

Application No.: A.15-02-006
Exhibit No.: SDGE-02-A
Witnesses: Michael L. De Marco
Adam H. Levin
Tim Curtis
Tracy Dalu

UPDATED

PREPARED DIRECT TESTIMONY

IN SUPPORT OF SDG&E's 2014 SONGS COSTS

ON BEHALF OF

SAN DIEGO GAS & ELECTRIC COMPANY

(SDG&E Review Efforts)

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

April 1, 2015

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**UPDATED PREPARED DIRECT TESTIMONY
ON BEHALF OF SDG&E¹**

I. Summary of Testimony and Reasonableness Review Standard (M. De Marco)

In this Application, San Diego Gas & Electric Company (“SDG&E”) seeks authorization to recover its 2014 San Onofre Generating Station (“SONGS”) Operations & Maintenance (“O&M”), as billed by Southern California Edison Company (“SCE”) or incurred solely by SDG&E, and “non O&M” SONGS costs. For purposes of this Application, SDG&E assumes that (absent the Commission’s adoption of Southern California Edison Company’s (“SCE”) proposed reasonableness standard)² the reasonableness review standard employed by the Commission will be the “prudent manager” standard in this proceeding, specifically, “the prudence of a particular management action . . . depends on what the utility knew or should have known at the time that the managerial decision was made.”³

As a minority owner of SONGS, SDG&E was neither the Decommissioning Agent that incurs most decommissioning costs nor was it responsible for making decisions and managing activities during decommissioning in 2014. The Decommissioning Agent role is currently filled by SCE, the majority owner of SONGS and the Nuclear Regulatory Commission’s (“NRC”) designated licensee for title and possession of the spent fuel at SONGS. As a minority owner, SDG&E did not have the contractual power in 2014 to block or veto any of SCE’s decisions during SONGS decommissioning. Furthermore, the vast majority of SDG&E’s 2014 costs subject to the Commission’s reasonableness review now, are simply a subset of the total (100%) costs incurred by SCE at SONGS. As it relates to this point, the Commission has previously recognized SDG&E’s limited role as a 20% minority owner and that its ability to influence

¹ Ordering Paragraph 4 of D.14-11-040 requires SDG&E to submit updated testimonies in support of its Updated Application by April 1, 2015. Therefore, SDG&E is providing this Updated SDGE-02-A in compliance with the Commission’s requirement. SDGE-02-A supersedes the previously submitted SDGE-02. The differences between SDGE-02-A and SDGE-02 are non-substantive errata, as depicted in the Change Log provided at the end of this document.

² In Ex. SCE-01 in support of the Joint Application, A.14-12-007, SCE proposes an annual revised reasonableness standard. Ex. SCE-01 “Testimony On The Nuclear Decommissioning Of SONGS 2 & 3” – Page 42, Lines 16-21. SCE is advocating a return to a standard formerly used by the Commission. See, generally, SCE’s Application for Rehearing of D.14-12-082 in proceeding A.12-12-012. SDG&E’s assumption that the Commission will apply the “prudent manager” standard in this proceeding should not be taken as a lack of support by SDG&E for SCE’s proposals in A.14-12-007 or other applications.

³ D.14-12-082 at 14 (2012 Nuclear Decommissioning Cost Triennial Proceeding Phase 2).

1 SCE's expenditures is limited.⁴

2 Therefore, when applying the reasonableness review standard to SDG&E's expenditures
3 for 2014, it is important to take into account SDG&E's limited role at SONGS. Besides
4 fulfilling its financial obligations commensurate with SDG&E's 20% ownership of the facility,
5 SDG&E's traditional role at SONGS as a minority owner has been to review SCE's actions and
6 provide oversight and feedback concerning SCE's activities and costs, to the extent possible. As
7 a minority owner, SDG&E has a responsibility to fund its share of decommissioning work.
8 SDG&E is not the NRC-recognized agent responsible for the actual decommissioning work itself
9 and thus, is not making "managerial decisions" concerning the specific type of work to undertake
10 at SONGS during decommissioning.

11 The testimony that follows describes SDG&E's continued involvement at SONGS as a
12 "reviewer of" and "commenter on" major decommissioning activities at SONGS in 2014, as well
13 as SDG&E's own (100%) costs. In Chapter 2 below, I describe my role at SONGS as an
14 "observer" of SCE through my role as SDG&E's on-site representative and my participation in
15 and observations of SCE's decision-making processes for many of the major decommissioning
16 activities undertaken in 2014.

17 Cognizant of its own lack of expertise in nuclear decommissioning, SDG&E engaged the
18 services of nuclear decommissioning and spent fuel expert, Mr. Levin, to provide SDG&E an
19 independent expert assessment of SCE's decommissioning efforts at SONGS relative to industry
20 practices and NRC mandates. Chapter 3 herein provides the testimony of Mr. Levin, and his
21 expert review of many of SCE's major decommissioning activities in 2014.

22 As part of its involvement at SONGS and to ensure accurate accounting, SDG&E tracks
23 actual costs against SCE's internal budgets, to the extent possible. Therefore, the testimony of
24 Mr. Curtis in Chapter 4 describes SDG&E's efforts to compare amounts incurred by SCE to
25 SCE's stated budget and investigate the reason for variances, if any.

26 Similarly, Ms. Dalu provides testimony in Chapter 5 describing SDG&E's review of SCE
27 invoices and ongoing efforts to align SDG&E's SONGS amounts to the 2014 Decommissioning
28 Cost Estimate ("DCE") cost categories.⁵

29 In sum, the testimony provided in Ex. SDGE-02-A describes SDG&E's efforts to review

⁴ D.06-11-026 at 12.

⁵ The DCE has been provided as Attachment B to SDGE-01-A.

1 and provide feedback on SCE's activities and resulting costs at SONGS, as well as oversee
2 SDG&E's internal costs. Based on the information made available to SDG&E and because of its
3 review and oversight, SDG&E believes the costs that SDG&E incurred related to SONGS in
4 2014 were reasonable.

5 **II. SDG&E Overview of Initial Decommissioning Activities at SONGS in 2014**
6 **(M. De Marco)**

7 My testimony herein describes my efforts on behalf of SDG&E to provide review and
8 feedback on SCE's major decommissioning activities at SONGS during 2014. I have reviewed
9 SCE's actions and decision-making in many ways. As SDG&E's SONGS Site Representative, I
10 personally observed SCE and sub-contractor employees engaged and focused on preparing the
11 facility for decommissioning. SCE has provided me with unrestricted access to the facility,
12 responded to SDG&E inquiries, and supported my efforts to provide SDG&E employees with
13 access to the facility. In addition to the monthly executive level co-owner meetings already
14 taking place at SONGS, SCE's decommissioning director hosts a weekly co-owner meeting to
15 discuss progress with current activities, identify and explain future activities, and seek co-owner
16 review and comment. I attend those weekly meetings on behalf of SDG&E. I have attended
17 presentations and meetings concerning vendor selections. Finally, I have frequently provided
18 SDG&E feedback or concerns to SCE management. Descriptions of my review efforts by major
19 activities undertaken in 2014 are provided below.

20 To SDG&E's knowledge and belief, and based on the information SCE has made
21 available to SDG&E, SCE approached the major SONGS decommissioning activities
22 reasonably in 2014, and the resulting costs that SDG&E incurred related to those activities were
23 reasonable. Furthermore, the costs that SDG&E incurred in 2014 overseeing those activities
24 (such as my actions described herein) were reasonable.

25 **A. Initial Decommissioning Planning and Activities**

26 **i. Retention of Decommissioning Advisor**

27 Realizing the need for independent decommissioning expert advice, SCE procured Areva
28 as the Decommissioning Advisor through a solicitation process with recognized industry
29 vendors. The decommissioning advisor's role is to provide a review of the decommissioning
30 planning work from an independent perspective. Areva has a "deep bench" of experienced

1 personnel in all aspects of decommissioning and spent fuel management. This allows Areva to
2 employ industry experts with the experience and capabilities that correspond favorably with the
3 decommissioning work occurring at SONGS.

4 As part of the weekly co-owner meetings, I followed the progress of SCE's competitive
5 solicitation efforts to secure the decommissioning advisor and provided SDG&E's feedback
6 concerning its efforts regarding a decommissioning advisor. For example, SDG&E urged SCE
7 to have two separate entities serve as decommissioning advisor and decommissioning cost
8 estimator when SCE was contemplating no such restriction. Ultimately SCE retained two
9 different vendors for those roles. In the end, I reported to SDG&E senior management that SCE
10 procured Areva, a qualified entity to serve as Decommissioning Advisor, through what, in my
11 opinion and based on information provided to me by SCE, was a reasonable and thorough
12 selection process.

13 **ii. Development of a New Decommissioning Cost Estimate**

14 While SONGS was still operating and producing power, SONGS Unit 2 & 3 DCEs were
15 developed by ABZ, Inc. for SCE with the intention of determining if the SONGS
16 decommissioning trusts were sufficiently funded to pay for decommissioning responsibilities and
17 if not, to calculate required ratepayer collections to the trusts. ABZ based its estimates in part on
18 commercial nuclear industry information and analogous decommissioning data used to create
19 other decommissioning cost estimates for other nuclear facility operators.

20 SONGS entered the decommissioning period in June 2013. NRC requirements⁶ specify
21 that a detailed site-specific cost estimate must be submitted to the NRC within 2 years of
22 shutdown. This requirement changes the purpose of the decommissioning cost estimates from
23 estimates for trust fund collection purposes to estimates for an executable decommissioning plan
24 and schedule –essentially a ‘bottom up’ estimate.

25 SCE held a competitive solicitation process to select a vendor to draft the new DCE. I
26 attended SCE's co-owner solicitation overview meetings in early November 2013. SCE assessed
27 the prospective vendors for the new DCE from two main perspectives: 1) technical capability
28 and 2) commercial viability. The technical review was conducted primarily by SCE engineering
29 while the commercial review was conducted primarily by SCE procurement. I reviewed SCE's

⁶ 10 CFR 50.82(a)(8)(iii) & (iv).

1 solicitation evaluation and spoke with SCE about its selection process. SCE narrowed the
2 bidders down to two vendor finalists in late November. In December 2013, SCE senior
3 management approved the selection of the Energy *Solutions* (“ES”)/Chicago Bridge & Iron
4 (“CBI”) consortium.⁷ Based on information provided by SCE, in my judgment, SCE’s
5 procurement process was impartial and competitive and its assessment of the potential DCE
6 vendors was thorough, resulting in the selection of ES/CBI, a highly qualified vendor with
7 decommissioning and decommissioning cost estimate creation experience, for the production of
8 a detailed site specific DCE.

9 SCE conducted a project kickoff meeting in January 2014 and the first phase DCE draft
10 was completed in March of 2014. During May 2014, the second phase DCE drafts were
11 circulated among the SONGS co-owners for review and comment. SDG&E, along with Mr.
12 Levin, conducted an in-depth review of the drafts and I conveyed SDG&E’s comments to SCE.
13 SDG&E’s comments and concerns were addressed and, to the extent appropriate, incorporated
14 into the DCE draft. In August 2014, SDG&E received the updated DCE. SDG&E again
15 reviewed the draft and provided additional feedback. SDG&E also provided its internal
16 (SDG&E only; 100%) costs to SCE for inclusion in the DCE. In September 2014, SCE reviewed
17 our comments and provided responses for each comment in subsequent meetings. The DCE was
18 subsequently submitted to the NRC in late September 2014.

19 Throughout the DCE development, SDG&E provided feedback, which was incorporated
20 (when appropriate) into the final document. Based on its knowledge and on information
21 provided by SCE, SDG&E believes the resulting DCE reflects an industry-accepted approach
22 and takes into consideration the uniqueness of the SONGS site and particular SONGS attributes.

23 **B. Implementation of Decommissioning Project Planning**

24 **i. Preparation of Site for Transition to Decommissioning General** 25 **Contractor**

26 SDG&E believes that a majority of SONGS decommissioning should be undertaken by a
27 qualified Decommissioning General Contractor (“DGC”)⁸ that has experience in the unique area
28 of decommissioning. In late 2013, SCE began meeting with experienced decommissioning

⁷ ES owns and operates a low-level radiation waste facility in Clive, Utah. Both CBI and ES have experience in decommissioning nuclear facilities, for example, at Exelon’s Zion Station.

⁸ SDG&E and SCE previously referred to the DGC as the Decommissioning Operations Contractor or “DOC” in Commission filings.

1 vendors to collect information on the most recent decommissioning practices and to assess each
2 vendor's capabilities related to fulfilling upcoming scopes of work at SONGS including, but not
3 limited to, the decommissioning advisor, the DGC, regulatory submittal preparation, engineering
4 analysis, and the preparation of various independent scopes of work. These meetings with
5 vendors have continued to take place, with the most recent meeting occurring in August 2014. I
6 attended many of these meetings and reviewed several SCE's assessments of potential vendors.⁹

7 One of the key findings from these introductory meetings was that completing some
8 major activities prior to the arrival of the DGC at SONGS would be advantageous because such
9 activities would clarify the scope of work for the DGC. Such activities include, but are not
10 limited to, the completion of the DCE, the Cold and Dark Initiative, and the Independent Spent
11 Fuel Storage Installation ("ISFSI"). SDG&E agrees that completing these activities prior to the
12 DGC's arrival at SONGS is a reasonable approach because undertaking these activities in 2014
13 and 2015 will help define the scope of work and activities required for the DGC.

14 **ii. The Cold and Dark Initiative**

15 Several projects are already underway to prepare SONGS for the DGC, and many of
16 them are components of the 'Cold and Dark' Project. The 'Cold and Dark' name alludes to
17 SONGS systems being placed in the safest configuration for the DGC to begin tearing down and
18 removing the facility. This is a familiar concept within the decommissioning industry to
19 improve personnel safety. During the Cold and Dark Initiative, SONGS systems not required for
20 maintaining the SONGS spent fuel will be depressurized and drained, thus rendered 'cold.'
21 Likewise, systems not required for maintaining the SONGS spent fuel will be de-energized and
22 thus rendered 'dark.'

23 I reviewed SCE's on-going Cold and Dark planning efforts and proposed plans and also
24 sought peer review by SDG&E's outside decommissioning expert Mr. Levin to make sure SCE's
25 proposed approach was sound and consistent with industry practices. Furthermore, by
26 participating in planning and review meetings, I have been able to help protect SDG&E and its
27 customers' interests by ensuring continued service at the 12 kV level for local customers and the
28 continuation of unimpaired operation of the SDG&E switchyard during the decommissioning
29 process.

⁹ SCE prepared and issued a Request for Information ("RFI") and subsequent Request for Proposal ("RFP") for DGC in 2014. Final bids and the selection of the DGC are expected in 2015, with the DGC contracted by early 2016.

1 use in U.S. nuclear facilities.¹⁰ SCE identified two prevalent technologies and through SCE's
2 competitive solicitation process Holtec was selected to: 1) design and construct the ISFSI pad; 2)
3 construct the storage modules that would hold the spent fuel; and 3) safely and efficiently
4 transfer the fuel from the spent fuel pools to the ISFSI storage location. The selection was
5 completed in late December 2014 so Holtec is not expected to begin work (or incur costs) until
6 2015. I reported the final vendor selection to SDG&E senior management in December 2014.

7 During the solicitation process, I attended the finalists' vendor presentations at SONGS,
8 followed SCE's solicitation progress through the weekly co-owner meetings, and conferred with
9 Mr. Levin on the industry viability of the ISFSI storage technologies that SCE identified. In my
10 opinion, based on the information provide by SCE, SCE's solicitation process was competitive
11 and impartial.

12 **III. SDG&E Reasonableness Review Of The Decommissioning Activities Undertaken At** 13 **Songs Units 2 & 3 During 2014 (A. Levin)**

14 The purpose of my testimony is to provide my expert opinion regarding the
15 decommissioning activities undertaken at SONGS during 2014, and whether they were
16 reasonably undertaken in light of nuclear decommissioning industry best practices. SDG&E has
17 retained me as a decommissioning expert. Part of my role is to continually review and provide
18 my expert opinion on the reasonableness of decommissioning activities undertaken at SONGS in
19 the context of the broader nuclear decommissioning industry.¹¹ My testimony here addresses
20 decommissioning activities at SONGS during 2014.

21 SONGS decommissioning of Units 2 & 3 is proceeding in a manner I would expect,
22 based upon my prior and current industry experience. It is my opinion, based upon the
23 information that I have received, that the proper activities are being performed at this stage of the
24 SONGS decommissioning project and thus, are reasonable.

¹⁰ At the SONGS Community Engagement Panel's behest, SCE also investigated a technology emanating from Germany, but eliminated it as a possible option because it has not been approved by the NRC, and any such approval would result in a very prolonged assessment period before it could be used at SONGS.

¹¹ Please see the direct testimony of Mr. DeMarco, Chapter 2 above, for a description of SDG&E's oversight of the particular SONGS activities, and the direct testimonies of Mr. Curtis and Ms. Dalu, Chapters 3 and 4 below, respectively, for descriptions of SDG&E's review of the resulting costs in 2014.

1 **A. Introduction**

2 During my 37-year career in the commercial nuclear industry, I have participated in 11
3 major decommissioning projects.¹² I have performed or participated in radiological
4 characterizations of reactor pressure vessels and internals, historical site assessments, design and
5 installation of dry cask storage technology, development of radiological release standards,
6 selection of and contract negotiations with decommissioning operations contractors, and general
7 oversight of decommissioning projects.

8 In my roles as Technical Advisor for TLG Services, Inc. (decommissioning cost
9 estimators) and Director, Spent Fuel and Decommissioning, for Exelon Generation Company,
10 LLC (“EGC”)¹³, I have had the opportunity to develop and review decommissioning cost
11 estimates for more than 40 nuclear units. While at EGC, my responsibilities included the safe
12 management of 12,600 metric tonnes of spent nuclear fuel, the implementation and oversight of
13 dry cask storage for spent nuclear fuel at eight sites,¹⁴ the development of strategic initiatives to
14 meet EGC’s long-term decommissioning and spent fuel management needs, and oversight of
15 decommissioning cost estimates and EGC’s \$12 billion decommissioning liability.

16 I have thoroughly reviewed the SONGS 2014 Decommissioning Cost Estimate (“2014
17 DCE”) and 2014 decommissioning activities. As discussed in further detail below, I find the
18 activities performed in 2014 are reasonable when compared to the conduct of operations at
19 similar, contemporary industry decommissioning projects.

20 **B. SONGS 2014 DCE as the Foundation for Project Planning and Schedule**

21 Activities executed at SONGS during 2014 generally followed the project scenario laid
22 out in the 2014 DCE. Based on the information I have reviewed, it is my opinion that SCE has
23 commenced DECON decommissioning activities appropriately and in concert with best industry
24 practices.

¹² Specifically, Cintichem, Inc., Trojan Nuclear Plant, Big Rock Point Plant, Dresden Nuclear Power Station Unit 1, Pathfinder Generating Plant, Shippingport Atomic Power Station, Rancho Seco Nuclear Generating Station, Crystal River Unit 3, Zion Nuclear Power Station, Vermont Yankee Nuclear Power Plant and San Onofre Nuclear Generating Station.

¹³ During my tenure at EGC, EGC owned-operated 17 operating and four retired nuclear units.

¹⁴ Peach Bottom Atomic Power Station, Limerick Generating Station, Oyster Creek Nuclear Generating Station, Byron Station, Braidwood Station, LaSalle County Station, Quad Cities Nuclear Power Station and Dresden Nuclear Power Station.

1 In general, the 2014 DCE follows the guidelines produced by the Atomic Industrial
2 Forum (“AIF”) Guidance.¹⁵ The 2014 DCE uses industry-accepted methods for cost estimating,
3 appropriate site-specific inputs, and reasonable, conservative assumptions regarding the
4 disposition of radiological, hazardous and municipal waste from the site. Additionally, the 2014
5 DCE generally conforms to the guidance for preparing decommissioning cost estimates provided
6 by the NRC.¹⁶

7 Following the DECON¹⁷ decommissioning scenario in the 2014 DCE, the major
8 decommissioning activities at SONGS will begin with (1) the completion of the transfer of spent
9 nuclear fuel into dry cask storage, and (2) major equipment removal (e.g., the reactor vessel,
10 reactor internals, steam generators, primary loop piping and valves). Radioactively contaminated
11 components will be disposed of at the NRC-licensed low-level radioactive waste (“LLRW”) disposal
12 facilities at Envirocare of Utah (“Envirocare” operated by ES) and Waste Control
13 Specialists (“WCS”) in Texas. Other non-hazardous, non-radioactive waste generated during
14 decommissioning will be disposed of at an out-of-state municipal landfill. All of these activities
15 and disposal plans are reasonably reflected in the 2014 DCE.

16 Once the site has been cleared of LLRW and municipal waste, the NRC licensee (SCE)
17 will (1) submit a license termination plan to NRC for its approval, and (2) the site will be
18 restored to a state acceptable to the State of California and various federal agencies. Spent
19 nuclear fuel will remain on site at the SONGS ISFSI until accepted and removed by the
20 Department of Energy (“DOE”) for storage off site or disposal.

21 The decommissioning process at SONGS began in 2013. The activities performed to
22 date generally reflect the decommissioning process as discussed in the AIF Guidelines and
23 documented in the 2014 DCE for the SONGS site. The activities commenced or continued in
24 2014 are those typically expected early in the nuclear plant decommissioning process.

¹⁵ LaGuardia, T.S., et. al., “Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,” AIF/NESP-036, May 1986.

¹⁶ U.S. Nuclear Regulatory Commission, Regulatory Guide 1.202, “Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors,” February 2005.
<http://pbadupws.nrc.gov/docs/ML0502/ML050230008.pdf>.

¹⁷ The DECON decommissioning scenario is defined by the NRC as “the equipment, structures, and portions of the facility and site that contain radioactive contaminants are promptly removed or decontaminated to a level that permits termination of the license after cessation of operations. (Decontamination is initiated within a couple of years after shutdown and continues until completed, usually within 7 to 10 years)”. *Id.* at I.202-3.

1 **C. Benchmarking SONGS Decommissioning Activities to Recent Industry**
2 **Decommissioning Projects**

3 In order to assess the 2014 SONGS decommissioning activities for SONGS, I have made
4 comparisons to contemporary activities underway at other recently retired commercial nuclear
5 plants in the U.S., specifically: Kewaunee Power Station (“Kewaunee”), Crystal River Unit 3
6 Nuclear Generating Plant (“CR3”), Vermont Yankee Nuclear Power Station (“VY”), and Zion
7 Nuclear Power Station (“Zion”). Kewaunee and CR3 were retired in 2013, and VY was retired
8 in 2014. Zion was retired in 1998, and after a short period of safe storage, moved into active
9 decommissioning in 2010.

10 Of the five (including SONGS) recently-retired nuclear plants, SONGS and Zion are
11 beginning the DECON immediate dismantlement decommissioning scenario (with Zion waiting
12 12 years to start). Kewaunee, CR3 and VY have all chosen to enter into a SAFSTOR¹⁸
13 decommissioning scenario.

14 Both DECON or SAFSTOR decommissioning has very similar activities that must be
15 performed. These activities include filing all required regulatory documents and studies, moving
16 plant systems, structures and components into “Cold and Dark” configurations, isolating the
17 spent fuel pool from the original plant cooling and filtration systems, obtaining a site historical
18 assessment, and moving spent fuel into dry storage. Regardless of the decommissioning
19 scenario, it is my opinion the activities performed at SONGS in 2014, should be performed early
20 in decommissioning, and are the most cost-effective way to manage decommissioning trust fund
21 assets. While some of these activities have large initial investments (e.g., dry cask storage), the
22 life-cycle costs of these activities are far lower than if they were not undertaken. For four of the
23 five plants (SONGS, CR3, Kewaunee and Zion), I have personally reviewed and verified that
24 moving spent nuclear fuel into dry cask storage early in the decommissioning project is
25 beneficial both financially to the trust funds, and in safety during decommissioning for the plant
26 staff.

27
28
29

¹⁸ The SAFSTOR decommissioning scenario is defined by the NRC as having placed the facility “in a safe, stable condition and maintained in that state (safe storage). The facility is decontaminated and dismantled at the end of the storage period to levels that permit license termination.” *Id.*

1 **D. SONGS Decommissioning Activities Undertaken In 2014**

2 During 2014, SCE performed activities scheduled in the 2014 DCE’s DECON Period 2,
3 Spent Nuclear Fuel Period 2 (“SNF Period 2”) and Site Restoration Period 1 (“SR Period 1”), as
4 discussed further below, for Units 2 & 3.

5 **i. DECON Period 2 Activities**

6 DECON Period 2 is described in the 2014 DCE as “Decommissioning Planning and Site
7 Modifications.”¹⁹ In 2014, major DECON Period 2 activities performed at SONGS included the
8 following:

- 9 1. “Cold and Dark” – depressurizing, draining and de-energizing non-essential systems, and
10 placing all systems, structures and components in configurations safe to begin
11 decommissioning activities. Temporary power, ventilation, fire protection and
12 communications equipment are installed to facilitate decommissioning activities. There
13 are two major subtasks under the “Cold and Dark” task including:
14 a. Spent fuel pool isolation; providing independent cooling and filtration systems
15 b. Installation of a temporary power ring to provide redundant offsite power for
16 decommissioning
17
18 2. Legacy Low-Level Radioactive Waste – a corollary to the “Cold and Dark” task, to clear
19 the site of any LLRW created during the operating lifetime of the units.
20
21 3. Development of the Request for Quotation (RFQ) for a DGC – includes a canvassing
22 effort to determine interest, down-selecting candidates to those who are qualified, and
23 preparation of a work bid package.
24
25 4. Historical Site Assessment – a study to document radiological and hazardous material
26 contamination and spills which occurred during the operating lifetime.
27
28 5. Regulatory Submissions – NRC documentation, submitted in accordance with regulatory
29 requirements. The major submissions to the NRC included, but were not limited to:
30 a. Post-Shutdown Decommissioning Activities Report (“PSDAR”)
31 b. Decommissioning Cost Estimate (2014 DCE)
32 c. Irradiated Fuel Management Plan (“IFMP”)
33 d. Certified Fuel Handler Program
34
35

¹⁹ The DCE was submitted to the Commission in a separate SONGS application proceeding, A.14-12-007 in the testimony of SCE at SCE-01at Appendix A-1. Martin, J.J., et. al., “2014 Decommissioning Cost Analysis of the San Onofre Nuclear Generating Station Units 2 & 3,” Document No. 164001-DCE-001, July 31, 2014, page 32 of 37.

- 1 e. Post Shutdown Emergency Plan
- 2 f. Post Shutdown Site Security Plan
- 3 g. Post Shutdown Quality Assurance Plan
- 4 h. Post Shutdown Fire Protection Plan
- 5 i. Defueled Radiation Protection Manual
- 6 j. Defueled Technical Specifications

7 The transition-to-decommissioning activities performed at SONGS are consistent with
8 those performed, or planned to be performed, at other decommissioning projects across the
9 nuclear industry. Kewaunee, CR3, Zion and VY are scheduling emergency planning changes
10 and security modifications, and have submitted exemption requests to NRC. Additionally, all are
11 planning or have already performed Historical Site Assessments and removal of legacy LLRW.
12 In all cases, these activities are the same as or very similar to those undertaken during 2014 at
13 SONGS.

14 It is my understanding that SCE personnel appropriately selected these activities through
15 industry benchmarking as being the best practices with respect to occupational and public health
16 and safety, and minimizing total project cost. I have recently personally observed a similar
17 approach at other plants transitioning to decommissioning, including Zion and CR3, and based
18 upon my experience, I agree with the choice of work to be performed at this stage of the project.

19 **ii. Spent Nuclear Fuel Period 2 Activities**

20 SNF Period 2 is described in the 2014 DCE as Spent Fuel Transfer to Dry Storage.²⁰
21 During 2014, SCE completed the selection process for a dry cask storage vendor. The selected
22 vendor, Holtec, will be responsible for providing design, fabrication and construction services to
23 provide dry cask storage systems, expand the ISFSI, and provide certain services to move spent
24 fuel out of the spent fuel pools into dry storage.

25 Based on my industry experience, Holtec is one of three vendors I would rely upon for
26 providing dry cask storage systems; the others are AREVA and NAC International. I have
27 worked with all three in the past (during my tenure at Exelon), and find that technically, any one
28 of them can provide safe and reliable systems for spent fuel storage and ultimate transportation
29 off site. Given the lack of space for an ISFSI, the proximity of the storage location to public
30 land, and the proposed below-grade placement, Holtec is a reasonable choice. Holtec began

²⁰ *Id.*

1 work on the task in 2014. See the direct testimony of Mr. De Marco, in Chapter 2 above, for a
2 description of SDG&E’s involvement in the ISFSI vendor selection process.

3 The decision to move spent fuel into dry storage early in the decommissioning project is
4 beneficial both financially to the trust funds, and in safety during decommissioning for the plant
5 staff. Maintaining spent fuel in the fuel pools during decommissioning has several distinct
6 disadvantages:

- 7 1. Maintaining spent fuel in the pools until DOE can accept it for disposition is costly. A
8 much larger site security force and several additional plant personnel (in maintenance,
9 engineering and operations) are required to keep spent fuel in the pools at SONGS. The
10 additional cost is approximately \$20 million to \$30 million per year to keep spent fuel in
11 the pools compared to maintaining it in dry cask storage. If spent fuel is anticipated to
12 remain on site for more than 15 years, the life-cycle costs for dry storage are typically
13 more favorable.
- 14 2. Negative impact upon decommissioning schedule. With spent fuel remaining in the spent
15 fuel pools, decommissioning would have to proceed around the spent fuel pools. Only
16 after DOE completed accepting all spent fuel from the SONGS site could the pool
17 facilities be decommissioned. This decommissioning scenario would lengthen the overall
18 decommissioning schedule by several years.
- 19 3. Occupational health and safety. While both spent fuel pool storage and dry cask storage
20 provide reasonable assurance of public health and safety, decontamination and
21 demolition activities result in a somewhat greater risk of spent fuel damage if the fuel
22 remains in the pools. Moving spent fuel into dry storage – away from decommissioning
23 activities – mitigates this risk.

24 **iii. Site Restoration Period 1 Expenses**

25 SR Period 1 is described in the 2014 DCE as Transition to Site Restoration.²¹ In 2014, a
26 portion of the Historical Site Assessment was performed for the overall SONGS site, including
27 the Mesa site and facilities east of Interstate 5 (both of which are outside of the NRC licensed
28 areas).

29 A primary goal early in all decommissioning projects is to “shrink” the footprint of the
30 plant site by releasing for unrestricted use any land and facilities utilized during plant operations.
31 This is done for two reasons: (a) to prevent the migration of radiological and hazardous material
32 that could lead to contamination to areas previously unaffected, and (b) to control site security
33 costs.

34 ²¹ *Id.*

1 The Mesa site, part of Marine Corps Base Camp Pendleton and under the control of the
2 Department of the Navy, was leased to Edison for the provision of maintenance, repair and
3 emergency services to SONGS during operations, and also housed Edison's administration
4 facilities. While it was anticipated that no radiological and/or hazardous material will be found
5 at the Mesa site, it remains the responsibility of SCE to demonstrate the Mesa site is free of
6 contaminants.

7 To do so, SCE moved all of its activities off of the Mesa site, and included the Mesa site
8 in the Historical Site Assessment, in preparation of releasing the land back to the Navy. In my
9 expert opinion, I believe this to be a reasonable activity to be performed at this juncture of the
10 decommissioning project.
11

1 **IV. SDG&E Oversight of SONGS Invoices (T. Curtis)**

2 The purpose of my testimony is to describe my oversight of SCE's SONGS invoicing.
3 As SDG&E's SONGS Financial Project Manager, my SONGS responsibilities include
4 reviewing invoices presented by the Decommissioning Agent, currently SCE,²² for errors. In
5 addition, my review of invoices determines whether the amounts billed are accurate, valid,
6 correctly stated and related to decommissioning activities undertaken. The purpose of my review
7 is to assure that the costs reflected in the SCE invoices for Units 2 & 3 are appropriately incurred
8 decommissioning costs and that the costs are supportable for the decommissioning activities
9 being completed.

10 **A. Appropriately Incurred Charges**

11 Using my knowledge and professional experience as a CPA and my knowledge of
12 SONGS decommissioning activities, I review the invoiced charges to verify that
13 decommissioning costs are appropriately incurred. SCE provides SDG&E with a monthly
14 Consolidated Cost Performance Report. The report provides a discussion of the activities for
15 both O&M and Capital cost categories. SCE also provides a weekly status update of
16 decommissioning activities, which I review. Using my judgment, I follow up, as needed, with
17 SCE to obtain further details and explanations of how the activities and their resulting costs are
18 decommissioning related.

19 **B. Cost are Supportable**

20 Using my knowledge and professional experience, I review on a sample basis individual
21 charges and obtain supporting documents from SCE to confirm the invoiced costs and that the
22 work is decommissioning related. Supporting documents include, but are not limited to, vendor
23 invoices, contracts and purchase orders.

24 **C. Budget Variance Review**

25 My variance review process obtains and reviews SCE's annual O&M and capital budget
26 by month, by SCE manager/director, and by project. While SCE's annual 2014 budget was not
27 approved by the other SONGS co-owners, including SDG&E, SDG&E's share of SCE's
28 monthly budget information is nevertheless input into SDG&E's budget management system
29 solely for comparison and reporting of budget to actual variances.

²² See the Testimony of Ms. Dalu, Chapter 5.

1 SCE provides a monthly review of budget performance in the Consolidated Cost
2 Performance Report. The Report provides brief explanations for any variances between budget
3 and actual costs. SDG&E submits inquiries to SCE regarding significant under and over budget
4 line items to determine the reason(s) for the under- or over-run compared to budget and to
5 determine whether the variance is timing related or a permanent variance, such as a change in
6 work scope or project delays. Notices of these changes are obtained by the Team Lead, Mr. De
7 Marco²³, through his attendance at the weekly co-owners meetings on decommissioning.
8 SDG&E investigates changes to the timing of decommissioning activity costs and revises
9 budgeted amounts as needed.

10 Based on my review of the invoices issued by SCE, as well as my review of SCE's
11 Consolidated Cost Performance Report, I follow up on potential budget changes with the SCE
12 Budget Manager to obtain updated monthly cash flows and update the SDG&E budget quarterly
13 outlook. As needed, I inform SDG&E management of significant budget variances, along with
14 explanations and relate potential budget changes.

15 I inform SDG&E Generation and Resource Planning management, as needed, of potential
16 issues, concerns or potential changes in budget outlook on a monthly basis to keep SDG&E
17 apprised of issues it may wish to address with SCE at the monthly SONGS co-owner executive
18 decommissioning meetings.
19

²³ See the testimony of Mr. De Marco, Chapter 2 above.

1 **V. SDG&E's Accounting and Tracking of SONGS Costs (T. Dalu)**

2 The purpose of my testimony is to explain how SDG&E tracked costs, whether invoiced
3 from SCE or another third party, or internal SDG&E (100%) costs in 2014, and the process
4 SDG&E Generation Accounting used to review those costs. My testimony also discusses the
5 upcoming changes to SCE invoices and SONGS cost categorization that are expected to occur in
6 the near future and explains why SDG&E is unable to provide most of its cost information in
7 accordance with DCE categories at this time.

8 **i. SDG&E Cost Tracking and Review Processes for SONGS 2014 Costs**

9 Traditionally, SDG&E receives a monthly invoice from SCE for SDG&E's portion of its
10 20% share of SONGS costs, plus SCE overheads, incurred during the prior month. For example,
11 in April 2014, SDG&E received an invoice from SCE for SONGS costs incurred during March.
12 The SONGS costs are billed to SDG&E as either capital or O&M and segregated between Unit 1
13 (alone) or Units 2 & 3 (combined).

14 Under the current process, SDG&E has 15 calendar days from the date the invoice is
15 received until the payment date to review and pay the invoice. Upon receipt of the invoice,
16 SDG&E Generation Accounting performs several key functions. It reviews the invoice for
17 errors, comparing total costs by type (Capital, O&M or Severance), to the prior month's invoice
18 and reviews the supporting detailed O&M and Capital Expenditure schedules for unusual or
19 unexpected fluctuations. The invoice is reviewed for mathematical accuracy. In addition, the
20 overhead rates appearing in the invoice are validated for compliance with applicable SONGS
21 agreements. SDG&E Generation Accounting also reviews the invoice to see if it agrees with the
22 O&M and Capital Expenditure supporting schedules, such as the Statement of O&M Expenses
23 and the Capital Expenditure Summary Reports, and any other relevant documentation provided
24 by SCE.

25 Once approved by SDG&E Generation Accounting, the invoice package, which consists
26 of the invoice, the Statement of O&M Expenses, the Capital Expenditure summary Report and
27 the supporting schedules for severance charges, is sent to Mr. Curtis for review and approval for
28 payment. After approval by SDG&E's Nuclear Team, the full package is returned to Generation
29 Accounting and reviewed by SDG&E Management before payment is issued. For additional
30 information on the review by the SDG&E Nuclear Team, see the direct testimony of Mr. Curtis
31 above at Chapter 4.

1 Invoices received from third parties, such as SDG&E consultant fees, internal labor, and
2 outside counsel costs, are tracked using specifically identified decommissioning work orders and
3 are reviewed monthly by the Nuclear Team and/or other applicable SDG&E departments.

4 **ii. Future SDG&E Cost Tracking and Review Processes for SONGS Costs**

5 At the time of this testimony's submission, SDG&E and the other SONGS co-owners
6 (i.e., SCE, and the Cities of Riverside and Anaheim) are finalizing a Decommissioning
7 Agreement. Upon completion, the Decommissioning Agreement will govern SONGS
8 decommissioning costs and activities for Units 1, 2 & 3. The Decommissioning Agreement is
9 expected to be executed in mid-April 2015.

10 Assuming that the Decommissioning Agreement is executed in its current form, under the
11 terms of the Decommissioning Agreement, SDG&E will receive decommissioning invoices from
12 SCE on a monthly basis that will segregate costs by unit and by decommissioning cost categories
13 required by the NRC and/or the Commission. This new invoice format is designed to mimic the
14 cost categorization in the recently-submitted 2014 DCE. Specifically, SCE will bill SDG&E for
15 decommissioning costs by Unit (1, 2 & 3) and under the three major NRC-designated
16 decommissioning work categories: License Termination, Spent Fuel Storage and Site
17 Remediation. In addition, Major Activities within each of the three categories, as defined in the
18 DCE, will be identified by a Work Breakdown Structure ("WBS") element/activity, consistent
19 with those noted in the DCE.

20 Once SDG&E Generation Accounting receives the required information from SCE,
21 SDG&E Generation Accounting will create individual work orders in SDG&E's accounting
22 system that will map to the WBS elements. Coupled with the new invoice format, this new
23 system will enable SDG&E to independently track and report its share of decommissioning
24 costs, compare them to the DCE and report them to the NRC and/or Commission, as needed.

25 Under the new process, SDG&E intends to review and provide payment within 15
26 calendar days. Just as SDG&E Generation Accounting does today, the invoice will be reviewed
27 for errors and accuracy by SDG&E Generation Accounting and the Nuclear Team, and
28 Management. In addition, under the new process, SDG&E's work orders should align with
29 SCE's work orders, so SDG&E's invoice review will also include confirmation that the work
30 order provided is correct and mapped properly.

1 For those costs that are not billed to SDG&E by SCE, such as internal SDG&E costs,
2 SDG&E will also track those costs to specifically identified decommissioning work orders that
3 align with the DCE. To my knowledge and belief, SCE will begin using this new invoice format
4 in Q1 2015 and SDG&E will be able to implement the necessary changes to its accounting
5 system once its receives necessary information from SCE.²⁴ SCE has also informed SDG&E
6 that it intends on re-issuing the 2013 and 2014 invoices to SDG&E in the revised format in 2015.
7 It is unclear to SDG&E exactly when it will receive the reissued invoices.

8 **iii. Application of Future Cost Tracking System and SDG&E's 2014**
9 **SONGS Costs**

10 All invoices received by SDG&E from SCE in 2014 use the old format, and do not break
11 down the invoiced amounts by unit, NRC cost category or WBS. Therefore, SDG&E is unable
12 to provide its 2014 SONGS costs in the same categories used by the DCE, or compare its 2014
13 SONGS costs to the DCE estimate for 2014 at this time.

14 Based on information provided by SDG&E, it is my knowledge and belief that SCE will
15 re-issue invoices to SDG&E for June 2013 through December 2014 to SDG&E in the new
16 format in 2015. Therefore, as stated in SDG&E's Application, SDG&E respectfully seeks the
17 ability to file supplemental testimony concerning its 2014 costs, which will provide SDG&E's
18 2014 invoiced costs through December 31, 2014 broken down by unit, NRC cost category and
19 WBS, once SCE has provided the information, SDG&E has modified its own SAP system to
20 accommodate the new cost categorization system, and SDG&E has been able to verify the data.
21 At the time of this submission, it is not clear to SDG&E when these events will occur.

22 For those costs that are not billed to SDG&E by SCE, such as internal SDG&E costs,
23 SDG&E will track those costs to specifically identified decommissioning work orders that align
24 with the DCE as well. SDG&E is already transitioning its internal system to do so, and expects
25 to be able to track these costs using specifically identified work orders that will allow these costs
26 to be allocated to the appropriate "cost bucket" once it has finished modifying its own SAP
27 system to accommodate the new cost categorization system.

28

²⁴ At the time this testimony was submitted, SDG&E has not yet received invoices from SCE in the new format.

1
2

CHANGE LOG FOR SDGE-02-A (April 1, 2015)

Exhibit	Witness	Page	Line	Revision Detail
SDGE-02-A		Cover		Inserted Application number "A.15-02-006"
SDGE-02-A		Cover		Changed "SDG&E-02" to "SDG&E-02-A"
SDGE-02-A		Cover		Added "Updated"
SDGE-02-A		Cover		Changed "January 30" to "April 1"
SDGE-02-A		2	FN1	Inserts FN1 concerning the Commission's orders to file this updated testimony
SDGE-02-A	M. De Marco	2	1	Added "Updated"
SDGE-02-A	M. De Marco	3	29	Changed "SDGE-02" to "SDGE-02-A"
SDGE-02-A	M. De Marco		FN5	Changed "SDGE-02" to "SDGE-02-A"
SDGE-02-A	M. De Marco	5	12	Deleted "an"
SDGE-02-A	M. De Marco	5	24	Changed "bottoms up" to "bottom up"
SDGE-02-A	M. De Marco	7	10	Changed "but not be" to "but are not"
SDGE-02-A	M. De Marco	7	FN9	Changed "Production" to "Proposal"
SDGE-02-A	M. De Marco	8	24	Changed "islanding" to "isolation work"

3

1 **Witness Qualifications of Adam H. Levin**

2 My name is Adam H. Levin, and my business address is 7642 Trillium Boulevard,
3 Sarasota, Florida 34241. I have been retained by SDG&E to provide professional consulting
4 services as Decommissioning Advisor directly to SDG&E.

5 Since April 2013, I have been consulting to the nuclear energy industry, doing business
6 as AHL Consulting. I currently provide decommissioning and spent fuel management consulting
7 services to Duke Energy Florida Crystal River 3 (Decommissioning Project Management
8 Oversight Board), Entergy Nuclear Vermont Yankee (Third Party Decommissioning Advisor –
9 through Price Waterhouse Cooper), Dairyland Power Cooperative LaCrosse Boiling Water
10 Reactor (Decommissioning Advisor – through Techsource), as well as SDG&E
11 (Decommissioning Advisor). Additionally, I am providing consulting services to the
12 Department of Energy (DOE), Office of Nuclear Energy (DOE-NE), where I serve on several
13 steering committees overseeing the activities of the Nuclear Fuels Storage and Transportation
14 Project (NFST Project). The NFST Project is DOE’s program to implement recommendations
15 made by the Blue Ribbon Commission on America’s Nuclear Future, regarding the long-term
16 management of spent nuclear fuel in the United States.

17 Prior to April 2013, I spent 16 years at Exelon Generation in Illinois, the last seven years
18 as the Director of Spent Fuel and Decommissioning for Exelon’s fleet of 19 operating and four
19 retired nuclear units. Specifically, in this role I provided governance and oversight to Exelon’s
20 decommissioning activities and decommissioning cost estimating, and supported Exelon’s
21 corporate finance and tax organizations with trust fund asset management and financial
22 reporting.

23 I began my career in 1977 providing site characterization analyses for decommissioning
24 the Shippingport reactor, and have been involved in cost estimating and/or technical engineering
25 decommissioning activities at the vast majority of the commercial nuclear plant
26 decommissioning projects in the U.S. to date. I hold a master’s degree in nuclear engineering
27 and a bachelor’s degree in physics from Rensselaer Polytechnic Institute.

28 The purpose of my testimony in this proceeding is to provide my expert opinion
29 regarding the reasonableness of certain decommissioning activities undertaken by SCE at
30 SONGS Units 2 & 3 during 2014. I am sponsoring Chapter 3 in Ex. SDGE-02 in support of the
31 Application.

1 This material was personally reviewed by me and I believe it to be correct that it is
2 factual in nature. Insofar as the material is in the nature of opinion or judgment, it represents my
3 best judgment.

4 I have not previously testified before this Commission.
5
6