



Decommissioning **San Onofre** Nuclear Generating Station

SCE Oversight Enhancements and Path Forward

Doug Bauder

Chief Nuclear Officer and Vice
President Decommissioning



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Nuclear Generating Station

Changes to Oversight

- Addressed weaknesses to support more robust oversight
- Procedures revised to include rigorous review of contractor procedures and training programs
- All SONGS oversight personnel trained via Holtec System
- Procedures revised to include improved task guides, risk management, and direction on intervention
- Formal Senior Management observation program
- Additional expert fuel transfer personnel
- Periodic independent assessment of effectiveness and sustainability



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Path Forward

- **Preparations:** Extensive preparations for resuming FTO include:

Mobilization of personnel

Training of personnel on new procedures

Qualification of personnel

Checks of equipment & certifications

Final readiness reviews

- **Timeline:** Restart is projected for sometime in coming weeks contingent upon final readiness reviews
- **Final notification:** Public will be notified prior to restart

NRC Region IV

Scott Morris, Regional Administrator

Linda Howell, Deputy Director, DNMS

BREAK

Information Booths Available

Public Comment

Submit written comments to:
nuccomm@songs.sce.com

2019 CEP Meetings

Future Topics
Topics That Keep Coming Up
ISFSI-only Security & Emergency Plans
Defense-In-Depth for Dry Cask Storage
The State of Private Consolidated Interim Storage

**Submit Additional Topic Recommendations
to:**

nuccomm@songs.sce.com

Workshops and topics to be integrated

- Extreme Events, Understanding Radiation & Emergency Response Workshop
- Ongoing Radiation Monitoring & Timely Publicly Available Data Workshop
- SONGS Decommissioning *Solutions* (General Contractor)

Subject to Change



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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



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APPENDIX



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San Onofre Dry Cask Storage Discussion

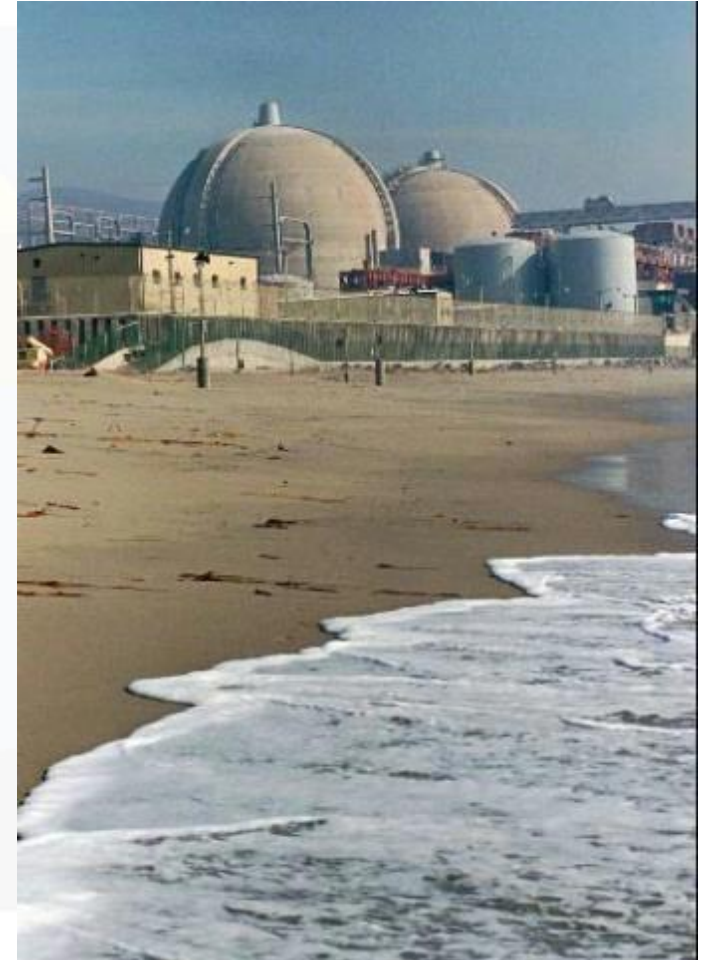
Tom Palmisano
Vice President, External Engagement
May 29, 2019



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San Onofre Plant History

- **Unit 1**
 - Online January 1968
 - Retired 1992, partially decommissioned
- **Units 2 and 3**
 - Online November 1983, April 1984
 - Retired June 7, 2013
- **Spent Fuel Storage**
 - Over 50 years
 - Dry Cask Storage since 2003





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SONGS Site

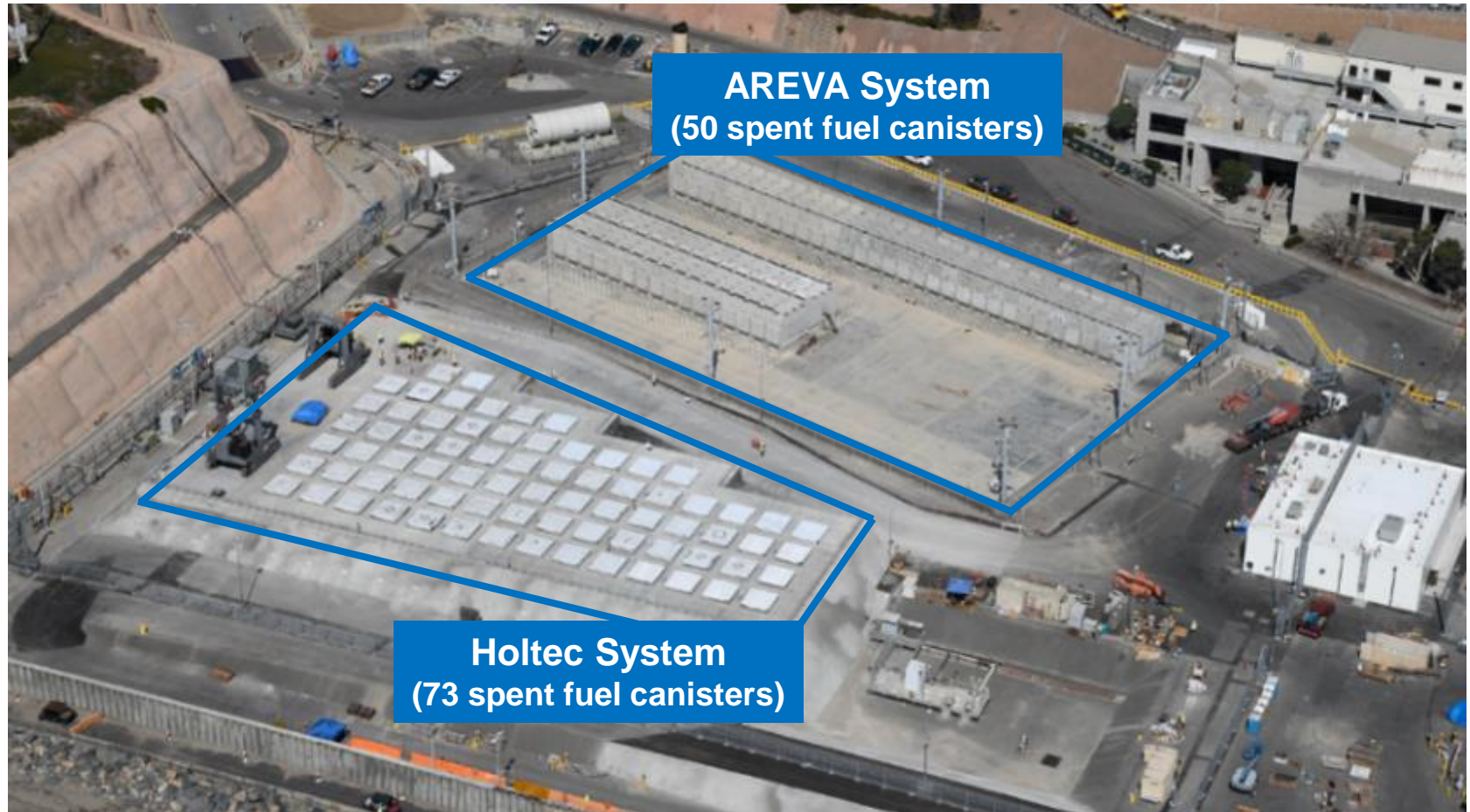


SONGS Independent Spent Fuel Storage Installation (ISFSI)

Provides Passive Dry Cask Storage for Spent Fuel While On Site



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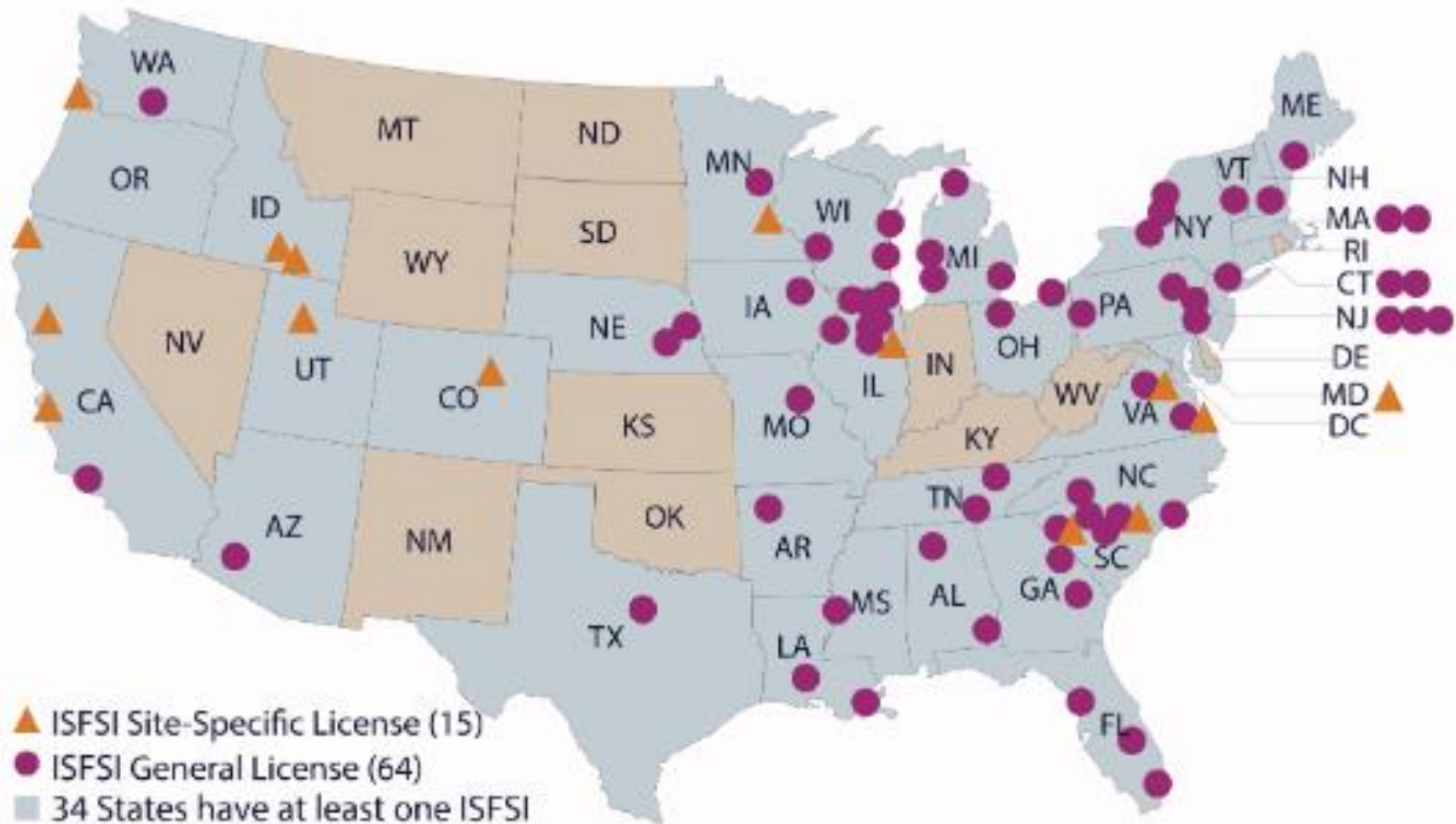




Used Fuel Management Strategy

1. Safely manage and store San Onofre's used nuclear fuel until it is removed from site
2. Promptly offload fuel from pools to passive dry cask storage
3. Support all safe and reasonable options to remove used nuclear fuel from San Onofre site
4. Recover used fuel storage costs from DOE

Spent Fuel Storage Sites



On-site Used Fuel Storage

INITIAL STATE

Spent Fuel
Pools

2668 fuel
assemblies

Existing ISFSI
50 canisters (1187
fuel assemblies)

EXPANDED ISFSI

73 canisters
(2668 fuel
assemblies)

+

existing 50
canisters
(1187 fuel
assemblies)

**29 CANISTERS HAVE BEEN
LOADED ONTO THE ISFSI**

FUTURE STATE

**3855 fuel
assemblies in
123 canisters**



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Specifications of SONGS Dry Fuel Storage System

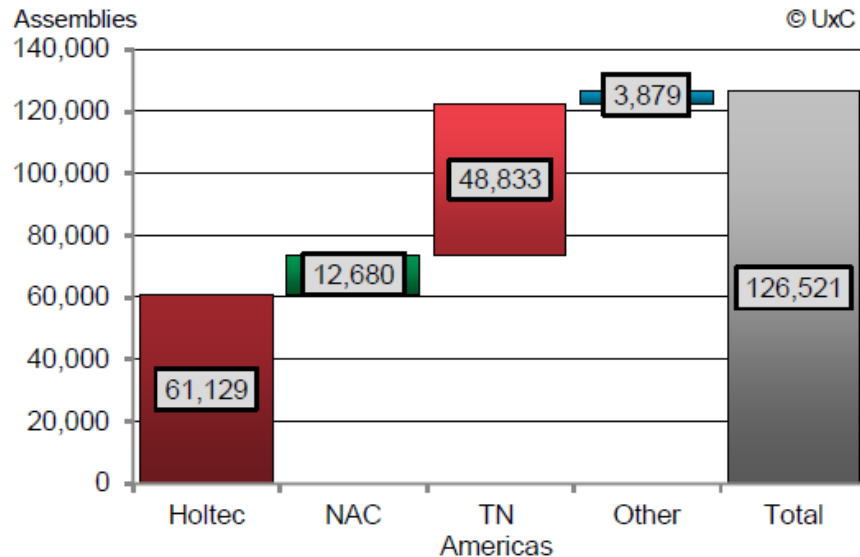
- Licensed for storage and transportation
- Higher seismic design
- Thicker canister: 5/8 inch vs 1/2 inch
- 316L stainless steel
- Holtec canister improvements: welding; peening



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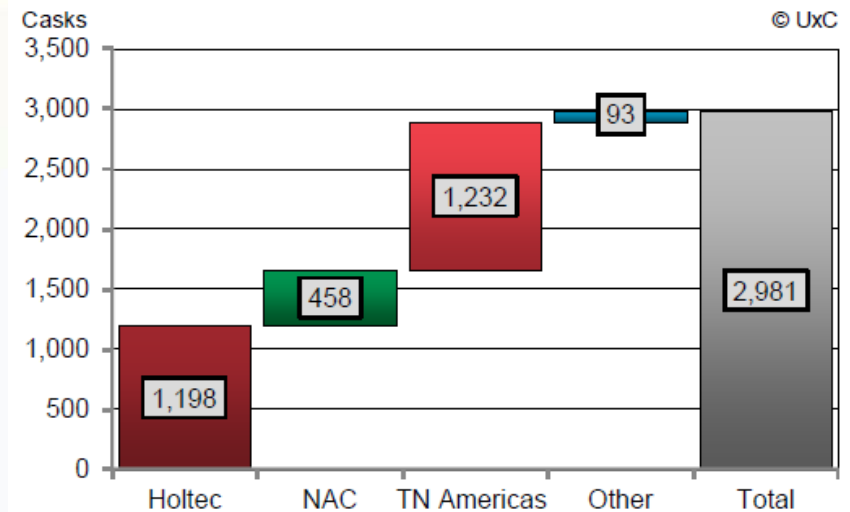
Industry Dry Storage Systems at end of 2018

Assemblies in Dry Storage in the U.S.



Source: January 2019 *StoreFUEL*

Dry Storage Systems – Total Storage Modules in Use in the U.S.





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Cask Systems Used in the U.S.

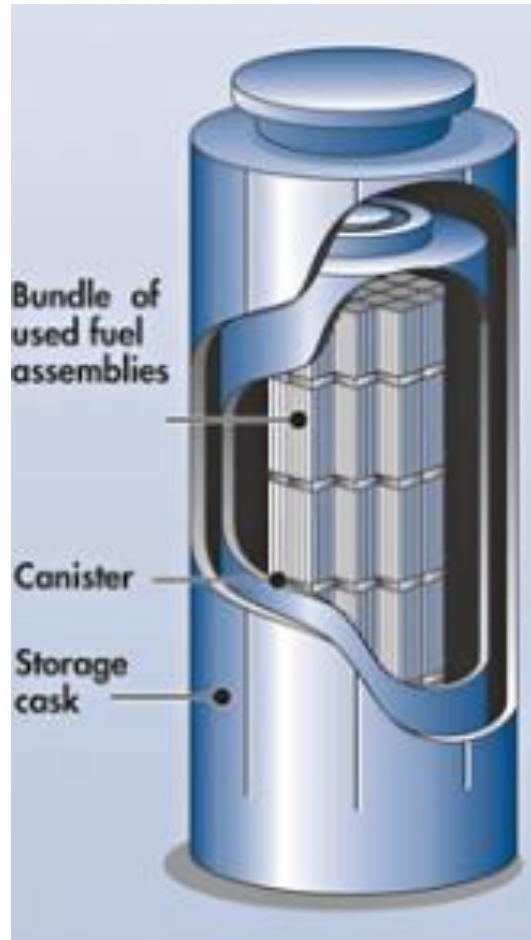
	Maker	Cask Type	Active Cask Vendor in U.S.	General License Available	Store High Burnup Fuel	Licensed for Transport	Basket Length Adequate	Meet SONGS Seismic
1	GNS	Castor V/21	No	No	No	No	No	Unknown
2	GNS	Castor X/33	No	No	No	No	No	Unknown
3	West	MC-10	No	No	No	No	No	Unknown
4	Areva	TN-24	Yes	No	No	No	No	Unknown
5	NAC	NAC 128 S/T	Yes	No	No	No	No	Unknown
6	Areva	TN-68*	N/A	N/A	N/A	N/A	No	N/A
7	REA	REA-2023*	N/A	N/A	N/A	N/A	No	N/A
8a	Areva	TN-40	Yes	No	No	Yes	No	No
8b	Areva	TN-40HT	Yes	No	Yes	No	No	No
9	Areva	TN-32	Yes	Yes 72-1021	No	No	No	No

* For boiling water reactors only



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Canister Storage System



- SONGS Canisters are steel canisters stored in a concrete monolith/module
- SONGS Canisters will be placed in a TRANSPORTATION overpack when an offsite facility is available
- 92% of all the dry storage systems loaded in the U.S., use canisters, approximately 225 (less than 8%) are thick-wall casks
- All 15 shutdown sites use canister-based technology
- Of the recent shutdown sites, over 546 canisters have been loaded or are planned (e.g., SONGS, Fort Calhoun)



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AREVA and Holtec Transportation Cask Licensing Status

SONGS Unit	Canister Model	Transportation Cask Certificate of Compliance	Cask Model	NRC License Status	Compatible with DOE ATLAS Railcar
Unit 1	AREVA NUHOMS 24PT1	71-9255	MP187	Approved	Yes
Units 2/3	AREVA NUHOMS 24PT4	71-9302	MP197HB	Approved	Yes
Units 2/3 fuel in wet storage	Holtec MPC-37	71-9373	HI-STAR 190	Approved	Yes



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Used Fuel Readiness for Transportation

- Some fuel qualified for transport now
- Remaining fuel qualifies over time

	NOW	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30	TOTAL
Units 2/3 AREVA NUHOMS 24PT4	27	6												33
Unit 1 AREVA NUHOMS 24PT1	2					1					5		9	17
Units 2/3 HOLTEC MPC-37			67		2	2		1			1			73



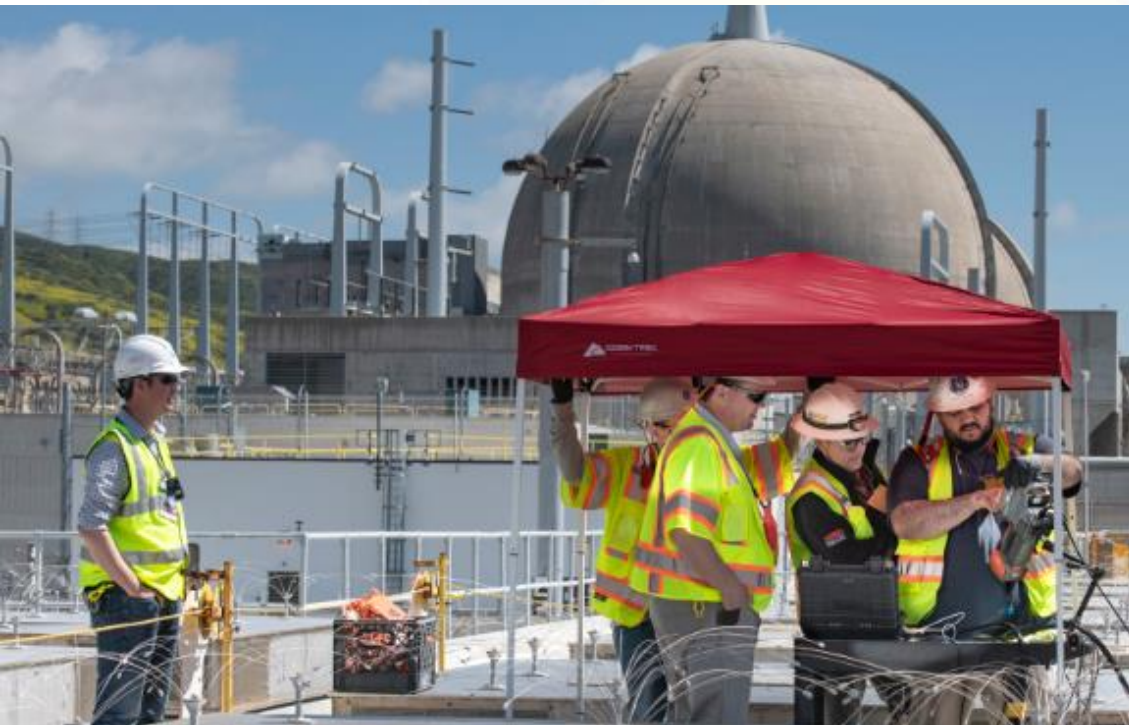
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Canister Inspections



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Canister Inspections





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Canister Inspection Summary

In situ inspections of 8 canisters

- Wear marks far below depth that would be a safety concern
- Incidental wear during downloading poses no safety significance
- Oxide layer re-forms to protect from corrosion
- No increased corrosion
- Canister containment integrity remains robust
- Inspection & Maintenance program will monitor over time



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Recurring Questions



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Recurring Questions

- Canisters vs casks
- Lifetime of system
- ASME design requirements
- Transportability of canisters
- Stress corrosion cracking
- Inspection of canisters
- Scratches on canisters
- Mitigation of canister issues
- Design basis events
- Consequences of a crack in canister



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End of Presentation



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Differences between U.S. Nuclear Plants and the Chernobyl Nuclear Plant

Key differences in U.S. reactor design, regulation and emergency preparedness mean an accident like Chernobyl cannot occur in the U.S.

- Chernobyl Accident and Its Consequences (NEI - May 2019)
 - <https://www.nei.org/resources/fact-sheets/chernobyl-accident-and-its-consequences>
- NRC Backgrounder: Chernobyl Nuclear power Plant Accident (NRC - August 2018)
 - <https://www.nrc.gov/docs/ML0511/ML051160016.pdf>
- SONGS reactors are permanently defueled – Safety & emergency planning for SONGS decommissioning
 - <https://www.songscommunity.com/safety/emergency-planning>