

CEP Regular Meeting
**SONGS Decommissioning Update and
Dry Cask Storage Defense-in-Depth**

Thursday, August 20, 2020

5:30 - 8:30 p.m.

Virtual Meeting for Social Distancing

THIS MEETING IS BEING RECORDED

Agenda Topic	Presenter(s)	Time
CEP and SCE welcome & opening comments	David Victor, Doug Bauder	5:30 - 5:40
CEP general community updates • CEP agenda-planning meeting • Outlier events follow-up; Letters to NRC & SCE • NRC Community Advisory Board Report & Rep. Levin Task Force Report • EnergySolutions low-level waste disposal facility	David Victor, Dan Stetson, Martha McNicholas	5:40 – 5:50
SONGS decommissioning – The big picture • Fuel transfer operations complete • Shifting focus to deconstruction • Established SONGS stand-alone ISFSI organization • Continuing work on plan to explore relocating spent fuel offsite	Doug Bauder	5:50 – 6:00
Dry cask storage system defense-in-depth • UMAX inspection & maintenance program and canister repair method	Randall Granaas	6:00 – 6:10
Decommissioning Update • Dismantlement timeline and ongoing low-level waste shipments • Safety of liquid batch releases	Vince Bilovsky Eric Goldin	6:10 – 6:20 6:20 – 6:30
Wheeler North Reef • Project completion	Jenny McGee	6:30 – 6:40
Strategic plan to relocate spent fuel offsite • Status and timeline	Manuel Camargo	6:40 – 6:50
Break		6:50 – 6:55
General public comment period		6:55 – 7:55
Facilitated public dialogue	Dan Stetson, Martha McNicholas	7:55 – 8:20
SCE and CEP closing comments	Doug Bauder, David Victor	8:20 – 8:30

Welcome and Opening Comments

David Victor and Doug Bauder



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Opening Comments

David Victor

- Thank you, Jerry Kern, for your service!
- Welcome Rob Howard, new Oceanside representative to CEP
- Congratulations new CEP Secretary Martha McNicholas
- Public comment and facilitated dialogue
 - Sign up for public comment via the question form at <https://on.sce.com/cep>
 - Comments submitted in advance of the meeting will be addressed first
 - Dan Stetson and Martha McNicholas will review comments and facilitate discussion



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Opening Comments

Doug Bauder

- COVID-19 update
- Decommissioning information on www.songscommunity.com

CEP General Community Updates

CEP Updates

David Victor, Dan Stetson & Martha McNicholas

CEP member agenda-planning meeting

- More focus on efforts to relocate spent fuel off-site
 - Specifics actions people can take
 - Coalition-building and advocacy
- Annual focus defense-in-depth for safe on-site spent fuel management
- Updates on deconstruction and milestone attainment

CEP Updates

David Victor, Dan Stetson & Martha McNicholas

- Outlier events follow-up letters
 - David Victor letter to NRC regarding ISFSI security rulemaking
 - SCE letter to David Victor on SONGS security & emergency planning
 - Evergreen document libraries at [songscommunity.com](https://www.songscommunity.com)
<https://www.songscommunity.com/community-engagement/meetings/community-engagement-panel-meeting-20200421>
- NRC Community Advisory Board (CAB) Report
 - Best practices for decommissioning nuclear power plants
- Rep. Levin Task Force Report

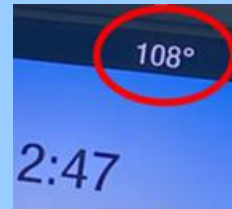
CEP Updates

David Victor

SAN ONOFRE
COMMUNITY
ENGAGEMENT
PANEL

- *EnergySolutions* disposal facility tour, Clive Utah

Temperature
on July 31



Rail Cars



Shredder

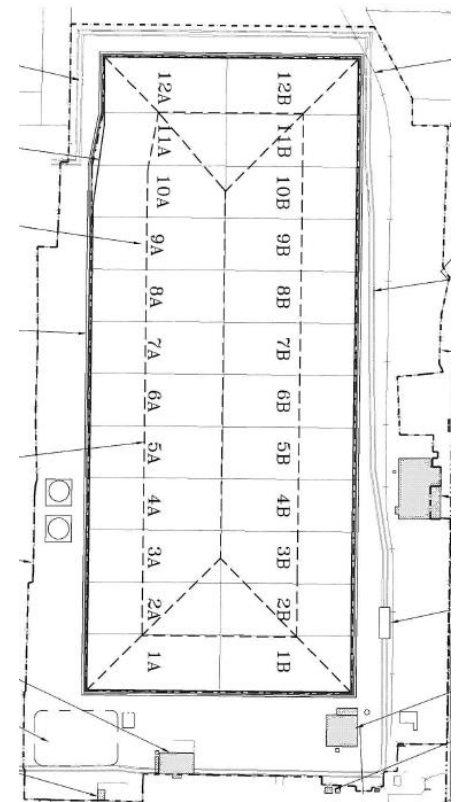
- 6,000 HP Electric Motor
- Reduce debris to 4 inches or less





Mixed Waste

- Radioactive and Hazardous Waste
- RCRA-designed Landfill
- 24 Sumps
- Triple-Lined – Leak Detection





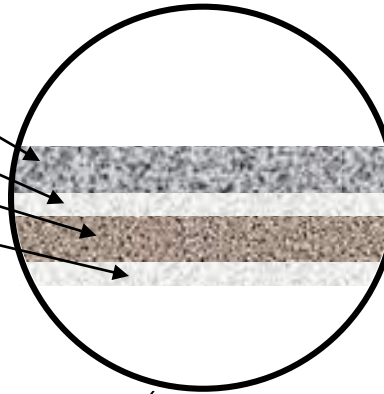
Embankment Construction

Rip Rap 18 in (48 cm)

Type A Filter 6 in (15 cm)

Sac. Soil 12 in (30 cm)

Type B Filter 6 in (15 cm)



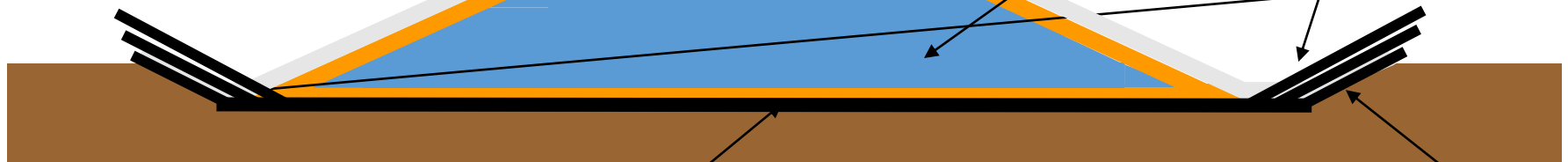
- **Mixed Waste**

Install Engineered Cover

Layers of Waste Compacted and Disposed

Install Radon Barrier (Clay Cap)
2 ft (61 cm)

Synthetic Liner with
Leachate Collection System



Install and Approve Clay Liner

Excavate ~ 10 ft.



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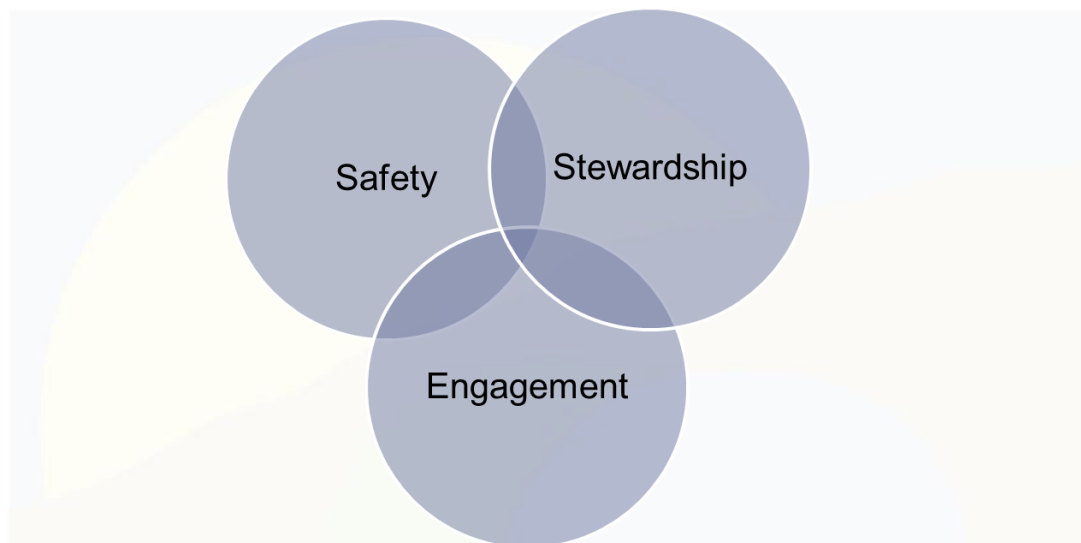
SONGS The Big Picture

Doug Bauder
Chief Nuclear Officer and
VP Decommissioning



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Decommissioning Principles



Safe and prompt **deconstruction**

Defense-in-depth for **on-site storage** of spent nuclear fuel

Take action in an effort to **relocate spent fuel** off site



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Big Picture

- Inspection & maintenance program for Holtec ISFSI approved July 16
- Fuel transfer operations completed Aug. 7
- Established stand-alone ISFSI organization
- Shifting focus to deconstruction
 - SONGS Decommissioning Solutions (SDS) focusing on safe work in containment domes



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Quarterly Update

- Tri-fold mailed in July
- Posted online
- Link provided here:

https://www.songscommunity.com/internal_redirect/cms.ipressroom.com.s3.amazonaws.com/339/files/20206/G20-112%20SONGS%203Q%202020%20Trifold%20Brochure%20071620.pdf



SAN ONOFRE
DECOMMISSIONING UPDATE | JULY 2020

SEEN AND UNSEEN

That will be the nature of the deconstruction work taking place at San Onofre over the next eight years. Some of the projects we undertake will be highly visible to those in the area while others, particularly the early projects, are taking place inside the structures on-site, such as the containment domes. The domes contain many components, which will need to be removed before the domes themselves are eventually torn down. In preparation for that work, we removed more than 300 tons of asbestos-containing material, which has been safely shipped off-site to an appropriate waste repository.



We continue to perform all the work on site, including spent nuclear fuel transfer operations, under our COVID-19 pandemic guidelines to ensure the health and welfare of our employees. Please let us know if you have questions about decommissioning. Visit [SONGSCommunity.com](https://www.songscommunity.com) for more information and to contact us directly.

Thank you for your interest in the decommissioning of SONGS.

Doug Sauder
Vice President and Chief Nuclear Officer
San Onofre Nuclear Generating Station
Southern California Edison



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Dry Cask Storage Defense-in-Depth

Randall Granaas
SCE Nuclear Fuel / ISFSI
Engineer



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UMAX ISFSI

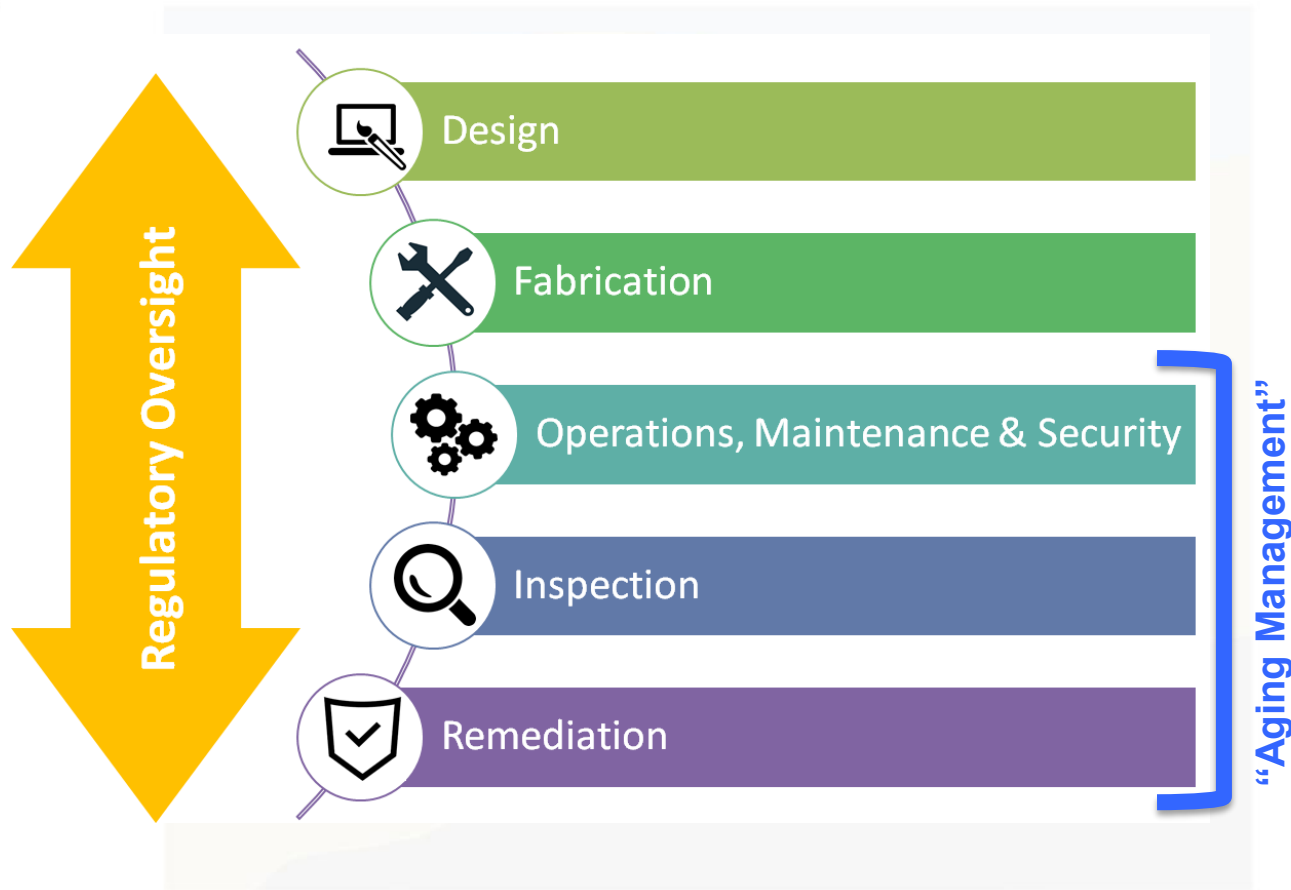


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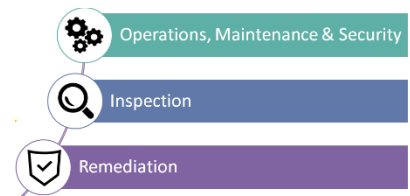
Dry Cask Storage Defense-in-Depth





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Inspection and Maintenance Program



- Implementation of the IMP during the initial 20-year licensing period exceeds NRC requirements
- A comprehensive program to monitor Holtec canisters
 - Ensures the canisters remain ready for onsite/offsite transfer
- Degradation is slow developing, IMP ensures early detection
- Includes metallic overlay repair method
 - Ready to deploy in the unlikely event it is needed



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Metallic Overlay

- Standards:
 - MIL-STD (Military Standard) 3021
 - References ASTM¹ International standards for adhesion and porosity
 - SONGS qualification included hardness requirement (ASTM E92)
- Validation:
 - Military applications (e.g., B-1 aircraft hydraulic lines, Apache helicopter mast support)
 - Vendor facility mock-up
 - In-situ application on SONGS test canister
 - Test coupons validate proper system operation before and after repair
 - Periodically inspect simulated repair as part of IMP-required test canister inspection
 - LPI, Inc. independent third-party engineering review of SONGS IMP, including the metallic overlay process

1. ASTM International, formerly known as American Society for Testing and Materials



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IMP – Inspections

- ISFSI system inspections (e.g., storage module)
- Multi-purpose canister (MPC) inspections
 - Remote robotic inspection of the canister surface
 - Two canisters inspected every 5 years beginning in 2019
- Heated test canister inspections
 - Identical to loaded MPC
 - Inspected every 2.5 years beginning in 2022
- Radiation monitoring

Test Canister



Canister Inspections





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Other CISC Repair Initiatives

- EPRI² three-year project to evaluate, develop, and demonstrate down-selected technology at a dry storage facility:
 - Liquid metal surface treatment
 - Inorganic
 - Geopolymer
 - Atomic layer deposition
 - Plasma spray
- DOE Nuclear Energy University Program (NEUP):
 - Friction stir welding
- ASME Code Case N-860³ approved by Board of Codes and Standards, submitted for publication:
 - IMP modeled after Code Case N-860
 - Next step is to add mitigation and repair section to the code case

2. Electric Power Research Institute

3. Examination Requirements and Evaluation Standards for Spent Nuclear Fuel Storage and Transportation Containment Systems

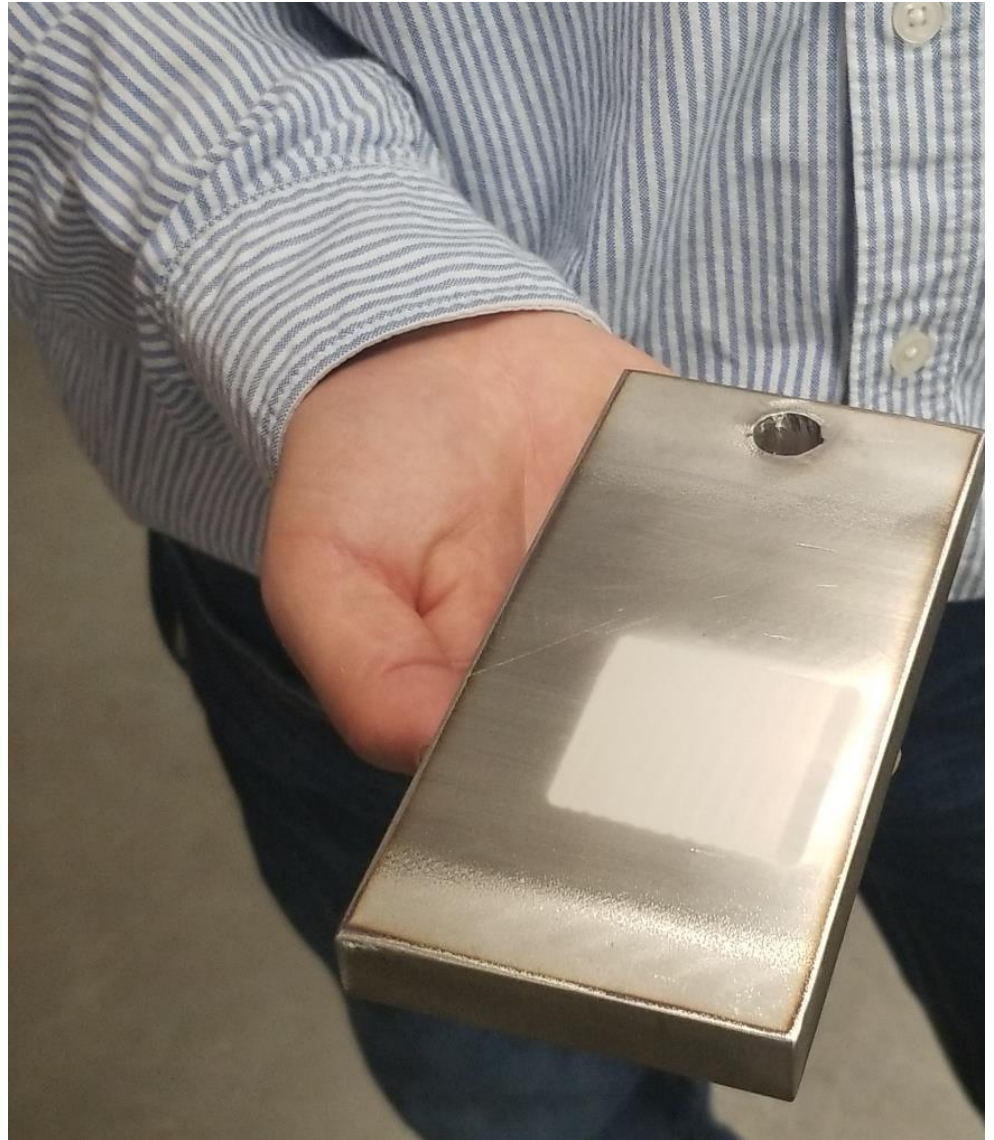


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IMP – Maintenance

- ISFSI structure maintenance performed, based on periodic inspections
- Temperature monitoring & Radiation Monitoring systems checked as periodic maintenance
- Canister maintenance performed based on inspection results
- Canister maintenance includes application of metallic overlay, if necessary

Metallic Overlay Repair Method



Metallic Overlay Demonstration





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IMP – Reporting

- MPC & ISFSI system inspection results reported to CCC every five years after each set of inspections
- Radiation monitoring data reported to state and federal officials
- Will be available on www.SONGScommunity.com



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SONGS Decommissioning Update

Vince Bilovsky
Director, Decommissioning Project



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Dismantlement

- Completed Activities
 - Asbestos removal in containment domes
 - New office trailer complex
 - Equipment upgrades and refurbishment
 - Radiological characterization
- Current activities:
 - Asbestos removal continues in buildings adjacent to containment
 - Preparation of work areas inside containment domes
 - Containment building modifications; including widening the equipment hatch
 - Delivery and staging of specialized tooling and waste containers

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Containment Equipment Hatch

Containment equipment hatch opening at base of dome



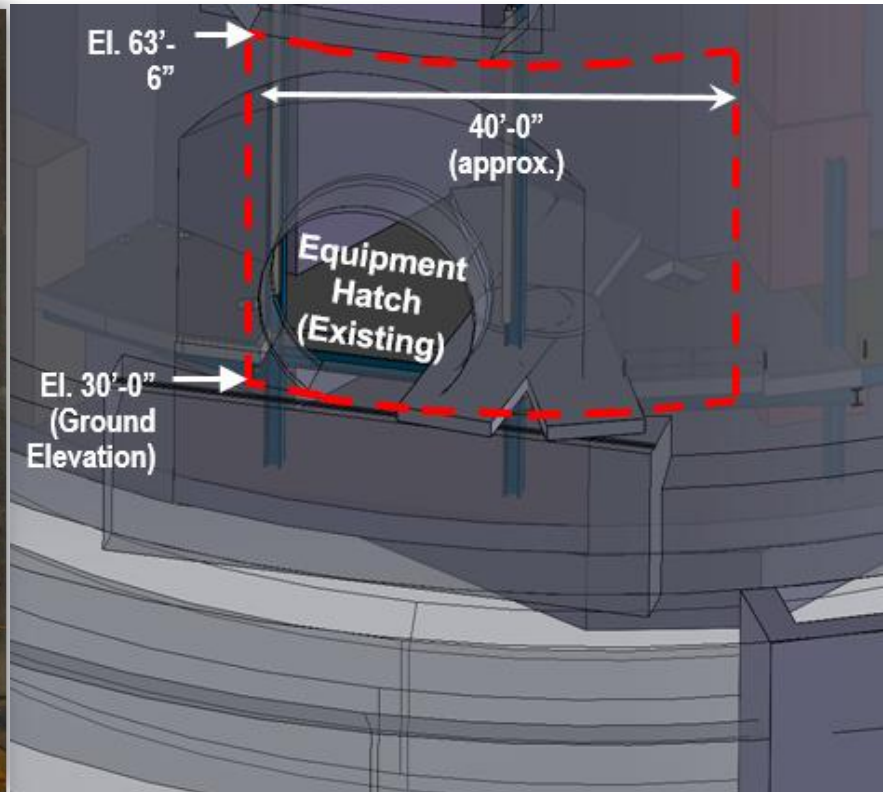


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Containment Hatch Changes



Containment Equipment Hatch Opening

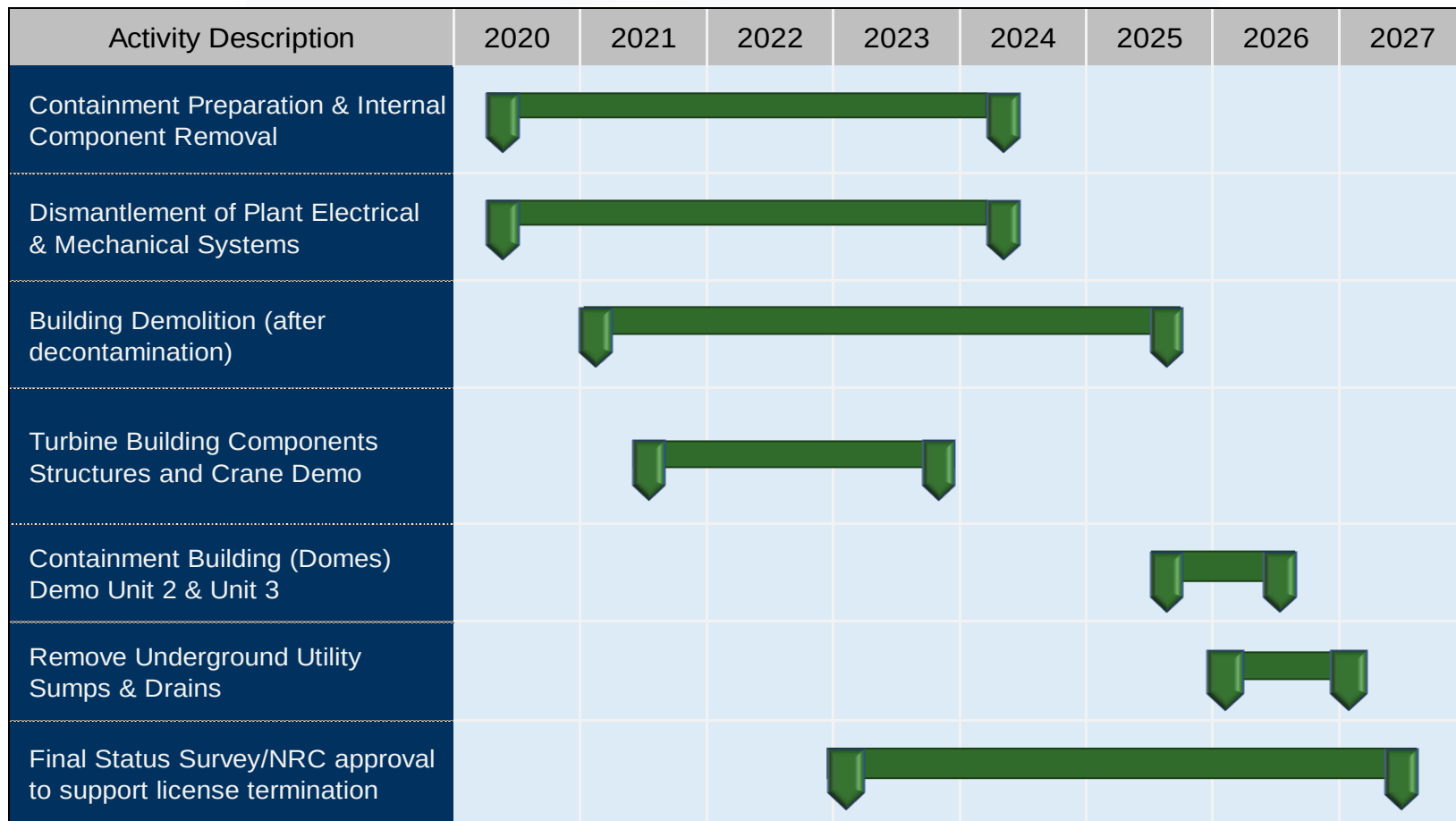


Planned Modification to Opening



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Timeline of Major Work Streams





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Minimizing Impacts on Local Communities

- Maximizing rail vs. trucks to avoid traffic impacts
 - Truck shipments occur during off-peak hours
 - Truck shipments are low volume and low frequency
- Transporting waste by railcar is the preferred method in lieu of trucking on highways

1 Rail Car or...



6 Truck Shipments with Cargo Containers





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Low-level Radiological Waste Shipments

- Reactor pressure vessel (RPV) and low-level waste shipments
 - Unit 1 RPV departed SONGS May 25 and arrived at EnergySolutions facility in Clive, UT on July 14



- 285,00 Tons will be Class A low-level waste sent to Utah, mostly by rail
- 35 Tons will be Class B or C low-level waste sent to Texas by truck
- 125 Tons will be greater than class C (GTCC) low-level waste stored onsite in 12 canisters adjacent to fuel awaiting repository

Waste Class (A,B,C and GTCC) Definitions: <https://www.nrc.gov/reading-rm/basic-ref/glossary/waste-classification-classes-of-waste.html>

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Safety of Liquid Batch Releases

Eric M Goldin, PhD
Certified Radiation Protection
Professional



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Batch Release Process

- Water accumulated, isolated in tanks, filtered, ion exchanged, samples analyzed in lab
- Permit developed with limits (radionuclide concentrations, estimated dose to a maximally exposed member of the public, radiation monitor set-points, etc.)
- Once approved, operators start required dilution and discharge pumps
- Water discharged along with dilution water into discharge conduit, enters ocean in diffuser section ~50 feet below sea level and over a mile offshore, mixes with vast quantities of ocean water



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What Happens?

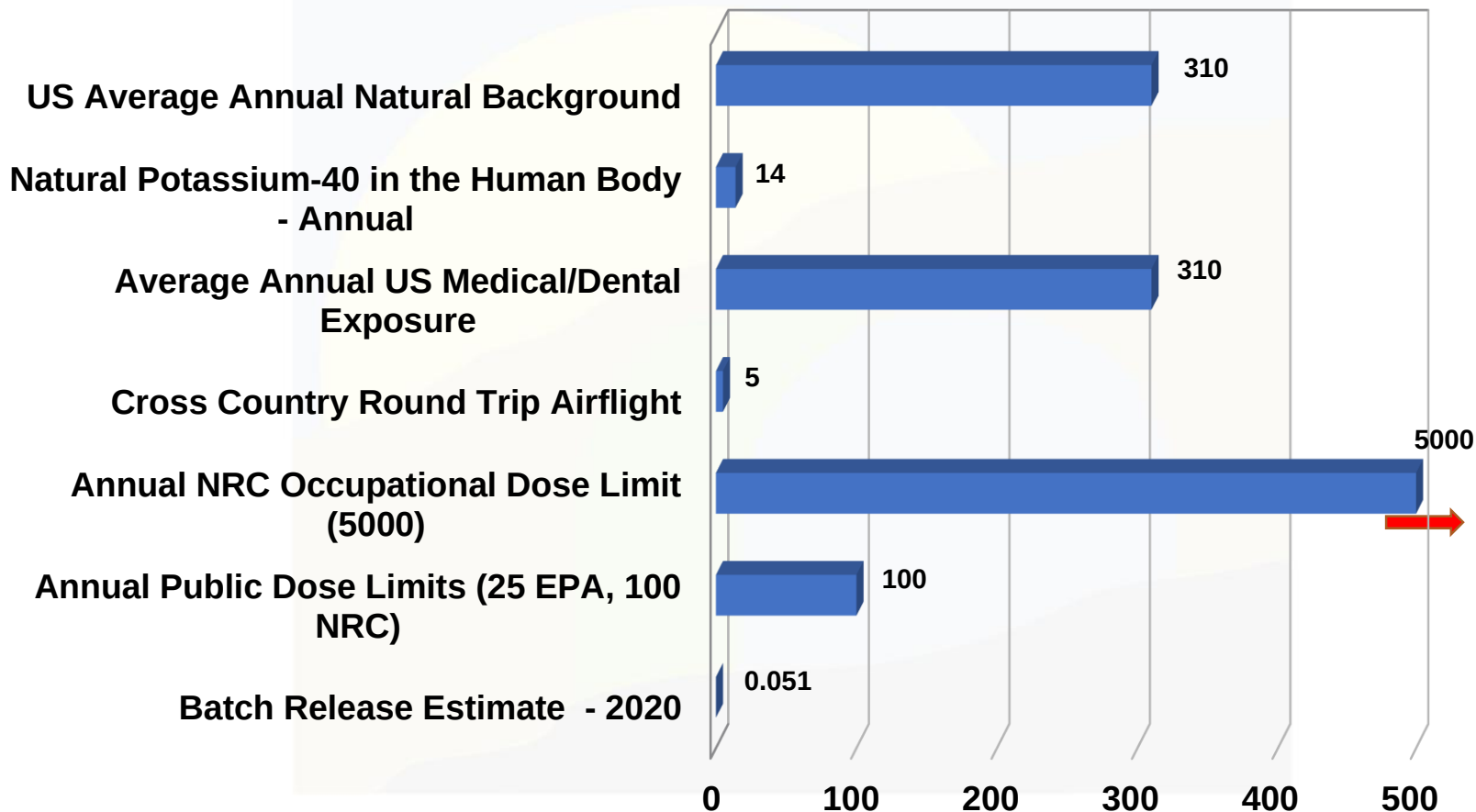
- Radiation exposure estimated using concentrations at the point of discharge (the diffusers) and is therefore very conservative
- Dose based on someone eating seafood that might accumulate radioactive material (fish, crustaceans)
- The regulatory-required Radiological Environmental Monitoring Program confirms safety by validating the releases have no impact on the environment by sampling fish, crustaceans, ocean water, shoreline sediment, ocean bottom sand, and kelp (reviewed by the State and NRC and publicly available including SONGS Community website: <https://www.songscommunity.com/stewardship/responsible-stewardship>)
- The conservatively estimated dose from all 2020 liquid batch releases is 0.051 mrem

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Dose Perspective (millirem)





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Is it Safe? - Yes

- Estimated dose to a member of the public was 0.000722 mrem for the most recent 2020 batch release
 - Less than one hour on the beach yields ~25 times more dose (cosmic, terrestrial, and radon) than the average release dose
 - If you drank all 20,000 gallons, dose would be 4,000 times less than EPA drinking water limit (4 mrem/yr)
 - Estimate for the entire year 2020 is 0.051 mrem
- Compare to natural background of about 1 mrem per day



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Conclusion

- Well below regulatory limits: safe levels established by federal agencies (EPA, NRC) and below Water Board limits
- National and international scientific organizations note that any dose less than about 10,000 mrem per year have no measurable effects in humans
 - Safe levels recommended by National Council on Radiation Protection & Measurements and International Commission on Radiological Protection
- Conclusion - very safe for swimmers, surfers, public



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Wheeler North Reef Expansion Project

Jenny McGee
Project Manager, Restoration Ecologist



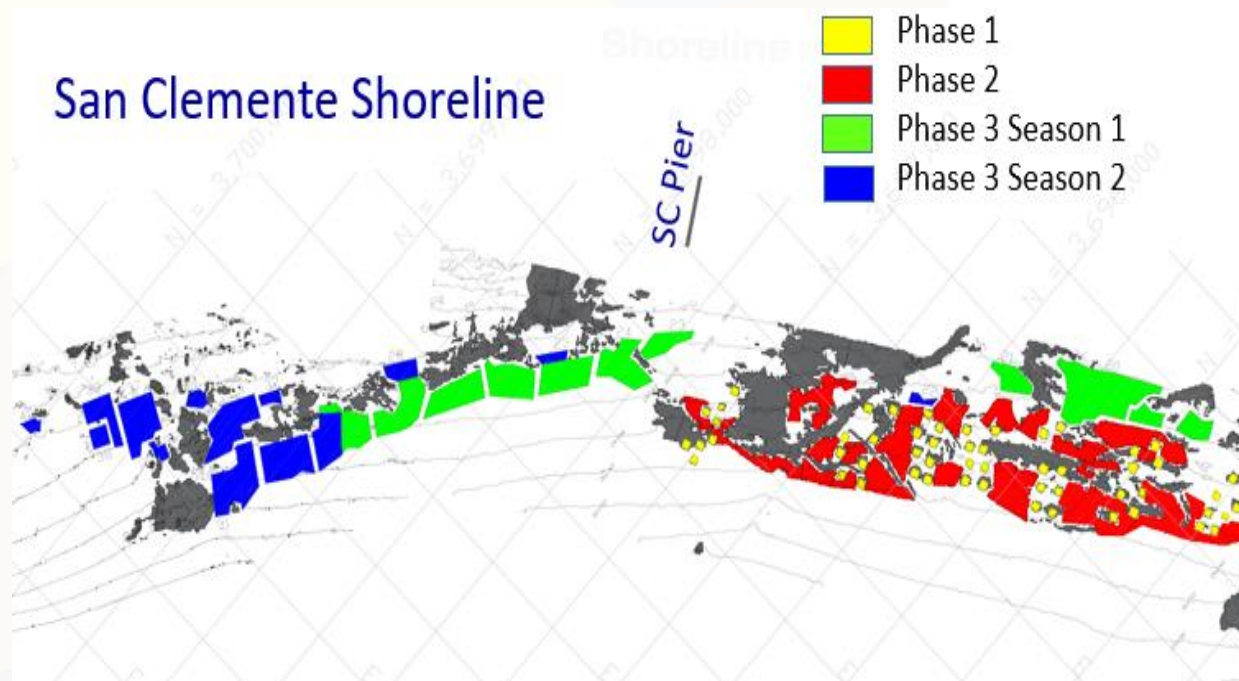


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Wheeler North Reef Expansion Project Complete

Largest man-made reef in the world

- Built in three phases
- Phase 3 was 202 acres 150,900 tons of rock
- Reef more than doubled to 376 acres





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Consultation with Tribal Nation to Protect Cultural Resources

Tribal Consultation under CEQA (Assembly Bill 52, 2015)

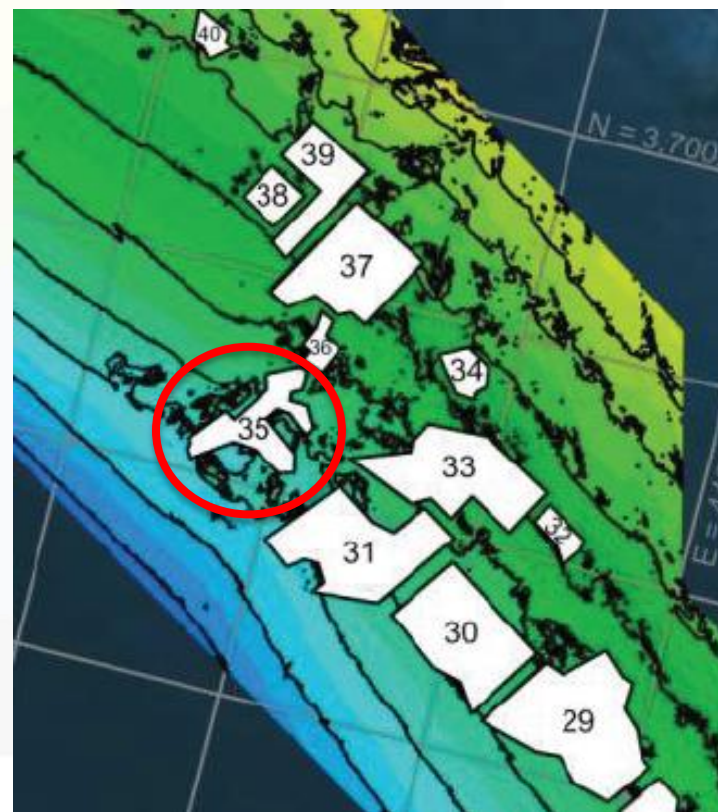
Consultation Process:

- Tribal notification
- Acjachemen Nation pre-construction dive for resources in project area
- Identified cultural sensitivity within Polygon 35

Consultation Outcome:

- SCE eliminated Polygon 35
- Post-construction cultural dive
- Ca. State Lands/ Dudek and SCE to develop professional paper on consultation process

Bathymetry Map Showing Polygon 35





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Marine Wildlife Monitoring

Fulltime Monitoring to Protect Marine Animals

- Species identification
- Monitor compliance with applicable laws
- Stop Work Authority to avoid marine animal collisions or harm
- Exclusion Zone: 500 feet small animals; 1,640 feet large animals
- Trained dedicated boatmen to monitor transport vessels



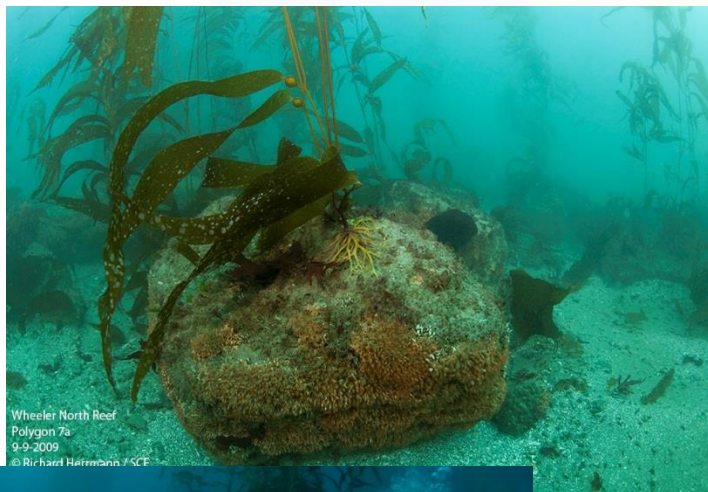
2019 Observations

- Total number of sightings: 1,378
- Total number of animals: 1,253
- Total Stop Work orders: 17



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Monitoring Success: A Pathway Forward



Coastal Commission/ SCE Agreement

- Defined compliance period, now tied to SONGS Operation life 32 years
- Shift performance standards
 - 896 tons of fish (28 tons/yr. x 32 years)
 - 4,800 acres of kelp (150 acres/yr. x 32 years)
 - 32 years of relative data performance
- Reduced annual monitoring effort
- Hard substrate monitoring every 5 years



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Strategic Plan Update

Manuel Camargo
Principle Manager, Strategic Planning
and Stakeholder Engagement



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Purpose

- The safe and commercially reasonable relocation of SONGS spent fuel to a licensed off-site facility as soon as possible
- Initiated by a settlement agreement
- Plan development provides for engagement with a range of stakeholders



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About the Plan

- Relocating spent fuel offsite is an SCE priority
- Strategic Plan is not to select a single solution but rather identify and keep open several potential alternatives
 - Includes near-term efforts to ensure SONGS fuel is ready for pickup
- Conceptual Transportation Plan will help SCE understand the steps needed to safely transport spent fuel to the Southwest U.S.
- SCE Action Plan will guide implementation



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Development of the Plans

- Guidance is being provided by an “Experts Team”
 - Comprised of leading experts in regulation, siting & licensing, nuclear engineering, radiation science, and spent fuel transportation
- Writing and analysis provided by North Wind Team
- Direct stakeholder engagement built into plan development process
 - Also, comments may be submitted via www.SONGScommunity.com
- An Action Plan is being prepared by SCE to support the implementation of findings

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Completing the Strategic Plan

Status

- Analysis is in process and drafting is underway

Next Steps

- Detailed CEP briefing at 4Q meeting on Nov. 19
- Complete Strategic Plan, Conceptual Transportation Plan, and SCE Action Plan and release in early 2021
- Work to catalyze coalition(s) to advocate for federal policy

SAN ONOFRE
COMMUNITY
ENGAGEMENT
PANEL

BREAK

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Public Comment

Submit written comments to nuccomm@songs.sce.com



3:00



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CLOSING COMMENTS

DAVID VICTOR AND DOUG BAUDER



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2020 CEP Meetings

Focus Topics	Dates
1Q CEP Meeting – Decommissioning and fuel transfer operations	March 26
2Q CEP Meeting – Outlier events and response strategies	May 28
CEP member consultation meeting To advise SCE on topics for 3Q and 4Q CEP meetings	July 23
3Q CEP Meeting – SONGS Decommissioning Update and Dry Cask Storage: Defense-in-Depth	Aug. 20
4Q CEP Meeting SONGS Strategic Plan	Nov. 19

Subject to Change

Thank you
Stay safe and healthy



Decommissioning San Onofre Nuclear Generating Station

Acronyms

AMP	Aging Management Program
C&D	Cold & Dark
CAP	Corrective Action Program
CCC	California Coastal Commission
CDP	Coastal Development Permit
CEC	Cavity Enclosure Container
CEP	Community Engagement Panel
CEQA	California Environmental Quality Act
CIS	Consolidated Interim Storage
CISCC	Chloride-Induced Stress Corrosion Cracking
CPUC	California Public Utilities Commission
CSLC	California State Lands Commission
D&D	Decontamination & Dismantlement
DA	Decommissioning Agreement; Decommissioning Agent
DCE	Decommissioning Cost Estimate
DDT	Decommissioning & Dismantlement Team
DGC	Decommissioning General Contractor
DID	Defense-in-Depth
DOD	Department of Defense
DOE	Department of Energy
DON	Department of Navy
DSAR	Defueled Safety Analysis Report (replaces FSAR)
DSC	Dry Storage Canister
D-SEIS	Draft Supplemental Environmental Impact Statement
D-SER	Draft Safety Evaluation Report
DTF	Decommissioning Trust Fund
EIR	Environmental Impact Report
EP	Emergency Plan
EPRI	Electric Power Research Institute
FIER	Final Environmental Impact Report
FTO	Fuel Transfer Operations
GEIS	Generic Environmental Impact Statement
HI-PORT	Holtec International – (Engineered Low Profile) Transporter
HI-TRAC	Holtec International – Transfer Cask

IFMP	Irradiated Fuel Management Plan
ISFSI	Independent Spent Fuel Storage Installation
LAR	License Amendment Request
LOED	Large Organism Exclusion Device
MAPS	Managing Aging Programs in Storage
MARSSIM	Multi-Agency Radiation Survey Site & Investigation Manual
MOU	Memorandum of Understanding
NAHC	Native American Heritage Commission
NDCTP	Nuclear Decommissioning Cost Triennial Proceeding
NDE	Non Destructive Examination
NDTF	Nuclear Decommissioning Trust Fund
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act
NGS	Nuclear Generating Station
NOP	Notice of Preparation
NPP	Nuclear Power Plant
NRC	Nuclear Regulatory Commission
OC	Orange County
PDEP	Permanently Defueled Emergency Plan
PDTs	Permanently Defueled Technical Specifications
PSDAR	Post-Shutdown Decommissioning Activities Report
Q&A	Questions & Answers
REIR	Request for Environmental Impact Review
SCE	Southern California Edison
SD	San Diego
SDG&E	San Diego Gas & Electric
SDS	SONGS Decommissioning Solutions
SFP	Spent Fuel Pool
SFPI	Spent Fuel Pool Island
SLC	State Lands Commission (CA)
SLR	Sea Level Rise
SONGS	San Onofre Nuclear Generating Station
TBA	To Be Announced
VCT	Vertical Canister Transporter
ZCAP	Zion Community Advisor Panel