability to meet AB-32 goals
 - 280 Metric Tons of NO_x /Year
 - 1,100 Metric Tons of PM-10/Year (particulate emissions)
 - Approximately three to four times current South Coast Air Quality basin PM-10 emissions emanating from electricity sector

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Vishal Patel

Title: Senior Power System Planner

Dated: 04/25/2011

Question F.02:

What new generation and/or transmission facilities would be needed to maintain voltage support and system and local reliability in the event of a long-term outage at Diablo Canyon or SONGS? Please describe the contingency plans to maintain reliability and grid stability in the event of an extended shutdown at the plant. (Diablo Canyon, SONGS)

Response to Question F.02:

San Onofre Nuclear Generating Station Units 2 & 3 (SONGS 2 & 3) is the largest electric generation plant in southern California. The plant is located geographically between two major load centers¹ in Los Angeles/Orange and San Diego counties. SONGS has been an integral part of the electric grid in southern California, providing power delivery, voltage support, import capability and transient stability support for the last 43 years. As the electric grid has grown it has relied on the electric system reliability attributes provided by SONGS.

Electric system reliability in southern California would be imperiled by an unplanned long-term outage at SONGS 2 & 3, especially in the SCE and SDG&E service territories. SONGS 2 & 3 provide energy for customers and significant support to keep the grid operable and compliant with state and federal performance standards.² Without this support, the electric grid becomes especially vulnerable to failures and preserving the integrity of the electric grid would likely require implementing controlled rolling blackouts.

In the event of a long-term outage at SONGS 2 & 3, it is likely that controlled rolling blackouts would be implemented,³ in the short-term, to reduce the stress on the electric grid by disconnecting customers until the risk of electric grid failure is gone. The implementation of this contingency plan would likely occur under moderate to heavy load conditions, and would continue to occur intermittently. The significant investment required for new transmission and generation, and the associated lead times, are not conducive for use as a contingency plan.

Footnote 1: The two major load centers refer to the metropolitan areas of the SCE and SDG&E service territories, however southern California is also comprised of other municipal and public agency utilities including Los Angeles Department of Water and Power (LADWP), Imperial Irrigation District (IID), Metropolitan Water District of Southern California (MWD), and the City of Riverside.

Footnote 2: Applicable system-reliability standards include those issued by the California Independent System Operator (CAISO), Western Electricity Coordinating Council (WECC), and North American Electric Reliability Corporation (NERC).

Footnote 3: Controlled rolling blackouts would be implemented in accordance with operating procedures and nomograms, however these procedures would need to be revised to account for the long-term outage of both SONGS units.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Geetha Eva Shanmugasundarm

Title: Project Manager

Dated: 04/25/2011

Question F.03:

Please describe plans for replacing power from the plant if an outage lasts longer than 90 days. What are the contingency plans for replacement power if a prolonged outage lasts one year or more? (Diablo Canyon, SONGS)

Response to Question F.03:

Replacing power from a dual-unit outage (a not normally expected event) of longer than 90 days or longer than one year, would follow the plans outlined below:

Grid Reliability and Transmission Stability

San Onofre Nuclear Generating Station Units 2 & 3 (SONGS 2 & 3) is the largest electric generation plant in southern California. The plant is located geographically between two major load centers¹ in Los Angeles/Orange and San Diego counties. SONGS has been an integral part of the electric grid in southern California, providing power delivery, voltage support, import capability and transient stability support for the last 43 years. As the electric grid has grown it has relied on the electric system reliability attributes provided by SONGS.

Electric system reliability in southern California would be imperiled by an unplanned long-term outage at SONGS 2 & 3, especially in the SCE and SDG&E service territories. SONGS 2 & 3 provide energy for customers and significant support to keep the grid operable and compliant with state and federal performance standards.² Without this support, the electric grid becomes especially vulnerable to failures and preserving the integrity of the electric grid would likely require implementing controlled rolling blackouts.

In the event of a long-term outage at SONGS 2 & 3, it is likely that controlled rolling blackouts would be implemented,³ in the short-term, to reduce the stress on the electric grid by disconnecting customers until the risk of electric grid failure is gone. The implementation of this contingency plan would likely occur under moderate to heavy load conditions, and would continue to occur intermittently. The significant investment required for new transmission and generation, and the associated lead times, are not conducive for use as a contingency plan.

Footnote 1: The two major load centers refer to the metropolitan areas of the SCE and SDG&E service territories, however southern California is also comprised of other municipal and public

agency utilities including Los Angeles Department of Water and Power (LADWP), Imperial Irrigation District (IID) , Metropolitan Water District of Southern California (MWD), and the City of Riverside.

Footnote 2: Applicable system-reliability standards include those issued by the California Independent System Operator (CAISO), Western Electricity Coordinating Council (WECC), and North American Electric Reliability Corporation (NERC).

Footnote 3: Controlled rolling blackouts would be implemented in accordance with operating procedures and nomograms, however these procedures would need to be revised to account for the long-term outage of both SONGS units.

Planning Process

SCE is required to meet its customer's energy, ancillary service, and capacity needs for electrical energy. SCE takes guidance on those needs from various sources including the CPUC, and the CAISO. Examples of areas where guidance is forthcoming are (1) the CPUC Planning Reserve Margin (PRM) which is currently set at 15% above the average-year peak hour load in a given month, and (2) Local Area Requirements (LAR) from the CAISO's annual Local Capacity Requirement (LCR) studies. The LCR study takes into account various outage contingencies as does the PRM including extended generation facility outages. Currently, it may require multiple years to replace generation facilities due to the planning, permitting, regulatory approval, and construction time lines. The CPUC's review of the PRM requirements should also consider such an event as well as any other state policy needs.

To the extent that any of SCE bundled customers energy and capacity needs are not met if SONGS has an outage longer than 90 days, SCE may need to seek bids from wholesale energy markets to procure replacement power. The timing and method of such procurement may vary. In addition to reviewing the cost of replacement power, SCE does financial modeling to measure the procurement cost risk associated with portfolio changes, including changes in SCE's "must-take" resources such as run-of-river hydro, intermittent renewable resources, and nuclear resources.

SCE engages in a review of its fleet of energy producing resources and adjusts its procurement activity on a daily basis. Included in the fleet of energy resources is SONGS, which is a major element. The fleet, or portfolio, of energy resources changes quite often due to various factors such as planned or forced outages. In addition, other frequently-changing elements affect SCE's customer requirements for generation such as the load or market price forecast. SCE's procurement process calculates those requirements taking into account all of these factors for the next hour, next day, next month, next year, and several years out in the future and then adjusts its procurement strategy as necessary.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Mark Minick

Title: Manager of Resource Planning

Dated: 04/25/2011

Question F.04:

What resources might be needed to provide grid stability to the system in the absence of the nuclear plants for an extended outage during the summer? Would replacement power purchased by the utility be likely to come from those resources? (Diablo Canyon, SONGS)

Response to Question F.04:

San Onofre Nuclear Generating Station Units 2 & 3 (SONGS 2 & 3) is the largest electric generation plant in southern California. The plant is located geographically between two major load centers¹ in Los Angeles/Orange and San Diego counties. SONGS has been an integral part of the electric grid in southern California, providing power delivery, voltage support, import capability and transient stability support for the last 43 years. As the electric grid has grown it has relied on the electric system reliability attributes provided by SONGS.

Electric system reliability in southern California would be imperiled by an unplanned long-term outage at SONGS 2 & 3, especially in the SCE and SDG&E service territories. SONGS 2 & 3 provide energy for customers and significant support to keep the grid operable and compliant with state and federal performance standards.² Without this support, the electric grid becomes especially vulnerable to failures and preserving the integrity of the electric grid would likely require implementing controlled rolling blackouts.

In the event of a long-term outage at SONGS 2 & 3, it is likely that controlled rolling blackouts would be implemented,³ in the short-term, to reduce the stress on the electric grid by disconnecting customers until the risk of electric grid failure is gone. The implementation of this contingency plan would likely occur under moderate to heavy load conditions, and would continue to occur intermittently. The significant investment required for new transmission and generation, and the associated lead times, are not conducive for use as a contingency plan.

Footnote 1: The two major load centers refer to the metropolitan areas of the SCE and SDG&E service territories, however southern California is also comprised of other municipal and public agency utilities including Los Angeles Department of Water and Power (LADWP), Imperial Irrigation District (IID), Metropolitan Water District of Southern California (MWD), and the City of Riverside.

Footnote 2: Applicable system-reliability standards include those issued by the California

Independent System Operator (CAISO), Western Electricity Coordinating Council (WECC), and North American Electric Reliability Corporation (NERC).

Footnote 3: Controlled rolling blackouts would be implemented in accordance with operating procedures and nomograms, however these procedures would need to be revised to account for the long-term outage of both SONGS units.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC
Prepared by: Walker Matthews
Title: Senior Attorney
Dated: 04/25/2011

Question G.01:

Please provide current information summarizing the insurance policies concerning nuclear liability claims for the facilities including what is the current maximum liability for secondary financial protection for your facility. (Diablo Canyon; SONGS; Humboldt Bay)

Response to Question G.01:

Federal law limits public liability claims from a nuclear incident to approximately \$12.6 billion. SCE and other owners of San Onofre Nuclear Generating Station (SONGS) have purchased the maximum private primary insurance available (\$375 million), provided by American Nuclear Insurers (ANI) in the "Facility Form." The balance is covered by the industry's retrospective rating plan that uses deferred premium charges to every reactor licensee if a nuclear incident at any licensed reactor in the United States results in claims and/or costs which exceed the primary insurance at that plant site. Federal regulations require this secondary level of financial protection. The NRC exempted SONGS Unit 1 from this secondary level, effective June 1994. The current maximum deferred premium for each nuclear incident is \$117.5 million per reactor, but not more than \$17.5 million per reactor may be charged in any one year for each incident. The maximum deferred premium per reactor and the yearly assessment per reactor for each nuclear incident is adjusted for inflation at least once every five years. The most recent inflation adjustment took effect on October 29, 2008. The owners of SONGS 2 & 3 could collectively be required to pay up to \$235 million. However, the owners would have to pay no more than \$35 million per incident in any one year. Such amounts include a 5% surcharge if additional funds are needed to satisfy public liability claims and are subject to adjustment for inflation. If the public liability limit above is insufficient, federal regulations may impose further revenue-raising measures to pay claims, including a possible additional assessment on all licensed reactor operators.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: John Butler

Title: EIX Director of Corporate Risk Management

Dated: 04/25/2011

Question G.02:

Does the plant's liability insurance coverage, e.g., the Price-Anderson Act coverage, include unanticipated natural disasters and extended offsite damage, such as decontamination and debris removal, losses to fisheries, wineries, agriculture, food, milk and water supplies, ranching? If so, what is the deductible and maximum coverage? (Diablo Canyon, SONGS)

Response to Question G.02:

The liability insurance provided by American Nuclear Insurers (ANI) broadly provides coverage for off-site damages from bodily injury or property damage caused by the nuclear energy hazard (i.e., the radioactive, toxic, explosive or other hazardous properties of nuclear material), as well as for environmental damage. However, complainants are required to prove damages, and claims would be adjudicated in state court.

ANI provides coverage for the first \$375 million of liability, with no deductible. Price-Anderson provides additional coverage of approximately \$12.2 billion, which is funded through an assessment on all operating reactors in the U.S.

Southern California Edison
IEPR 11-IEPR

DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: John Butler

Title: EIX Director of Corporate Risk Management

Dated: 04/25/2011

Question G.03:

Does the utility have any form of coverage for outage expenses and replacement power costs, and, if so, what is the deductible and what is the maximum coverage? (Diablo Canyon, SONGS)

Response to Question G.03:

SONGS purchases accidental outage insurance from NEIL (Nuclear Electric Insurance Limited), which covers extra expenses and replacement power costs associated with accidental property damage at the plant site (subject to the terms and conditions of the policy). The deductible period is 12 weeks, and the coverage limit thereafter is, for each unit, \$3.5 million per week for the first 52 weeks and \$2.8 million per week thereafter until a total maximum coverage limit of \$490 million is reached. The coverage limit per unit would be reduced by 20% if both units were out of service as a result of the same accident. The NEIL coverage is shared among the co-owners of the plant.

Southern California Edison
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DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: John Butler

Title: EIX Director of Corporate Risk Management

Dated: 04/25/2011

Question G.04:

Does the utility have nuclear liability and property tax insurance for non-certified acts (as defined by the Terrorism Risk Insurance Act) for terrorism-related losses, including replacement power costs, and, if so, what is the deductible and what is the maximum coverage? (Diablo Canyon; SONGS; Humboldt Bay)

Response to Question G.04:

The SONGS nuclear liability insurance with ANI (American Nuclear Insurers) provides \$375 million in coverage, with no deductible, for third-party property damage and bodily injury resulting from a nuclear incident caused by a non-certified act of terrorism.

The SONGS nuclear property insurance with NEIL (Nuclear Electric Insurance Limited) also provides coverage (including replacement power costs) for non-certified acts of terrorism. The policy limits are \$2.75 billion for property damage, decontamination, and decommissioning (with a \$2.5 million deductible), and \$490 million for replacement power costs (with a 12-week waiting period as the deductible). However, losses resulting from non-certified acts of terrorism are subject to a NEIL common occurrence aggregate limit of \$3.24 billion. If several non-certified terrorist acts occurred at one or more nuclear power plants insured by NEIL within a 12-month period, the affected plants would be subject to a total coverage limit of \$3.24 billion, which would be shared by those plants. In this situation, payments for decontamination and decommissioning coverage would be prioritized over other coverage.

**Southern California Edison
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DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Paul T. Hunt, Jr.

Title: Director of Regulatory Finance and Economics

Dated: 04/25/2011

Question H.01:

If Diablo Canyon or SONGS were to be shut down in the mid-2020s, will there be sufficient funds available to pay the decommissioning costs? What are the current estimated costs for decommissioning these plants? (Diablo Canyon, SONGS)

Response to Question H.01:

Under the assumptions adopted in the Settlement Agreement in SCE's most recent Nuclear Decommissioning Contribution Triennial Proceeding (NDCTP) at the CPUC (A.09-04-007/A.09-04-009), there would be sufficient funds available to pay the decommissioning costs, if decommissioning trust fund contributions by SCE and San Diego Gas & Electric Company ratepayers continue through 2022.

The City of Anaheim and the City of Riverside also have decommissioning funding obligations with respect to SONGS 2 & 3. In the Annual Report for Anaheim Public Utilities dated June 30, 2010, Anaheim states that by 2022, the expected value of its reserve for these decommissioning costs will exceed the current estimate of Anaheim's share of decommissioning costs. Regarding the City of Riverside, Riverside has informed SCE of its decommissioning funding status as follows:

"Riverside collects and reserves its proportionate share of decommissioning costs based on the most recent decommissioning study prepared in 2008. Assuming that actual costs to decommission SONGS 2/3 are not substantially in excess of the projections contained in these triennial independent studies, Riverside will have sufficient funds to pay its 1.79 % proportionate share.

The total estimated cost to decommission SONGS 2/3 is estimated at \$3,658,805,000 (in 2008 dollars). With a 1.79% ownership interest, Riverside's estimated decommissioning cost is at \$65,492,610 (in 2008 dollars). Riverside plans to set aside approximately \$1,581,000 per year to fund this obligation. Increases to the reserves are from amounts set aside and investment earnings. As of June 30, 2010, Riverside has set aside \$63,551,619 in cash investments.

Assuming an inflation rate of 4.5% and an investment earnings rate of 4.5%, Riverside estimates that the reserves will be fully funded by 2017 and continue to be fully funded

by 2022. "

In 2008 dollars, the current estimated cost for decommissioning SONGS 2 & 3 is \$3.659 billion.
(Source: CPUC Decision 10-07-047, mimeo, pages 54-55, Conclusion of Law 4.)

Southern California Edison
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DATA REQUEST SET 11-IEP-1J CEC-SCE-001

To: CEC

Prepared by: Jose Luis Perez

Title: Manager, Strategic Generation Projects

Dated: 04/25/2011

Question H.02:

What are some of the major advantages and disadvantages for establishing a San Onofre Independent Safety Committee similar to the Diablo Canyon Independent Safety Committee for Diablo Canyon? (SONGS)

Response to Question H.02:

SCE understands that the purpose of the Diablo Canyon Independent Safety Committee is to assess the safety of operations and suggest any recommendations for safe operation.

At all U.S. nuclear power plants, the NRC Resident Inspector Program includes a rigorous and ongoing assessment of safety which is extensively discussed in the public record. This assessment ensures that station management receives necessary independent input required for safe operation. Duplicating this input from another independent source would result in an unwarranted and unacceptable distraction to station management.