

# **North Anna ISFSI License Renewal**

**US Nuclear Regulatory Commission  
September 29, 2015**



# Agenda

- License renewal scope and timeline
- Lead cask inspection scope
- Inspection process/criteria
- Lead cask selection
- Schedule for inspections

# North Anna ISFSI License

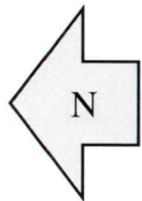
- ISFSI license (SNM-2507) issued June 30, 1998, expires 2018
- Site-specific license includes only Pad 1 and the TN-32 casks
- Submit application by June 2016

# North Anna ISFSI





# North Anna ISFSI - Pad 1



# Lead Cask Inspections

- Guidance on lead cask inspections provided by:
  - NUREG-1927, draft Revision 1, Appendix C
  - NEI 14-03
  - Requests for Additional Information for Prairie Island License Renewal Application
- Lead cask inspections supplemented by
  - Quarterly material condition surveillances
  - Post-seismic event inspections on five TN-32 casks

# Scope of Lead Cask Inspections

- Lift a TN-32 cask and visually inspect bottom for coating adhesion and corrosion (i.e., loss of material)
- Remove a protective cover and visually inspect the following components for corrosion:
  - Protective cover
  - Neutron shield and neutron shield bolts
  - Overpressure system components
  - Visible lid sealing surface including lid bolts
- Visually inspect upper and lower trunnions for corrosion (loss of material)

# Lead Cask Inspections

- Visual inspections will be conducted by certified NDE personnel (i.e., VT-1 or VT-3)
- A mockup of the cask bottom was used to test inspection technique and ensure meeting NDE requirements
- Indications of corrosion or lack of coating adhesion will be recorded and a Condition Report submitted for disposition
  - Description/resolution will be included in the license renewal application
- Cask handling will be conducted by qualified personnel



# Lead Cask Selection

- Selection of lead cask based on degradation mechanism of concern (corrosion)
- Circumstances unique to the North Anna ISFSI result in the selection of two different casks for the bottom and the protective cover inspections
  - August 2011 seismic event (5.8 magnitude earthquake centered near Mineral, VA)
  - Replacement of nine protective covers in 2002-2003 with new protective cover design

# **Selection of Lead Cask**

## **Bottom Inspection**

- Factors contributing to selection of cask for bottom inspection:
  - Accessibility for lifting
  - Movement during seismic event
  - Decay heat of the fuel in the cask
  - Time since loading

# Selection of Lead Cask

## Bottom Inspection



# Selection of Lead Cask

## Bottom Inspection

- Based on the selection factors, cask TN-32.49 was chosen for bottom inspection
  - One of four casks accessible with transporter
    - TN-32.45 accessible now, but TN-32 high burnup demonstration cask will block it for future bottom inspections
  - Moved the most of the accessible casks (3 inches) during seismic event
  - Decay heat 29 KW when loaded
  - Oldest of remaining accessible casks
- Best candidate with accessibility, movement during seismic event, high initial heat load, earliest loading date



# Selection of Lead Cask

## Bottom Inspection

Cask	Accessible with Transporter	Movement During Seismic Event (In)	Decay Heat When Loaded (KW)	Date Loaded
TN-32.06		1.50	16.90	Jul 1998
TN-32.10		2.50	18.28	Aug 1998
TN-32.12		0.50	15.40	Jun 1999
TN-32.13		1.00	14.13	Jul 1999
TN-32.14		0.75	13.30	Dec 1999
TN-32.16		3.50	15.39	Jun 2000
TN-32.19		2.25	16.20	Aug 2000
TN-32.20		1.00	14.94	Sep 2000
TN-32.21		4.50	21.29	Jan 2001
TN-32.23		3.50	17.96	Jul 2001
TN-32.24		3.00	22.15	Aug 2001
TN-32.26		1.25	15.95	Jan 2002
TN-32.29		2.00	13.62	Feb 2002
TN-32.30		0.00	13.92	Aug 2002
TN-32.32		1.50	13.84	Nov 2002
TN-32.36		4.00	28.53	Jul 2003
TN-32.37		3.00	28.89	Aug 2003
TN-32.38		1.00	28.72	Sep 2003
TN-32.41		0.00	25.62	Dec 2003
TN-32.42		1.50	25.95	Feb 2004
TN-32.43		3.50	26.01	Mar 2004
TN-32.45	Yes	1.50	26.21	Jun 2004
TN-32.47		1.00	26.43	Apr 2005
TN-32.48		2.00	30.10	Jun 2006
TN-32.49	Yes	3.00	28.94	Aug 2006
TN-32.52	Yes	2.00	30.66	Sep 2006
TN-32.53	Yes	2.50	20.70	Jan 2007



# **Selection of Lead Cask Protective Cover Inspection**

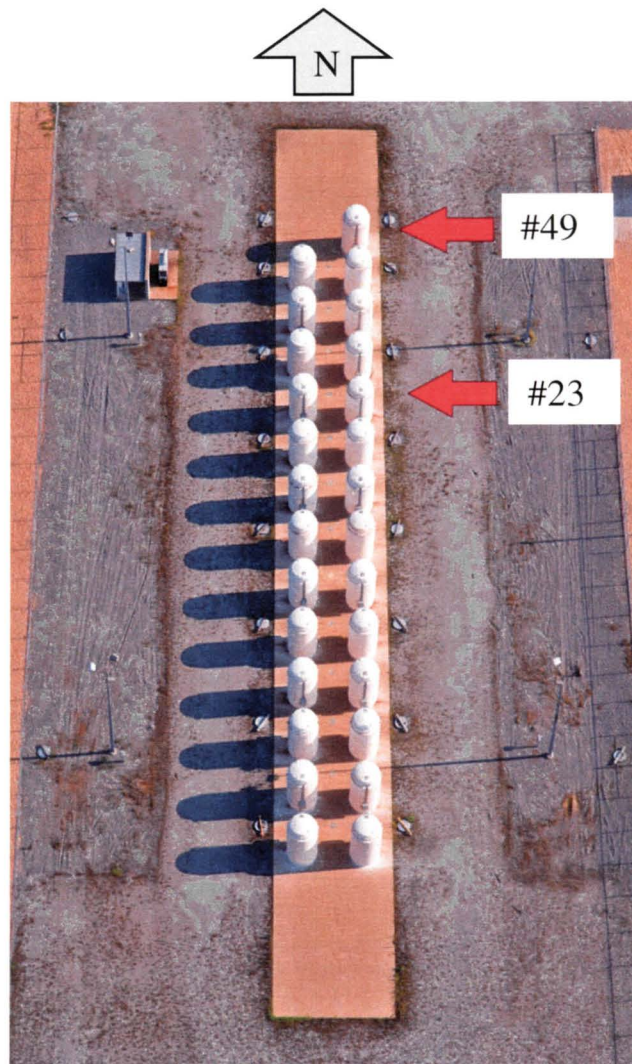
- Factors contributing to the selection of the cask for protective cover inspection
  - Time since cover installation
  - Movement during seismic event
  - Not inspected after seismic event
- Based on these factors, cask TN-32.23 was chosen for protective cover inspection
  - Oldest installed protective cover
  - Cask moved 3.5 inches during seismic event
  - Not one of the five casks inspected after seismic event

# Selection of Lead Cask

## Protective Cover Inspection

Cask	Date Loaded	Date Protective Cover Replaced	Movement During Seismic Event (In)	Inspected Following Seismic Event	Recoated in 2014
TN-32.06	Jul 1998	Mar 2002	1.50		Yes
TN-32.10	Aug 1998	Mar 2002	2.50		
TN-32.12	Jun 1999	Jun 2002	0.50		Yes
TN-32.13	Jul 1999	May 2002	1.00		
TN-32.14	Dec 1999	Jun 2003	0.75		Yes
TN-32.16	Jun 2000	Jun 2003	3.50		
TN-32.19	Aug 2000	Jun 2003	2.25		
TN-32.20	Sep 2000	Jun 2003	1.00		
TN-32.21	Jan 2001	Jun 2003	4.50	Yes	Yes
TN-32.23	Jul 2001		3.50		
TN-32.24	Aug 2001		3.00	Yes	Yes
TN-32.26	Jan 2002		1.25		
TN-32.29	Feb 2002		2.00		
TN-32.30	Aug 2002		0.00	Yes	
TN-32.32	Nov 2002		1.50		Yes
TN-32.36	Jul 2003		4.00	Yes	
TN-32.37	Aug 2003		3.00		
TN-32.38	Sep 2003		1.00		
TN-32.41	Dec 2003		0.00	Yes	
TN-32.42	Feb 2004		1.50		Yes
TN-32.43	Mar 2004		3.50		
TN-32.45	Jun 2004		1.50		
TN-32.47	Apr 2005		1.00		
TN-32.48	Jun 2006		2.00		Yes
TN-32.49	Aug 2006		3.00		
TN-32.52	Sep 2006		2.00		
TN-32.53	Jan 2007		2.50		Yes

# Lead Cask Locations



# Lead Cask Inspection Schedule

- Planning for lead cask inspections substantially complete
- Inspection under protective cover of TN-32.23 scheduled for October 13 (weather-dependent)
- Inspection of bottom of TN-32.49 scheduled for October 14

# Summary

- A detailed evaluation process was used to determine the lead cask(s) for inspection
- The two casks selected are believed to best meet our selection criteria, and are representative of the aging effects of concern
- Inspections will utilize industry-accepted standards and criteria to assess the cask conditions for license renewal
- Results to be included in License Renewal Application, submitted by June 2016