

# Dry Cask Storage: Defense-In-Depth

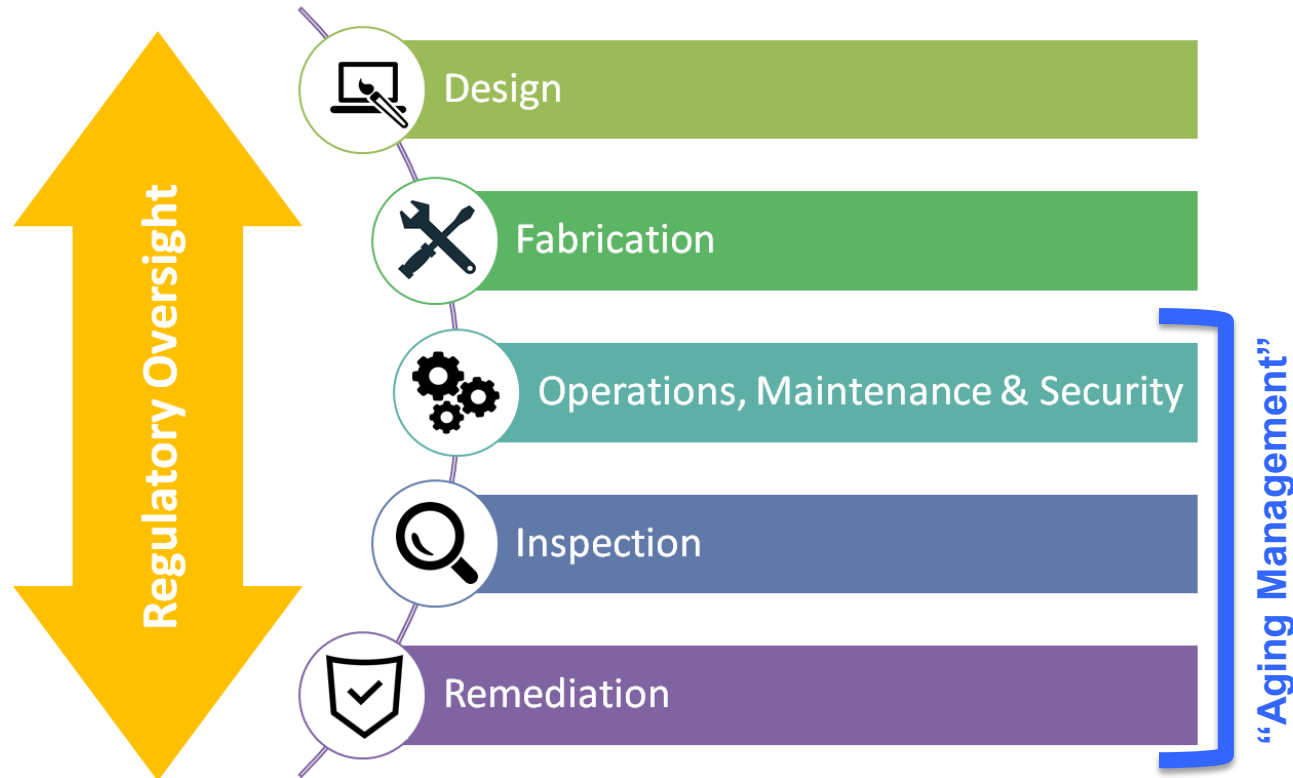
**Randall Granaas**

SCE Nuclear Fuel / ISFSI Engineer



# Dry Cask Storage Defense-in-Depth

(dry fuel storage)



# What's New with Defense-In-Depth?

- Developments with inspections
- Importance of reinforced concrete
- New aging management program



# Inspections of Dry Cask Storage Systems at SONGS and Industry Wide



New Aging Management Program (AMP) in effect to monitor “health” of SONGS NUHOMS system



Good results from recent SONGS NUHOMS inspections



Inspections of other dry cask storage systems industry-wide show similar, good results



Renewal of Certificates of Compliance for other dry cask storage systems mean increasing inspections over time

# SONGS NUHOMS System



# Reinforced Concrete

- Reinforced concrete provides shielding and structural integrity
- Structures qualified for 1.5g horizontal and 1g vertical
- Concrete provides shielding that keeps dose low
- Concrete structures are within the scope of the aging management program
- Concrete protects canisters and helps ensure they remain transportable

# SONGS NUHOMS Aging Management Program

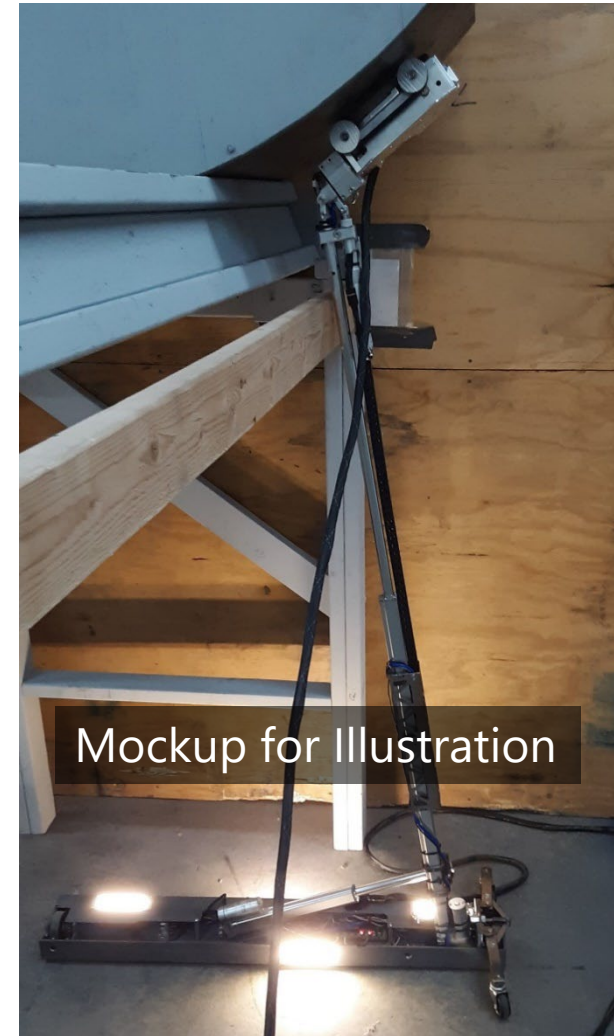
- NRC license for SONGS NUHOMS system renewed after first 20 years of service
- AMP required as a condition of license renewal
- New AMP in place for NUHOMS (ORANO TN) covers canisters, storage modules, and concrete support pad
  - Inspected 2 canisters and system in November 2021 and system in January 2022
  - “Baseline” inspections inform NRC-approved AMP
  - Ongoing inspections every 5 years



# Advanced Pneumatic Robot

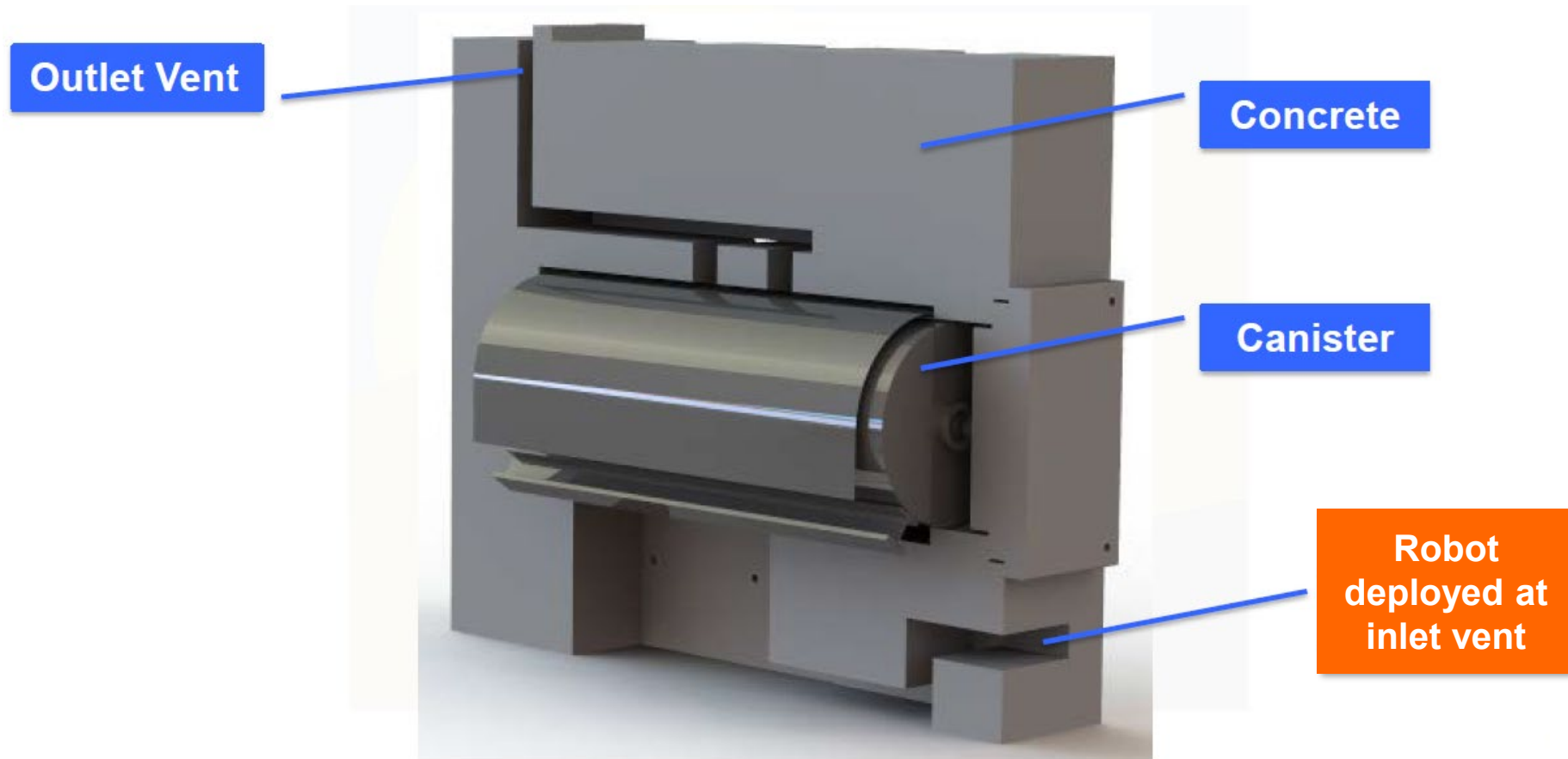
## NUHOMS Inspection Innovations

- Now able to inspect ~100% of canister
- Piggyback pneumatic (vacuum) robot deployed by carrier robot
- Carrier robot enters via inlet vent
- Pneumatic robot deployed from beneath canister
- Deployed at 3 sites in 2020, SONGS in 2021, and two more sites in 2022





# Robot Deployment for NUHOMS Canister Inspections



# 2021 Inspection of SONGS NUHOMS



# 2021 Inspection of SONGS NUHOMS



# Inspections Show Systems at SONGS and Elsewhere are in Good Condition

- Consistently found canisters and structures in good condition
- Ensures canisters are always ready to ship
- Industry-wide inspections are relevant to SONGS
- Industry operating experience growing
  - 30+ years of canister experience in the US without a single degraded canister or structure





# Increasing Number of Inspections Industry Wide

