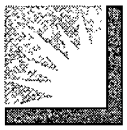

SOUTHERN CALIFORNIA
EDISON®
An *EDISON INTERNATIONAL*® Company

DOCKET
09-IEP-1L
DATE July 28 2009
RECD. July 28 2009

July 28, 2009

California Energy Commission
Docket Office
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

Re: California Energy Commission (energy Commission)
Docket 09-IEP-1L: Response to Request for Data Related to Nuclear Power Plants

To Whom It May Concern:

Southern California Edison (SCE) is pleased to provide its response to the Energy Commission's Request for Data Related to California's Nuclear Power Plants. SCE has included a CD copy of the responses.

1. CEC-SCE-SONGS-01 and Palo Verde-01 Data Request Answers & Attachments (I-L-M)

All data responses included on these CD's are considered public information. Should you have any questions, please do not hesitate to contact me at (916) 441-2369.

Sincerely,

/s/ Manuel Alvarez
Manuel Alvarez
Manager, Regulatory Policy & Affairs

2244 Walnut Grove Ave
Rosemead, CA 91770

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Russell N. Harding
Title: Manager
Dated: 07/01/2009

Question I.01:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

Please provide hourly generation data for each unit for 2001-2008.

Response to Question I.01:

Attached file includes the hourly generation for Palo Verde Unit1, Unit 2, and Unit 3 for the period 2001 through 2008.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Russell N. Harding
Title: Manager, Co-Owner and Regulatory Affairs
Dated: 07/01/2009

Question I.02:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

Please include GADS (Generating Availability Data Systems) Data for 2001-2008 on availability and outages.

Response to Question I.02:

Please refer to the attached file.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Jose Luis Perez
Title: Manager, Generation Strategy
Dated: 07/01/2009

Question I.03:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

For each of the periods in which one or more of the units were operating at reduced output during 2001-2008, please provide an estimate of the cost of replacement power ($/MWh).

Response to Question I.03:

Estimates of the cost of replacement power for periods of operation at reduced output were prepared for 2006. No other estimates have been developed.

The estimated replacement power costs for refueling outages at Palo Verde for 2006 was $15.04 Million (SCE share). The estimated replacement power cost for non-refueling outages at Palo Verde for 2006 was $27.3 million (SCE share). In addition to these outages, Palo Verde unit 1 operated at reduced output for a period of time during 2006 while an investigation into vibration of a shutdown cooling line was conducted. This reduced output resulted in estimated replacement power costs of $10.98 million (SCE share).

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Mark Minick
Title: Manager 3
Dated: 07/01/2009

Question I.05:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

Please provide any studies or reports that describe the characteristics of the resources that would 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.

Response to Question I.05:

SCE has not conducted any recent studies regarding the issues requested herein for Palo Verde.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Marc L. Ulrich
Title: Director of Energy Planning
Dated: 07/01/2009

Question I.06:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

Please describe plans for replacing power from the plant if an outage lasts longer than 90 days.

Response to Question I.06:

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, the CEC, and the CAISO. Examples of guidance are (1) the CPUC Planning Reserve Margin (PRM) which is currently in debate in an open proceeding at the CPUC but for now is set at 15% above the average-year peak hour load in a given month, (2) annual CEC load forecasts, (3) 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 outages. Currently, it may require multiple years to replace generation due to permitting, regulatory, and construction timelines and the CPUC's review of the PRM should take this into account as well as any other state policy development.

To the extent that any of SCE bundled customers energy needs are unmet if Palo Verde has an outage longer than 90 days SCE may need to go to the wholesale energy markets to procure replacement power. The timing and method of 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 resources, and nuclear resources.

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

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Marc L. Ulrich
Title: Director of Energy Planning
Dated: 07/01/2009

Question I.07:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

If there is a prolonged outage (one year or more) at the plant, what are the contingency plans for replacement power?

Response to Question I.07:

See response to Question No. I.06.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Marc L. Ulrich
Title: Director of Energy Planning
Dated: 07/01/2009

Question I.09:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

How would portfolio needs and “best fit” criteria change in the absence of the nuclear facility for short-term (up to 90 days) and mid-term (91 days – five years) procurement?

Response to Question I.09:

SCE reviews its energy needs on a daily basis. A major element of the portfolio SCE uses to meet its customers need is Palo Verde. Analysis reviewing "Best Fit" criteria is considered when searching for the appropriate substitutes for Palo Verde's absence. If there was an absence of the Palo Verde nuclear facility, SCE would need to secure some level of capacity and generation. This is guided by the CPUC's Resource Adequacy (RA) requirements. Thus, the "Best Fit" would now require a resource, or sets of resources, that would provide capacity up to SCE's Palo Verde share and provided similar energy benefits. These "Best Fit" needs would be applied in both the short-term (up to 90 days) and mid-term (91 days - five years) period. The main difference in the term (short versus mid) would be the method of procurement.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Mark Minick
Title: Manager of Resource Planning
Dated: 07/01/2009

Question I.10:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

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?

Response to Question I.10:

Palo Verde is a remote resource. As a result, a summer outage at Palo Verde is unlikey to cause grid stability issues in Southern California. Such an outage may change import limits but Edison is not familiar with any regional or WECC studies that have studied an outage of all the Palo Verde units simultaneously and the effects of such an outage. To replace Palo Verde energy and capacity, SCE would most likely purchase the required capacity and energy from the market.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Russel N. Harding
Title: Manager, Co-Owner and Regulatory Affairs
Dated: 07/01/2009

Question M.01:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Please describe any major fires or safety related events occurring at the plant (2005-2009) that were reported to the NRC, for example, transformer fires. Please describe the cause of the event and corrective action taken. (Diablo Canyon, SONGS)

Response to Question M.01:

Palo Verde did not have any fires at Units 1, 2, or 3 during the 2005 - 2009 period. Palo Verde, however, did submit to the NRC a series of Licensee Event Reports (LER) from 2005 to 2009. The attached LER's are classified as a Safety System Functional Failure (SSFF), where a SSFF is defined as:

An event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to:

(a) Shut down the reactor and maintain it in a safe shutdown condition;
(b) Remove residual heat;
(c) Control the release of radioactive material; or
(d) Mitigate the consequences of an accident.

Each LER submitted to the NRC provides a summary cause to the NRC as well as corrective actions taken to address the issue.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Russell N. Harding
Title: Manager, Co-Owner and Regulatory Affairs
Dated: 07/01/2009

Question M.04:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Operators of nuclear power plants are expected to face a critical shortage of plant workers in the coming years as the current labor force retires. Nearly half of all employees in the nuclear industry are over 47 years old. What is the estimated percent of the employees at Diablo Canyon and SONGS that will be eligible for retirement over the next five? Please update information provided on what PG&E and SCE are doing to recruit and train plant workers, for example, engineers, technical workers, and managers, to replace these retiring workers. (Diablo Canyon, SONGS, Palo Verde)

Response to Question M.04:

Palo Verde estimates the percentage of employees expected to retire over the next five years to be approximately 15%. The number of eligible employees for retirement is greater than that number but is not considered to be realistic. A key strategy for recruiting employees is the Hiring Model used at Palo Verde. Their model ensures that there is a mix of people hired from the outside infused at various levels in the organization. For Engineering specifically, the Legacy Program is an industry recognized strength - taking a degreed, inexperienced Engineer through a two year training program prior to a permanent assignment. Palo Verde is committed to comprehensive hiring and talent management strategies for long term skills and knowledge, retention and growth for their people. This includes workforce planning and hiring for the future, increasing the talent level of the staff by developing their own talent, and retaining and growing high performers.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Russell N. Harding
Title: Manager, Co-Owner and Regulatory Affairs
Dated: 07/01/2009

Question M.05:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Nuclear power plants also are expected to face shortages in key reactor materials and components for which the supply and production worldwide is limited. Please describe how these shortages might affect currently operating plants, if specialized reactor components need to be replaced through plant retirement. What is the lead time for delivery of key reactor components, for example, reactor vessel heads? (Diablo Canyon, SONGS, Palo Verde)

Response to Question M.05:

The expected shortages in key reactor materials will not impact Palo Verde. Long lead time key reactor replacement components have either already been installed (Steam Generators) or are scheduled to be installed (Reactor Heads starting in 2010).

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Russell N. Harding
Title: Manager, Co-Owner and Regulatory Affairs
Dated: 07/01/2009

Question M.07:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Please describe the current status of worker recruitment and training programs (plant operation and maintenance manuals, etc.) to help ensure that knowledge and experience with the plant, particularly with respect to plant operation and maintenance and strong safety cultures are instilled in new workers. (Diablo Canyon; SONGS, Palo Verde)

Response to Question M.07:

All new hires to Palo Verde attend a one week new hire orientation class. In that class, the Chief Nuclear Officer spends time talking about the importance of knowledge and training, and the need to know the plant. He specifically discusses safety culture with the new hires, as do individuals from Human Performance and Employee Concerns. All new hires now attend a Systems training class. Operations and Engineering new hires attend Systems training class through their normal qualification process, and all other disciplines attend the four week Systems Class. These classes anchor the Leadership Model and values with the new employees, and focus the employee on the Palo Verde Mission to "Safely and Efficiently generate Electricity for the Long Term."

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-PaloVerde-01

To: CEC
Prepared by: Russell N. Harding
Title: Manager, Co-Owner and Regulatory Affairs
Dated: 07/01/2009

Question M.08:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Please provide an update of efforts you have made to maintain and enhance effective safety culture and equipment maintenance programs at your plants, including worker training, transfer of institutional knowledge to newer employees, maintaining adequate staffing levels and other program areas. (Diablo Canyon, SONGS, Palo Verde)

Response to Question M.08:

The Palo Verde Leadership Model maintains and enhances the safety culture and equipment maintenance program at Palo Verde. This model trains both new and existing employees on the core mission and Site Integrated Business Plan (SIBP). The SIBP ensures that institutional knowledge about Plant Equipment, People, Safety, and the Corrective Action Program is understood by all employees. Training programs include areas such as equipment maintenance programs. Employees also learn and practice the Line of Sight program that enhances Safety Culture. Please refer to the response to Question M.07 regarding programs to maintain adequate staffing levels.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Russell Harding
Title: Manager, Co Owner & Regulatory Affairs
Dated: 07/01/2009

Question I.01:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

Please provide hourly generation data for each unit for 2001-2008.

Response to Question I.01:

Attached file includes the hourly generation for SONGS Unit 2 and Unit 3 for the period January, 2001 through December, 2008.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Russell Harding
Title: Manager, Co Owner & Regulatory Affairs
Dated: 07/01/2009

Question I.02:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

Please include GADS (Generating Availability Data Systems) Data for 2001-2008 on availability and outages.

Response to Question I.02:

The attachment provides GADS (Generating Availability Data Systems Data) availability and outages for SONGS 2&3 from 2001 - 2008.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Jose Luis Perez
Title: Manager, Generation Strategy
Dated: 07/01/2009

Question I.03:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

For each of the periods in which one or more of the units were operating at reduced output during 2001-2008, please provide an estimate of the cost of replacement power ($/MWh).

Response to Question I.03:

SCE has not prepared an estimate of the cost of replacement power during any period of reduced operation during 2001 - 2008 at SONGS 2&3. The requested study has not been performed.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Mark Minick
Title: Manager 3
Dated: 07/01/2009

Question I.05:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

Please provide any studies or reports that describe the characteristics of the resources that would 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.

Response to Question I.05:

The 2004 application for the Steam Generator Replacement Project included assessments of the costs of deferring transmission mitigation and replacement generation until 2022, but the assumptions are no longer valid (i.e. assumes implementation of the DPV2 transmission line). The CAISO completed a SONGS shutdown study many years ago to assess transmission grid issues but this study is also too dated to be of any significant value based on new state and local regulatory requirements.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Marc L. Ulrich
Title: Director of Energy Planning
Dated: 07/01/2009

Question I.06:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

Please describe plans for replacing power from the plant if an outage lasts longer than 90 days.

Response to Question I.06:

Grid Reliability and Transmission Stability

San Onofre is a significant contributor to electric grid reliability throughout southern California. The presence of this large generation source makes it possible to import power from distant locations including remotely located renewable energy resources. Depending on system condition, the long term unavailability of both SONGS units would require significant mitigation such as construction of new transmission lines and voltage support equipment to prevent potential negative effects to the grid that include line overloads, low voltages and system instability that could lead to rotating blackouts and other service reductions in the region.

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, the CEC, and the CAISO. Examples of guidance are (1) the CPUC Planning Reserve Margin (PRM) which is currently in debate in an open proceeding at the CPUC but for now is set at 15% above the average-year peak hour load in a given month, (2) annual CEC load forecasts, (3) 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 outages. Currently, it may require multiple years to replace generation due to permitting, regulatory, and construction timelines and the CPUC's review of the PRM should take this into account as well as any other state policy development.

To the extent that any of SCE bundled customers energy needs are unmet if SONGS has an outage longer than 90 days SCE may need to go to the wholesale energy markets to procure replacement power. The timing and method of 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 resources, and nuclear resources.

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

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Marc L. Ulrich
Title: Director of Energy Planning
Dated: 07/01/2009

Question I.07:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

If there is a prolonged outage (one year or more) at the plant, what are the contingency plans for replacement power?

Response to Question I.07:

See response to Question No. I.06.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Marc L. Ulrich
Title: Director of Energy Planning
Dated: 07/01/2009

Question I.09:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

How would portfolio needs and "best fit" criteria change in the absence of the nuclear facility for short-term (up to 90 days) and mid-term (91 days – five years) procurement?

Response to Question I.09:

San Onofre is a significant contributor to electric grid reliability throughout southern California. The presence of this large generation source makes it possible to import power from distant locations including remotely located renewable energy resources. Depending on system condition, the long term unavailability of both SONGS units would require significant mitigation such as construction of new transmission lines and voltage support equipment to prevent potential negative effects to the grid that include line overloads, low voltages and system instability that could lead to rotating blackouts and other service reductions in the region.

SCE reviews its energy needs on a daily basis. A major element of the portfolio SCE uses to meet its customers need is SONGS. Analysis reviewing "Best Fit" criteria is considered when searching for the appropriate substitutes for SONGS absence. For example, SONGS is a must-take high capacity factor resource that provides local area reliability and operational benefits for the California Independent System Operator (CAISO). If there was an absence of the SONGS nuclear facility, SCE would need to secure some level of capacity and generation from additional Los Angeles basin (LA Basin) generation facilities. This is guided by the CAISO's Local Capacity Requirements (LCR) studies. Thus, the "Best Fit" would now require a resource in a certain location (i.e., LA Basin). These "Best Fit" needs would be applied in both the short-term (up to 90 days) and mid-term (91 days - five years) period. The main difference in the term (short versus mid) would be the method of procurement.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Mark Minick
Title: Manager, Resource Planning
Dated: 07/01/2009

Question I.10:

I. PLANT PERFORMANCE (Diablo Canyon; SONGS 2&3; Palo Verde)

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?

Response to Question I.10:

The answer assumes that the phrase "absence of nuclear plants" refers to both units at SONGS simultaneously. For extended summer outages the CAISO would most likely need to rely on generation that is in close proximity to the SONGS plant. The CAISO would need to determine how to dispatch existing units in the southern California area, as new units and/or new transmision cannot be constructed that quickly, to meet grid operational needs. These existing units would provide some of the replacement energy but more economical choices for energy would most likely be purchased from the market for the remainder of the needed energy. Depending on system conditions, the long term unavailability of both SONGS units would require significant mitigation such as construction of new transmission lines and voltage support equipment to prevent potential negative effects to the grid that include line overloads, low voltages and system instability that could lead to rotating blackouts and other service reductions in the region.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Jose Luis Perez
Title: Manager, Generation Strategy
Dated: 07/01/2009

Question L.01:

L. RELICENSING OR PLANT RETIREMENT (Diablo Canyon; SONGS 2&3)

Please describe the current status and overall schedule for plant license renewal activities related to a license renewal application to the NRC. What is the current estimate for the amount of time needed to complete a license renewal application and submit it to the NRC? What studies for your plant are underway and are needed to support such an application to the NRC? What is the schedule and planned studies that will be completed for the license renewal feasibility studies for the CPUC and in response to the AB 1632 assessment recommendations? (Diablo Canyon, SONGS 2 and 3)

Response to Question L.01:

SCE continues to act affirmatively to analyze the CEC's AB 1632 recommendations, and to create appropriate plans, schedules, and budgets for the programs and projects required to address the recommendations. SCE presently anticipates submitting an application to the California Public Utilities Commission (CPUC) requesting funding necessary to prepare and process an NRC License Renewal application in the third quarter of 2010. SCE anticipates filing a License Renewal application with the NRC in late 2012.

The application to the CPUC will address the CEC's AB 1632 recommendations, significant policy issues, cost-effectiveness, and a roadmap to the NRC submittal. In addition to requesting funding to prepare and process the NRC License Renewal application, SCE will also request funding to support projects required to address the CEC's AB 1632 recommendations.

As identified in the response to F.01, plans are being developed to perform studies identified in the AB 1632 recommendations. In addition, as noted in the response to L.02, studies are also underway to address NRC requirements for license renewal. While all studies may not be complete when the CPUC application is submitted, sufficient information will be available for the CPUC to grant SCE's request.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Russell Harding
Title: Manager, Co Owner & Regulatory Affairs
Dated: 07/01/2009

Question L.02:

L. RELICENSING OR PLANT RETIREMENT (Diablo Canyon; SONGS 2&3)

Please describe the license renewal studies to be completed for the plant (for example, the general topics and areas of investigation) and provide a status report, including any results, of license renewal feasibility studies that are planned, are in progress or have been completed

Response to Question L.02:

This response addresses License Renewal filing with the NRC. See response to question L.1. for License Renewal filing with CPUC and related AB 1632 issues.

The NRC requires an environmental review and a safety review. Work to assess the environmental impacts associated with the license renewal feasibility study began in January 2009. A draft of the environmental report will be prepared by the end of 2009. Also included in the environmental review is an analysis of severe accident mitigation alternative (SAMA) strategies; this study will be started in 2010. In the safety review, the NRC requires the application to identify those systems, structures, and components that are within the scope of license renewal and subject to an aging management review and must also identify applicable aging mechanisms and describe programs in place to manage aging. These studies will start in early 2010 and culminate in 2012, resulting in a decision of whether to file an application with the NRC. The earliest date for filing the NRC application for SONGS license renewal is in the fourth quarter 2012.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Russell Harding
Title: Manager, Co Owner & Regulatory Affairs
Dated: 07/01/2009

Question M.01:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Please describe any major fires or safety related events occurring at the plant (2005-2009) that were reported to the NRC, for example, transformer fires. Please describe the cause of the event and corrective action taken. (Diablo Canyon, SONGS)

Response to Question M.01:

SCE did not have any fires at SONGS 2 & 3 during the 2005 - 2009 period. SCE, however, did submit to the NRC a series of Licensee Event Reports (LER) from 2005 to 2009. The attached LER's are classified as a Safety System Functional Failure (SSFF), where a SSFF is defined as:

An event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to:

(a) Shut down the reactor and maintain it in a safe shutdown condition;
(b) Remove residual heat;
(c) Control the release of radioactive material; or
(d) Mitigate the consequences of an accident.

Each LER submitted to the NRC provides a summary cause to the NRC as well as corrective actions taken to address the issue.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Jacqueline Jones
Title: Sr. Project Manager
Dated: 07/01/2009

Question M.02:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Please provide updated information on the total revenue requirements for the power plant for each year, since an operating license for the facility was issued? Please indicate for each of these years whether the annual revenue requirements were determined through a cost-of-service or performance-based mechanism. Where possible, please break down these revenue requirements into fixed and variable operating costs, capital additions, return on equity, and return of equity (depreciation). (Diablo Canyon, SONGS)

Response to Question M.02:

SCE does not disaggregate total revenue requirements for SONGS by year. Prior to 1997 and since 2004, the revenue requirement for SONGS 2&3 was recovered through the Commission authorized Generation revenue requirement which is an aggregated revenue requirement for all of SCE's retained generating plants (i.e., nuclear, coal and hydro) as determined in SCE's General Rate Case. From 1997 through the end of 2003, SCE recovered its SONGS 2&3 revenue requirement through its Incremental Cost Incentive Procedure (ICIP) which varied based on the output of the plant.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Jose Luis Perez
Title: Manager, Generation Strategy
Dated: 07/01/2009

Question M.03:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

What are the current estimates for the projected total plant lifetime costs including costs for plant design and construction, operation, maintenance, fuel, repair and retrofit, emergency response planning, security, insurance, decommissioning, waste storage, transport, and disposal, with and without license renewal? (Diablo Canyon, SONGS)

Response to Question M.03:

The most recent estimate of the costs of continued operation of SONGS 2 & 3 from 2002 - 2022 are included in SCE's Steam Generator Replacement Project (SGRP) Application A.04-02-026 beginning on page 37. Similar estimates of costs for operation of SONGS 2 & 3 from 2022 - 2042 have not yet been completed. SCE anticipates submitting an application to the CPUC that would include this information in late 2010.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Russell Harding
Title: Manager, Co Owner & Regulatory Affairs
Dated: 07/01/2009

Question M.04:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Operators of nuclear power plants are expected to face a critical shortage of plant workers in the coming years as the current labor force retires. Nearly half of all employees in the nuclear industry are over 47 years old. What is the estimated percent of the employees at Diablo Canyon and SONGS that will be eligible for retirement over the next five? Please update information provided on what PG&E and SCE are doing to recruit and train plant workers, for example, engineers, technical workers, and managers, to replace these retiring workers. (Diablo Canyon, SONGS, Palo Verde)

Response to Question M.04:

The estimated percentage of employees at SONGS that may retire over the next five years is approximately 25%. The actual percentage of employees eligible to retire is higher than this, but is not deemed realistic.

In SCE's response to AB1632 data request H.1. dated April 7, 2008, SCE stated that additional funding was approved by the CPUC in SCE's 2006 GRC (for aging workforce replacement costs) and SCE's 2009 GRC requested funding for enhanced recruitment tools and educational partnerships (approved by CPUC in March 2009).

SCE commenced hiring in advance of expected retirements in 2003 and continues this effort today. The hiring in advance of retirements is focused on important hard-to-fill job classifications such as Health Physics (HP) Technicians, Instrumentation & Control (I&C) Technicians, Chemistry Technicians, Boiler & Condenser (B&C) Mechanic, Machinists, Electricians, and Engineers that require one or more years of training prior to the employee becoming qualified to perform work. SCE initiated four new training classes in 2007 (Electrician, Apprentice Chemistry Technician, and two Engineering classes) and six new classes in 2008 (Apprentice I&C Technician, B&C Mechanic, Machinist, Health Physics Technician, and two Engineering classes). One class (Machinist) was initiated during the first half of 2009.

SCE implemented the utilization of enhanced recruitment tools in 2007 and continues to utilize

these tools today. The tools include enhanced hiring sign-on bonuses, increased usage of SCE's relocation plans, and enhanced use of monthly housing allowances where appropriate. These tools are utilized to meet the competitive challenge for nuclear qualified workers in important and difficult to fill skill areas.

SCE continues to develop partnerships with educational institutions to assist them in developing courses and curricula to build skills and create a pipeline for future employees at SONGS. SCE's current educational partnership program includes the following:

- Palomar Community College - Maintenance and Operations Job Preparation Certification program was launched in 2008. This program focuses on placing students in specific curriculum (e.g. math, science, and technical) that is required to enter the nuclear industry. Students are accepted in the program based on placement scores and receive tuition scholarships, books, paid summer internships and prospect of employment after program completion. During 2009, twenty three program participants who had fulfilled their first year of academic studies, spent their summer semester as interns gaining on-the-job training as Maintenance Helpers at SONGS. Course work for this program is being upgraded at MiraCosta College to align the program with new community college curriculum standards developed by the Nuclear Energy Institute (NEI) and the Institute for Nuclear Power Operations (INPO).

- MiraCosta Community College - Radiation Protection Technologies (RPT) Certification Program is an ongoing program that offers students a unique opportunity to obtain state-of-the-art training in radiation technology. The first class of eight students began in the spring 2008. Of these, seven students worked as paid co-ops during SONGS Unit 3 Cycle 15 refueling outage. The second class of ten students commenced in the fall of 2008 and SONGS anticipates that six or seven of these students will participate in the SONGS Unit 2 Cycle 16 outage beginning in September, 2009.

- MiraCosta administration and faculty have begun efforts to link a Maintenance and Operations Technician training program with the RPT program in an Engineering Technology program, meeting requirements for the new Institute of Nuclear Power Operations (INPO) Uniform Curriculum. This new ETEC program should be available for new students in the fall of 2010. When fully implemented, the MiraCosta/San Onofre partnership will be one of the leading programs in the United States for nuclear plant workforce development.

In addition to the educational partnership programs, SONGS also has a very active College Relations program that provides SONGS with interns throughout the year as they complete their degrees and transition to full time employment with the company. SONGS also continues to work to attract recent college graduates through our New Grad program focused on entry level professional positions (engineers, technical specialists, financial analysts). In addition, SONGS has a strong focus on military hiring including the United States Marine Corp at Camp Pendleton and the Navy in San Diego. SCE also utilizes its ever growing Employee Referral program focused on difficult to fill positions.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Russell Harding
Title: Manager, Co Owner & Regulatory Affairs
Dated: 07/01/2009

Question M.05:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Nuclear power plants also are expected to face shortages in key reactor materials and components for which the supply and production worldwide is limited. Please describe how these shortages might affect currently operating plants, if specialized reactor components need to be replaced through plant retirement. What is the lead time for delivery of key reactor components, for example, reactor vessel heads? (Diablo Canyon, SONGS, Palo Verde)

Response to Question M.05:

SONGS does not foresee shortages in key reactor materials and components. Within the next 5 years, SONGS will replace the High Pressure Turbines as well as the Reactor Vessel Heads. All material and components for the Reactor Vessel Heads and High Pressure Turbines have already been procured and scheduled for delivery.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Russell Harding
Title: Manager, Co Owner & Regulatory Affairs
Dated: 07/01/2009

Question M.06:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

To protect plant workers, plant assets, and equipment in an emergency, please describe recent reassessments of the adequacy of access roads to the plants and surrounding roadways for allowing emergency personnel to reach the plant and to allow local communities and plant workers to evacuate. (Diablo Canyon, SONGS)

Response to Question M.06:

Evacuation Time Study Reviews and Updates
SONGS Procedures, specifically its Maintenance and Control of Emergency Planning Documents, requires an annual review of the evacuation time study. This study requires that if there are significant changes related to population or construction of roads and highways that would affect the evacuation time estimates, the Emergency Plan shall be changed.

An Evacuation Time Estimate (ETE) was performed in June 2007 by Wilbur Smith Associates. An ETE is conducted at SONGS approximately every six years as a matter of good emergency planning practice. An ETE could also be conducted when population or roadway changes indicate a need per procedure guidance. The estimate conducted at SONGS prior to the June 2007 estimate was in July 2001.

ETE studies include updates, reviews and integration of population data, transportation facilities, schools and special institutions and the emergency response of the various jurisdictions. The simulation model used is a state-of-the art dynamic route assignment model sponsored by the Federal Highway Administration and developed by the University of Maryland. It includes earthquake assumptions and road closure and management plans to numerous evacuation scenarios. The output of ETE studies inform the SONGS Emergency Plan as well as the jurisdictional plans.

Evacuation Route Assessment
Annually, both southern evacuation routes are verified passable for passenger vehicles per the Emergency Plan Equipment Surveillance Program. Both southern evacuation routes can be used for plant access if necessary. Interstate-5 (I-5) and Camp Pendleton are also available

evacuation routes. The status of these open and used roadways is known on an ongoing basis.

Interstate-5 is normally used to access the plant. Adequacy of the interstate is known on an ongoing basis. If I-5 is closed for any reason arrangements have been made with the California Highway Patrol to have SONGS emergency responders assemble at the Oceanside or San Juan Capistrano Highway Patrol Office where law enforcement escorts to the plant can be coordinated. Camp Pendleton access roads can be used to access the plant if an emergency condition dictates.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Russell Harding
Title: Manager, Co Owner & Regulatory Affairs
Dated: 07/01/2009

Question M.07:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Please describe the current status of worker recruitment and training programs (plant operation and maintenance manuals, etc.) to help ensure that knowledge and experience with the plant, particularly with respect to plant operation and maintenance and strong safety cultures are instilled in new workers. (Diablo Canyon; SONGS, Palo Verde)

Response to Question M.07:

See response to question M.04. for current status of recruitment activities and responses to questions M.08. and M.09 for additional discussion on safety culture, training, and knowledge of the plant.

New hires at San Onofre attend new employee orientation. In this orientation, Leaders at SONGS spend time talking about the importance of knowledge and training, our safety culture, human performance, performance improvement and employee concerns. New hires supporting our operations, maintenance and technical programs attend systems training class through their normal qualification process. We are currently developing a systems training class to be part of our new employee orientation. This orientation anchors the Leadership model and values with the new employees, and focus the employee on SCE's mission of "Leading the Way in Electricity".

SONGS utilizes many methods to train and reinforce the importance of a strong safety culture in its employees (including new hires). These techniques include formal training modules (classes), SONGS Directives, employee handbooks, mandatory weekly stand-up meetings, operational alignment and all leader meetings, surveys & assessments, and periodic communications via letters and publications (brochures). These methods are identified and discussed briefly in the attachment below.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Russell Harding
Title: Manager, Co Owner & Regulatory Affairs
Dated: 07/01/2009

Question M.08:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Please provide an update of efforts you have made to maintain and enhance effective safety culture and equipment maintenance programs at your plants, including worker training, transfer of institutional knowledge to newer employees, maintaining adequate staffing levels and other program areas. (Diablo Canyon, SONGS, Palo Verde)

Response to Question M.08:

SCE has undertaken extensive measures to maintain and enhance the safety culture and ensure effective equipment maintenance programs at SONGS. The site's organizational structure has been reorganized to more closely follow industry best practices and a new senior leadership team, comprised of industry-recognized individuals who were recruited for their leadership in their particular area of expertise and responsibility, put in place. We developed and are implementing a comprehensive program for "Returning SONGS to Excellence" that clearly delineates SCE's core mission and establishes performance metrics. The program involves training and education of every site worker on the performance metrics and the Principles of a Strong Nuclear Safety Culture to ensure an effective safety culture. New employees are also being trained in these principles and work closely with our existing staff to enhance the transfer of institutional knowledge. As we discuss in more detail in the response to question M.09., we are actively monitoring the site's safety culture to ensure that our employees are comfortable and willing to raise issues.

SONGS' maintenance and surveillance programs are designed to provide assurance that plant equipment will fulfill its design functions and perform reliably. To achieve this goal, we rigorously test and evaluate the performance of those systems to ensure they are performing as designed. Training programs include equipment maintenance programs and surveillance activities.

Southern California Edison
09-IEP 09-IEP

DATA REQUEST SET CEC-SCE-SONGS-01

To: CEC
Prepared by: Russell Harding
Title: Manager, Co Owner & Regulatory Affairs
Dated: 07/01/2009

Question M.09:

M. OTHER ISSUES (Diablo Canyon; SONGS 2&3; Palo Verde)

Please describe safety culture issues that have arisen at SONGS, the NRC's response to the lapses in safety culture at SONGS and the NRC's concerns about plant performance. Please provide copies of NRC plant assessments and reports. Please describe SCE's overall plan and progress being made to address these safety culture issues at SONGS. (SONGS).

Response to Question M.09:

Please describe safety culture issues that have arisen at SONGS, the NRC's response to the lapses in safety culture at SONGS, and the NRC's concerns about plant performance:
The NRC first identified two cross-cutting issues in the areas of human performance, and problem identification and resolution for San Onofre in its 2007 Annual Assessment Letter, dated March 3, 2008. Specifically, a cross-cutting theme in human performance was identified involving instances of failing to provide adequate procedures or work instructions. In the area of problem identification and resolution (also known as the Corrective Action Program), a cross-cutting theme was identified involving instances failing to thoroughly evaluate problems such that the resolutions address causes and extent of condition.

To date, significant work has been done to address these two cross-cutting issues, including a detailed evaluation of the site's culture against best performing plants to fully understand the issues.

For human performance issues: we expanded our training programs, clarifying our performance standards; established clear station priorities and metrics for measuring our progress; and instituted weekly meetings for all personnel to communicate our priorities and ensure that everyone is aligned and understands their roles in meeting those priorities and performance standards.

We have rebuilt our corrective action program from the ground up, utilizing lessons learned and bringing in recognized experts and industry leaders to mentor our personnel in problem identification and resolution. As in the human performance issue, our corrective action program includes specific performance objectives and metrics. Other industry experts will periodically assist us in evaluating the on-going effectiveness of the corrective action program.

The NRC is closely monitoring our progress and tracking the effectiveness of our efforts. We have discussed our progress with the NRC in our Mid-Cycle Assessment letter for 2008 and Annual Assessment for 2008.

Additionally, on January 11, 2008, the NRC issued Southern California Edison (SCE) a Confirmatory Order in response to concerns from the NRC regarding the falsification of records by a contract fire protection specialist over five years and willful violations by a few individuals. Deliberate misconduct is not acceptable even though these individual worker actions never compromised public health and safety. SCE agreed to take on a number of corrective actions to address this issue along with a handful of non-related employee concerns that are outlined in the letter. The comprehensive corrective measures included, among other things: (1) enhanced training for SCE and contractor management; (2) expanded general employee training; (3) modified periodic independent assessment of safety culture; (4) unannounced inspections and modified processes to better identify individual misconduct, and (5) clear disciplinary guidelines concerning worker misconduct.

At this time, eight of the actions have been evaluated by the NRC and closed, with four more pending final closure from the NRC (see attachment below entitled "NRC Confirmatory Order Status Summary").

Please describe SCE's overall plan and progress being made to address these safety culture issues:

The overarching commitment of San Onofre Nuclear Generating Station is to operate our facility at the highest standards – safely and reliably – and to protect the health and safety of the public. Additionally, San Onofre is committed to maintaining a strong nuclear safety culture. Over the last few years, we have taken several steps to strengthen our culture and improve plant performance. We understand our challenges to achieving excellence and are driving for sustainable, long-term performance improvement with all employees fully engaged with greater accountability and alignment. This is a long-term process and quality is a priority. Here is an overview of actions:

- Beginning in December 2007 the site organization has been restructured to more closely follow industry best practices and a new leadership team made up predominantly of recognized top performers from other utilities has been put in place.
- The site is focused on industry fundamentals.
- Extensive root cause evaluations were done on both cross cutting issues (human performance, and problem identification and resolution). Corrective actions were identified, and detailed improvement plans have been developed and implemented, including an industry-benchmarked Human Performance program and a new Corrective Action Program.
- New metrics that closely correlate with a well-defined set of core performance indicators have been implemented and are being monitored weekly for progress.
- The site is focused on strengthening our performance on the three top station priorities to achieve improved operational focus and equipment performance. These priorities are the

Corrective Action Program, Human Performance and Work Management.

- A closure review process has been implemented to provide rigor and oversight and ensure the corrective actions are done in a timely and effective manner.
- An effectiveness review process has also been implemented to ensure the corrective actions are sustainable.
- The site has implemented a weekly site-wide meeting to discuss human performance and safety issues and lessons learned.
- There is sustained emphasis on INPO's *Principles of a Strong Nuclear Safety Culture* ; daily messages and operational experience are shared with all employees to help them understand the link between the corporate values, their work and decision-making, and a strong nuclear safety culture.
- The site has a strong Nuclear Safety Concerns program that provides employees a mechanism for raising and addressing concerns.

In its 2008 Annual Assessment Letter, the NRC asked SONGS to perform a safety culture assessment in 2009. The survey was performed and the data are currently being analyzed.

- A comprehensive site survey was completed in May.
- A follow-on evaluation by an independent team of experience industry and non-nuclear personnel is being done in July.
- Data analysis is expected to be done by October, and we will develop corrective action to address issues, which will be subject to our closure and effectiveness reviews.