



# Decommissioning **San Onofre** Nuclear Generating Station

## Update on Decommissioning Plans

Tom Palmisano

Vice President & Chief Nuclear Officer

August 12, 2014



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# Decommissioning Principles

**With our co-owners, Southern California Edison is committed to:**

## Safety

- Safely decommissioning San Onofre
- Safely move the power plant's spent fuel into dry cask storage, until government approved long-term storage options are available

## Stewardship

- Leave the community better off
- Spending Nuclear Trust Funds wisely
- Return any unused money to ratepayers

## Engagement

- Decommissioning process is inclusive, forward-thinking, involving diverse stakeholders



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# Open Communication

- Public engagement and education includes:
  - A Community Engagement Panel to foster open dialogue
  - Decommissioning Previews
  - Walking tours open to the public
  - Private tours for key stakeholders
  - Website with robust information: [www.SONGScommunity.com](http://www.SONGScommunity.com)





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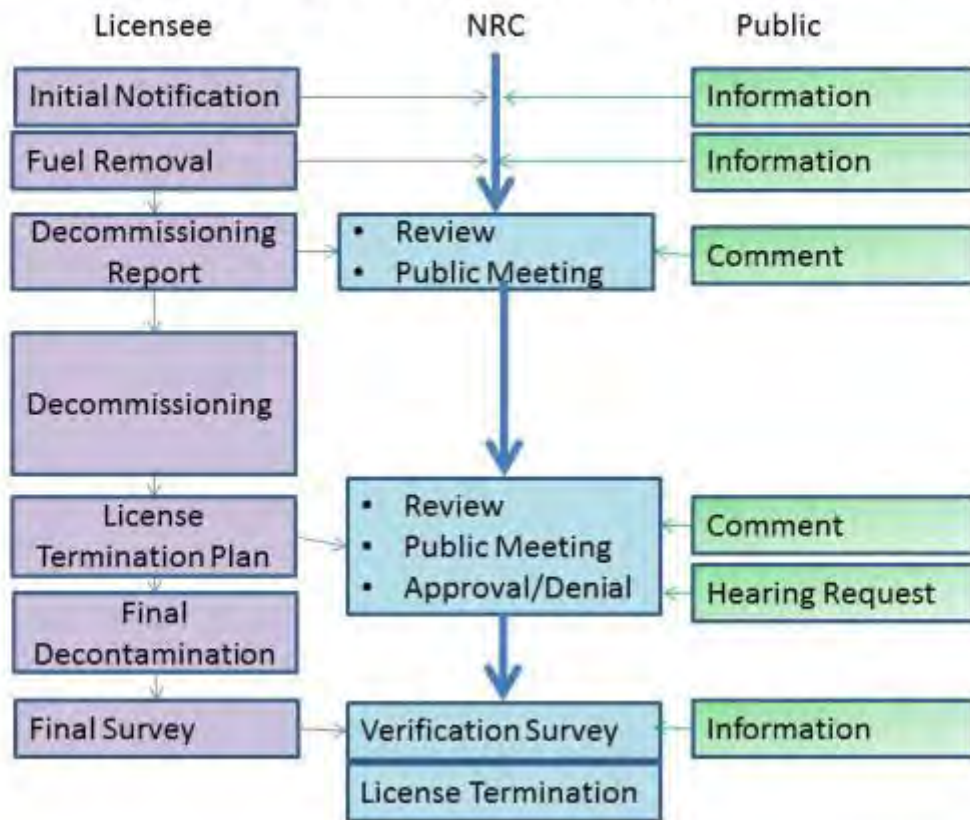
# SONGS Decommissioning Plan



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# Reactor Decommissioning Process Summary

## Reactor Decommissioning Process







# SONGS Site Overview Plan





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# SONGS Plant View







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# SONGS Mesa View





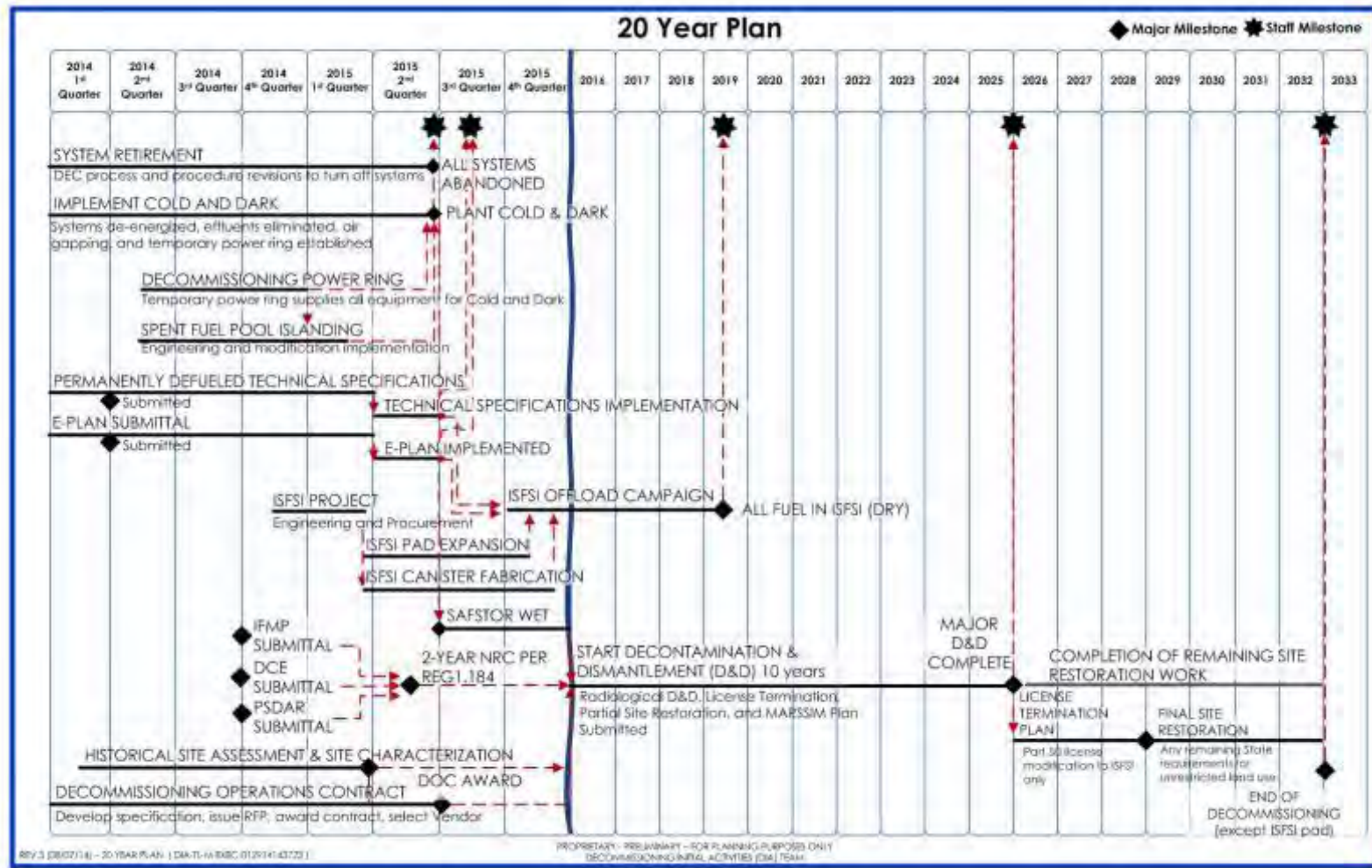


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# SONGS Plant Detailed View



# Decommissioning Plan

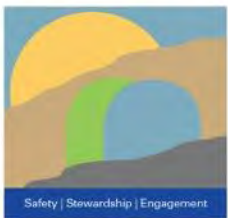




# Key Milestone Dates

Dates	Milestone Description
06/07/2013	Announcement of Cessation of Operations
06/22/2014	Required NRC Submittal – PSDAR, IFMP, DCE
06/30/2015	Cold and Dark Achieved
06/30/2015	Implement Permanently Defueled Technical Specifications
06/30/2015	Implement Permanently Defueled Emergency Plan
01/01/2016	Start of Decontamination and Dismantlement
06/01/2019	All Spent Fuel Transferred to Dry Storage
12/30/2028	Start of License Termination Submittal and Final Site Restoration
12/30/2032	License Termination During Demolition
06/24/2050	Independent Spent Fuel Storage Installation Part 50 License Termination
03/17/2051	Independent Spent Fuel Storage Installation Demolition
02/02/2052	Final Site Restoration and Easement Termination
2024-2049	Spent Fuel Transfer Window to Department of Energy (DOE)

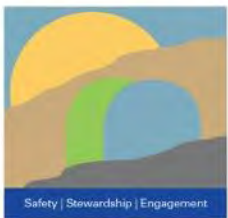




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# Regulatory Submittals

**POST-SHUTDOWN DECOMMISSIONING ACTIVITIES REPORT  
IRRADIATED FUEL MANAGEMENT PLAN  
DECOMMISSIONING COST ESTIMATE  
LONG TERM PLANNING**



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# Post-Shutdown Decommissioning Activities Report



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# Post-Shutdown Decommissioning Activities Report

## Basis

- 10CFR50.82 and NRC Reg Guide 1.185 Rev 1
- Review of recent decommissioning plants' Post-Shutdown Decommissioning Activities Report (PSDAR) submittals to NRC from other utilities

## Content

- Description of the planned decommissioning activities
- Schedule for the completion of these activities
- Expected costs
- Discussion of environmental impacts





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# Post-Shutdown Decommissioning Activities Report

## Key Points:

- Consistent with the planned methods of Decontamination and Dismantlement (D&D), Environmental Impact Evaluation (EIE), and the DCE
- EIE Summary in the PSDAR:
  - The results of the EIE,
  - Confirms differences are bounded by the Generic or existing Environmental Impact Statement (EIS),
  - Evaluated differences are ‘small’ not requiring additional Environmental Review (ER) or License Amendment Request (LAR)
- Reiterates SCE planned compliance with:
  - Offsite Dose Calculation Manual (ODCM),
  - Radiological Environmental Monitoring Program (REMP),
  - Ground Water Protection, federal, state, and local requirements,
  - California State Lands Commission (CSLC) easement,
  - California Coastal Commission (CCC) requirements
- Specifies a total cost of \$4,411,246 (from DCE)



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# Environmental Impact Evaluation

## Basis

- NUREG-0490 SONGS Environmental Impact Statement (EIS), 1981
- NUREG-0586 Generic EIS Decommissioning of Nuclear Facilities, 1988
- NUREG 1496 Generic EIS Support of Rulemaking for License termination
- 10CFR51.53 Post Construction Environmental Reports (ER)
- Consistent with the planned methods of D&D described in the PSDAR

## Content

- All key impacts assessed found to be not detectable or so minor that they will neither destabilize or noticeably alter any important attribute of the resource (does not trigger additional ER or LAR)
- Confirms differences are bounded by the Generic or existing Environmental Impact Statement



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# Environmental Impact Evaluation

## Definitions:

### SMALL

Environmental impacts are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource: (does not trigger additional ER or LAR)

### MODERATE

Environmental impacts are sufficient to alter noticeably but not to destabilize important attributes of the resource: (requires additional ER or may potentially require a LAR)

### LARGE

Environmental impacts are clearly noticeable and are sufficient to destabilize: (requires additional ER and LAR)





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# Environmental Impact Evaluation

## Key EIE Assumptions Related to Keeping Impacts “Small”:

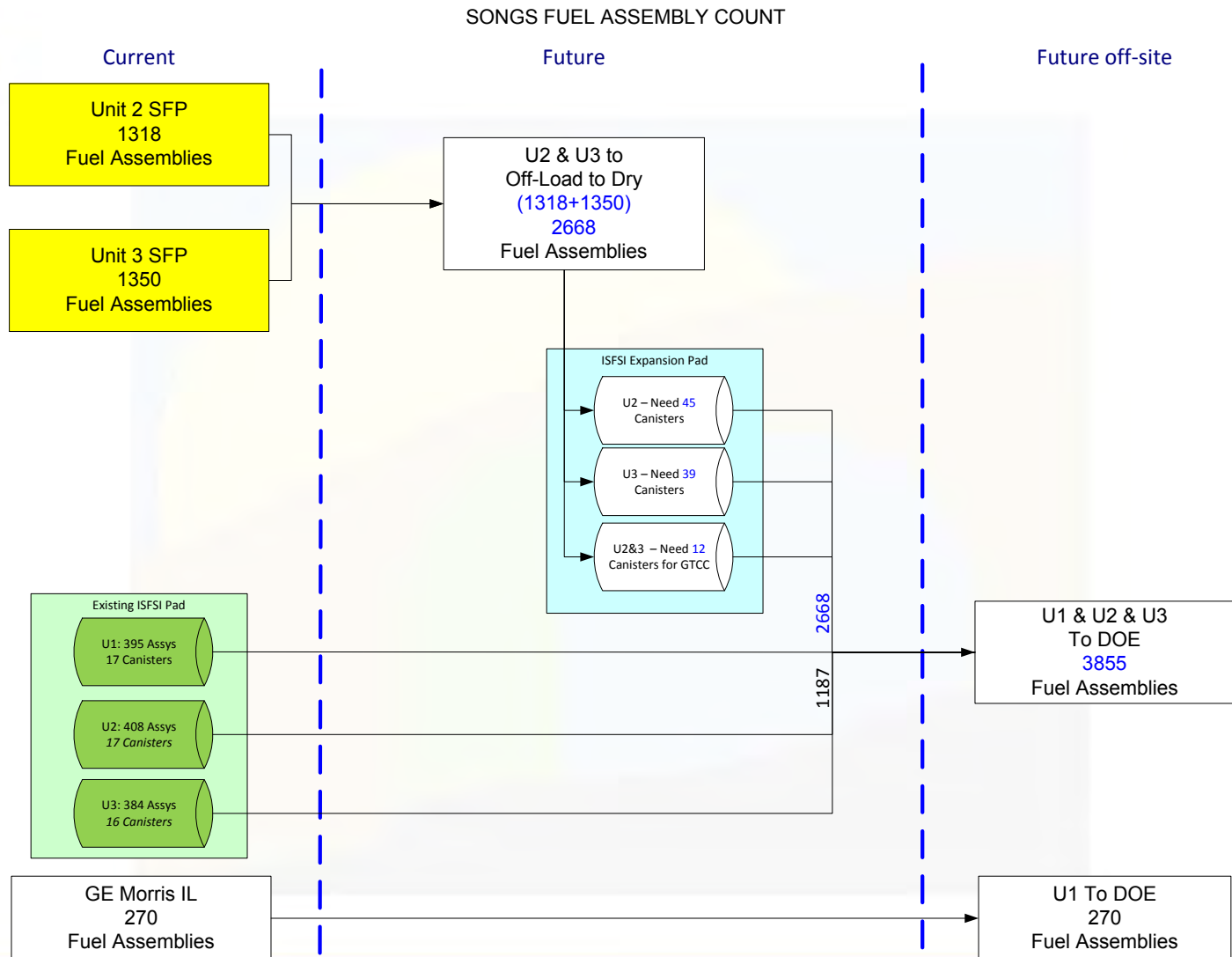
- Assume that ocean conduits will not be removed
- Ensure no blasting will be used in decommissioning
- Maintain existing land ‘use’ (building / zoning) designations
- Limit dewatering to 1000 foot radius from site
- There are no drinking water wells in the area of SONGS
- Comply with existing permits, obtain other permits where required
- Limit excavations to area previously excavated during original construction
- Ensure air quality impacts are minimized (diesel engines)



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# Irradiated Fuel Management Plan

# Spent Fuel Storage







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# Irradiated Fuel Management Plan

## Basis

- 10CFR50.54 License Conditions
- 10CFR50.54 (bb) Irradiated Fuel Management Plan (IFMP)
- Within 2 years of permanent cessation of operation, submit to the NRC written notification of the irradiated fuel management plan

## Content

- Program by which the licensee intends to manage and provide funding for the management of all irradiated fuel
- Licensee demonstrates that the program is consistent with NRC requirements and will be implemented on a timely basis
- Must demonstrate compliance until possession of the fuel is transferred to the Secretary of Energy for ultimate disposal



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# NRC Review Criteria

## IFMP Review and Approval Criteria:

NRC to evaluate and provide preliminary approval of the spent fuel management and funding program, the submittal should include:

- Estimated cost to isolate the spent fuel pool (SFP) and fuel handling systems or the cost to construct an ISFSI or a combination of wet/dry storage;
- Estimated annual cost for the operation of the selected option (wet or dry storage or a combination of the two) until DOE takes possession of the fuel;
- Estimated cost for the preparation, packaging, and shipping the fuel to DOE;
- Estimated cost to decommission the spent fuel storage facility; and
- A brief discussion of each of the areas identified and the estimated time for these activities



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# Industry Comparison of Irradiated Fuel Management Plans

## Recent IFMP submittals:

Plant	Number of fuel assemblies in Wet storage	Completed by date from wet to dry storage	Irradiated Fuel Management Plan Submittal
Crystal River	1243	2019	December 3, 2013 (updated) November 29, 2011
Kewaunee	1079	2016	April 25, 2014 (updated) February 26, 2013 (updated) December 19, 2008
San Onofre	2668	2019	Forecast late September 2014





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# Decommissioning Cost Estimate



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# Decommissioning Cost Estimate

## Basis

- 10CFR50.75(c), 10CFR72.30, 10CFR50.54(bb)
- EnergySolutions estimating model and data
- SONGS-specific walk down validation for quantities

## Structure

- Discusses the decommissioning plan
- Assurance of the adequacy of funding
- Provides total cost by period
- Plan for adjusting funding
- Summarizes the costs of services
- Summarizes undistributed costs
- Outlines costs for:
  - Spent Fuel Management
  - License Termination
  - Site Restoration



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# Decommissioning Cost Estimate

## Key Assumptions:

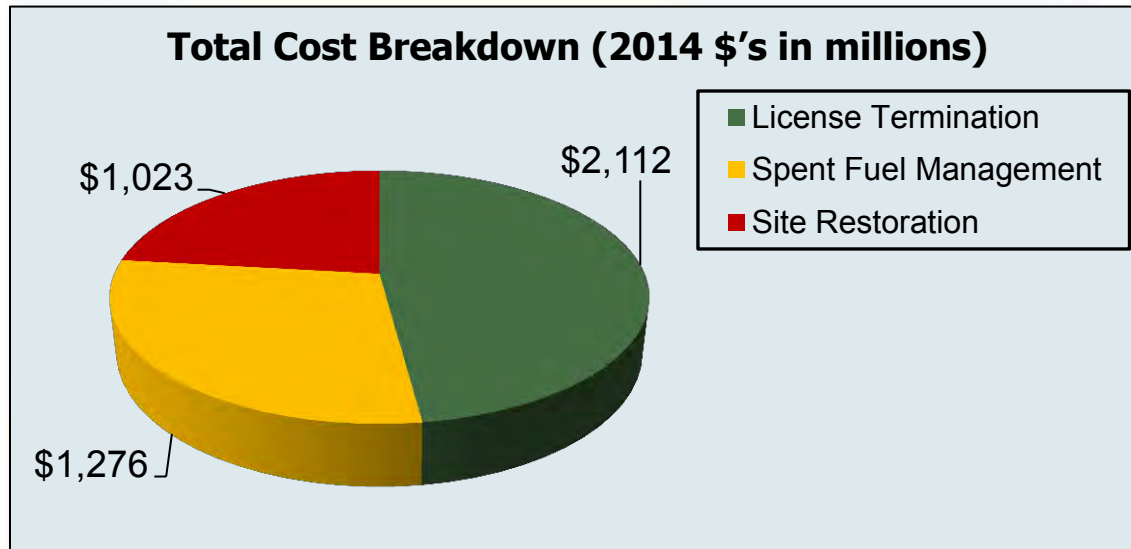
Assumption	DCE Assumption
Date Fuel is Out of Spent Fuel Pool	June 2019
DOE Performance Start Date	2024
Pool Islanding Date	June 2015
Substructure Excavation	All Substructures Removed
Duration of D&D	10 Years
Contingency	25% (22.8% weighted)
Ocean Conduits	Remove
Treatment of Class A Waste	No Class A Waste Exempt
Start of D&D	January 2016
Low Level Waste Burial Cost Escalation	D&D - CPI Post - D&D 7.33%





# Decommissioning Cost Estimate Breakdown

- **Total Cost = \$4.411B (2014 \$'s, 100% Level)**



- **Description of Cost Categories:**
  1. License Termination (50.75): Decommissioning planning through reactor and other plant system dismantlement and decontamination
  2. Spent Fuel Management (50.82): Transfer of spent fuel into and management of dry cask storage, and ultimate demolition of the ISFSI
  3. Site Restoration Costs: Clean building demolition and site grading



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# San Onofre Easement



## Navy Easement

- Established in 1964
- Land comprised of 85 acres, coastal site west of Interstate 5
- Term of the easement through 2023
- Need to extend the easement through decommissioning
- Need to clarify Navy requirements for return of property



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# Trust Fund and Regulatory Oversight

## SCE Decommissioning Trust Committee

- The Nuclear Decommissioning Trusts are overseen by a five member committee (2 internal, 3 external) who are nominated by management, confirmed by the Edison Board, and approved by the CPUC. Responsibilities include:
  - Prudently manage the investments in the Trust
  - Approve asset allocation based on expected decommissioning schedule provided by the company
  - Hire and manage investment advisors and trustee
  - Hire and manage other advisors as appropriate

## Regulatory Oversight of Decommissioning Trusts

- CPUC regulates all spending from the Nuclear Decommissioning Trust, including review, approval and reasonableness
  - Filed a request for interim access to the Trust in November 2013
  - Will file an application for permanent approval with site specific Decommissioning Cost Estimate (DCE) in 2014
- NRC regulates all radiological decommissioning
- NRC regulates spent fuel management





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# Onsite and Offsite Emergency Preparedness

- Tailored, comprehensive approach to safety and emergency response measures based on the permanently defueled condition
- With the plant's defueled state, the emergency plan is being revised; proposed plan submitted to the NRC for approval
- Proposed plan maintains staff and ability to mitigate spent fuel pool events and communicate with offsite agencies
- Proposed plan includes continued involvement in and financial support for Interjurisdictional Planning Committee
- While NRC considers the proposed plan, SCE continues to maintain its current emergency plan



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# Seismic Issues Update

	Activity	Sub-Activity	Status
1	Shallow Marine Surveys	Low Energy Seafloor Sediment Sampling & Age Dating	Complete
2		2D Focused Fill-in Low Energy Geophysical Survey	Complete
3		Regional Low Energy Geophysical Survey	Complete
4		Bathymetry and Backscatter Survey	Complete
5		3D P-Cable Geophysical Survey	Complete
6	Summary Document	Summary of Shallow Marine Documents	In Progress
7	On-Shore Surveys	Deep 3D Geophysical Survey Project	Cancelled
8		Paleo Seismic Trenching Project	Complete
9		Marine Terrace and Coastal Deformation Project	Complete



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# Seismic Issues Update

	Activity	Sub-Activity	Status
10	Other	Historic Marine Geophysical Data Reanalysis Report	Complete
11		GPS Monitoring Project	Complete
12		High Energy 2D/3D Marine Acoustic Surveys	Complete
13	NUREG 1738	Seismic Checklist	In Progress
14	NRC 10CFR50.54(f)	Revaluation of Seismic and Flooding Hazards	Rescinded
15		Mitigation Strategies for Seismic and Flood	Rescinded
16	NRC Orders	EA-12-049 Mitigation Strategies for External Events	Rescinded
17		EA-12-051 Spent Fuel Pool Instrumentation	Rescinded



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# Decommissioning Principles

## *Safety*

## *Stewardship*

## *Engagement*