Application No.: A.09-04-___

Exhibit No.: SCE-1

Witnesses: J.A. Morales

M.P. Short

SOUTHERN CALIFORNIA EDISON

An *EDISON INTERNATIONAL* Company

(U 338-E)

Testimony On SONGS 1 Decommissioning Work Completed And Remaining Work Scope

Before the

Public Utilities Commission of the State of California

Rosemead, California

April 3, 2009

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I.

POLICY

Southern California Edison Company (SCE) and San Diego Gas & Electric Company (SDG&E) own 80% and 20% interests in San Onofre Nuclear Generating Station Unit 1 (SONGS 1), respectively. On November 30, 1992, SONGS 1 permanently ceased operations.

As holders of the Nuclear Regulatory Commission (NRC) license, SCE and SDG&E (hereinafter collectively referred to as "the Utilities"), on behalf of their customers, have an unavoidable obligation, under federal regulation, to decommission SONGS 1, 2, and 3.[1] The Utilities do not own the site upon which SONGS 1, 2, and 3 are located. Instead, they are authorized to use the site under grants of easement and leases from the U.S. Department of the Navy and the California State Lands Commission. These leases and easements also require the Utilities to decommission SONGS 1, 2, and 3.[2]

On January 11, 2007, the California Public Utilities Commission (Commission) issued Decision D. 07-01-003, which: (1) concluded that the $298 million (100% share, 2004$) of decommissioning work completed at SONGS 1 between January 1, 2002 and June 30, 2005 was reasonable, (2) adopted a $309 million (100% share, 2004$) estimate for SONGS 1 remaining decommissioning work, and (3) authorized no revenue requirement for SONGS 1 decommissioning during the 2005-2008 triennial period.

In this application, the Utilities demonstrate that the $207 million (100% share, 2008$) cost of the SONGS 1 decommissioning work completed between July 1, 2005 and December 31, 2008 is

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[1] According to the Code of Federal Regulations, Title 10, Part 50.2 (10 C.F.R. 50.2), "Decommissioning means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits -- (1) Release of the property for unrestricted use and termination of the license…." 10 C.F.R. 50.82(a)(3) provides that, "Decommissioning will be completed within 60 years of permanent cessation of operations…."

[2] Paragraph 12 of the Grant of Easement with the U.S. Department of the Navy for the onshore site provides, "That upon termination of the easement granted herein, the Grantees at their expense may remove, and if desired by the government, shall remove any and all improvements installed or constructed hereunder and shall restore the Premises to a condition satisfactory to the Director, Southwest Division, Bureau of Yards and Docks; except that the Grantees shall not be obligated to restore any natural material cut or filled in the necessary excavation and grading of the Premises. Upon termination of the easement, the Grantees shall also, if required by the Government, decontaminate the Premises and such surrounding area within the Reservation as may have been contaminated by the operation of the Nuclear Station."

reasonable. This is because the cost was within the $221 million (100% share, 2008$) estimated for the work scope approved by the Commission in D.07-01-003.

The work completed between July 1, 2005 and December 31, 2008 marked the completion of Phase I of the SONGS 1 Decommissioning Project. Phase I included the following activities:

- Decontamination, dismantling, and disposal of all contaminated and non-contaminated SONGS 1 equipment, components, and buildings that were installed either above-ground or below ground but above the water table.
- Removal of any residual radioactivity above natural background levels from foundations or structures located below the water table.
- Installation of low-density concrete within any void spaces in structures located below the water table to ensure stability of the site.
- Licensing and construction of a dry spent fuel storage facility on the SONGS 1 site, the fabrication of dry storage canisters, and the loading and placement of all SONGS 1 spent fuel stored at SONGS and one canister of Greater Than Class C (GTCC) Waste from SONGS 1, into the dry spent fuel storage facility.
- Maintenance of infrastructure located on the SONGS 1 site, such as the sea wall, the meteorological conduit trench, the utility trench, the fire water main, and the storm drains that will continue to be used by the site until final site restoration.
- Performance of a site characterization record to document the "as-left" environmental and radiological condition of the SONGS 1 site. This record, including ground soil samples and sample testing records, was retained under strict procedural controls to establish documentary and physical evidence that the environmental and radiological condition of the SONGS 1 site was substantially below the allowable amounts of quantities of hazardous and radioactive materials allowed under current regulatory standards.

The Utilities also provide an updated SONGS 1 Decommissioning Cost Estimate of $184.4 million (100% share, 2008$) for the Remaining Work to be performed.[3] In this proceeding, Remaining Work includes all post-Phase I demobilization and document close-out activities not completed by December 31, 2008, and all Phase II and Phase III decommissioning activities.

Consistent with previous Commission-adopted SONGS 1 decommissioning cost estimates, the estimate presented in this filing is based on planning studies developed specifically to prepare for the remaining decommissioning work. The updated SONGS 1 Decommissioning Cost Estimate includes a 25% contingency amount for the Remaining Work. The Commission should find that the updated $184.4 million (100% share, 2008$) SONGS 1 decommissioning cost estimate for the Remaining Work is reasonable.

The Utilities forecast that the $136.9 million (2008$) available in the SCE SONGS 1 Decommissioning Trusts and the $67.3 million (2008$) available in the SDG&E SONGS 1 Decommissioning Trusts, when combined with tax benefits generated from the expenditure of non-qualified decommissioning funds, will be sufficient to meet the estimated $184.4 million (100% share, 2008$) future cost requirements.[4] The Utilities, therefore, request no contribution of customer funds for SONGS 1 decommissioning.

Phase II of the SONGS 1 decommissioning project will include the maintenance and monitoring of the SONGS 1 spent fuel stored at the SONGS site and the transfer of the fuel from the onsite spent fuel dry storage facility, known as the Independent Spent Fuel Storage Installation (ISFSI), to the U.S. Department of Energy (DOE) transporter for shipment to a permanent DOE disposal facility.[5] SCE currently projects that the DOE will remove the last SONGS 1 fuel from the

[3] The SONGS 1 Decommissioning Cost Study, dated March 2009, is included in the Workpapers for this Exhibit.

[4] The $136.9 million (SCE) and $67.2 million (SDG&E) include qualified trust fund liquidation amounts of $56.0 million (SCE) and $16.2 million (SDG&E), and non-qualified trust fund liquidation amounts of $80.9 million (SCE) and $51.1 million (SDG&E), respectively, as of December 31, 2008 (2008$). Under current tax laws, SCE and SDG&E would also have tax benefits in the amounts of $48.4 million and $20.8 million (2008$), respectively, associated with the expenditure of their non-qualified trust funds.

[5] The costs to maintain the SONGS 1, 2, and 3 spent fuel in the ISFSI will be apportioned between the SONGS 1 Decommissioning Trusts and SONGS 2 & 3 Operating Funds on a pro-rata basis based on the projected number of canisters containing spent fuel from each unit each year.

site in 2036.[6] Phase II will also include the final disposition of the SONGS 1 offshore circulating water conduits; the segmentation of the SONGS 1 reactor pressure vessel (RPV) into pieces capable of being shipped by truck or rail within existing transportation infrastructure constraints; and the shipment and burial of the RPV segments at a licensed disposal facility.

Phase III of SONGS 1 decommissioning will include the termination of the NRC License for the SONGS 1 site, and final site restoration and termination of the grant of easement from the U.S. Department of the Navy. Phase III will be completed concurrently with Phase III of SONGS 2 & 3 decommissioning. This is not expected to occur until two years after the DOE removes the last SONGS 2 & 3 spent fuel from the SONGS site, which is currently projected to occur in 2051.[7] Therefore, notwithstanding the fact that the funds currently available to the Utilities – including the tax benefits from the non-qualified SONGS 1 decommissioning trusts exceed the projected costs of the Remaining SONGS 1 Decommissioning Work – the Utilities request that no funds be refunded to customers or transferred to the SONGS 2 or SONGS 3 decommissioning trusts at this time due to economic uncertainties, and due to the many uncertainties inherent in the cost to complete a project several decades in the future.

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[6] Infra at page 9.

[7] As explained on page 3 of Exhibit No. SCE-2 in this filing, SCE projects that the DOE will remove the last SONGS 2 & 3 spent fuel from the ISFSI by 2051.

II.

SONGS 1 DECOMMISSIONING PROJECT OVERVIEW

A. Decommissioning Methodology

SCE, the decommissioning agent, is performing the SONGS 1 decommissioning project in three phases. As discussed above, in Phase I, SCE decontaminated, dismantled, and disposed of all contaminated and non-contaminated SONGS 1 systems and structures excluding the SONGS 1 offshore conduits, the shipping and disposal of the SONGS 1 reactor pressure vessel, and the removal of some of the SONGS 1 below grade materials. The decommissioning of all site common facilities, including those shared by SONGS 1, is included in the SONGS 3 Decommissioning Cost Estimate consistent with previous decommissioning cost estimates.[8]

Figure II-1
SONGS 1 Prior To Commencement Of Decommissioning

Figure II-1 depicts the configuration of SONGS 1 prior to the commencement of decommissioning. SCE commenced Phase I of SONGS 1 decommissioning in June 1999, and

[8] The site common facilities include all structures, roads, and infrastructure located east of Interstate Highway ("I-5"), and all structures, roads, and infrastructure located on the west side of I-5 that have been used to support the operation of all three SONGS units.

completed this phase in December 2008. The Phase I decommissioning effort removed approximately 200 million pounds of material from the SONGS 1 site, including 133 million pounds of radioactively contaminated material and 67 million pounds of non-contaminated (clean) material. The updated SONGS 1 Decommissioning Cost Estimate for the Remaining Work projects that 37 million pounds of radioactively contaminated material and 447 million pounds of non-contaminated material remain to be removed during Phases II and III. SCE will be required to handle, package, and dispose of the radioactively contaminated material as Low-Level Radioactive Waste (LLRW). LLRW includes materials containing concentrations of radionuclides within the federal limits for shallow land or near surface burial at federally licensed LLRW disposal facilities.

SCE constructed the ISFSI for SONGS 1 spent fuel on the eastern portion of the SONGS 1 site during Phase I. As of June 30, 2005, SCE had transferred all 395 SONGS 1 spent fuel assemblies from underwater storage in the spent fuel pools to dry storage in the ISFSI.[9] This fuel transfer was required to support the continued decommissioning activities because the SONGS 1 spent fuel pool was located in the center of SONGS 1. SCE continues to provide security for the ISFSI and to monitor the fuel environment (temperature and radioactivity) consistent with NRC license requirements.

[9] SCE transferred to the ISFSI 207 SONGS 1 fuel assemblies from the SONGS 1 spent fuel pool, 70 SONGS 1 fuel assemblies from the SONGS 2 spent fuel pool, and 118 SONGS 1 fuel assemblies from the SONGS 3 spent fuel pool.

Figure II-2
SONGS 1 Decommissioning Progress As Of December 2008

Figure II-2 depicts the externally visible progress on the SONGS 1 decommissioning project through December 2008. Conspicuous by their absence in this photo are all above-ground structures except the first ISFSI pad, which houses 17 canisters containing spent fuel from SONGS 1, one canister containing GTCC from SONGS 1, and 13 canisters containing spent fuel from SONGS 2 & 3. Also conspicuous are the presence of the recently completed second ISFSI pad which contains several canisters of spent fuel from SONGS 2 & 3, and recently constructed enclosures for the SONGS 2 & 3 steam generator replacement project, which are unrelated to the decommissioning of SONGS 1.

Phase II commenced on January 1, 2009. In Phase II, SCE will continue to monitor and provide security for the SONGS 1 spent fuel in the ISFSI. SCE will also disposition the SONGS 1 Offshore Intake and Discharge Conduits consistent with an amendment to its grant of easement with the

California State Lands Commission.[10] SCE plans to perform this work before the current term of the easement expires in 2013.

Phase II will end after the DOE removes all SONGS 1 spent fuel from the site. SCE currently projects that this will occur by 2036 based on studies developed from the DOE Acceptance Priority Ranking & Annual Capacity Report (DOE/RW-0567), dated July 2004,[11] and by subsequent developments and public statements made by the Director of the Office of Civilian Radioactive Waste Management. SCE's current spent fuel management studies are based on an assumption that the DOE will open its permanent repository in 2020.[12] SCE also anticipates that it will complete disposal of the SONGS 1 reactor pressure vessel package during the 2025-2026 timeframe, concurrent with the projected segmentation and disposal of the SONGS 2 & 3 RPVs.

Phase III of SONGS 1 decommissioning will occur concurrently with Phase III of SONGS 2 & 3 decommissioning. In Phase III, SCE will (1) remove and dispose of all remaining above-ground structures, except any the U.S. Department of the Navy requests be left in place; (2) dismantle and dispose of the ISFSI; (3) excavate and dispose of all remaining SONGS 1 below-grade appurtenances and structural foundations, including any remaining radioactively contaminated materials that exceed the then-current standard for NRC license termination; (4) backfill and compact the void spaces left after removal of all below-grade structures and foundations; (5) submit a license termination plan to the NRC and terminate the NRC license; (6) complete the final site restoration work; and (7) terminate the grant of easement from the U.S. Department of the Navy for the plant site. The updated SONGS 1 Decommissioning Cost Estimate assumes that Phase III will commence after the DOE has removed all

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[10] Amendment to Grant of Easement, California State Lands Commission to Southern California Edison Company and San Diego Gas & Electric Company, P.R.C. 3196.3, dated October 20, 2005.

[11] This document is accessible on the DOE website at http://www.ocrwm.doe.gov/receiving/pdf/apr_acr.pdf.

[12] Office of Civilian Radioactive Waste Management (OCRWM) , Yucca Mountain Repository, About The Project, http://www.rw.doe.gov/ym_repository/about_project/index.shtml, accessed on October 1, 2008, states that under the Best Achievable Repository Construction Schedule, the DOE would begin receipt of spent nuclear fuel on March 31, 2017. However, OCRWM Director Ward Sproat has been widely quoted that the 2017 date will not be met. For example, *See* Mother Jones, "The Nuclear Option", May/June 2008 Issue, stated that, "The repository's most recent opening date was set for 2017. But that date "is clearly out the window," says Ward Sproat, who directs the Yucca project for the DOE. "Based on what I'm seeing right now it's a two- to three-year slip from that."'

SONGS 2 & 3 spent fuel from the site, which is currently estimated to occur in 2051.[13] The estimate also assumes SCE will complete Phase III within two years of the removal of all SONGS spent fuel from the SONGS site.

B. Policies, Programs, And Procedures

At the beginning of the SONGS 1 Decommissioning Project in 1999, SCE developed the SONGS 1 Decommissioning Project Charter, which broadly defined the Policies, Goals and Objectives, Organizational Structure, Authority Levels, and Reporting requirements for the project. Under broad scope of the Project Charter, SCE developed a series of Policies, Programs, and Procedures to (1) ensure the prudent use of the decommissioning funds, and (2) create a technical and financial record of how SCE managed the SONGS 1 decommissioning project. These documents provided the foundation to support the reasonable and prudent use of decommissioning funds for the SONGS 1 decommissioning project.

Policy Statements established guidelines for conducting decommissioning activities and assigning organizational responsibilities associated with those activities. They covered subjects such as staffing, worker training and qualifications, procurement of equipment and services, and money management. For example, the decommissioning staffing policy described the sources of personnel (e.g., direct SCE decommissioning project staff, SCE employees matrixed to the decommissioning project from other SCE organizations, and third party contractors and consultants), management responsibilities, and personnel cost controls.

Program Statements were established to interpret and add detail to the Policy Statements. They provided specific direction to personnel assigned to: (1) carry out the organizational responsibilities associated with conducting decommissioning activities, (2) document SCE's methods for complying with various state and federal regulations, and (3) ensure that SONGS site programs applicable to decommissioning were followed by the decommissioning project. The programs included security, environmental protection, quality assurance, safety, fire protection, and health physics and radiological

[13] *See* Footnote 7.

protection. For example, the SONGS radiological program described the control of radioactive materials such as surveying, packaging, and shipping.

Finally, Procedures were developed as the implementing documents for the Program Statements. They established when and how to perform activities, specified actions for ensuring that program requirements were met, and provided pre-established forms used to document the results of decommissioning activities. For example, procedures provided specific steps for the application of detailed integrated work scheduling and cost accounting processes to monitor the cost of work performed versus the estimated cost required to complete the project.

The Nuclear Regulatory Commission (NRC) conducted frequent on-site inspections of SONGS 1 decommissioning policies, programs, and procedures and the documentation created from them. These inspections ensured that SCE conducted the project consistent with federal regulations. The NRC inspection reports did not identify any significant issues. This assertively indicates the SONGS 1 decommissioning project was conducted in a manner consistent with federal regulations, and not adverse to public health and safety.

C. Project Controls

Effective execution of the SONGS 1 Decommissioning Project depended upon an accurate understanding of the relationships between the project schedule, the completion of project work, and the expenditure of funds. SCE managed the cost of SONGS 1 decommissioning work using the Integrated Project Controls System (IPCS). The IPCS is a project management tool for monitoring the relationships between the project schedule, estimated cost, budget, and other resources on a real-time basis. The IPCS also provides a basis for reconciling the costs for the completed scope of work to the estimated costs for the same scope of work in the previously approved 2005 SONGS 1 decommissioning cost estimate.

In July 2008, SCE implemented SAP software to record and track costs. From that point forward, both IPCS and SAP Project Orders were used to control and reconcile decommissioning costs.

SCE monitored the costs incurred throughout the project compared to indicators of physical progress and the estimated costs for each category of activity. Thus, SCE was able to identify deviations

to the project schedule and budget if they occurred. SCE was then able to identify the actions required to complete the activity within the budget and schedule, and/or make adjustments to the budget and/or schedule as needed.

D. Utilization of Qualified and Experienced Personnel

The SONGS 1 Decommissioning Project Charter, Policy Statements, Program Statements, and Procedures were designed to ensure that SCE would use qualified personnel to perform decommissioning work. Specifically, the decommissioning staffing policy statement described the sources of personnel (e.g., direct, matrixed, contractors, consultants), that would be employed to perform work on the SONGS 1 decommissioning project.[14] And the worker training and qualification policy statement established guidelines to ensure that qualified and experienced personnel were utilized.[15]

Consistent with the decommissioning policy statements, program statements, and procedures, SCE personnel who perform decommissioning work are required to meet applicable nuclear industry qualification standards for the activities they perform. Their qualifications are tracked in SCE's Electronic Qualification Information System (eQIS), and must be re-verified before they are permitted to commence work on each specific decommissioning activity.

Contractor personnel are pre-qualified through the SCE procurement process. All prospective contractors must be pre-qualified before they are invited to bid on decommissioning work. Contractor personnel retained to perform decommissioning work are also required to complete SONGS site-specific training that corresponds with their work responsibilities before they are permitted to commence work.

[14] SONGS 1 Decommissioning Project Policy Statement #001, "Staffing".

[15] SONGS 1 Decommissioning Project Policy Statement #005, "Worker Training and Qualification Policy".

III.

REASONABLENESS OF COSTS INCURRED FOR WORK COMPLETED BETWEEN JULY 1, 2005 AND DECEMBER 31, 2008

A. Basis For Cost Comparison

Section 4.2.2.2.c of the Settlement Agreement adopted in D.99-06-007 states that during the Phase I period of SONGS 1 Decommissioning work, the Utilities' triennial NDCTP applications shall include,

> "A comparison of completed SONGS 1 Decommissioning Work to date, and the costs incurred, to the previously submitted SONGS 1 Decommissioning Cost Estimate. If the scope of SONGS 1 Decommissioning Work completed and costs incurred to date are bounded by the most recently approved SONGS 1 Decommissioning Cost Estimate, the Utilities' conduct will be presumed reasonable. Any entity claiming the Utilities acted unreasonably would, therefore, bear the burden of proving the Utilities acted unreasonably. The Utilities will be responsible for proving that material variances from the most recently approved SONGS 1 Decommissioning Cost Estimate are reasonable."[16]

This chapter of testimony provides a cost comparison of SONGS 1 decommissioning work completed during this triennial period compared to the estimated cost for that work adopted in D.07-01-003. This cost comparison shows that the cost of SONGS 1 decommissioning work completed during the triennial period did not exceed the estimate adopted in D.07-01-003. As a result, based on the standard adopted in Section 4.2.2.2.c above, SCE's actions are presumed reasonable and satisfy the requirements of the above paragraph. As a result, any parties claiming that the Utilities acted unreasonably will have the burden to prove such a claim.

B. Criteria For "Completed Work To Date"

In A.02-03-039, the Utilities defined the criteria for a work activity to be complete for inclusion in the comparison to the previously submitted SONGS 1 decommissioning cost estimate as follows:

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[16] The Commission confirmed the reasonableness standard in its most recent Final Order in the 2005 NDCTP Proceeding: "with respect to Phase 1 SONGS 1 decommissioning work, the Commission in D.99-06-007 adopted a ratemaking settlement that included a presumption that the utilities' conduct is reasonable in performing Phase 1 SONGS 1 decommissioning work if the scope of the work completed and the most recently approved SONGS 1 decommissioning cost estimate bound the costs incurred." D. 07-01-003, Standards of Review, (*mimeo*) pp. 7-8, *citing* Settlement § 4.2.2.2.c. at 86 C.P.U.C. 2d 604, 620 (1999).

- *A decontamination and dismantling* activity is complete if: (1) the activity has been completed in its entirety, or (2) the activity has eliminated a specifically identifiable decommissioning liability. Decommissioning liability is eliminated when material is removed from the SONGS 1 site.
- For *ISFSI design, licensing, and construction work,* completed work satisfied a defined regulatory activity or construction milestone.

In D.07-01-003, the Commission utilized the above definition when it found that the $309 million cost (100% share, 2004$) SCE incurred for SONGS 1 decommissioning work completed between January 1, 2002 and June 30, 2005 was reasonable because it was bounded by the $317 million estimate (100% share, 2004$) for those activities in the then-most recently approved SONGS 1 Decommissioning Cost Estimate. In the following section, SCE demonstrates that the $207 million (100% share, 2008$) incurred for SONGS 1 Decommissioning Work between July 1, 2005 and December 31, 2008 was reasonable because it was bounded by the $221 million estimated cost (100% share, 2008$) for those activities in SCE's 2005 SONGS 1 Decommissioning Cost Estimate.

C. Comparison Of Costs Incurred To Estimated Costs For Work Completed

Table III-1 below presents a summary of the costs incurred for SONGS 1 decommissioning work completed between July 1, 2005 and December 31, 2008 to the costs for that scope of work estimated in the 2005 Decommissioning Cost Estimate that was adopted in the 2005 NDCTP:

Table III-1
Reconciliation Of Costs For Work Complete
Between July 1, 2005 And December 31, 2008
To The 2009 Decommissioning Cost Estimate
(100% Share, 2008$)

Line No.	Activity Cost Category	2004 Estimated Costs for Work Completed between July 1, 2005 and December 31, 2008	Actual Costs for Work Completed between July 1, 2005 and December 31, 2008
1.	Building and Systems Removal		
A.	Turbine Building and North Turbine Extension Structures and Foundations	$17,213,303	$16,829,801
B.	Containment and Sphere Enclosure Building (Zone 4 Wall and SEB Foundations)	$74,627,453	$69,551,437
C.	Reactor Auxiliary (Radwaste) Building	$68,932,237	$58,165,254
D.	Circulating Water System Intake and Discharge Structures	$14,528,946	$13,255,730
E.	Backyard, Fuel Storage Building, Yard Areas, and Miscellaneous	$56,063,024	$57,604,083
F.	Subtotal – Building and Systems Removal	$231,364,963	$215,406,305
2.	Reactor Pressure Vessel Relocation	$1,514,226	$1,480,025
3.	Transfer of Dry Spent Fuel Moving Equipment from SONGS 1to SONGS 2 & 3	($11,554,029)	($9,706,724)
4.	TOTAL	$221,325,160	$207,179,606[17]

SCE incurred a net cost of $207.2 million (100% share, 2008$) for the work scope described in Section III.E below that was completed between July 1, 2005 and December 31, 2008. The estimated cost for the completed activities that were identified in the 2005 cost estimate and performed during this period was $221.3 million (100% share, 2008$).

D. Method For Reconciling Costs Incurred To Estimated Costs For Work Completed

SCE used the IPCS and SAP Project Orders discussed in Section II.C above to compare actual costs incurred for the scope of SONGS 1 decommissioning work completed between July 1, 2005 and December 31, 2008 to the estimated costs for that work scope in SCE's 2004 SONGS 1 Decommissioning Cost Estimate adopted in the 2005 NDCTP.

[17] Net of $123,000 (100% share, 2008$) from Salvage Proceeds, as discussed in Section 3.D.2 infra.

E. Description Of SONGS 1 Decommissioning Work Completed Between July 1, 2005 And December 31, 2008

1. Building And Systems Removal and Disposal

During the July 1, 2005 through December 31, 2008 period, SCE removed approximately 128 million pounds of concrete, steel, and other materials from the SONGS 1 site. This testimony describes the major building and system removal activities during this period.

a) Turbine Building and North Turbine Extension Structures and Foundations

Before the Turbine Building structure could be demolished, the turbine gantry crane and the crane rails were removed. The top was fitted with shackle eyes and connected to rigging using a large crane. As the concrete was broken away from the rails, the rails and their drain system were torch cut into sections, loaded into inter-modal containers, and shipped to a licensed disposal facility. After the crane rails and the electrical wiring were removed, the balance of the Turbine Building was considered non-contaminated with the exception of the crane rail drain lines. These drain lines, embedded in the concrete deck, were all considered potentially contaminated because low levels of contamination were found at the drains and no viable process to survey the entire system was available. The drain lines were removed during demolition of the Turbine Deck and Pedestals, and shipped to a licensed disposal facility.

Figure III-3
Removal of Turbine Gantry Crane

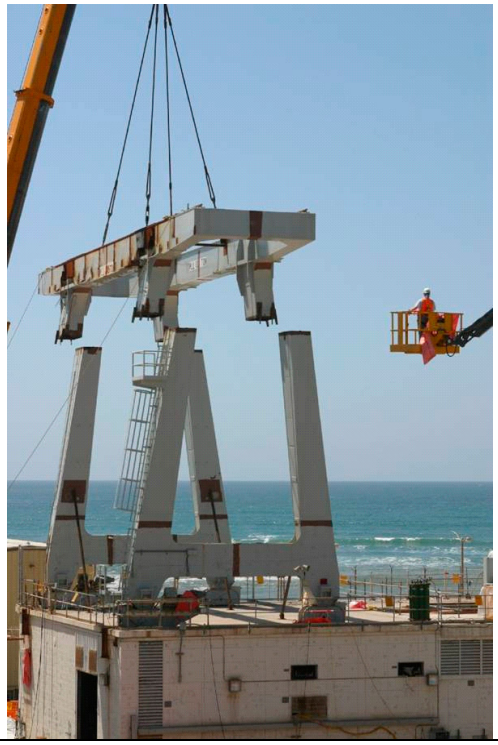


Figure III-4
Demolition of Turbine Building

The Turbine Building was demolished down to the top of the base mat at Elevation 8' 6" using conventional demolition techniques. The South Turbine Building Extension, West

Heater Deck, and the North Turbine Deck Extension and their respective foundations were then removed. Loose soil areas were remediated, and then the area was backfilled and compacted back to the grade level at approximately Elevation 20'. This work scope included the removal of approximately 18 million pounds of concrete and metal debris. Most of the debris was not radiologically contaminated. The contaminated debris was shipped to a licensed disposal facility. The noncontaminated debris was transported to the Mesa and processed for reuse by the Marine Corps at Camp Pendleton.

b) Containment Building and Foundations, and Sphere Enclosure Building Foundations and Zone 4 Wall

Prior to this period, SCE dismantled and removed the large components and other plant systems from inside the SONGS 1 Containment Building. During this period, SCE dismantled and removed reinforced concrete structures that supported those systems and components. Approximately 48 tons of concrete rubble and metal scrap were removed from inside the Containment Building.

Figure III-5
Demolition of Systems and Structures Inside SONGS 1 Containment Sphere

Figure III-6
Debris Inside SONGS 1 Containment Sphere

Figure III-7
Removing Debris from Inside SONGS 1 Containment Sphere

Before those materials could be removed, SCE was required to bolt the 140-foot diameter, 1-inch thick steel Containment Sphere to the 3-foot thick concrete saddle that served as its foundation, and to weld custom outrigger arms to the outside of the Sphere to prevent it from floating on the water table or rotating as the rubble was removed. Subsequently, SCE installed and operated several de-watering pumps around the Containment Building perimeter.

Figure III-8
Anchoring SONGS 1 Containment Sphere to Concrete Foundation

All of the rubble removed from inside the Containment Sphere was shipped to a licensed LLRW disposal facility. Subsequently, the Containment Sphere was torch-cut into pieces, stacked inside shipping containers, and shipped to the same disposal facility.

Figure III-9
Exterior Stabilization of SONGS 1 Containment Sphere

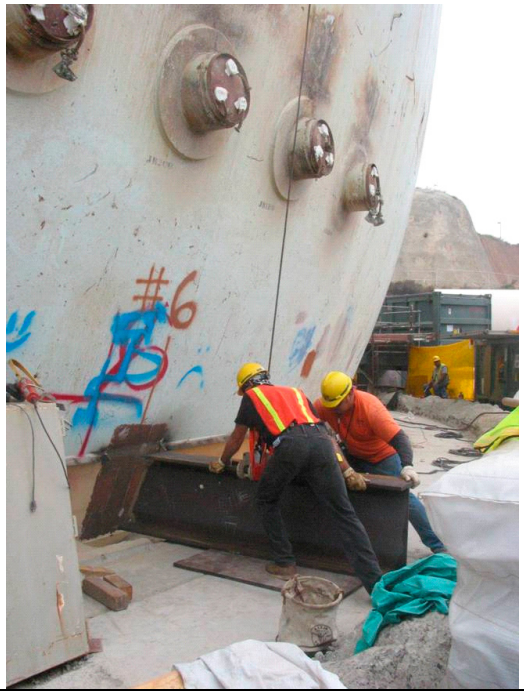


Figure III-10
Installation of Dewatering Well Prior to Containment Demolition

Figure III-11
Removal of Top of SONGS 1 Containment Sphere

Figure III-12
Removal of Torch Cut Piece of SONGS 1 Containment Sphere

After the Containment Sphere was removed, its concrete foundation was backfilled to approximately 6 inches above the water table with a low-density grout material and an 18-inch layer of concrete. Upon completion of this effort, Zone 4, the west portion of the Sphere Enclosure Building that was not removed prior to this triennial period, was collapsed and removed.

Figure III-13
Preparing Pieces of SONGS 1 Containment Sphere for Disposal

Figure III-14
Filling SONGS 1 Containment Concrete Foundation with Low Density Grout

Figure III-15
Installing Concrete Cap over Grout in SONGS 1 Containment Foundation

Finally, the Sphere Enclosure Building Foundations and the remaining 3-foot thick concrete Containment foundation were removed from the top of the concrete cap (at approximately Elevation 8'6") to the plant grade (at approximately Elevation 20'). The resulting void space was then backfilled with Type 2 base material, and compacted, in order to support expansion of the ISFSI.

Figure III-16
Demolition of Sphere Enclosure Building Zone 4 Wall

Figure III-17
Demolition of Containment Cradle and Sphere Enclosure Building Foundations above Elevation 8' 6"

c) Reactor Auxiliary (Radwaste) Building

The Radwaste Building was a two story reinforced concrete building that housed the systems used to maintain the proper chemistry of the reactor coolant water during SONGS 1 operations, and the spent fuel pool water for as long as fuel was stored in the pool. The Radwaste

Building contained significant quantities of radiological contamination, especially in the lower level, which was located below grade.

After the Radwaste Building and all of its systems were depressurized and de-energized (i.e., placed in a "Cold and Dark" configuration), and Health Physics performed radiological surveys, the decontamination, demolition, and disposal of the Radwaste Building were accomplished in three phases.

Figure III-18
Debris from Hold Up Tank in Lower Radwaste Building

The first phase was to cleanup the Hold Up Tank (HUT) Rooms, which contained the Hold Up Tanks, Spent Resin Tank, and Volume Control Tank. Portable pumps were used to pump contaminated water between tanks and to filter out sediment. Approximately 10,500 gallons of radioactively contaminated water was treated with an absorbent in accordance with Health Physics procedures, and was then shipped along with the sediment to a licensed disposal facility. Then the tanks, piping, and associated equipment were removed, packaged, and shipped to a disposal facility.

The second phase was to cleanup the Upper Radwaste Area. The Radwaste Building was a two story building, with the top floor located at grade level and the bottom floor located below grade. Cleanup of this area included the removal of all systems, structures, and components from

the Slurry Room, Boric Acid Mixing Room, Reactor Coolant Filter Room, Boron Analyzer Room, Upstairs Laundry Storage area, Solid Waste Bailing Room, and the Volume Control Tank Vault. The Volume Control Tank was cut into strips using plasma torches and removed through a hatch opening, and then packaged for disposal. Asbestos fire block was found in the Boric Acid Mixing Room and was removed by qualified personnel in accordance with site procedures. All contaminated materials were shipped to a licensed disposal facility.

Figure III-19
Scabbling Walls and Floor in Lower Radwaste Building

Figure III-20
Cleanup of Contaminated Debris from Lower Radwaste Building

The third phase was to cleanup, dismantle, remove, and dispose of the Lower Radwaste Building. SCE scabbled 1-2 inches of the concrete wall and floor surfaces of the lower level Radwaste due to their higher radiation levels. After removing and disposing of those materials

separately, SCE demolished and disposed of the remainder of the building. The Ion exchangers and Demineralizers were removed one at a time through the hatch into the new resin slurry room where they were prepared for shipment. The components in the Switchgear area were disassembled and removed and separated as mixed waste and LLRW. The electrical components and conduits, all electrical panels and 4KV transfer switchgear were removed from the Switchgear area through the mixing room and separated for disposal. Pumps, compressors, tanks, and filters in the Pump, Sump, Waste Gas, Charging Pump and Gas Stripper Areas were removed and packaged for disposal. The Spent Resin tank was removed from the Bailing Room through an opening cut through the ceiling and floor above, then filled with grout to limit the radiation exposure while in transit to the disposal site. Other items in the general area were dismantled and removed to make room for the Radwaste area demolition including the Scaffold Yard, free standing vault, and the Tsunami Gate and high level waste storage areas. After dewatering pumps were installed around the perimeter of the Radwaste Building, the below-grade portion of the building was excavated and disposed of. Approximately 31 million pounds of concrete and metal from the Radwaste Building and systems required disposal at a licensed LLRW disposal facility.

Figure III-21
Demolition of Lower Radwaste Building

Figure III-22
Placing Lift Liner Containing Concrete Rubble into Gondola Rail Car

d) Circulating Water System Intake and Discharge Structures

After the fuel was transferred from the SONGS 1 spent fuel pool to the ISFSI, the systems that had been required to maintain the water quality in the spent fuel pool were no longer required. Those systems were decommissioned as part of the Radwaste Building decommissioning work scope discussed above. The circulating water system had also been kept in service to provide a discharge path and dilution capability for effluent releases from those systems.

The circulating water system also provided a discharge path for the SONGS 1 storm drain system. Therefore, before the circulating water system could be decommissioned, a replacement discharge path for the storm drain system was needed. SCE constructed a new yard sump in the Intake Structure pit that had previously been occupied by the circulating water pumps. In addition, SCE installed a cross-tie from the temporary yard sump to the SONGS 2 & 3 offshore discharge conduits

Figure III-23
Demolition of Intake Structure Above Elevation 8'6"

With a replacement sump and discharge path in place, SCE installed gates that permanently closed the SONGS 1 intake and discharge conduits. SCE filled the voids in the intake and discharge structures west of the gates that were located below Elevation 8'6" with low density grout.

SCE then demolished and removed all circulating system structures located above Elevation 8'6". storm drains and catch basins, SCE constructed a temporary yard sump in the area previously occupied by the circulating water pumps, which had been removed prior to this triennial period. SCE filled the voids within the intake structure culverts and foundations below Elevation 8' 6" with low density grout. Following the removal of these materials, this area was backfilled to grade and compacted.

e) Backyard, Fuel Storage Building, Yard Areas, and Miscellaneous

The "Backyard" area, in the northwest quadrant of the SONGS 1 site, was a radiological control area with restricted personnel access. It included above-ground structures such as the Ventilation Building and Ventilation Stack, the Component Cooling Water System and Pad, the upper and lower Sphere Doghouse, Valve Alley, and various tanks including the Refueling Water Storage Tank. It also included below-grade structures such as the Radwaste Pipe Trench. SCE dismantled and removed each of these systems and structures during this period. SCE shipped approximately 5 million pounds of contaminated debris from the "Backyard" to a licensed disposal facility.

Figure III-24
Demolition of Refueling Water Storage Tank

SCE also demolished and disposed of the Fuel Storage Building, including the spent fuel pool. The removal of the stainless steel spent fuel pool liner posed a unique challenge, as the cutting process resulted in razor-sharp edges on the debris. In addition, because the bottom of the spent fuel pool was several feet below the water table, it was necessary to de-water the area before the pool and foundations could be excavated, demolished, and removed. SCE shipped approximately 13 million pounds of materials from the Fuel Storage Building to a licensed disposal facility.

Figure III-25
Preparing Ventilation Stack for Demolition

Figure III-26
Removal of Spent Fuel Pool Stainless Steel Liner

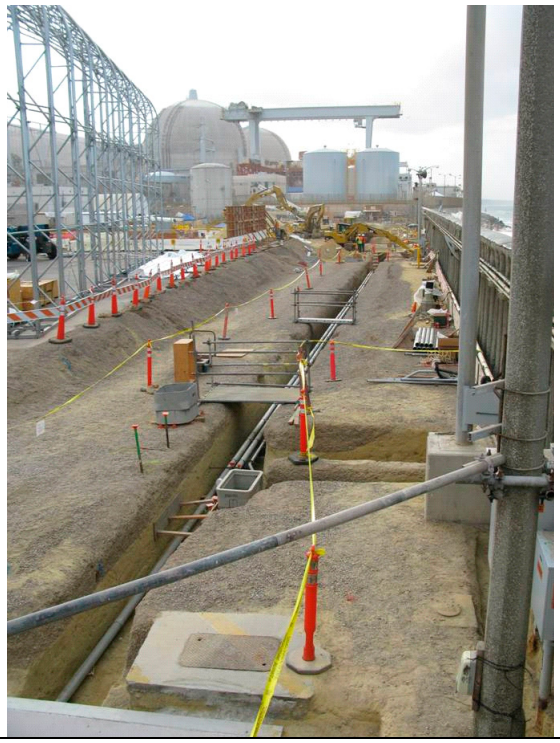
Figure III-27
Demolition of A50/A51 Building

Figure III-28
Excavation of Undergroung Piping

The "Yard" areas included portions of the Unit 1 site north, west, and south of the plant structures. The decommissioning of this area included the removal and disposal of a wide variety

of buildings, plant systems and components, and below-grade utilities and appurtenances. The buildings included A40/A41/A42, the Radioactive Materials Control Buildings; and A50/A51, the Health Physics Control Point Building. The plant systems included the Primary Plant Make-up Tank, the West Auxiliary Feedwater Pump, Station Service Transformers 2 and 4, and the two fire pumps. The below-grade utilities and appurtenances included Storm Drain system piping, catch basins, and many other buried pipes and conduits. SCE was able to free-release some materials from the "Yard" area, however, it was necessary to ship approximately 17 million pounds of these materials to a licensed LLRW disposal facility.

Figure III-29
Installation of SONGS 1 Utility Trench



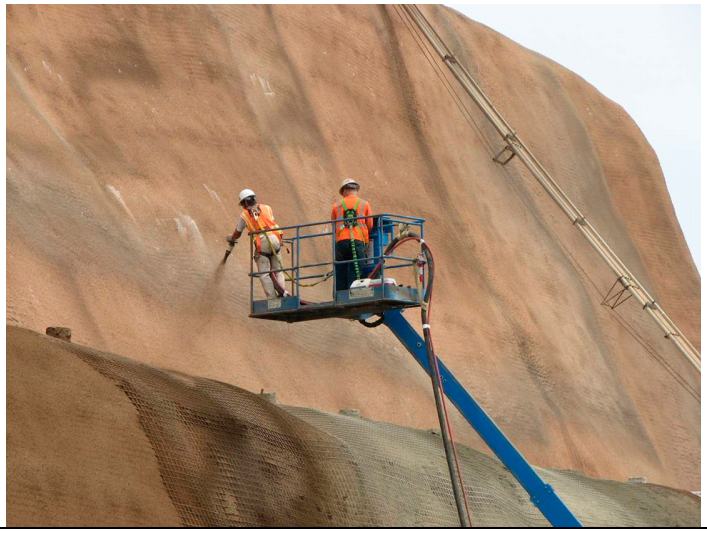
The "Yard" work scope also included the replacement of certain utilities on the SONGS 1 site that had been removed and replaced with temporary systems to support the "Cold and Dark" status required for decommissioning. SCE installed replacement electrical systems in a Utility Trench along the west boundary of the SONGS 1 site. SCE also installed a replacement fire water header. In addition, SCE performed maintenance on SONGS 1 site infrastructure items that are required

to ensure the long-term safe storage of the SONGS 1 spent fuel in the ISFSI. These include the SONGS 1 sea wall and the bluffs north of the ISFSI.

Figure III-30
Maintenance of SONGS 1 Sea Wall

Figure III-31
Maintenance of Bluff North of ISFSI

Figure III-32
Maintenance of Bluff North of ISFSI



SCE removed virtually all below-grade improvements in the SONGS 1 Yard area down to Elevation 8'6" except for those located in the southeast quadrant of the site. Because that area adjoins the Security Processing Facility, which is the primary personnel access/egress point to the SONGS 2 & 3 Protected Area, SCE included that work scope with the Phase III final site restoration activities.

Figure III-33
Excavation and Removal of Improvements in SONGS 1 Southwest Quadrant

Before backfilling excavated areas within the SONGS 1 site, SCE performed radiological surveys that are intended to satisfy the requirements of the final status surveys that will be required to terminate the NRC license. SCE established a grid system for the SONGS 1 site that allows radiological survey locations to be accurately identified using GPS technology or traditional survey techniques after former SONGS 1 landmarks were removed. SCE collected samples at survey locations identified by their grid locations and depths, and will retain the analyses and results to demonstrate the radiological status of the SONGS 1 site as required for NRC license termination. SCE also developed an extensive documentary record of the radiological and environmental condition of the SONGS 1 site, and established procedures to ensure accurate tracking of the radiological and environmental impacts of future activities on the site.

Figure III-34
Preparing Yard Area for Radiological Survey

Figure III-35
Performing Soil Compaction Testing in SONGS 1 Yard Area

Upon completion of the radiological and environmental survey activities, SCE backfilled the Yard areas with clean materials, performed compaction as required to meet engineered

standards, and then paved the areas with asphalt to protect the site from future contamination, as well as to facilitate future use of the SONGS 1 site.

Figure III-36

Figure III-37
Placement of Asphalt in SONGS 1 Yard Area

f) Reactor Pressure Vessel (RPV) Relocation

In order to safely store the RPV package until it can be segmented into smaller pieces and shipped to a licensed disposal facility, SCE constructed a reinforced concrete pad in the northeast corner of the SONGS 1 site and transferred the RPV package to that location.

Figure III-38
Construction of Interim Storage Pad for
SONGS 1 Reactor Pressure Vessel Package

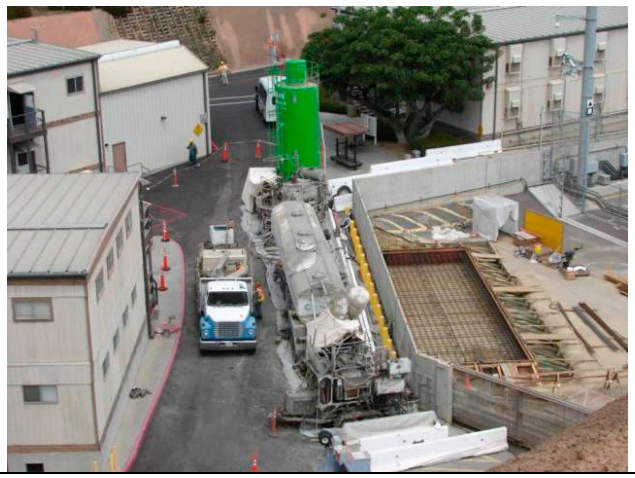


Figure III-39
SONGS 1 Reactor Pressure Vessel Package on
Interim Storage Pad

SCE currently projects that the SONGS 1 RPV package will be segmented and disposed of concurrently with the future segmentation and shipment of the SONGS 2 & 3 RPV's. This is currently projected to occur during the 2025-2026 timeframe. The costs to monitor and maintain the RPV until then are included in the estimate scope for Phase II of SONGS 1 decommissioning, and are discussed in Section IV.B.1.b below.

g) Transfer of Dry Spent Fuel Moving Equipment from SONGS 1 to SONGS 2 & 3

After the SONGS 1 spent fuel was placed in canisters in the SONGS 1 spent fuel pool and transferred to the ISFSI in 2004, the single failure-proof crane that had been temporarily installed at the SONGS 1 spent fuel pool was removed, and then reassembled at the SONGS 2 spent fuel pool, first to facilitate the removal of the SONGS 1 fuel stored there, and then to facilitate the removal of SONGS 2 fuel as required to support future SONGS 2 operations. The book value of the single failure-proof crane was transferred from SONGS 2 capital funds to offset contemporaneous decommissioning costs. Subsequently, after all SONGS 1 spent fuel stored in the SONGS 1, 2, and 3 spent fuel pools was removed to the ISFSI, the prime mover, transfer trailer, vacuum drying unit, rigging and lifting unit, fabrication and tooling, and spent fuel moving equipment was transferred to SONGS 2 & 3, and the fair market value was capitalized under SONGS 2 & 3 capital funding guideline, with SONGS 1 decommissioning funds being credited, thus reducing decommissioning costs.

Figure III-40
Ownership of Fuel Transfer Cask. Trailer, and Prime Mover's Fair Market Value Was Transferred and Capitalized following SONGS 2 & 3 Capital Funding Guidelines

2. Salvage Proceeds

As indicated in Section II.A above, 128 million pounds of the materials removed from the SONGS 1 site between July 1, 2005 and December 31, 2008 were not suitable for salvage because they could only be disposed of in licensed LLRW disposal facilities. Some of the remaining 15 million pounds of non-radiologically contaminated materials could be salvaged. As indicated in Footnote 16 above, SCE recovered $123,000 (100% share, 2008$) in salvage proceeds for these materials during this period, and used these proceeds to offset other decommissioning costs.

Most of the non-contaminated materials were scrap metals and concrete rubble. The scrap metals generally had salvage values that were greater than their shipping and disposal costs. Therefore, to ensure SCE benefited from the salvage value of the scrap metals, SCE retained contractors, through the competitive bidding process, to perform SONGS 1 decommissioning work who were experienced in salvage. The removal of scrap metals from the SONGS site was included in the total scope of their contracts. In this manner, SCE ensured that the salvage value of the scrap metals was reflected in the demolition contract prices.

In contrast, the salvage value of the concrete rubble would not have been sufficient to offset the costs SCE would have incurred for its shipping and disposal. However, SCE avoided incurring these costs by finding third parties who were willing to haul these materials from the SONGS site at their own expense.

IV.

SONGS 1 DECOMMISSIONING REMAINING WORK SCOPE

A. SONGS 1 Decommissioning Cost Estimating Methodology

1. Identification of SONGS 1 "As-Left" Condition and Remaining Work Scope

Section 4.2.2.2.b of the Settlement Agreement adopted in D.99-06-007 stated that during the Phase I period of SONGS 1 Decommissioning Work, the Utilities' triennial NDCTP applications shall include,

> "[a]n updated SONGS 1 Decommissioning Cost Estimate that identifies the remaining SONGS 1 Decommissioning Work to be performed based on a cost study. The new estimate of scope and cost may vary from the previous estimate due to unanticipated changes identified while performing the work during the previous three years."

The remaining work scope for SONGS 1 decommissioning consists of Phase II and Phase III. Phase II commenced on January 1, 2009, upon the completion of Phase I. In Phase II, SCE will continue to monitor and provide security for the SONGS 1 spent fuel in the ISFSI. Phase II will end after the DOE removes all SONGS 1 spent fuel from the site. SCE currently assumes this will occur by 2036 based on studies developed from the DOE Acceptance Priority Ranking & Annual Capacity Report (DOE/RW-0567), dated July 2004[18], and by subsequent developments and public statements made by the Director of the Office of Civilian Radioactive Waste Management. SCE's studies are based on an assumption that the DOE will open its permanent repository in 2020.[19] SCE also anticipates that it will complete disposal of the SONGS 1 reactor pressure vessel during the 2025-2026 timeframe.

Phase III of SONGS 1 decommissioning will occur concurrently with Phase III of SONGS 2 & 3 decommissioning. In Phase III, SCE will (1) dismantle and dispose of the ISFSI; (2) dispose of the remaining SONGS 1 below-grade materials and structural foundations; (3) submit a license termination plan to the NRC and terminate the NRC license; and (4) complete the final site restoration work. The updated SONGS 1 Decommissioning Cost Estimate assumes that Phase III will commence after the DOE has removed all SONGS 2 & 3 spent fuel from the site, which is currently

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[18] *See* Footnote 11.

[19] *See* Footnote 12.

estimated to occur in 2053.[20] The estimate also assumes SCE will complete Phase III within two years of the removal of all SONGS spent fuel from the SONGS site. SCE's cost estimate for the 2009 SONGS 1 decommissioning Remaining Work is based on executable planning studies for near-term activities (12 to 18 months). These studies identify the specific manner in which each task is to be performed, the project work sequence, and the forecast cost.

SCE first identified all SONGS 1 decommissioning work remaining to be completed. SCE then reviewed the 2004 SONGS 1 Decommissioning Estimate adopted in the 2005 NDCTP for each such activity, including (1) the scope and boundary of the work activity; (2) the weights and/or volumes of materials that would be removed within that scope of work; (3) visual inspections of the affected areas with representatives from every work group that would be involved; and (4) the tasks and resources required to complete each activity. Each work group, such as Engineering, Health Physics, and Construction, contributed its expertise to preparing an updated plan for performing the tasks required to complete each activity. SCE also identified tasks that (1) SCE would perform, and that (2) contractor resources would perform. SCE estimated labor costs based on corresponding labor rates, estimated crew sizes, and activity durations. The planning for activities scheduled later in the project is currently less detailed, but adequate for estimating purposes.

Due to the comparatively small area of the SONGS 1 site, as well as the operation of the ISFSI, effective management of the limited space available to stage equipment and to place dismantled materials continues to require significant project management attention in planning the work sequence. Past management decisions to return the rail line to service that leads into the SONGS 1 site and maintain operability of the motor operated gates to the SONGS 1 industrial area proved invaluable for moving material from the SONGS 1 site in a timely manner, thereby minimizing the potential for costly delays in the decommissioning project.

When available, SCE used actual contract prices to estimate the cost of Remaining Work for particular tasks based on the suppliers' analyses of the levels of effort required to perform those

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[20] *See* Footnote 7.

tasks. After SCE consolidated the plans, which were specific to identified tasks, into integrated schedules for the discrete project activities, SCE developed updated cost estimates for the activity plans, and passed the plans through decommissioning project management reviews. Then SCE consolidated them into a detailed, executable project plan and schedule. This project schedule established the sequence of the remaining work activities based on project priorities and constraints, and task interdependencies. SCE estimated the costs for activities based on the project schedule.

2. Forecast of Low-Level Radioactive Waste (LLRW) Disposal Costs

In A.02-03-039, the Utilities' NDCTP proceeding in 2002, the Utilities applied an LLRW disposal rate of $72.60 per cubic foot (2001$) for SONGS 2 & 3, and SCE applied an LLRW disposal rate of $87.00 per cubic foot (2001$) for Palo Verde. Concurrently, in A.02-03-020 PG&E applied a LLRW disposal rate of $404.00 per cubic foot for Diablo Canyon and Humboldt Bay 3. Each of those rates was described as a composite rate applicable to the Class A, B, and C LLRW generated during the decommissioning of each respective facility. Unable to reconcile those three seemingly disparate rates, the Commission ordered all three utilities to recalculate their decommissioning cost estimates applying a composite LLRW disposal rate of $200 per cubic foot (2001$) in D.03-10-014 and D.03-10-015.

Three years later, absent any new bases for adjusting that Commission-ordered composite rate, the three utilities escalated that rate to $248.62 (2004$) and used it in their A.05-11-008 and A.05-11-009 filings. In that proceeding, the composite rate was opposed by the DRA, which argued that it was too high, and by an Intervenor who argued that it was too low. Therefore, in D.07-01-003, Ordering Paragraph No. 7, the Commission ordered that "Edison, SDG&E, and PG&E shall serve testimony in their next triennial review of nuclear decommissioning trusts and related decommissioning activities that demonstrates that they have made all reasonable efforts to conservatively forecast the cost of low level radioactive waste storage."

In 2008, SCE, acting for itself and as agent for SDG&E, and PG&E, jointly retained a consultant to perform an objective analysis of representative LLRW disposal rates available throughout the industry, and to develop a projected rate for use in this proceeding.

Consistent with knowledge already possessed by the utilities, the consultant confirmed that the disposal facilities have complex rate structures for different types of LLRW based on an array of factors such as the types and densities of waste materials, differences in packaging configurations, radioactivity content, etc. In addition, the disposal facilities have varied pricing levels for similar types of LLRW based on specific contractual arrangements with different customers. Through the use of non-disclosure agreements, the consultant was able to review the rate schedules of and terms of numerous different contracts with LLRW disposal facilities, and identify representative LLRW disposal rates for each facility. The consultant then evaluated the probability that each of the disposal facilities, and their corresponding rates, would be accessible to LLRW generators from California when their decommissioning projects are scheduled to begin. On the basis of this analysis, the consultant proposed a composite LLRW disposal rate.

When the utilities reviewed the composite LLRW disposal rate initially proposed by the consultant, it became apparent that it is no longer appropriate to use a single composite LLRW disposal rate. This is because each decommissioning project has different ratios of waste in the various LLRW disposal cost categories. To mitigate this situation, the consultant developed distinct disposal rates for two general categories of Class A LLRW, as well as distinct rates for Class B LLRW and Class C LLRW. This allowed the cost estimators to apply the appropriate disposal rates to the corresponding quantities of materials in each LLRW cost category.

Each LLRW disposal rate contained in the consultant's study consists of a base disposal rate and a Southwestern LLRW Disposal Compact Export Fee. The two Class A LLRW disposal rates also include a Utah State tax. Therefore, the joint LLRW disposal cost study arrived at the following disposal rates, which are shown in Table IV-2 below:[21]

[21] The joint LLRW disposal cost study, "Establishing an Appropriate Disposal Rate for Low Level Radioactive Waste During Decommissioning, dated July 2008, by Robert A. Snyder, NEWEX, is provided as a Workpaper to this exhibit.

Table IV-2
Low Level Radioactive Waste Disposal Costs
(per cubic foot, 2008$)

	Base Rate	SW Compact Export Fee	Utah Tax	Disposal Rate
Class A Bulk (e.g., Crushed Concrete Rubble, Scrap Metal)	$57.00	$1.35	5%	$62.00
Class A General (e.g., Containerized Waste, High Density/Oversized Packages, Large Components)	$223.00	$1.35	12%	$252.00
Class B	$2,915	$1.35	N/A	$2,917.00
Class C	$2,915	$1.35	N/A	$2,917.00

3. Appropriateness and Conservatism of Contingency Factor

In D.07-01-003, Ordering Paragraph No. 8, the Commission ordered that "Edison, SDG&E, and PG&E shall serve testimony in their next triennial review of nuclear decommissioning trusts and related decommissioning activities that demonstrates that they have made all reasonable efforts to conservatively establish an appropriate contingency factor for inclusion in the decommissioning revenue requirements."

"Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook" as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating to estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur."

SCE researched cost engineering industry literature to identify accepted practices for applying contingency to construction projects in varying stages of planning. The consensus among all sources is that the contingency factor applied to any cost estimate should reflect several factors, including but not limited to the then-current planning status of the estimate, and the complexity of the project, the extent to which environmental restoration is included in the work scope, etc.[22] The contingency factor should also reflect the nearness or remoteness of the project start date.

[22] *See* Chapter 11 of U.S. Department of Energy (DOE) Decommissioning Implementation Guide DOE, G 430.1-1, March 28, 1997.

SCE has applied many lessons learned from Phase I of the SONGS 1 Decommissioning Project to its 2009 SONGS 1 Decommissioning Cost Study, 2009 SONGS 2 & 3 Decommissioning Cost Estimate and 2009 Palo Verde Decommissioning Cost Estimate. Nevertheless, these estimates remain conceptual estimates. No detailed engineering studies for these work scopes have been performed. No procurement activities have commenced and no contracts have been signed. Moreover, whereas SCE had gained first-hand experience in many decommissioning activities, some activities in the future work scopes, such as reactor vessel segmentation, packaging, shipping, and disposal, have not yet been performed anywhere in the industry. Therefore, SCE has only been able to include allowances for those work scopes in their cost estimates. In addition, no nuclear facility has been required to perform environmental restoration work to the extent that SCE may be required to cleanup the SONGS site in order to terminate its easement-lease with the U.S. Department of the Navy. And none of these decommissioning activities will commence until more than a decade into the future. Therefore, the planning for none of these estimates currently meets the threshold of a "Detailed Estimate" as defined in the industry literature.

The planning status in the literature that precedes a "Detailed Estimate" is "Budget, Authorization, or Control," or a "Preliminary Estimate."[23] The consensus in the industry literature, including sources from the U.S. Department of Energy (DOE)[24], the Association for the Advancement of Cost Engineering International (AACEI)[25], and the Electric Power Research Institute[26] is that an appropriate contingency factor for cost estimates in this stage of development should fall within a range of 15% to 30%. When the work scope requires environmental restoration activities, the contingency factor is generally increased.[27]

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[23] Stanford Institute of Economic Policy Research, SIEPR Discussion Paper No. 04-05, "Cost Contingency as a Standard Deviation of the Cost Estimate for Cost Engineering," dated February 9, 2004. *See* Table 1 on page 1.

[24] Id., page 11-3.

[25] Association for the Advancement of Cost Engineering International (AACE) Recommended Practice No. 18R-97. In particular, *See* page 2 of 9.

[26] *See* Footnote 22, abstract.

[27] *See* Footnote 21, pages 11-7 through 11-9.

In addition, PG&E identified several other documents, including several documents originating from the U.S. Nuclear Regulatory Commission (NRC), that specifically identify 25% as an appropriate contingency factor for nuclear plant decommissioning cost estimates. PG&E compiled and summarized these documents in a document titled, "Technical Position Paper for Establishing an Appropriate Contingency Factor for Inclusion in the Decommissioning Revenue Requirements", dated February 2008.[28] In summary, each of the industry and regulatory documents cited in this technical position paper concluded that it is appropriate to add a contingency factor of 25% to the sum of all estimated decommissioning costs because the 25% contingency factor provides reasonable assurance for unforeseen circumstances that could increase decommissioning costs, and should not be reduced or eliminated simply because foreseeable costs are low.[29]

For all of these reasons, SCE believes that a contingency factor of 25%, applied to all estimated decommissioning costs including LLRW disposal costs, is both conservative and appropriate for use in each of its decommissioning cost estimates in this proceeding.

B. Cost Estimate For Remaining SONGS 1 Decommissioning Work

Table IV-3 provides a summary of the estimated costs for the SONGS 1 Decommissioning Remaining Work as of January 1, 2009.

[28] PG&E's Technical Position Paper for Establishing an Appropriate Contingency Factor for Inclusion in the Decommissioning Revenue Requirements.

[29] Id., at page 5 of 12.

Table IV-3
Cost Estimate for Remaining SONGS 1 Decommissioning Work

Line No.	San Onofre Nuclear Generating Station Unit 1	2009 Estimate (100% Share, 2008$ x 1,000)
1.	Phase II Costs	
A.	Post-Phase I Demobilization and Documentation Close-out	$7,942
B.	Spent Nuclear Fuel Security and Maintenance	$2,063
C.	Offshore Conduits Disposition	$10,003
D.	Reactor Pressure Vessel Segmentation	$37,724
E.	Reactor Pressure Vessel Maintenance, Shipment, and Disposal	$52,032
F	Move SONGS 1 Spent fuel from ISFSI to DOE Transporter	$2,688
2.	Phase III Costs	
A.	ISFSI Demolition and Disposal	$3,854
B.	Miscellaneous Structure Removal and Disposal	$11,050
C.	Foundation Removal and Waste Disposal, Backfill, and Compaction	$53,155
D.	NRC License Termination and Final Site Restoration	$3,855
3.	TOTAL	$184,366

A brief discussion of these major cost categories is provided below. The remaining SONGS 1 decommissioning scope of work includes activities that began prior to June 30, 2005 that are not yet completed work. SCE expended approximately $11 million (100% share, 2004$) for those activities. The NDCTP filing following their completion will describe them in detail; compare their actual costs to the then-Commission approved decommissioning cost estimate.

1. Phase II Costs

a) Post-Phase I Demobilization and Documentation Close-out

Upon completion of Phase I activities on December 31, 2008, SCE was required to demobilize the equipment and temporary structures that remained in use at the end of the project.

SCE was required to perform radiological surveys of all equipment, tools, and other assets before they could be released from the SONGS 1 site. Non-contaminated rental equipment was returned to the vendors. Non-contaminated equipment or tools were salvaged. Remaining lumber was surveyed. Contaminated pieces were cut to fit into shipping containers and transported to a licensed disposal facility. Contaminated rental equipment was purchased from vendors at its remaining book value, and then dismantled, packaged, and shipped to a licensed disposal facility. Other contaminated equipment was salvaged, sold to NRC-licensed facilities. This equipment was packaged according to corresponding NRC and DOT standards, and shipped by licensed transporters. Temporary structures used to support the SONGS 1 decommissioning project were surveyed, and then disposed of appropriately or cleaned out and salvaged.

In addition, a substantial document closeout effort was required after Phase I activities were completed. Project cost and schedule documents were finalized. A Phase II and III Plan was developed to provide guidance for future maintenance and decommissioning activities based on current knowledge of the SONGS 1 site. Radiological survey records were compiled into volumes that will be available to support future termination of the NRC License. Engineering drawings were developed to detail the "as-left condition" of the SONGS 1 site, including three-dimensional CAD drawings of the deep foundations and other remaining site features, were prepared as references for future reuse of the site, and to assist with eventual final site restoration activities.

b) Spent Nuclear Fuel Security and Maintenance

SCE currently projects that the DOE will remove the last SONGS 1 spent fuel and GTCC waste from the ISFSI in 2036. Federal regulations require SCE to provide physical protection for the spent fuel.[30] This includes maintaining the physical security barriers around the spent fuel, continually monitoring the ISFSI from centralized control room, and performing periodic physical inspections of the AHSMs and security systems.

[30] The NRC License for the SONGS ISFSI was issued under the General License provisions of 10 C.F.R. 72.210. The 10 C.F.R. 72.212(b)(5) physical protection requirements are applicable to the SONGS ISFSI. .

Since the ISFSI also contains spent fuel from SONGS 2&3, and fuel from those units will continue to be placed in the ISFSI each year, SONGS 1 will be responsible only for its pro rata share of ISFSI security and maintenance costs.

c) Offshore Conduits Disposition

In October 2005, the California State Lands Commission approved an amendment to the Easement/Lease Agreement for the SONGS 1 offshore cooling water intake and discharge conduits. This amendment superseded the requirement to excavate and remove the conduits with a requirement to remove only the vertical portions of the conduit structures that penetrate above the ocean floor. This revised requirement was deemed to be the environmentally preferred disposition alternative.

In 2010-2011, SCE will retain a specialty contractor to remove the vertical terminal structures located at the end of each conduit at the first joint below the sea floor, and to install "mammal barriers" over the remaining openings. This will allow the conduits to infill with sea floor material. In addition, the contractor will locate the nine manhole risers that are located at 500-foot intervals along the conduits (i.e., five on the intake conduit and four on the discharge conduit), temporarily excavate around them down to the tops of the conduits, cut off the risers flush with the conduits and remove the manhole covers, and then install "mammal barriers" over the resulting openings to allow the conduits to infill there, too. The primary input used for this cost estimate is a vendor contract that was awarded in 2005 but was subsequently cancelled under an agreement between SCE and the U.S. Department of the Navy to wait to perform the conduits disposition work until 2010. The estimated costs for permitting fees and staff support necessary to obtain the required permits (including attorney fees) have also been included in this estimate.

d) Reactor Pressure Vessel Segmentation

SCE was not able to ship the RPV package to the Barnwell LLRW disposal facility in 2004 as planned. As a result, SCE now plans to dispose the SONGS 1 RPV package concurrently with the disposal of the SONGS 2 & 3 RPVs during the 2025-2026 timeframe. Due to the logistical challenges associated with shipping such a large, heavy package, SCE now projects that it may cut or "segment" the RPV package into several smaller, lighter pieces to allow transportation on the U.S.

rail system to a future disposal site for LLRW Class C waste, which is assumed to be available within 1500 miles of the SONGS site. Segmentation is believed to be the bounding cost option.

Segmentation of a Class C RPV package similar to the SONGS 1 package has never before been attempted in the nuclear industry. A detailed radiological characterization study of the SONGS 1 RPV package has not yet been performed, nor has a detailed segmentation plan been engineered. Although SCE anticipates that the radioactivity concentration in the RPV package will have decayed sufficiently to allow segmentation with reduced radiological doses to the workers than would have been experienced if this activity had been performed during Phase I of the Decommissioning Project, however, SCE has not yet confirmed that hypothesis. Therefore, SCE developed an allowance for the projected SONGS 1 RPV segmentation costs.

e) Reactor Pressure Vessel Maintenance, Shipment, and Disposal

The SONGS 1 RPV will remain on the pad in the northeast corner of the SONGS 1 site until it is segmented during the 2025-2026 timeframe. Although minimal in scope, the RPV will require occasional ongoing maintenance, including radiological surveys and painting. A small share of the security costs for the SONGS 1 site will also attributed to the RPV.

After the RPV is segmented into pieces capable of being shipped within the existing transportation infrastructure constraints, the RPV segments will be packaged, loaded onto a transportation devise, and shipped to a disposal site for LLRW Class C waste, which is assumed to be available within 1500 miles of the SONGS site, consistent with the assumption for such a facility in the SONGS 2&3 Decommissioning Cost Estimate. SCE has not performed a detailed engineering study for packaging, loading, and shipping the RPV segments. SCE also has no authoritative disposal rate for the RPV segments. SCE applied the disposal rate for Class C LLRW of $2,917 per cubic foot that was provided in the Joint LLRW Burial Cost Study to the RPV's volume. Therefore, SCE developed an allowance for the projected SONGS 1 RPV maintenance, shipment, and disposal costs.

f) Move SONGS 1 Fuel from ISFSI to DOE Transporter

Under the Standard Contract with the DOE, the DOE will take title to the SONGS 1 spent fuel and Greater Than Class C (GTCC) waste after it is placed on their transportation device.[31] Therefore, SCE is required to incur the cost of transfering the canisters from the ISFSI to the DOE transporter. SCE is able to project the cost to move the 17 SONGS 1 spent fuel canisters and the one SONGS 1 GTCC canister based on the costs previously incurred to transfer the canisters from the SONGS spent fuel pools to the ISFSI.

2. Phase III Costs

a) ISFSI Demolition and Disposal

SCE currently projects that the DOE will remove the SONGS 1 spent fuel from the ISFSI in 2036. However, due to the DOE's fuel acceptance constraints and priority ranking schedule, SCE projects that spent fuel from SONGS 2 & 3 will remain in the ISFSI until 2051. After the DOE removes the last SONGS 2 & 3 spent fuel from the ISFSI, SCE will demolish and dispose of the ISFSI. The ISFSI demolition and disposal costs will be apportioned between SONGS 1 and SONGS 2 & 3 decommissioning funds based on a weighted average of the quantity of spent fuel from each unit that was stored in the ISFSI throughout its useful life.

b) Miscellaneous Structure Removal and Disposal

After the ISFSI is demolished, SCE will excavate, remove, package, ship, and dispose of all remaining storm drains within the SONGS 1 Industrial Area. Based on the removal of other SONGS 1 storm drains during Phase I, 100% of these storm drains are assumed to require disposal at a licensed facility. In addition, SCE will excavate and remove the electrical duct bank that is located beneath the ISFSI. This work scope also includes the removal and disposal of all other systems,

[31] At page 3, paragraph 7 of U.S. DOE Contract for Disposal of Spent Nuclear Fuel and/or High Level Radioactive Waste Between U.S. DOE and Southern California Edison Company (Standard Contract), dated June 10, 1983, "delivery" is defined as "the transfer of custody, f.o.b. carrier, of spent nuclear fuel or high level radioactive waste from Purchaser to DOE at Purchaser's civilian nuclear power reactor or such other domestic site as may be designated by the Purchaser and approved by DOE.". Note that the Standard Contract does not explicitly identify its obligation to take title to GTCC, which is not, by definition, high level radioactive waste. However, the DOE has separately acknowledged that it is obligated to remove and dispose of the GTCC waste.

structures, and features installed above or below ground, including the SONGS 1 seawall and all asphalt installed on the SONGS 1 site. Ten percent (10%) of the below-grade improvements, excluding the storm drains, are also assumed to require disposal at a licensed facility. SCE will also perform comprehensive radiological surveys for the southeast quadrant of the SONGS 1 Industrial Area, which was not surveyed during Phase I due to ongoing use of that area. After excavation of below-grade improvements, Health Physics will survey and release all excavation areas, and then perform final status surveys as required for termination of the NRC License.

c) Deep Foundation Removal, Disposal, Backfill, and Compaction

After all near-surface below-grade improvements are removed, SCE will install dewatering pumps as required to prepare the site for excavation of the remaining deep foundations. These primarily include the Containment foundation below Elevation 8' 6", and the Intake Structure culverts and foundations below Elevation 8'6".

The Containment foundation includes the three-foot thick concrete saddle that the Containment sphere rested upon. During Phase I, SCE filled the saddle with low density grout up to Elevation 7', and then placed an 18-inch concrete cap between Elevation 7' and Elevation 8' 6". All of this material is assumed to be non-contaminated. During Phase I, SCE also filled the voids within the Intake Structure culverts and foundations below Elevation 8' 6" with low density grout. SCE will excavate and remove all of this material, which extends from beneath the former location of the Turbine Building as far west as the sea wall. Ten percent (10%) of this material is assumed to be contaminated. The structures west of the sea wall will be abandoned in place consistent with amended CA State Lands Commission easement-lease agreement. All excavated areas will be surveyed and released by Health Physics, and then backfilled to grade and compacted.

d) NRC License Termination and Final Site Restoration

SCE will be required to demonstrate that the SONGS 1 site is free from residual radioactivity above the threshold specified in 10 C.F.R. 61 in order to terminate the NRC License. Therefore, SCE will perform a final status survey of the SONGS 1 site and remove of any remaining radioactive materials as required to terminate NRC License. Following termination of the NRC License,

SCE will remove any remaining site improvements and perform any other tasks required to meet specifications of the U.S. Department of the Navy in order to terminate the site easement-lease agreements.

C. Independent Review of Cost Estimate for Remaining SONGS 1 Decommissioning Work

SCE retained ABZ, Inc., (ABZ) to perform an independent review of the SONGS 1 decommissioning cost estimate.[32] ABZ determined that SCE's 2009 SONGS 1 decommissioning cost estimate was based on sound engineering assumptions and estimating principles.[33]

[32] ABZ was contracted to perform this same function for SONGS 1 in the previous NDCTPs in 2002 and 2005. ABZ Inc., is an engineering and management-consulting firm that has prepared decommissioning estimates and decontamination studies for more than thirty (30) commercial nuclear power plants, including Calvert Cliffs, Indian Point 2, Nine Mile Point 1 and 2, Seabrook, Shoreham, Three Mile Island 2, Trojan, and Vermont Yankee.

[33] A copy of the ABZ review is provided in the Workpapers for this exhibit.

Appendix A

Witness Qualifications

SOUTHERN CALIFORNIA EDISON COMPANY

QUALIFICATIONS AND PREPARED TESTIMONY

QUALIFICATIONS OF MICHAEL P. SHORT

Q. Please state your name and business address for the record.

A. My name is Michael P. Short, and my business address is 5000,South Pacific Coast Highway, San Clemente, California 92674-0128.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I became the Vice President of Engineering and Technical Services at the San Onofre Nuclear Generating Station in October 2008, and am the senior executive at the SONGS site responsible for the SONGS Unit 1 Decommissioning Project, the SONGS Independent Spent Fuel Monitoring Installation (ISFSI), and for the Decommissioning Estimates for SONGS 2 & 3 and Palo Verde. Prior to my current assignment, I have served as Director of Nuclear Oversight and Director of Systems Engineering. In these capacities, I have been responsible for managing the oversight activities of the decommissioning of San Onofre Unit 1, and of the design and construction of the Independent Spent Fuel Storage Installation for Units 1, 2, and 3.

Q. Briefly describe your educational and professional background.

A. I received my Bachelor of Science degree in Engineering from the University of California, Irvine in 1974. I worked as a Nuclear Reactor Plant Engineering for Westinghouse Electric Corporation and United States Navy Nuclear Reactors from 1974 to 1976. In 1976, I joined Southern California Edison as a Nuclear Plant Engineer performing system assessments, inspections and testing at San Onofre Nuclear Generating Station. Since joining Southern California Edison, I have held several technical management positions related to the project management, construction, and operation of the San Onofre Nuclear Generating Station.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor the Policy testimony in Exhibit SCE-1 "*Testimony On SONGS 1 Decommissioning Work Completed And Remaining Work Scope"* as identified in the Table of Contents above.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best judgment?

A. Yes, it does.

Q. Does this conclude your qualifications and prepared testimony?

A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY

QUALIFICATIONS AND PREPARED TESTIMONY

QUALIFICATIONS OF JORGE A. MORALES

Q. Please state your name and business address for the record.

A. My name is Jorge A. Morales and my business address is 5000 South Pacific Coast Highway, San Clemente, California 92674-0128.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am responsible for managing Phase I of the SONGS Unit 1 Decommissioning Project, the SONGS Independent Spent Fuel Monitoring Installation (ISFSI), and for the Decommissioning Estimates for SONGS 2 & 3 and Palo Verde.

Q. Briefly describe your educational and professional background.

A. I am a Licensed Professional Engineer in the State of California. I received my Bachelor of Science degree in Mechanical Engineering from the University of Puerto Rico in 1972. I worked as a Manufacturing Engineer with Emerson Electric through 1974. I received a Masters degree in Business Administration from the University of California, Irvine in 1980, and have over 30 years of experience in the power industry in engineering, construction, and maintenance of fossil fired and nuclear power plants.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor the non-Policy testimony in Exhibit SCE-1 "*Testimony On SONGS 1 Decommissioning Work Completed And Remaining Work Scope"* as identified in the Table of Contents above.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best judgment?

A. Yes, it does.

Q. Does this conclude your qualifications and prepared testimony?

A. Yes, it does.

Appendix B

Definitions

1. DEFINITIONS

1. **Clean Material:** Material that is not classified as LLRW, GTCC Radioactive Waste, or Spent Fuel.
2. **Commercial Disposal Methods:** Demolition debris from the SONGS 1 Decommissioning Project may be salvaged, recycled, or shipped to a local landfill, or transferred to a demolition contractor that incurs the cost of removal from the SONGS site.
3. **Commission:** The California Public Utilities Commission
4. **CPUC:** The California Public Utilities Commission
5. **Decommissioning Trust Funds:** Those externally managed, segregated funds collected from customers to pay the costs of decontamination and decommissioning of the Utilities' nuclear generating units.
6. **Department of Energy (DOE):** A department of the United States federal government charged with regulating, among other things, the ultimate disposal of spent nuclear fuel and GTCC radioactive waste generated by the civilian nuclear industry.
7. **Greater Than Class C (GTCC) Waste:** Waste with greater radioactivity content than the 10 C.F.R. 61.55 federal limits allow to be classified as Class C Low-Level Radioactive Waste.
8. **Independent Spent Fuel Storage Installation (ISFSI):** An on-site, seismically designed, federally licensed facility constructed to store spent nuclear fuel and associated radioactive materials until they are removed from the site by the U.S. Department of Energy. An ISFSI employs passive convective cooling in lieu of plant systems required for spent fuel pool operation.
9. **Interim Disbursements:** Withdrawals from the decommissioning trusts that are used to pay decommissioning costs prior to the Final Disbursements. Interim Disbursements are currently limited to 90% of the forecast decommissioning costs

approved by the CPUC. Final Disbursements are withdrawals of funds exceeding 90% of the forecast decommissioning costs approved by the CPUC. See Sections 2.01(5) and 2.01(6) of SCE's SONGS Decommissioning MTA's.

10. **Large Components:** The SONGS 1 large components include the reactor pressure vessel, three steam generators, and pressurizer. They contain varying amounts of radioactive contamination. The SONGS 1 reactor pressure vessel is 31 feet in length, 15 feet in diameter, and weighs 321 tons. The reactor pressure vessel head is 15 feet in diameter, 8 feet in length, and weighs 66 tons. Each steam generator is 45 feet in length, 13 feet in diameter, and weighs 209 tons, and the pressurizer is 43 feet in length, 8 feet in diameter, and weighs 105 tons.

11. **Low-Level Radioactive Waste (LLRW):** Materials containing concentrations of radionuclides or potential doses within the federal limits for shallow land or near surface burial at federally licensed LLRW disposal facilities.

12. **MCBCP:** Marine Corps Base Camp Pendleton.

13. **NDCTP:** Nuclear Decommissioning Cost Triennial Proceeding

14. **NRC:** Nuclear Regulatory Commission.

15. **Reactor Vessel Internals:** Internal non-spent fuel components of a reactor pressure vessel.

16. **Remaining Work:** A decontamination and dismantling activity is Remaining Work if: (1) the activity has not commenced or been completed in its entirety, and (2) the activity has not eliminated a specifically identifiable decommissioning liability. Decommissioning liability is eliminated when material is removed from the SONGS 1 site. For the ISFSI, Remaining Work is monitoring the fuel until it is removed from the SONGS site by the DOE and decommissioning the ISFSI.

17. **Safety Analysis Report:** A report submitted by a nuclear facility licensee that provides information needed by the NRC staff to perform a safety review of a design or activity associated with the licensed nuclear facility.

18. **Safety Evaluation Report:** The report prepared by the NRC to present findings and recommendations relating to the acceptability of the applicant's Safety Analysis Report. The Safety Evaluation Report identifies the bases for those recommendations and the recommended technical specifications.

19. **San Onofre Nuclear Generating Station (SONGS):** A nuclear generating station with two operating units and one shutdown unit located at Camp Pendleton in Southern California.

20. **SCE:** Southern California Edison Company.

21. **SDG&E:** San Diego Gas & Electric Company.

22. **SONGS 1:** A Pressurized Water Reactor (PWR) nuclear generating unit with a gross maximum capacity of 410 Megawatts electric (MWe) that began commercial operation on January 1, 1968. SONGS 1 was permanently shut down on November 30, 1992. SONGS 1 is located at the site in southern California that is common to SONGS 2 & 3.

23. **Spent Fuel:** Nuclear fuel that has been irradiated in a reactor vessel.