UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 1, 2021

MEMORANDUM TO: Christopher Regan, Deputy Director
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

FROM: Christopher Markley, Systems Performance Analyst **/RA/**
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUMMARY OF JANUARY 26, 2021, MEETING WITH PACIFIC GAS & ELECTRIC COMPANY TO DISCUSS THE UPCOMING SUBMITTAL OF THE APPLICATION FOR RENEWAL OF THE DIABLO CANYON INDEPENDENT SPENT FUEL STORAGE INSTALLATION LICENSE (CAC NO. 001028)

Background

On January 26, 2021, a virtual meeting was held between representatives of Pacific Gas & Electric Company (PG&E) and the U.S. Nuclear Regulatory Commission (NRC) to discuss the upcoming submittal of the application for renewal of the Diablo Canyon Independent Spent Fuel Storage Installation (ISFSI) license. The list of meeting attendees is provided in Enclosure 1.

The meeting was noticed on January 6, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21006A204).

Discussion

The meeting discussion followed the meeting agenda, which is provided in Enclosure 2. PG&E presented their plans related to the Diablo Canyon ISFSI license number (SNM-2511) renewal application (Enclosure 3). The presentation provided an overview of the content of their forthcoming license renewal application (LRA). PG&E stated that the license renewal application will include general information, a scoping evaluation, an aging management review, and time-limited aging analyses (TLAAs). Appendices will cover the aging management programs (AMPs), granted exemptions, proposed license changes, a final safety analysis report, a pre-application inspection report, an environmental report, and a decommissioning funding plan.

PG&E plans to request a license renewal for a 40-year period starting from the current license expiration date. The current specific license expires in March 2024. To meet timely renewal requirements, PG&E must submit the LRA no later than March 2022. PG&E currently plans to submit the LRA in the fourth quarter of 2021.

In developing the LRA, PG&E indicated they intend to follow guidance in the Standard Review Plan for Renewal of Spent Fuel Dry Cask Storage System Licenses and Certificates of Compliance (NUREG-1927), Rev. 1, the Managing Aging Processes in Storage Report (NUREG-2214), and NEI 14-03. PG&E also indicated they will consider the following in developing the LRA: the Humboldt Bay, Rancho Seco, and Trojan LRAs, and the HI-STORM 100 and HI-STAR 100 certificate of compliance (CoC) renewals.

In their presentation, PG&E provided an overview of their six proposed AMPs and TLAAs. PG&E also provided an overview of existing ISFSI inspections which includes annual overpack and storage pad visual inspections, daily vent inspections, and quarterly thermoluminescent dosimeter dose monitoring. The transfer cask, cask transporter, and cask transfer facility are inspected prior to use. PG&E plans pre-application inspections on seven multipurpose canisters, overpacks, the ISFSI storage pads and the cask transfer facility's structural concrete in the March to May 2021 timeframe.

During the presentation, the NRC staff asked several clarifying technical questions and made suggestions to help ensure a high-quality LRA would be submitted.

After PG&E and NRC representatives completed their discussion, the meeting was opened to public comments or questions for the NRC. One out of scope comment on transportation was addressed.

Action Items/Next Steps

PG&E plans to submit the Diablo Canyon ISFSI LRA in the fourth quarter of 2021.

Docket No. 72-26
CAC No. 001028
EPID: L-2021-LRM-0000

Enclosures:
1. Meeting Attendees
2. Agenda
3. PG&E Presentation on Diablo Canyon ISFSI LRA Handout

SUBJECT: SUMMARY OF JANUARY 26, 2021, MEETING WITH PACIFIC GAS & ELECTRIC COMPANY TO DISCUSS THE UPCOMING SUBMITTAL OF THE APPLICATION FOR RENEWAL OF THE DIABLO CANYON INDEPENDENT SPENT FUEL STORAGE INSTALLATION LICENSE (CAC NO. 001028)

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DATE	2/10/2021	2/10/2021	2/11/2021

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MEETING AGENDA

Meeting with Pacific Gas & Electric (PG&E)

January 26, 2021
1:00 – 3:00 p.m. (Eastern Time) One

Virtual

Purpose: PG&E to discuss the upcoming submittal of the application for renewal of the Diablo Canyon Independent Spent Fuel Storage Installation license.

Agenda:

- Welcome, introductions, and meeting objectives
- PG&E presentation and discussion
- Public questions or comments
- Wrap-up and closing remarks
- Meeting adjourned

Enclosure 2

MEETING ATTENDEES

Public Meeting with Pacific Gas & Electric Company to discuss the upcoming submittal of the application for renewal of the Diablo Canyon Independent Spent Fuel Storage Installation license

January 26, 2021, 1:00 – 3:00 p.m.

MS TEAMS Attendee List	**Affiliation**
Chris Markley	NRC/NMSS/DFM
John McKirgan	NRC/NMSS/DFM
Kristina Banovac	NRC/NMSS/DFM
Christian Jacobs	NRC/NMSS/DFM
John Wise	NRC/NMSS/DFM
Darrell Dunn	NRC/NMSS/DFM
Eliezer Goldfeiz	NRC/NMSS/DFM
Antonio Rigato	NRC/NMSS/DFM
Angel Moreno	NRC/OCA
David McIntyre	NRC/OPA
Philippe Soenen	PG&E
Maureen Zawalick	PG&E
Michelle Olsofsky	PG&E
Richard Hagler	PG&E
Mark Mayer	PG&E
Coleman Miller	PG&E
Thomas Jones	PG&E
Brandy Lopez	PG&E
John Pfabe	Westinghouse Electric Co
Michael Holmes	Westinghouse Electric Co
Jason L Williams	Westinghouse Electric Co
Robert D. Quinn	Westinghouse Electric Co
Donald Lewis	Westinghouse Electric Co
David Weisman	Alliance for Nuclear Responsibility
Jeremy Browning	BHI Energy
Adam Cleary	Cardno
Susan Strachan	County of San Luis Obispo, Planning & Building
Chuck Anders	Diablo Canyon Decommissioning Engagement Panel Facilitator
Nick Harvey	Local 114/ So. Cal Pipe-Trades
Justin Aborn	LucidCatalyst, LLC
Sherry Lewis	Mothers for Peace
Carlyn Greene	UxC
Kevin Braico	

MS TEAMS Attendee List	**Affiliation**
Brian DiPaolo	
Kyle Duke	
Nikita Goswami	
Scott Lathrop	
Debu Majumdar	
Tom Marre	
Eric Nelson	
Kalyan K. Niyogi	
Michael Richardson	
Indresh Rampall	
Jane Swanson	
Bill Woodson	
Jill ZamEk	
Unidentified Callers	
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+1 805-000-0002	
+1 805-000-0003	
+1 720-000-0001	
+1 805-000-0004	
RSVP	
David Baldwin	Plumbers & Pipefitters Local Union 403
Kenneth Thompson	Avila Valley Advisory Council
Carole Hisasue	na
Bob Peterson	na
Susan Coffman	PG&E
Stephen Huffard	Westinghouse Electric Co
John Dalton	Westinghouse Electric Co

Diablo Canyon Independent Spent Fuel Storage Installation License Renewal

Pre-Application Meeting

January 26, 2020

Meeting Attendees

- Tom Jones – Pacific Gas and Electric (PG&E) Director, Strategic Initiatives
- Mark Mayer – Diablo Canyon (DC) Nuclear Fuel Manager
- Rich Hagler – PG&E Dry Cask Storage Supervisor
- Philippe Soenen – PG&E Decommissioning Environmental and Licensing Manager
- Michelle Olsofsky – Strategic Initiatives Licensing Engineer
- Holtec Leadership, Licensing, Engineering, and Project Manager

Tom Jones: PG&E Director, Strategic Initiatives

Slides 4 – 8

Meeting Purpose / Goals

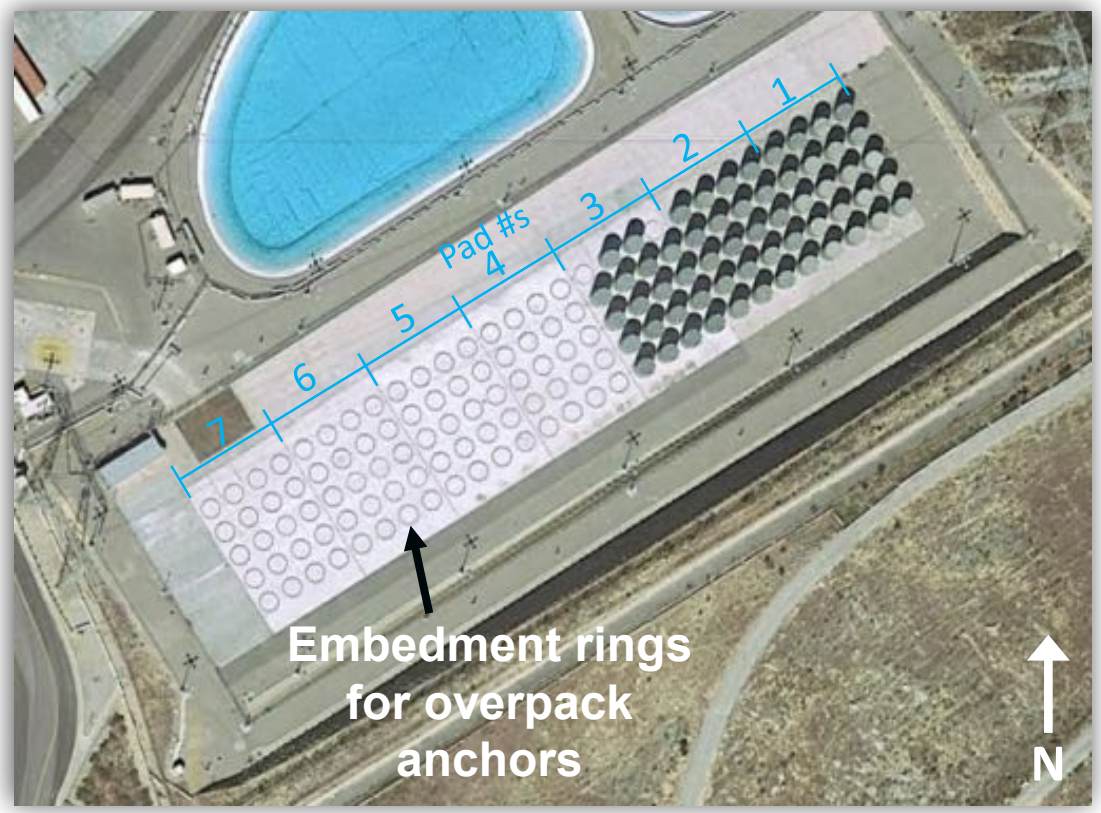
- **Provide background information to the NRC staff on the DC Independent Spent Fuel Storage Installation (ISFSI) license renewal**
- **Provide preliminary information to the NRC staff on the license renewal application (LRA)**
  - Humboldt Bay ISFSI lessons learned incorporated
- **Obtain feedback from the NRC staff on the LRA:**
  - Aging management program (AMP) scopes
  - Pre-application inspection scope

Overview of the DC ISFSI Site

- **Location:**
  - 6-7 miles northwest of Avila Beach, California (midway between San Francisco and Los Angeles)
  - Within the Diablo Canyon Power Plant (DCPP) site boundary and owner-controlled area
  - ISFSI is at 310 ft. above sea level
  - Marine environment

Overview of DC ISFSI and License

- **Site-specific 10 CFR Part 72 license SNM-2511 issued in March 2004**
  - License expires in March 2024
  - Storage of spent fuel, including high-burnup fuel (no greater than Class C waste)
  - Accommodates all spent fuel generated through the end of the DCPP operating licenses
- **DC ISFSI consists of:**
  - HI-STORM 100 System
  - Storage pads and anchorage
  - Cask Transfer Facility (CTF)
  - Cask Transporter, Transfer Cask, Low-Profile Transporter (LPT)
- **Current status:**
  - 7 completed loading campaigns
  - 1,856 fuel assemblies stored in 58 casks
- **LRA submittal planned for Q4 2021**



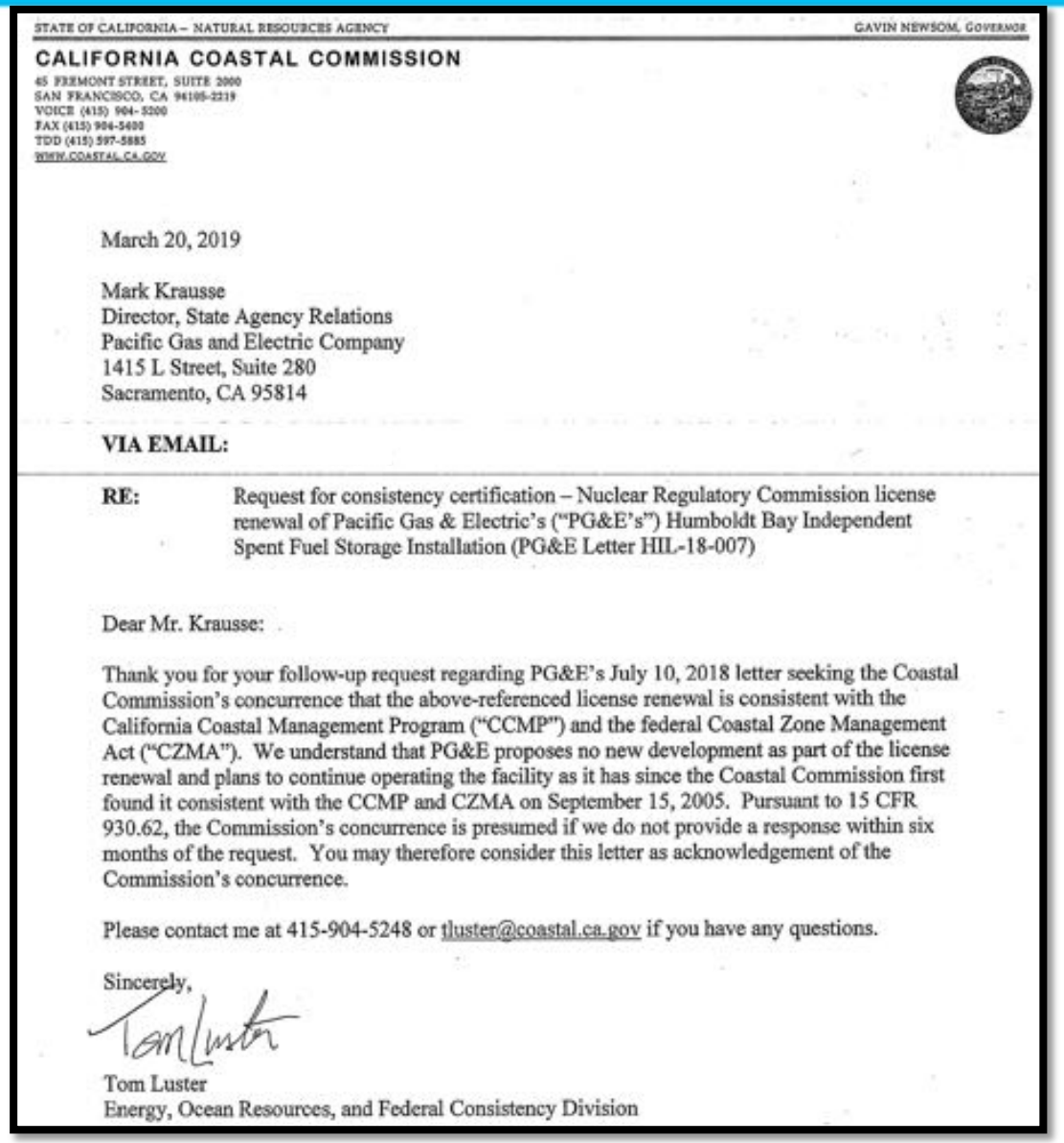
Overview of DC ISFSI and License

- **DC ISFSI was fully permitted and mitigated in perpetuity with state and local agencies:**
  - California Coastal Commission
  - San Luis Obispo County
- **Coastal Zone Management Act (CZMA):**
  - Addressed during initial permitting through the environmental impact statement in accordance with the California Environmental Quality Act
  - Consulted the California Coastal Commission regarding CZMA for license renewal
    - Requested submission of a coastal consistency letter similar to Humboldt Bay process

California Coastal Commission CZMA Letter for Humboldt Bay ISFSI / Applicability to DC ISFSI

- PG&E has initiated consultation with the California Coastal Commission for DC ISFSI license renewal

- Expect to use the same process as used for the Humboldt Bay ISFSI license renewal



STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY GAVIN NEWSOM, GOVERNOR

CALIFORNIA COASTAL COMMISSION

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VOICE (415) 904-5200
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WWW.COASTAL.CA.GOV

March 20, 2019

Mark Krausse
Director, State Agency Relations
Pacific Gas and Electric Company
1415 L Street, Suite 280
Sacramento, CA 95814

VIA EMAIL:

RE: Request for consistency certification – Nuclear Regulatory Commission license renewal of Pacific Gas & Electric's ("PG&E's") Humboldt Bay Independent Spent Fuel Storage Installation (PG&E Letter HIL-18-007)

Dear Mr. Krausse:

Thank you for your follow-up request regarding PG&E's July 10, 2018 letter seeking the Coastal Commission's concurrence that the above-referenced license renewal is consistent with the California Coastal Management Program ("CCMP") and the federal Coastal Zone Management Act ("CZMA"). We understand that PG&E proposes no new development as part of the license renewal and plans to continue operating the facility as it has since the Coastal Commission first found it consistent with the CCMP and CZMA on September 15, 2005. Pursuant to 15 CFR 930.62, the Commission's concurrence is presumed if we do not provide a response within six months of the request. You may therefore consider this letter as acknowledgement of the Commission's concurrence.

Please contact me at 415-904-5248 or tluster@coastal.ca.gov if you have any questions.

Sincerely,

Tom Luster

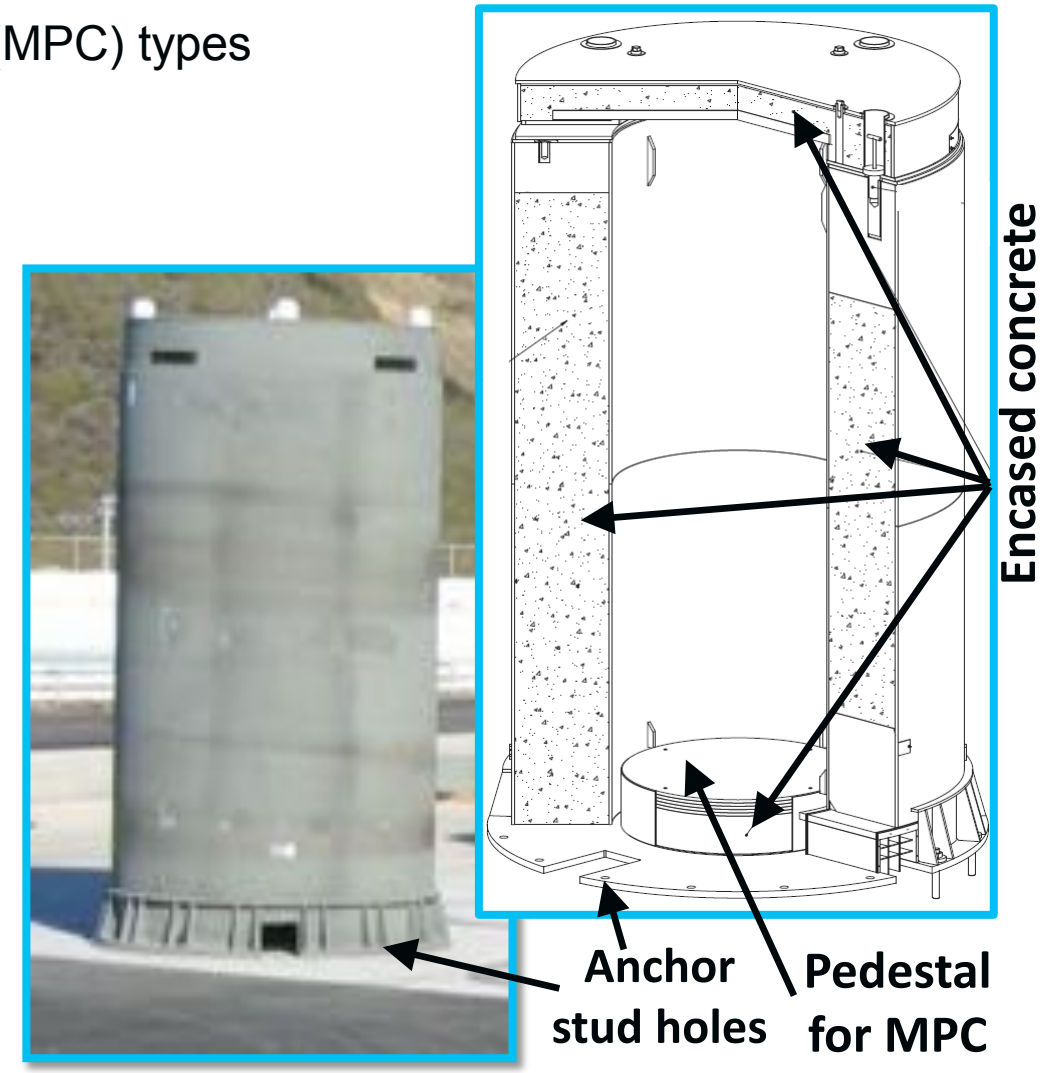
Tom Luster
Energy, Ocean Resources, and Federal Consistency Division

Mark Mayer: DC Nuclear Fuel Manager

Slides 10 – 13

Overview of DC ISFSI Cask System

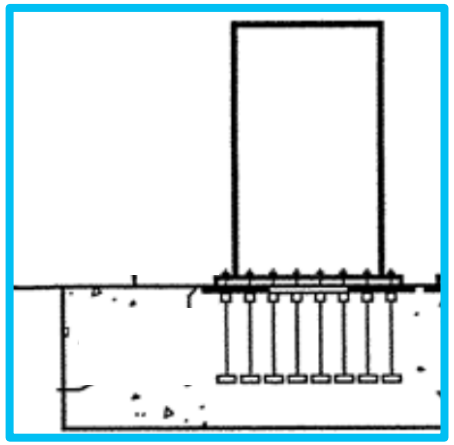
- **HI-STORM 100 System using the shortened, anchored (SA) overpack design**
  - License allows use of four multi-purpose canisters (MPC) types
    - MPC-24
    - MPC-24E
    - MPC-24EF
    - MPC-32
  - Only the MPC-32 has been loaded to-date
- **MPC**
  - Seal welded and helium-filled
  - Sheltered by the overpack
- **Overpack**
  - Bolted lid; air vents to support heat transfer
  - Anchored to the ISFSI pad embedment rings
  - Internal space is sheltered; external surfaces are exposed to outdoor air

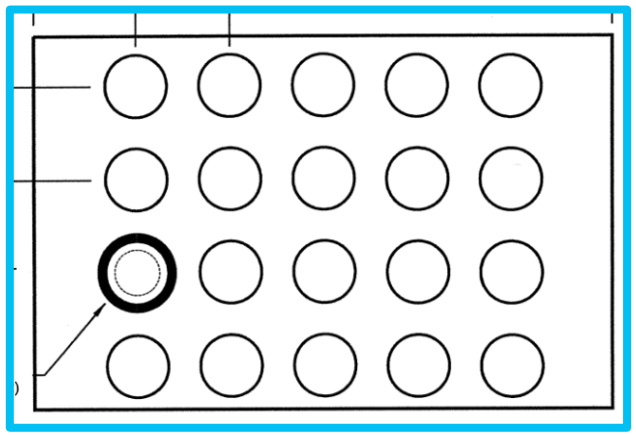


Overview of DC ISFSI Pads

- 7 storage pads
- Steel-reinforced concrete
- Provide the embedment for anchored overpacks
- Founded on bedrock with mudmat placement prior to concrete placement

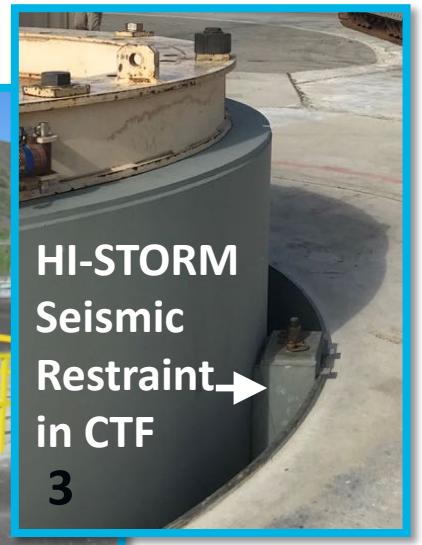
ISFSI Pad Construction

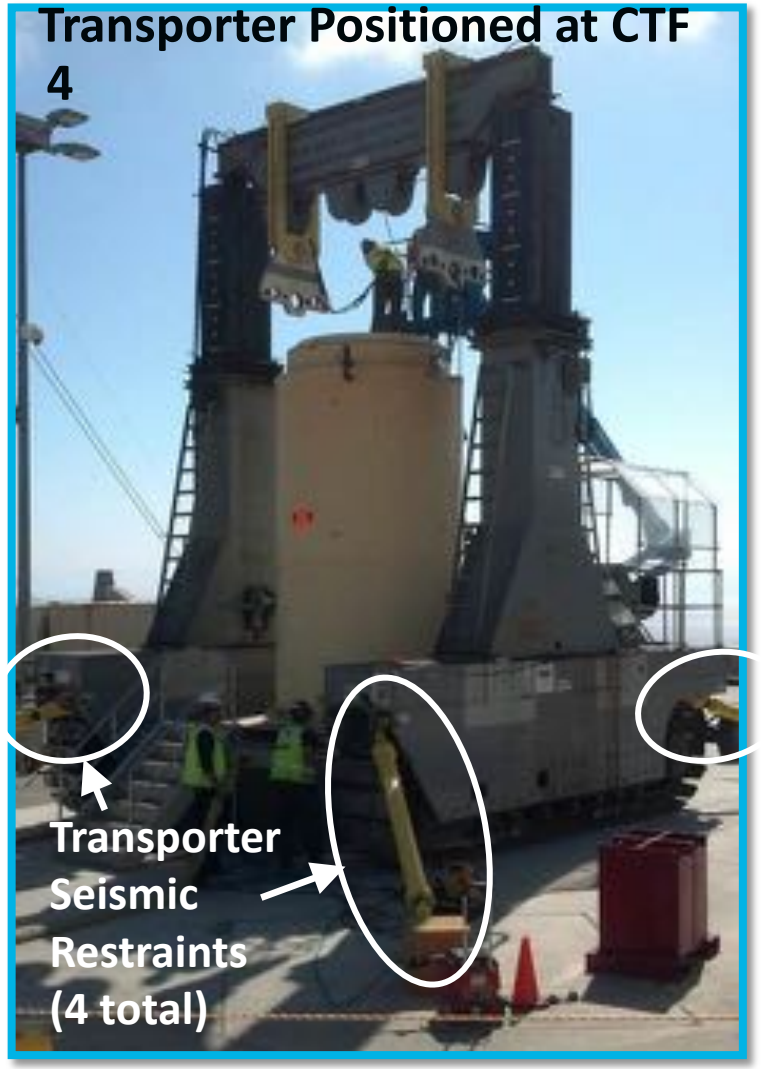




Overview of Unique DC ISFSI Components

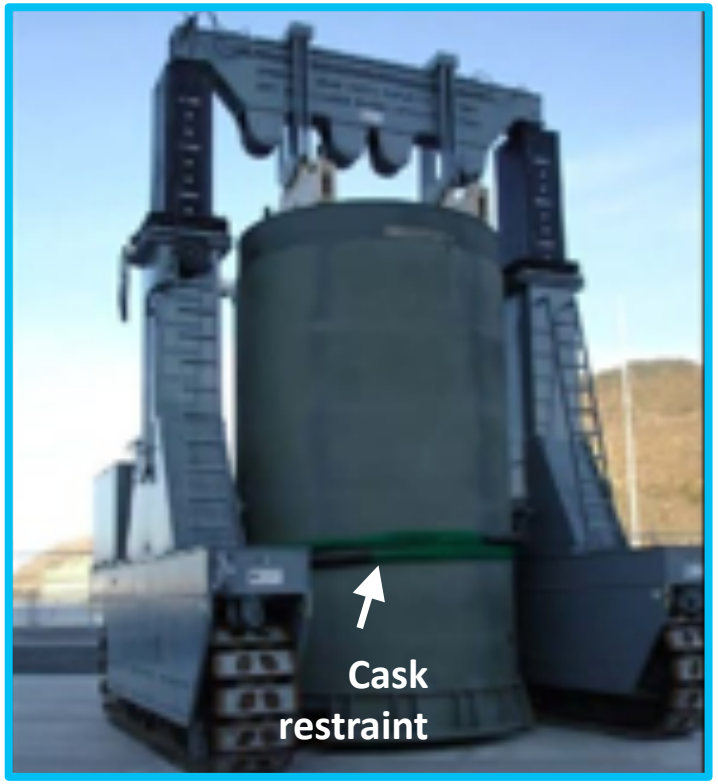
- **Cask Transfer Facility**
  - Comprised of reinforced concrete support structure (photo 1), interlaying steel shell (photo 2), removable seismic restraints (photo 3), and transporter restraint anchors (photo 4)
  - Facilitates transfer of a loaded MPC to the HI-STORM overpack
  - Mating device is used to guide the MPC transfer





Overview of Unique DC ISFSI Components

- **Cask Transporter**
  - Self-propelled, open-front, tracked vehicle
  - Custom-designed for DCPP conditions
  - Shared with PG&E's Humboldt Bay ISFSI



- **Low-Profile Transporter**
  - Dedicated-use multi-roller heavy haul device
  - Transports transfer cask outside of the power block to the Cask Transporter

Philippe Soenen: PG&E Decommissioning Environmental and Licensing Manager

Slides 15 – 31

DC ISFSI License Renewal Application Preparation

- **Will use the following guidance:**
  - NUREG-1927, the Standard Review Plan (SRP) for ISFSI renewal, Rev. 1
  - NUREG-2214, Managing Aging Processes in Storage (MAPS), Rev. 0
  - NEI 14-03, Guidance for Aging Management of Dry Cask Storage, Rev. 2
  - Recent ISFSI license renewal precedent:
    - Humboldt Bay (PG&E)
    - Rancho Seco
    - Trojan
    - HI-STORM 100 Certificate of Compliance *(NRC review in-progress)*
    - HI-STAR 100 Certificate of Compliance *(NRC review in-progress)*

DC ISFSI License Renewal Application Overview

- **Chapter 1, General Information**
- **Chapter 2, Scoping Evaluation**
- **Chapter 3, Aging Management Review**
- **Chapter 4, Time-Limited Aging Analyses**
- **Appendix A, Aging Management Programs**
- **Appendix B, Granted Exemptions**
- **Appendix C, Proposed License Changes**
- **Appendix D, Final Safety Analysis Report (FSAR) Supplement**
- **Appendix E, Pre-Application Inspection Report**
- **Appendix F, Environmental Report**
- **Appendix G, Decommissioning Funding Plan**

– Will have similar attributes as seen in PG&E's Humboldt Bay ISFSI LRA:
  - FSAR supplement with LRA summaries
  - Periodic AMP effectiveness reviews and health reports

DC ISFSI Scoping Results

Important to Safety (ITS) to ensure quality and purity; credited for long-term environment used to determine aging

FSAR specifically discusses why failure of these does not impact ITS function

Structures/Components	Criterion 1	Criterion 2	In-Scope
Spent Fuel Assemblies	Yes	N/A	Yes
MPC	Yes	N/A	Yes
HI-TRAC 125D Transfer Cask	Yes	N/A	Yes
HI-STORM 100SA Overpack	Yes	N/A	Yes
Cask Transportation System (including transporter)	Yes	N/A	Yes
ISFSI Storage Pads	Yes	N/A	Yes
Cask Transfer Facility	Yes	N/A	Yes
Helium Fill Gas	Yes	N/A	No
Fuel Debris (within MPCs)	No	No	No
Security Systems	No	No	No
Fencing	No	No	No
Lighting	No	No	No
Electrical Power	No	No	No
Communications Systems	No	No	No
Automated Welding System	No	No	No
MPC Helium Backfill System	No	No	No
MPC Forced Helium Dehydration System	No	No	No
Rockfall Fence	No	No	No
Rock-Bolted Cut-slope	No	No	No
Supplemental Cooling System	No	No	No

Scoping and Aging Management Review

- **Format and content will model PG&E's Humboldt Bay ISFSI LRA**
  - LRA will breakdown into sub-components per fabrication drawing bill of materials listings and provide the safety intended functions
    - Fabrication drawings will be made available to the NRC in an electronic reading room
  - Aging Management Review (AMR) is only conducted on those sub-components that have a safety intended function or whose failure could prevent fulfillment of a safety function
    - Safety function based on confinement, sub-criticality control, heat transfer, structural integrity, shielding, and retrievability
  - AMR tables in LRA Chapter 3 provide materials, internal and external environments, aging effects/mechanisms, and aging management
    - Each AMR line will address whether it is consistent with the MAPS Report

Aging Management Programs

PG&E is proposing six AMPs to manage all aging effects requiring management

1. High Burnup Fuel AMP

- Relies on the joint EPRI and Department of Energy High Burnup Dry Cask Storage Research and Development Project (HDRP).
- Includes justification that the demonstration program applies to DCPP fuel
- 3 formal evaluations will occur as follows:
  1. Prior to March 2024 (end of the initial license)
  2. March 2034 (10 years after first assessment)
  3. March 2044 (10 years after second assessment)

Aging Management Programs

2. MPC AMP

- Consistent with American Society of Mechanical Engineers (ASME*) Code Case N-860
  - Determines the site and MPC susceptibility to stress corrosion cracking
  - Performs screening exam, assessment exam (if required), and supplemental exam or analysis (if required)
  - Sets scope and inspection frequency based on results and susceptibility

3. Transfer Cask AMP

- Prior to use; inspections are valid for five years
  - Visual Testing (VT)-3 100% of normally accessible surfaces (exterior, interior cavity, lid surfaces, bottom)
  - VT-2 of water jacket
- Acceptance criteria is consistent with MAPS example AMP

*ASME is a not-for-profit membership organization that is known for setting codes and standards for mechanical applications. ASME conducts one of the world's largest technical publishing operations and holds numerous technical conferences and hundreds of professional development courses each year.

Aging Management Programs

4. Overpack AMP

- Every five years
  - VT-3 100% of normally accessible surfaces (outside of overpack, anchorages); applies to all loaded overpacks
  - VT-3 anchor stud sampling plan
- During remote inspections of MPCs
  - VT-3 100% of the metallic surfaces made accessible by the MPC inspections (i.e., inside of overpacks; number of overpacks inspected would be consistent with number of MPCs inspected)
- Acceptance criteria is consistent with MAPS example metallic surfaces AMP

Aging Management Programs

5. Reinforced Concrete Structures AMP

- Every five years
  - American Concrete Institute (ACI) 349.3R inspection of 100% of above-grade storage pads and CTF structural concrete
  - Soil testing in vicinity of ISFSI to determine whether soil is aggressive
  - Shielding concrete (un-reinforced) effectiveness survey on those overpacks inspected by remote means
- Opportunistic
  - ACI 349.3R inspection of below-grade concrete exposed for any reason
- Acceptance criteria is consistent with
  - ACI 349.3R (concrete inspections)
  - NUREG-1801, Rev. 2, Sections IX.D and IX.F (soil chemistry)
  - Calculated dose rates in the DC ISFSI Updated Final Safety Analysis Report

Aging Management Programs

6. Cask Transportation AMP

- Transporter: because it is shared with the Humboldt Bay ISFSI, the following proposed AMP inspections are the same as those approved by the NRC for Humboldt Bay
  - VT-3 100% of accessible portions of structural members, restraint system, MPC downloader, wedge lock assembly
  - Torque check for 100% accessible bolting
  - Visual and tactile inspection of 100% seismic restraint (sling)
  - Periodic replacement of polymer adjustable bumpers

- Transfer Equipment: prior to use; inspections are valid for five ye
  - VT-3 100% of the following accessible surfaces: lift links, lift cleats, lift brackets, connector pins, CTF liner and lateral restraints, mating device, LPT
- Acceptance criteria are consistent with
  - Previously-approved acceptance criteria from the Humboldt Bay LRA
  - MAPS example metallic surfaces AMP

Time-Limited Aging Analyses

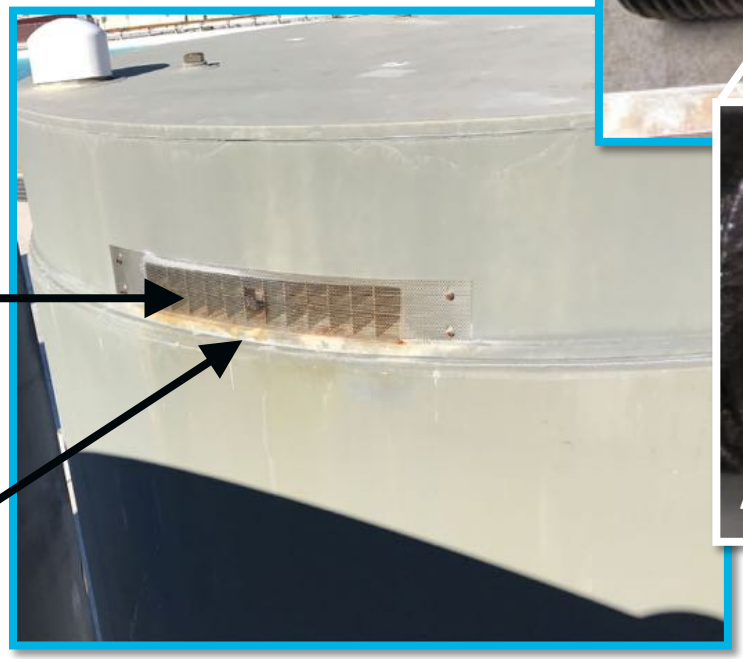
- **Developed a preliminary list of time-limited aging analyses (TLAAs) and technical evaluations based on:**
  - Previous LRA reviews
  - DC ISFSI design and licensing documentation reviews
  - NRC guidance
- **One evaluation was identified as meeting all six TLAA criteria and was evaluated for the additional 40 years:**
  - Neutron absorber and shielding performance
- **Although not a TLAA, one evaluation was reviewed to disposition aging on components within the scope of renewal:**
  - Number of MPC lifts allowed over renewed license period

Existing DC ISFSI Inspections

- **Annual overpack / surrounding storage pad visual inspections**
  - Coatings degradation – no impact to overpack intended function
  - Surface corrosion – no impact to overpack intended function
- **Minor anchor stud pitting and surface corrosion – no impact to intended function**
- **Daily overpack vent inspections**

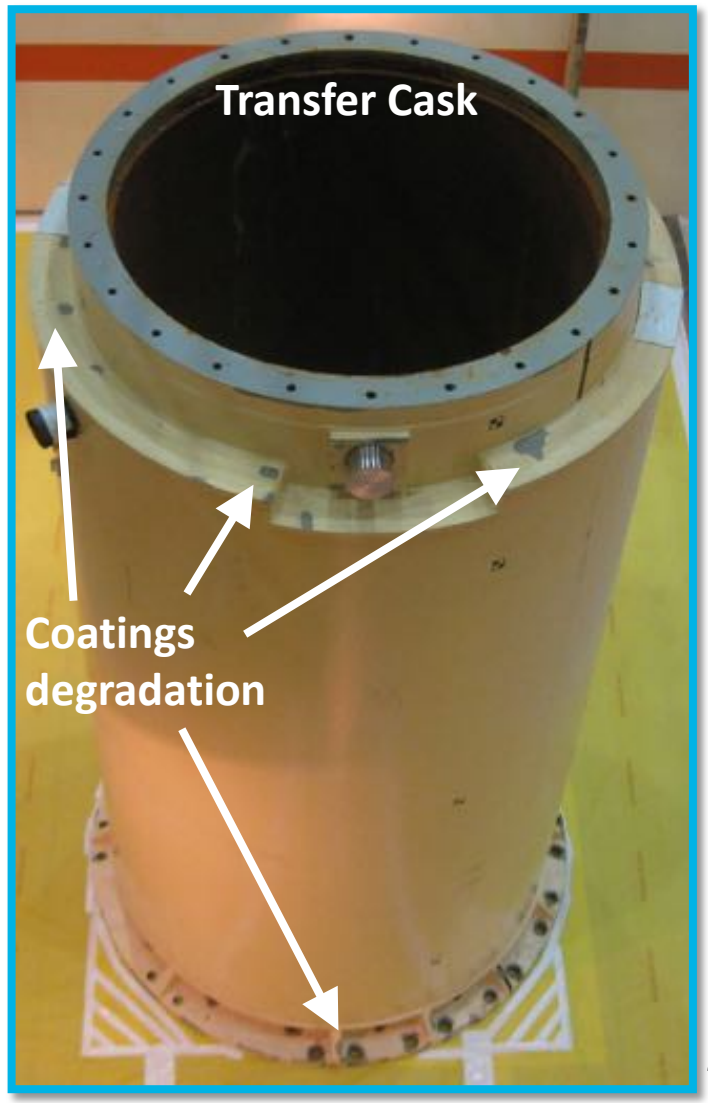
Overpack vents

Coating degradation / surface corrosion



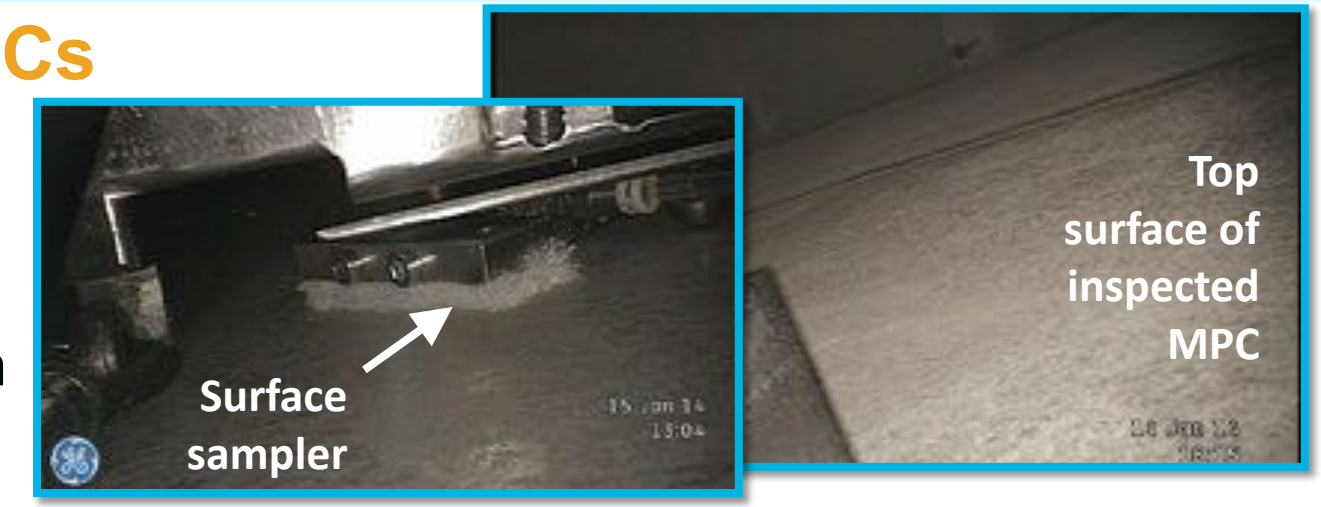
Existing DC ISFSI Inspections

- **Cask Transporter, CTF, and Transfer Cask prior-to-use inspections**
  - Coatings degradation
    - Complete Transporter re-coat in 2020
    - Transfer cask completely re-coated prior to loading campaigns
  - Transporter loose bolting and weld cracking
    - Weld continues to be monitored to ensure no impact to intended function

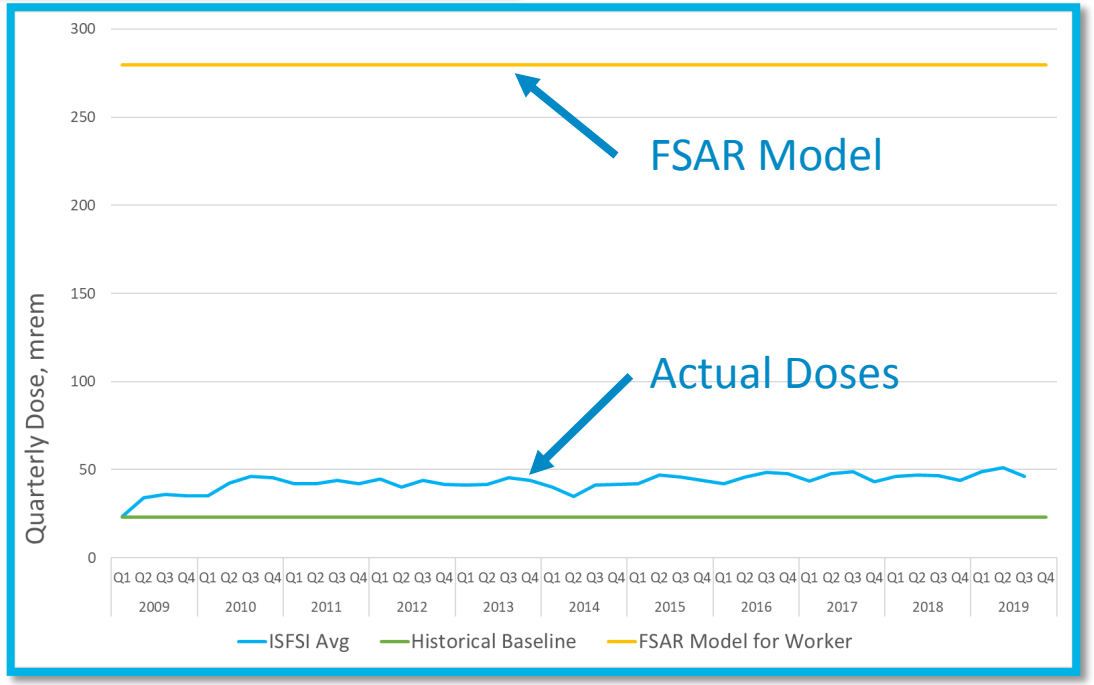


Existing DC ISFSI Inspections

- **2014 EPRI inspection of two MPCs (EPRI Report 3002002822)**
  - Volunteered for inspection
  - Temperature measurements, surface sampling, and remote visual examination
  - No stress corrosion cracking identified



- **Thermoluminescent dosimeter (TLD) dose monitoring compiled quarterly since initial loading**
  - No adverse dose trend observed compared to background
  - Well below conservative model assumed in FSAR



Proposed Pre-Application Inspection

- **Scope**
  - 7 MPC inspections (VT-3 100% accessible by remote means)
    - Includes each MPC build (i.e., vintage)
  - 7 overpack inspections (VT-3 100% accessible, same as MPCs)
  - ISFSI storage pads and CTF structural concrete (ACI 349.3R 100% above grade, accessible)
  - Soil testing
- **Planning for inspection in March – May 2021**
- **Relying on previous inspection results (2007-2020) for the Transfer Cask, CTF metallic components, and cask transportation components (transporter, LPT, lifting devices)**

Proposed Pre-Application Inspection

Proposed cask inspection considerations:

- Material: DC ISFSI has 3 MPC material types in service; some more susceptible to chloride-induced stress corrosion cracking (CISCC)
- Heat load: lower heat loads are more susceptible to CISCC
- Time since loading (age):
  - Components have more time to degrade (corrosion, etc.)
  - More time for fuel to cool (deliquescence)
- Burnup: high burnup fuel is the subject of significant research for long-term storage
- Manufacturing deviations: may impact canister susceptibility
- Trending information for EPRI-inspected casks

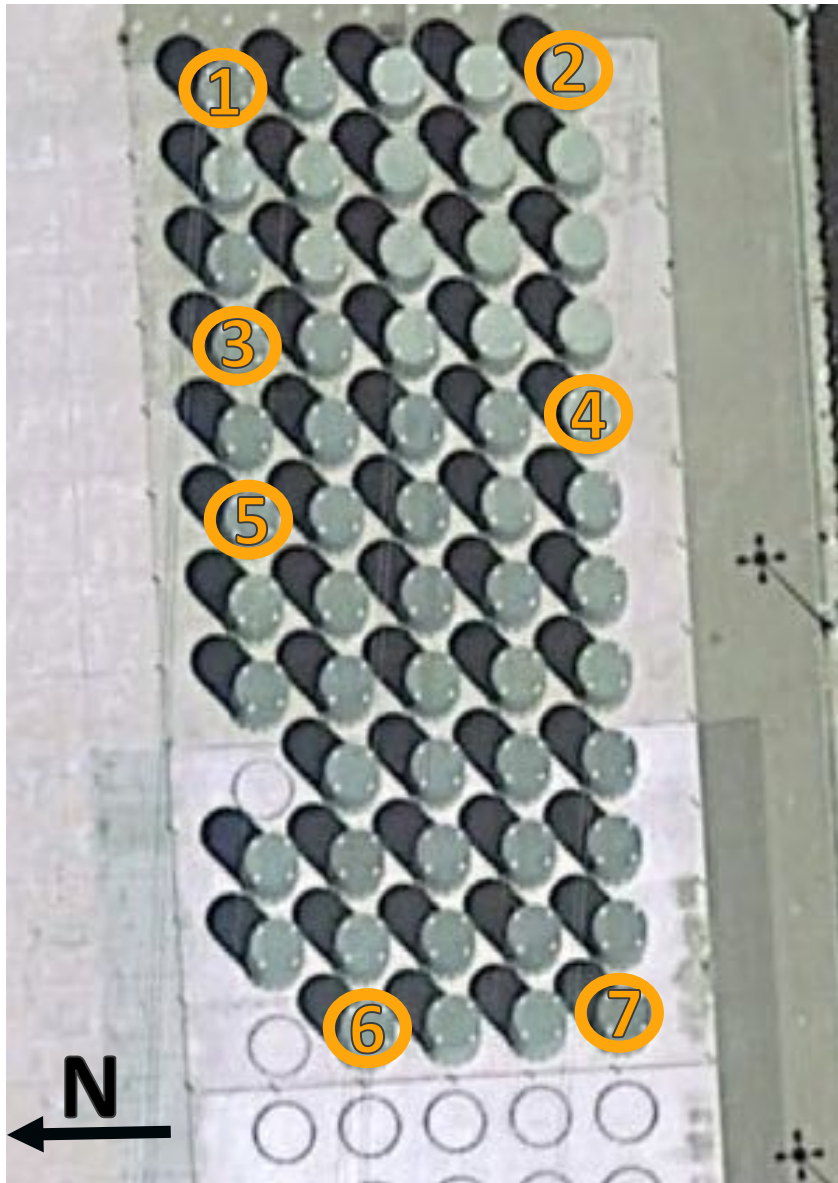
Proposed casks bound the above considerations

Pre-Application Inspection Locations

#	Heat Load[1] (kW)	Years Since Loading	Material Grade[2]
1	12	8	304
2	20	11	304
3	15	8	304
4	20	10	304
5	16	7	304/304L
6	24	2	316/316L
7	16	4	316/316L
Insp. Avg.[3]	17.8	7.1	N/A
Avg. All[4]	20.2	6.4	N/A

Notes – 1) Heat load at loading
2) Material types in use at DC ISFSI are 304, 304/304L, and 316/316L stainless steels
3) Average of the 7 inspection locations
4) Average of all 58 loaded casks

Selection accounts for all material types, all builds, range of cask ages, and range of heat loads



Next Steps

Schedule

- Pre-Application Inspection: March – May 2021
  - Inviting NRC, California Energy Commission, and Diablo Canyon Independent Safety Committee to observe
- LRA submittal: Q4 2021
- Required submittal: March 2022

Questions and Feedback?

Thank You

Diablo Canyon Independent Spent Fuel Storage Installation License Renewal

Pre-Application Meeting

January 26, 2020

Meeting Attendees

- Tom Jones – Pacific Gas and Electric (PG&E) Director, Strategic Initiatives
- Mark Mayer – Diablo Canyon (DC) Nuclear Fuel Manager
- Rich Hagler – PG&E Dry Cask Storage Supervisor
- Philippe Soenen – PG&E Decommissioning Environmental and Licensing Manager
- Michelle Olsofsky – Strategic Initiatives Licensing Engineer
- Holtec Leadership, Licensing, Engineering, and Project Manager

Tom Jones: PG&E Director, Strategic Initiatives

Slides 4 – 8

Meeting Purpose / Goals

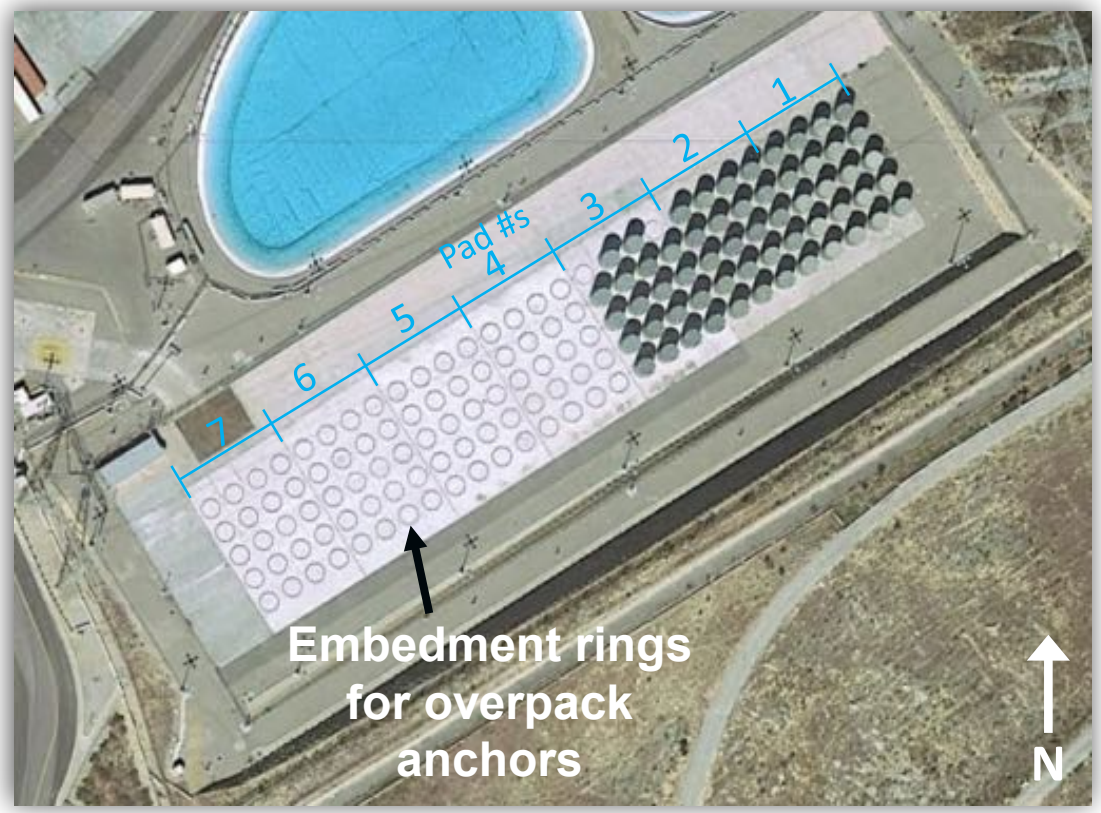
- **Provide background information to the NRC staff on the DC Independent Spent Fuel Storage Installation (ISFSI) license renewal**
- **Provide preliminary information to the NRC staff on the license renewal application (LRA)**
  - Humboldt Bay ISFSI lessons learned incorporated
- **Obtain feedback from the NRC staff on the LRA:**
  - Aging management program (AMP) scopes
  - Pre-application inspection scope

Overview of the DC ISFSI Site

- **Location:**
  - 6-7 miles northwest of Avila Beach, California (midway between San Francisco and Los Angeles)
  - Within the Diablo Canyon Power Plant (DCPP) site boundary and owner-controlled area
  - ISFSI is at 310 ft. above sea level
  - Marine environment

Overview of DC ISFSI and License

- **Site-specific 10 CFR Part 72 license SNM-2511 issued in March 2004**
  - License expires in March 2024
  - Storage of spent fuel, including high-burnup fuel (no greater than Class C waste)
  - Accommodates all spent fuel generated through the end of the DCPP operating licenses
- **DC ISFSI consists of:**
  - HI-STORM 100 System
  - Storage pads and anchorage
  - Cask Transfer Facility (CTF)
  - Cask Transporter, Transfer Cask, Low-Profile Transporter (LPT)
- **Current status:**
  - 7 completed loading campaigns
  - 1,856 fuel assemblies stored in 58 casks
- **LRA submittal planned for Q4 2021**



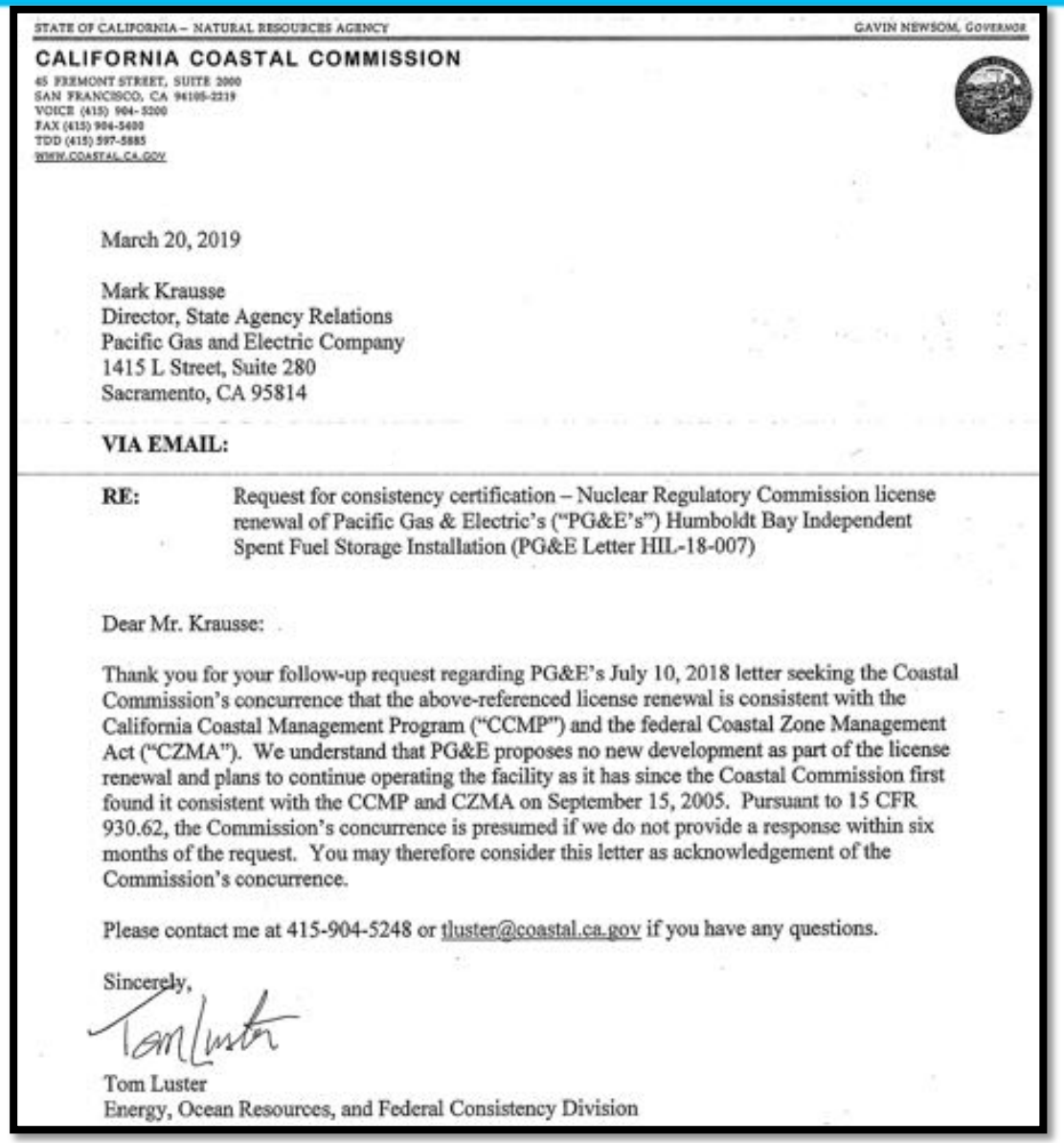
Overview of DC ISFSI and License

- **DC ISFSI was fully permitted and mitigated in perpetuity with state and local agencies:**
  - California Coastal Commission
  - San Luis Obispo County
- **Coastal Zone Management Act (CZMA):**
  - Addressed during initial permitting through the environmental impact statement in accordance with the California Environmental Quality Act
  - Consulted the California Coastal Commission regarding CZMA for license renewal
    - Requested submission of a coastal consistency letter similar to Humboldt Bay process

California Coastal Commission CZMA Letter for Humboldt Bay ISFSI / Applicability to DC ISFSI

- PG&E has initiated consultation with the California Coastal Commission for DC ISFSI license renewal

- Expect to use the same process as used for the Humboldt Bay ISFSI license renewal



STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY GAVIN NEWSOM, GOVERNOR

CALIFORNIA COASTAL COMMISSION

45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE (415) 904-5200
FAX (415) 904-5400
TDD (415) 597-5885
WWW.COASTAL.CA.GOV

March 20, 2019

Mark Krausse
Director, State Agency Relations
Pacific Gas and Electric Company
1415 L Street, Suite 280
Sacramento, CA 95814

VIA EMAIL:

RE: Request for consistency certification – Nuclear Regulatory Commission license renewal of Pacific Gas & Electric's ("PG&E's") Humboldt Bay Independent Spent Fuel Storage Installation (PG&E Letter HIL-18-007)

Dear Mr. Krausse:

Thank you for your follow-up request regarding PG&E's July 10, 2018 letter seeking the Coastal Commission's concurrence that the above-referenced license renewal is consistent with the California Coastal Management Program ("CCMP") and the federal Coastal Zone Management Act ("CZMA"). We understand that PG&E proposes no new development as part of the license renewal and plans to continue operating the facility as it has since the Coastal Commission first found it consistent with the CCMP and CZMA on September 15, 2005. Pursuant to 15 CFR 930.62, the Commission's concurrence is presumed if we do not provide a response within six months of the request. You may therefore consider this letter as acknowledgement of the Commission's concurrence.

Please contact me at 415-904-5248 or tluster@coastal.ca.gov if you have any questions.

Sincerely,

Tom Luster

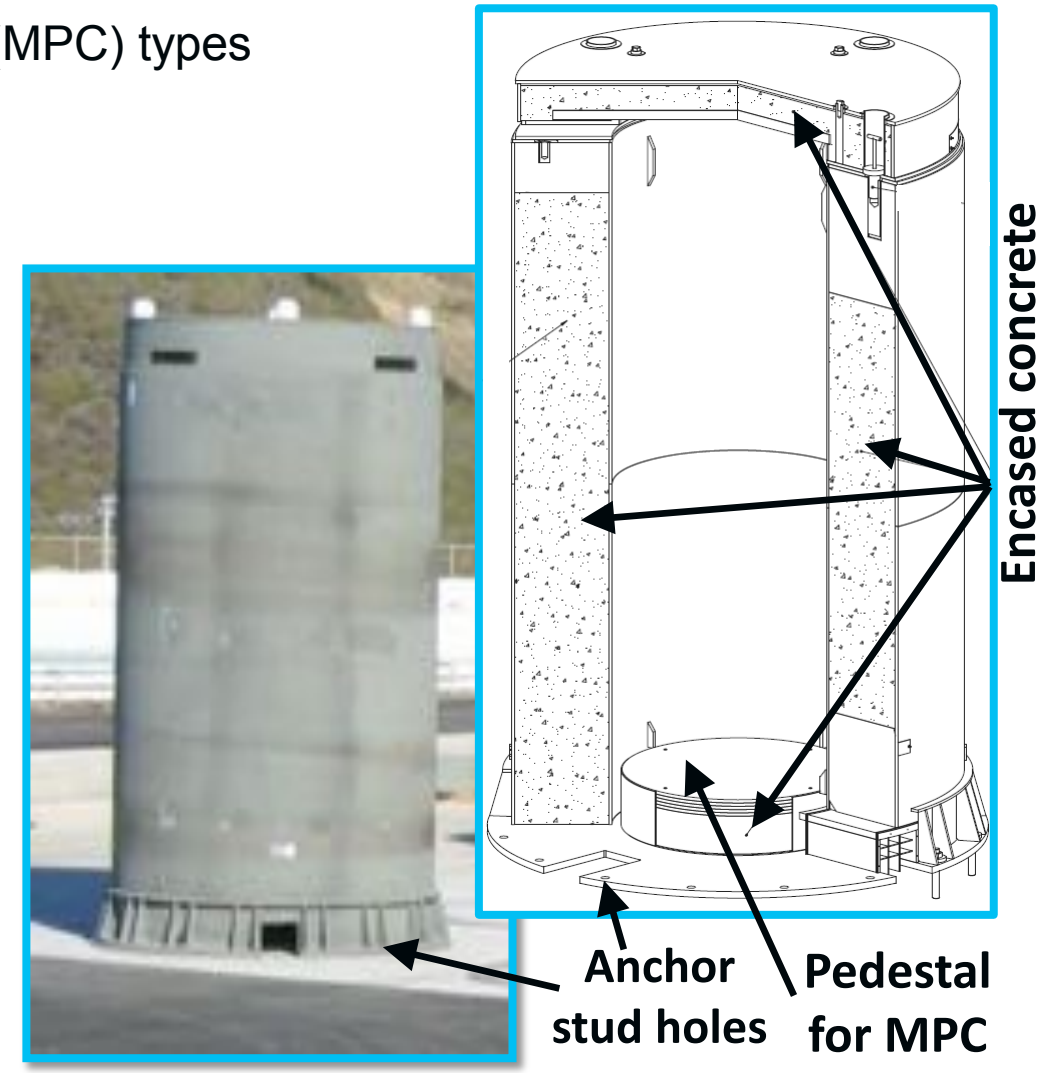
Tom Luster
Energy, Ocean Resources, and Federal Consistency Division

Mark Mayer: DC Nuclear Fuel Manager

Slides 10 – 13

Overview of DC ISFSI Cask System

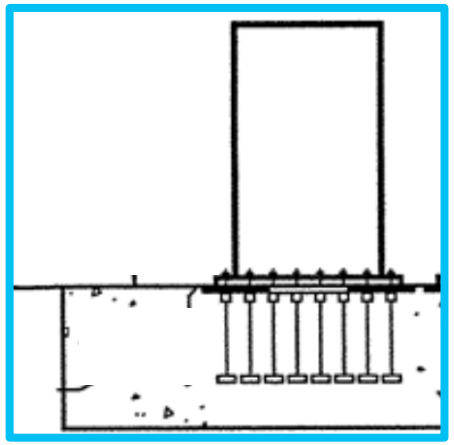
- **HI-STORM 100 System using the shortened, anchored (SA) overpack design**
  - License allows use of four multi-purpose canisters (MPC) types
    - MPC-24
    - MPC-24E
    - MPC-24EF
    - MPC-32
  - Only the MPC-32 has been loaded to-date
- **MPC**
  - Seal welded and helium-filled
  - Sheltered by the overpack
- **Overpack**
  - Bolted lid; air vents to support heat transfer
  - Anchored to the ISFSI pad embedment rings
  - Internal space is sheltered; external surfaces are exposed to outdoor air

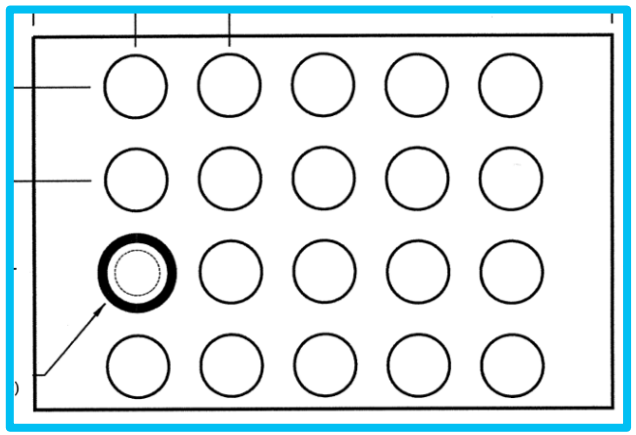


Overview of DC ISFSI Pads

- 7 storage pads
- Steel-reinforced concrete
- Provide the embedment for anchored overpacks
- Founded on bedrock with mudmat placement prior to concrete placement

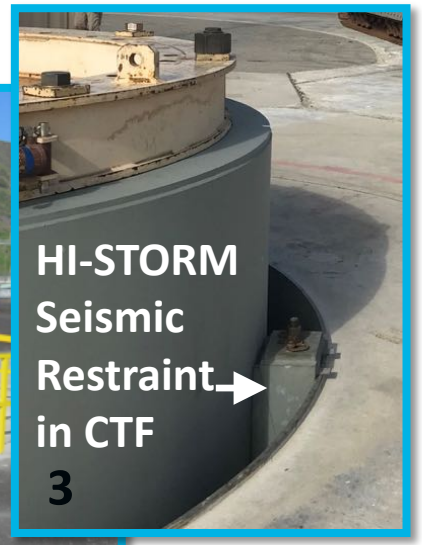
ISFSI Pad Construction

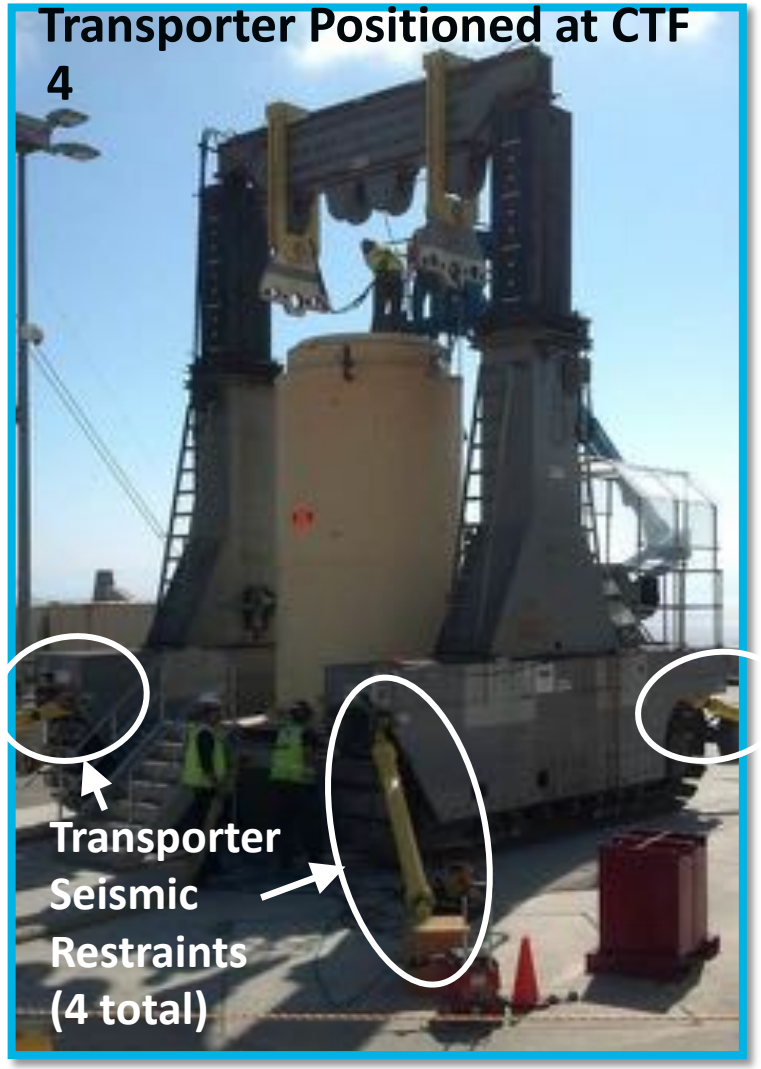




Overview of Unique DC ISFSI Components

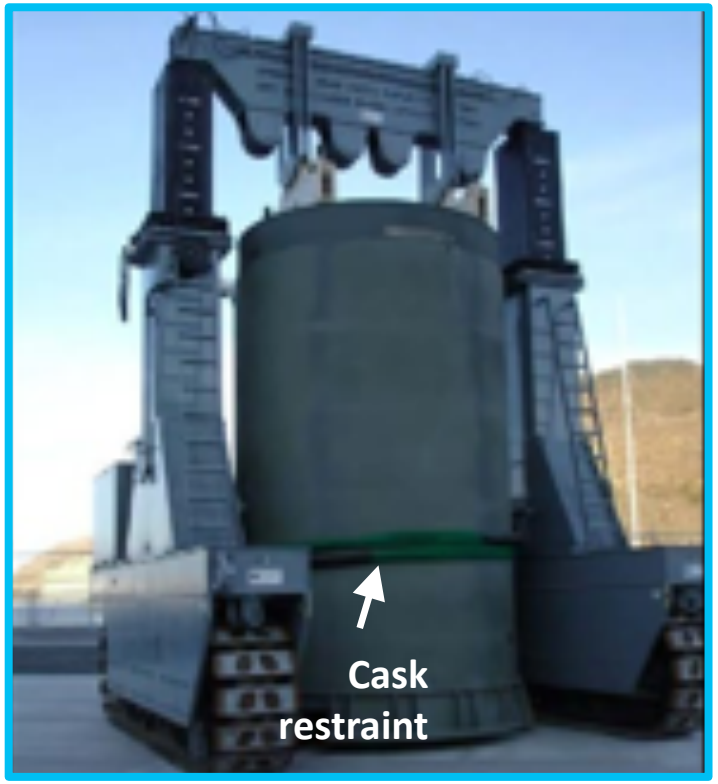
- **Cask Transfer Facility**
  - Comprised of reinforced concrete support structure (photo 1), interlaying steel shell (photo 2), removable seismic restraints (photo 3), and transporter restraint anchors (photo 4)
  - Facilitates transfer of a loaded MPC to the HI-STORM overpack
  - Mating device is used to guide the MPC transfer





Overview of Unique DC ISFSI Components

- **Cask Transporter**
  - Self-propelled, open-front, tracked vehicle
  - Custom-designed for DCPP conditions
  - Shared with PG&E's Humboldt Bay ISFSI



- **Low-Profile Transporter**
  - Dedicated-use multi-roller heavy haul device
  - Transports transfer cask outside of the power block to the Cask Transporter

Philippe Soenen: PG&E Decommissioning Environmental and Licensing Manager

Slides 15 – 31

DC ISFSI License Renewal Application Preparation

- **Will use the following guidance:**
  - NUREG-1927, the Standard Review Plan (SRP) for ISFSI renewal, Rev. 1
  - NUREG-2214, Managing Aging Processes in Storage (MAPS), Rev. 0
  - NEI 14-03, Guidance for Aging Management of Dry Cask Storage, Rev. 2
  - Recent ISFSI license renewal precedent:
    - Humboldt Bay (PG&E)
    - Rancho Seco
    - Trojan
    - HI-STORM 100 Certificate of Compliance *(NRC review in-progress)*
    - HI-STAR 100 Certificate of Compliance *(NRC review in-progress)*

DC ISFSI License Renewal Application Overview

- **Chapter 1, General Information**
- **Chapter 2, Scoping Evaluation**
- **Chapter 3, Aging Management Review**
- **Chapter 4, Time-Limited Aging Analyses**
- **Appendix A, Aging Management Programs**
- **Appendix B, Granted Exemptions**
- **Appendix C, Proposed License Changes**
- **Appendix D, Final Safety Analysis Report (FSAR) Supplement**
- **Appendix E, Pre-Application Inspection Report**
- **Appendix F, Environmental Report**
- **Appendix G, Decommissioning Funding Plan**

– Will have similar attributes as seen in PG&E's Humboldt Bay ISFSI LRA:
  - FSAR supplement with LRA summaries
  - Periodic AMP effectiveness reviews and health reports

DC ISFSI Scoping Results

Important to Safety (ITS) to ensure quality and purity; credited for long-term environment used to determine aging

FSAR specifically discusses why failure of these does not impact ITS function

Structures/Components	Criterion 1	Criterion 2	In-Scope
Spent Fuel Assemblies	Yes	N/A	Yes
MPC	Yes	N/A	Yes
HI-TRAC 125D Transfer Cask	Yes	N/A	Yes
HI-STORM 100SA Overpack	Yes	N/A	Yes
Cask Transportation System (including transporter)	Yes	N/A	Yes
ISFSI Storage Pads	Yes	N/A	Yes
Cask Transfer Facility	Yes	N/A	Yes
Helium Fill Gas	Yes	N/A	No
Fuel Debris (within MPCs)	No	No	No
Security Systems	No	No	No
Fencing	No	No	No
Lighting	No	No	No
Electrical Power	No	No	No
Communications Systems	No	No	No
Automated Welding System	No	No	No
MPC Helium Backfill System	No	No	No
MPC Forced Helium Dehydration System	No	No	No
Rockfall Fence	No	No	No
Rock-Bolted Cut-slope	No	No	No
Supplemental Cooling System	No	No	No

Scoping and Aging Management Review

- **Format and content will model PG&E's Humboldt Bay ISFSI LRA**
  - LRA will breakdown into sub-components per fabrication drawing bill of materials listings and provide the safety intended functions
    - Fabrication drawings will be made available to the NRC in an electronic reading room
  - Aging Management Review (AMR) is only conducted on those sub-components that have a safety intended function or whose failure could prevent fulfillment of a safety function
    - Safety function based on confinement, sub-criticality control, heat transfer, structural integrity, shielding, and retrievability
  - AMR tables in LRA Chapter 3 provide materials, internal and external environments, aging effects/mechanisms, and aging management
    - Each AMR line will address whether it is consistent with the MAPS Report

Aging Management Programs

PG&E is proposing six AMPs to manage all aging effects requiring management

1. High Burnup Fuel AMP

- Relies on the joint EPRI and Department of Energy High Burnup Dry Cask Storage Research and Development Project (HDRP).
- Includes justification that the demonstration program applies to DCPP fuel
- 3 formal evaluations will occur as follows:
  1. Prior to March 2024 (end of the initial license)
  2. March 2034 (10 years after first assessment)
  3. March 2044 (10 years after second assessment)

Aging Management Programs

2. MPC AMP

- Consistent with American Society of Mechanical Engineers (ASME*) Code Case N-860
  - Determines the site and MPC susceptibility to stress corrosion cracking
  - Performs screening exam, assessment exam (if required), and supplemental exam or analysis (if required)
  - Sets scope and inspection frequency based on results and susceptibility

3. Transfer Cask AMP

- Prior to use; inspections are valid for five years
  - Visual Testing (VT)-3 100% of normally accessible surfaces (exterior, interior cavity, lid surfaces, bottom)
  - VT-2 of water jacket
- Acceptance criteria is consistent with MAPS example AMP

*ASME is a not-for-profit membership organization that is known for setting codes and standards for mechanical applications. ASME conducts one of the world's largest technical publishing operations and holds numerous technical conferences and hundreds of professional development courses each year.

Aging Management Programs

4. Overpack AMP

- Every five years
  - VT-3 100% of normally accessible surfaces (outside of overpack, anchorages); applies to all loaded overpacks
  - VT-3 anchor stud sampling plan
- During remote inspections of MPCs
  - VT-3 100% of the metallic surfaces made accessible by the MPC inspections (i.e., inside of overpacks; number of overpacks inspected would be consistent with number of MPCs inspected)
- Acceptance criteria is consistent with MAPS example metallic surfaces AMP

Aging Management Programs

5. Reinforced Concrete Structures AMP

- Every five years
  - American Concrete Institute (ACI) 349.3R inspection of 100% of above-grade storage pads and CTF structural concrete
  - Soil testing in vicinity of ISFSI to determine whether soil is aggressive
  - Shielding concrete (un-reinforced) effectiveness survey on those overpacks inspected by remote means
- Opportunistic
  - ACI 349.3R inspection of below-grade concrete exposed for any reason
- Acceptance criteria is consistent with
  - ACI 349.3R (concrete inspections)
  - NUREG-1801, Rev. 2, Sections IX.D and IX.F (soil chemistry)
  - Calculated dose rates in the DC ISFSI Updated Final Safety Analysis Report

Aging Management Programs

6. Cask Transportation AMP

- Transporter: because it is shared with the Humboldt Bay ISFSI, the following proposed AMP inspections are the same as those approved by the NRC for Humboldt Bay
  - VT-3 100% of accessible portions of structural members, restraint system, MPC downloader, wedge lock assembly
  - Torque check for 100% accessible bolting
  - Visual and tactile inspection of 100% seismic restraint (sling)
  - Periodic replacement of polymer adjustable bumpers

- Transfer Equipment: prior to use; inspections are valid for five ye
  - VT-3 100% of the following accessible surfaces: lift links, lift cleats, lift brackets, connector pins, CTF liner and lateral restraints, mating device, LPT
- Acceptance criteria are consistent with
  - Previously-approved acceptance criteria from the Humboldt Bay LRA
  - MAPS example metallic surfaces AMP

Time-Limited Aging Analyses

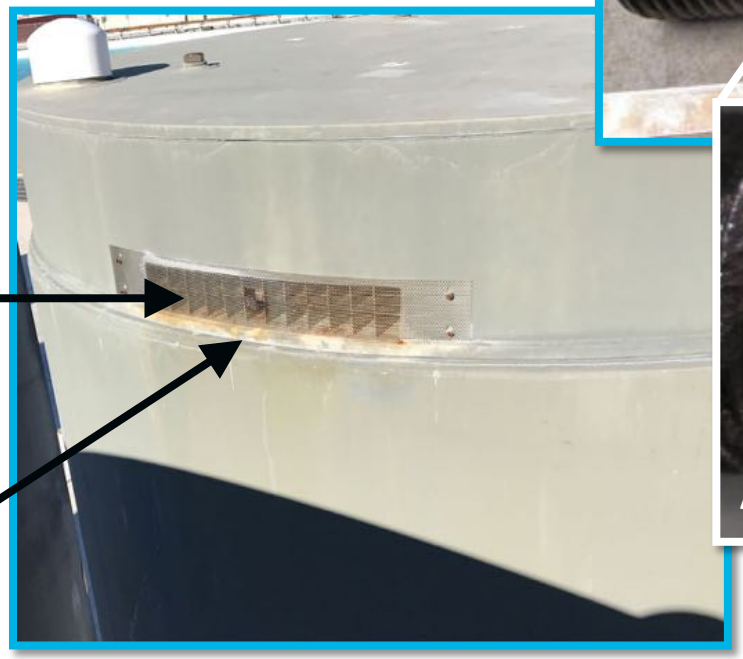
- **Developed a preliminary list of time-limited aging analyses (TLAAs) and technical evaluations based on:**
  - Previous LRA reviews
  - DC ISFSI design and licensing documentation reviews
  - NRC guidance
- **One evaluation was identified as meeting all six TLAA criteria and was evaluated for the additional 40 years:**
  - Neutron absorber and shielding performance
- **Although not a TLAA, one evaluation was reviewed to disposition aging on components within the scope of renewal:**
  - Number of MPC lifts allowed over renewed license period

Existing DC ISFSI Inspections

- **Annual overpack / surrounding storage pad visual inspections**
  - Coatings degradation – no impact to overpack intended function
  - Surface corrosion – no impact to overpack intended function
- **Minor anchor stud pitting and surface corrosion – no impact to intended function**
- **Daily overpack vent inspections**

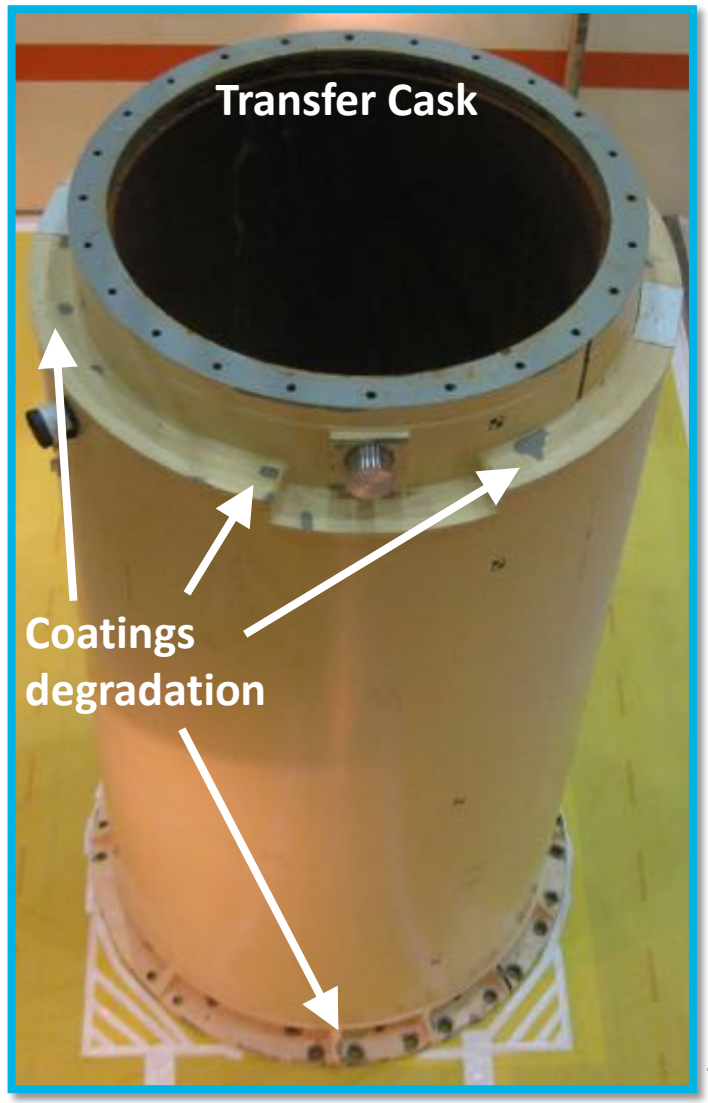
Overpack vents

Coating degradation / surface corrosion



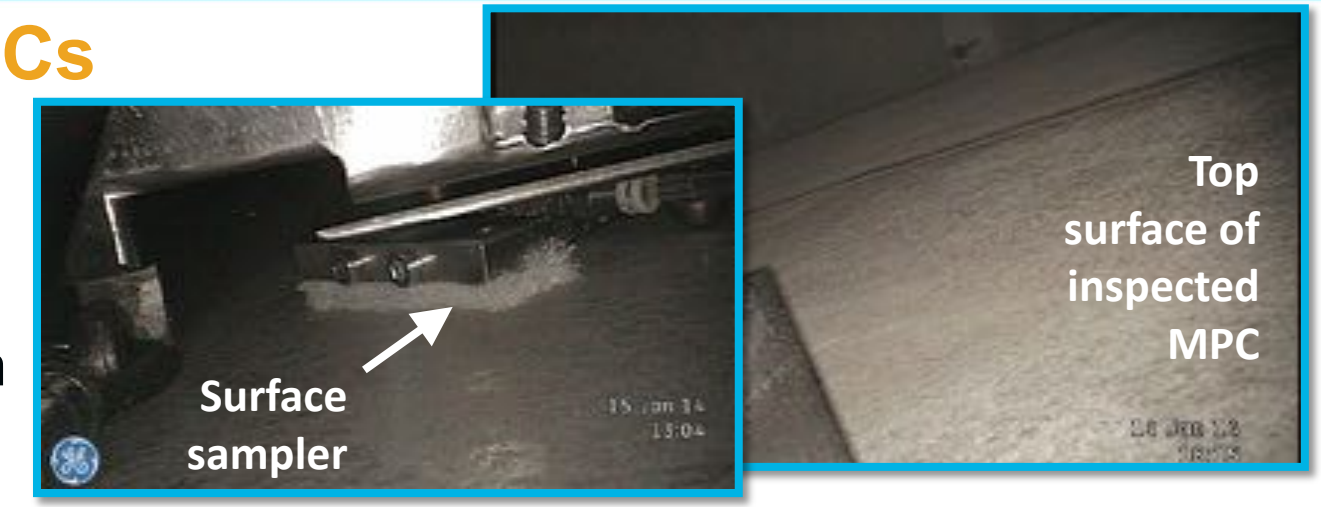
Existing DC ISFSI Inspections

- **Cask Transporter, CTF, and Transfer Cask prior-to-use inspections**
  - Coatings degradation
    - Complete Transporter re-coat in 2020
    - Transfer cask completely re-coated prior to loading campaigns
  - Transporter loose bolting and weld cracking
    - Weld continues to be monitored to ensure no impact to intended function

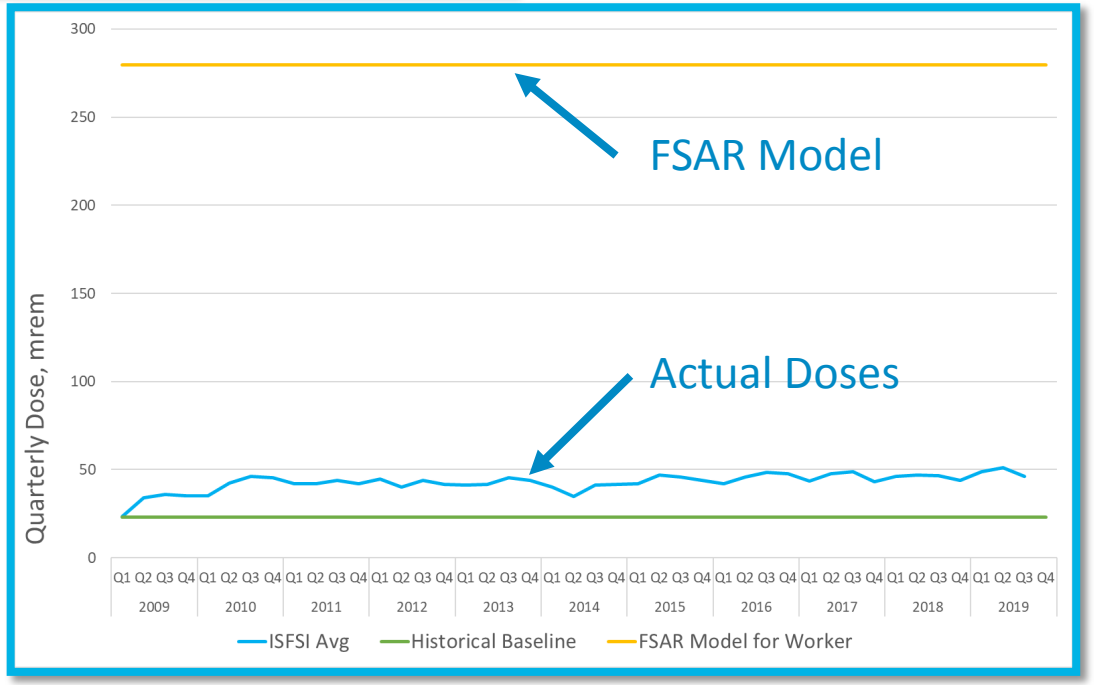


Existing DC ISFSI Inspections

- **2014 EPRI inspection of two MPCs (EPRI Report 3002002822)**
  - Volunteered for inspection
  - Temperature measurements, surface sampling, and remote visual examination
  - No stress corrosion cracking identified



- **Thermoluminescent dosimeter (TLD) dose monitoring compiled quarterly since initial loading**
  - No adverse dose trend observed compared to background
  - Well below conservative model assumed in FSAR



Proposed Pre-Application Inspection

- **Scope**
  - 7 MPC inspections (VT-3 100% accessible by remote means)
    - Includes each MPC build (i.e., vintage)
  - 7 overpack inspections (VT-3 100% accessible, same as MPCs)
  - ISFSI storage pads and CTF structural concrete (ACI 349.3R 100% above grade, accessible)
  - Soil testing
- **Planning for inspection in March – May 2021**
- **Relying on previous inspection results (2007-2020) for the Transfer Cask, CTF metallic components, and cask transportation components (transporter, LPT, lifting devices)**

Proposed Pre-Application Inspection

Proposed cask inspection considerations:

- Material: DC ISFSI has 3 MPC material types in service; some more susceptible to chloride-induced stress corrosion cracking (CISCC)
- Heat load: lower heat loads are more susceptible to CISCC
- Time since loading (age):
  - Components have more time to degrade (corrosion, etc.)
  - More time for fuel to cool (deliquescence)
- Burnup: high burnup fuel is the subject of significant research for long-term storage
- Manufacturing deviations: may impact canister susceptibility
- Trending information for EPRI-inspected casks

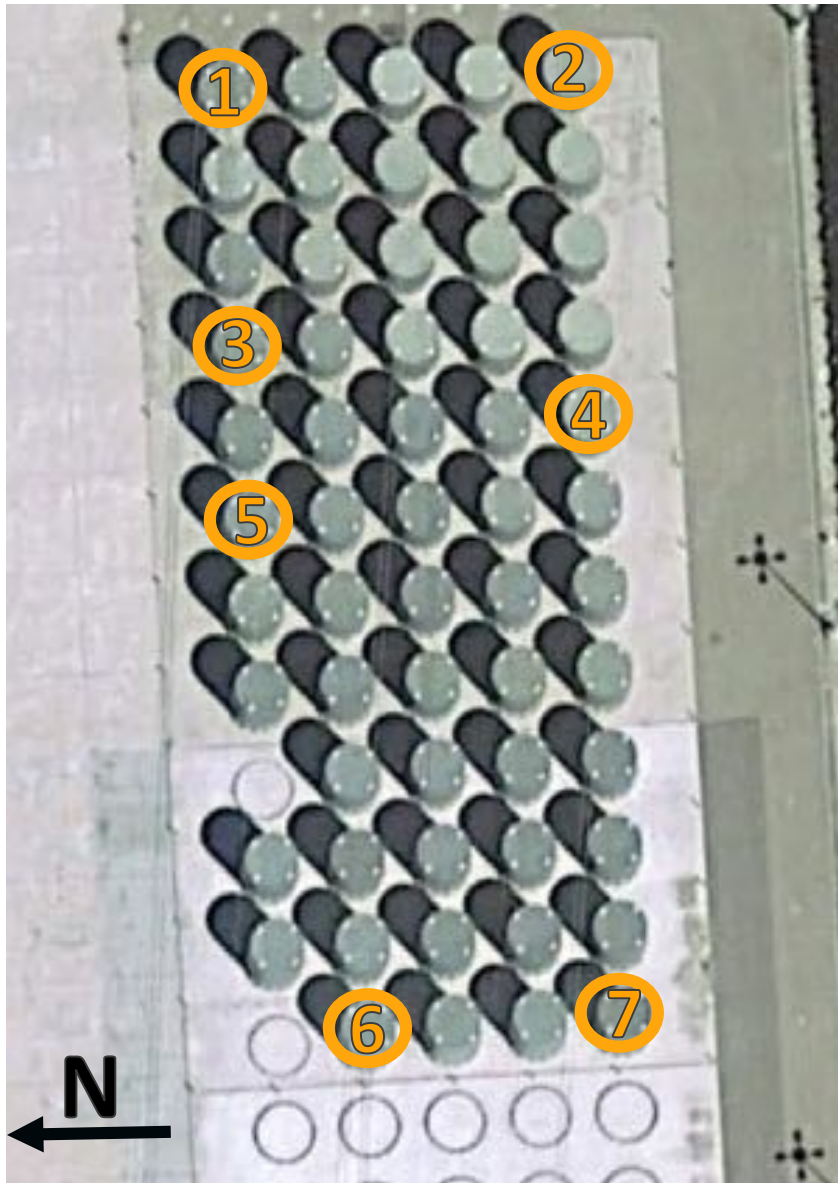
Proposed casks bound the above considerations

Pre-Application Inspection Locations

#	Heat Load[1] (kW)	Years Since Loading	Material Grade[2]
1	12	8	304
2	20	11	304
3	15	8	304
4	20	10	304
5	16	7	304/304L
6	24	2	316/316L
7	16	4	316/316L
Insp. Avg.[3]	17.8	7.1	N/A
Avg. All[4]	20.2	6.4	N/A

Notes – 1) Heat load at loading
2) Material types in use at DC ISFSI are 304, 304/304L, and 316/316L stainless steels
3) Average of the 7 inspection locations
4) Average of all 58 loaded casks

Selection accounts for all material types, all builds, range of cask ages, and range of heat loads



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