VSC-24 CoC Renewal Application Pre-Submittal Meeting #2

Rockville, MD
August 21, 2012

Introductions/Purpose of Meeting

- Introductions
  - Steve Sisley – Licensing/Regulatory Compliance Manager
  - James Hopf – Project Engineer
  - Suzanne Leblang – Entergy
- Purpose of Meeting
  - Discuss CoC Renewal Application for the VSC-24 Storage System
  - Focus on open items/questions from 1st NRC meeting on 1/19/12.
  - Obtain NRC feedback prior to submittal of CoC Renewal Application

Agenda

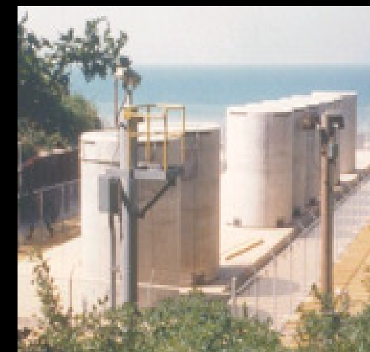
ENERGYSOLUTIONS

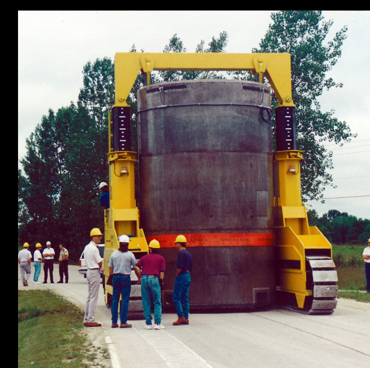
- Background Information
- Application Format and Content
- Scoping Evaluation
- Aging Management Review
  - Materials and Environments
  - Aging Effects Requiring Management
    - Operating Experience / Corrective Actions
    - Results of Initial Lead Cask Inspection
  - Time-Limited Aging Analyses
    - Radiation Effects Analysis
    - Palisades MSB-04 Crack Growth Analysis
  - Aging Management Program (AMP)
    - Overview of Proposed Examinations
  - Retrievability
- FSAR & TS Changes
- Schedule
- Summary and Discussion/Questions

Background

ENERGYSOLUTIONS

- VSC-24 Ventilated Storage Cask System is approved under 10 CFR 72, Subpart K (Docket No. 72-1007).
- VSC-24 CoC initially issued May 7, 1993
  – Current expiration date: May 7, 2013.
- ES will submit a CoC renewal application for the VSC-24 Storage Cask System
  – The requested 40-year CoC renewal term would extend the CoC expiration date to May 7, 2053.



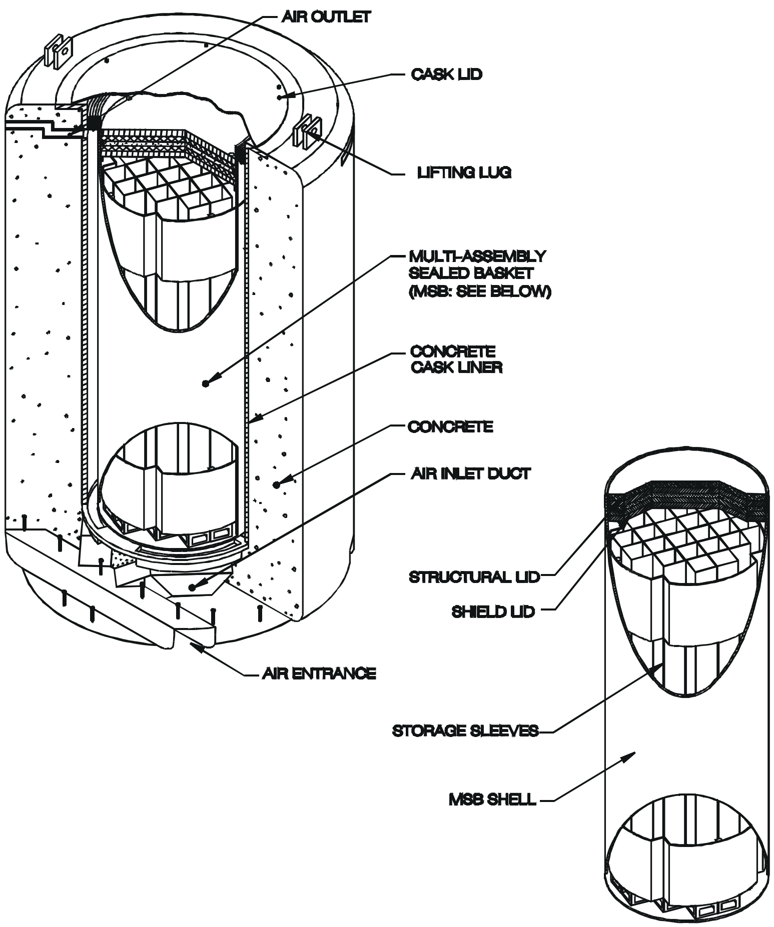


Background (continued)

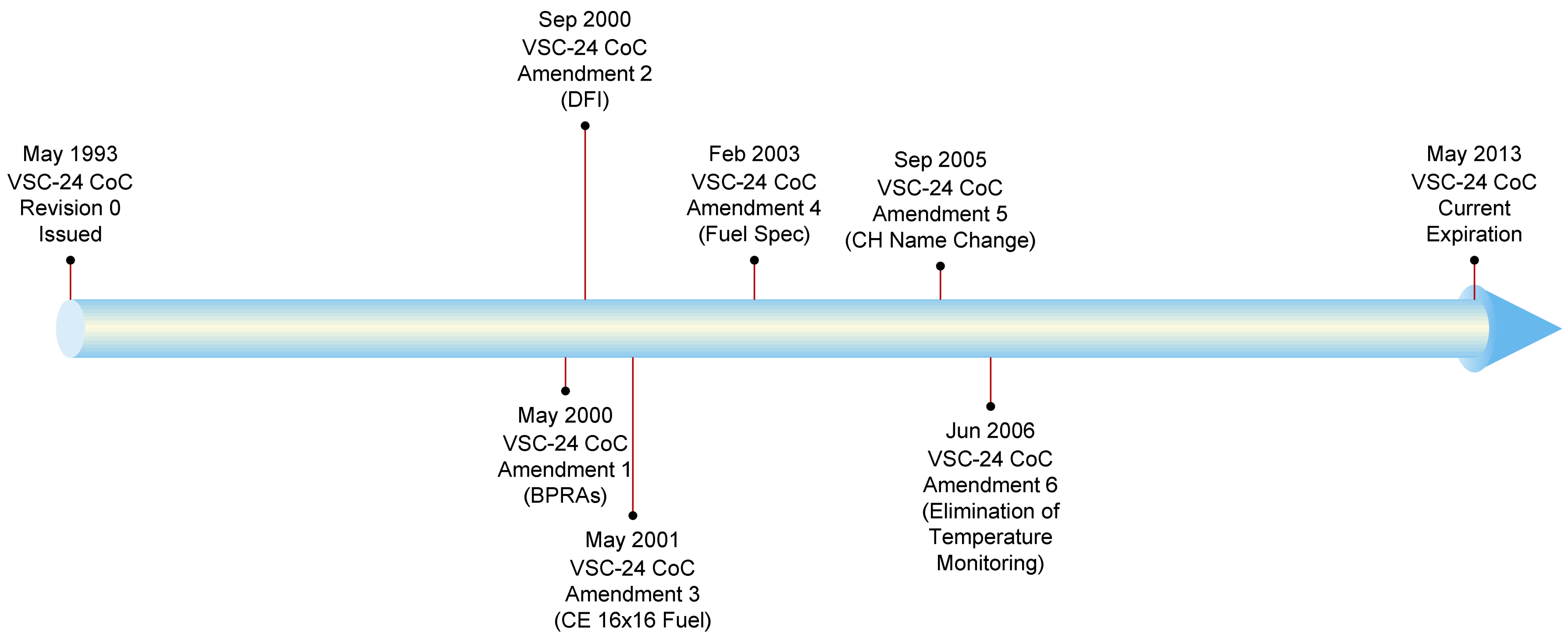
- 58 VSC-24 casks loaded and stored at three different ISFSIs between May 1993 and June 2003;
  - 18 casks at Palisades
  - 16 casks at Point Beach
  - 24 casks at ANO
- SNF assemblies stored in VSC-24 casks have low heat loads and low burnup.
  - Max. initial heat load of 58 loaded VSC-24 casks is < 15 kW.
  - Highest burnup of all SNF assemblies in 58 loaded VSC-24 casks is < 42 GWd/MTU.

Background (continued)

- Principal System Components
  - Ventilated Concrete Cask (VCC)
  - Multi-assembly Sealed Basket (MSB)
  - MSB Transfer Cask (MTC)
- VCC Design Features
  - Reinforced concrete shell
  - Coated CS liner, shield ring, and lid
  - Ceramic tiles support MSB
- MSB Design Features
  - Coated CS construction
    - MSB shell coating not relied upon for corrosion protection
  - Storage sleeve assembly has no neutron absorber plates
  - Payload: 24 PWR SNF assemblies



- VSC-24 CoC Amendment History
  - Requested by NRC at 1/19/12 meeting
  - Discussion added to CoC renewal application
  - VSC-24 CoC amended 6 times since initial issue



Application Content

- Format and content per guidance from NUREG-1927
- Reviewed other ISFSI renewal applications and industry reports for guidance
- Application Table of Contents

1.0 General Information

1.1 Background (Amendment history and cask loading overview)

1.2 Application Format and Content

(Regulatory compliance cross-reference matrix provided)

2.0 Scoping Evaluation

2.1 Scoping Evaluation Process

2.2 Scoping Evaluation Discussion and Results

2.2.1 Description of SSC

2.2.2 SSC Within the Scope of License Renewal

2.2.3 SSC Not Within the Scope of License Renewal

Application Content

- Application Table of Contents (continued)

  3.0 Aging Management Review

  - 3.1 Identification of Materials and Environments
    - 3.1.1 Materials
    - 3.1.2 Environments
  - 3.2 Aging Effects Requiring Management
    - 3.2.1 Possible Aging Effects
    - 3.2.2 Observed Aging Effects
  - 3.3 Time-Limited Aging Analyses
    - 3.3.1 TLAA Identification Criteria
    - 3.3.2 TLAA Identification Process and Results
    - 3.3.3 Evaluation and Disposition of Identified TLAAs

- Application Table of Contents (concluded)

Scoping Evaluation

- Recap of discussion from 1/19/12 NRC meeting
  - Identify SSC that will be reviewed for aging effects
  - Scoping process per Section 2 of NUREG-1927
    - Identify SSC as in-scope or not in-scope of renewal
    - Identify and describe subcomponents of in-scope SSC that support the intended safety function(s) of the SSC
  - Scoping Criteria
    - Criteria 1: SSC is Important to Safety (ITS)
    - Criteria 2: SSC not ITS, but failure could prevent fulfillment of a function that is ITS

ENERGYSOLUTIONS

Scoping Evaluation Results

SSC Description	Scoping Results		In-Scope SSC?
	Criteria 1[1]	Criteria 2[2]	
MSB Assembly	Yes	N/A	Yes
VCC Assembly	Yes	N/A	Yes
MTC Assembly	Yes	N/A	Yes
Spent Fuel Assembly[3]	Yes	N/A	Yes
Fuel Transfer and Auxiliary Equipment[4][5]	No	No	No
ISFSI Storage Pad	No	No	No
ISFSI Security Equipment[6]	No	No	No

Notes:

(1) SSC is Important-To-Safety (ITS).

(2) SSC is Not-Important-To-Safety (NITS), but its failure could prevent an ITS function from being fulfilled.

(3) Fuel pellets are not within the scope of the renewal.

(4) Fuel transfer equipment includes the lifting yoke, hydraulic roller skid, air-pallets, heavy haul trailer, and engineered cask transporter.

(5) Auxiliary equipment includes MSB closure equipment used to drain, backfill, and seal the MSB assembly (e.g., the vacuum drying system (VDS), welding equipment, weld inspection equipment, drain pump equipment, and helium leak detection equipment.)

(6) ISFSI security equipment Includes the ISFSI security fences and gates, lighting, communications, and alarms.

Aging Management Review - Materials and Environments

ENERGYSOLUTIONS

- Materials and Environments (discussed at 1st meeting)
  - Materials of In-Scope SSC
    - Fuel assembly: zirconium alloys, stainless steel, inconel
    - MSB: carbon steel (w/ coatings), RX-277 neutron shield
    - VCC: coated carbon steel, reinforced concrete
    - MTC: coated carbon steel, lead, RX-277 neutron shield
  - Environments
    - Inert Gas (MSB Cavity)
    - Sheltered Environment
    - Embedded Environment
    - Exposed Environment

Aging Management Review - Aging Effects Requiring Management

- Aging effects for VSC-24 storage system materials of construction, and the degradation mechanisms that cause them, were identified based on:
  - "Theoretical" aging effects discussed in known literature (e.g., ASTM C1562 and NUREG/CR-6831)
  - Observed aging effects from industry operating experience and VSC-24 storage system maintenance and inspection records
- Aging effects that are credible and could affect the ability of in-scope SSC to perform their intended functions require Aging Management Activity (AMA)
  - Time-Limited Aging Analysis (TLAA)
  - Aging Management Program (AMP)

Aging Management Review - Aging Effects Requiring Management

ENERGYSOLUTIONS

- Observed Aging Effects
  - Surveillance records from periodic examinations of VSC-24 casks
    - VCC exterior surface examinations
      - vent screens
      - concrete exterior
    - VCC interior surface inspections (5-year)
    - Performance monitoring
    - Lead cask inspection
  - Performance monitoring trends
    - VCC outlet temperature readings
    - ISFSI dose rate surveys

Aging Management Review - Observed Aging Effects

ENERGYSOLUTIONS

- VCC exterior surface examinations
  - Vent screen condition
    - Small amount of debris (e.g., leaves and/or mud) periodically found inside vents (removed)
    - Some bent screens and missing screen hardware (repaired)
  - Concrete surface condition
    - Small surface defects, e.g., hairline cracks and bug holes
    - Some larger cracks/defects requiring grout repair (repaired)
    - Local efflorescence/mineral deposits near cracks (tests show deposits primarily calcium carbonate)
  - Other conditions
    - Coating flakes found in VCC inlet vents
    - Coating degradation on optional VSC lifting lugs used at Point Beach (repaired)

Aging Management Review - Observed Aging Effects (continued)

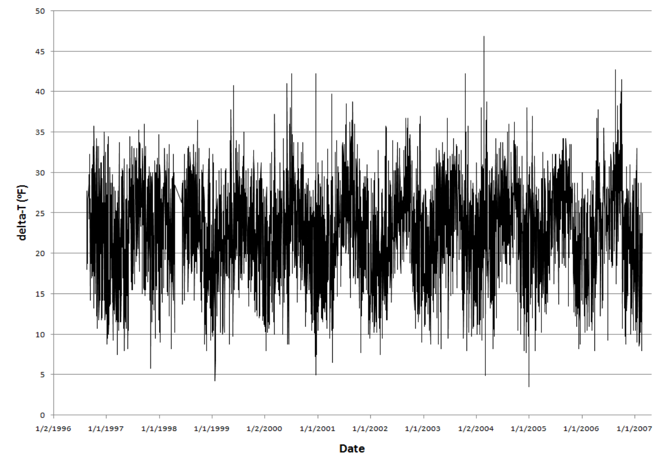
- VCC interior surface examinations
  - Condition of VCC ventilation paths
    - No significant blockage accumulation in inlet/outlet ducts and annulus
    - Small amount of debris (e.g., coating, dead insects) at bottom of VCC annulus
    - Small mineral deposits (e.g., stalactites) at entrance to VCC outlet vents
    - Small muddobber nest inside outlet vent of one VCC (removed)

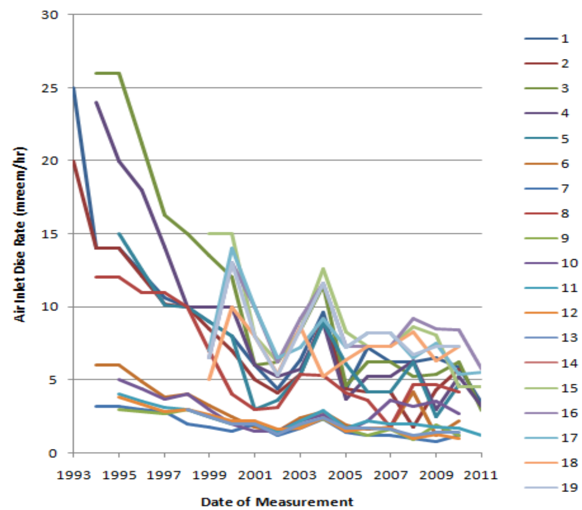
Aging Management Review - Observed Aging Effects (continued)

- VCC interior surface examinations (cont.)
  - Condition of MSB Shell and VCC liner and inlet/outlet duct surfaces
    - Coated steel surfaces in good condition
    - Discoloration of coating near top end of MSB shell
    - Small areas of corrosion (?) on MSB shell surface (< 0.045” allowance @ 15 yr)
    - VCC liner coating in excellent condition, few small areas of coating damage and corrosion

Aging Management Review - Observed Aging Effects (continued)

- Performance Monitoring
  - Outlet temperature readings
    - Average temperature rise has not changed significantly over time
    - Consistent with heat loads
  - Dose rate surveys
    - No adverse trends identified
    - Dose rates affected by addition of casks to ISFSI
    - Inlet dose rates decrease over time
    - Dose rates at ISFSI perimeter remain low





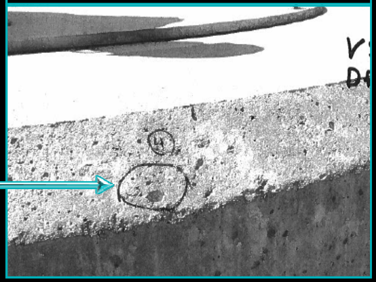
Aging Management Review - Observed Aging Effects (continued)

ENERGYSOLUTIONS

- Lead Cask Inspection Plan
  - Palisades Cask No. VSC-15, May 21-24, 2012
    - Design configurations similar at all 3 sites
    - Environment conditions similar at all 3 sites
    - Palisades VSC-15 had highest heat load (14.7 kW)
    - 13 years in service (loaded June 1999)
    - Location on ISFSI pad provides good accessibility/visibility
  - Inspection scope
    - Remote visual examination of VCC bottom surface
    - Remote visual examination of VCC air flow passages
    - Direct visual examination of VCC cask lid, liner flange, and shield ring, and MSB structural lid and closure weld
    - Direct visual inspection of VCC exterior concrete surfaces
  - Concrete inspector: ASME, Section XI, Subsection IWL
  - Steel inspector: ASME, Section XI, Subsection IWE

Aging Management Review - Observed Aging Effects (continued)

- Lead Cask Inspection Results
  - VCC bottom & underlying pad
    - Insects and some debris found
  - MSB shell, VCC liner & air ducts
    - No significant blockage, coating degradation or corrosion found (some debris/insects found)
  - VCC lid, MSB structural lid & closure weld
    - Some dust/dirt on MSB top end, but no significant coating degradation or corrosion
    - Coating scraped off in 2 areas when temporary shielding removed after inspection
      - No corrosion on exposed CS surfaces
      - Areas cleaned and recoated
  - VCC exterior concrete
    - Acceptable condition overall, 6 bug-holes found exceeding acceptance criteria (grout repair done)



Aging Management Review – Time-Limited Aging Analysis

ENERGYSOLUTIONS

- Recap of discussion from 1/19/12 NRC meeting:
  - Identification of TLAAs based on following criteria:
    - TLAA already in design basis (i.e., SAR, SER, etc.)
    - TLAA for in-scope SSC with a pre-determined life span.
    - Involves time-limited assumptions defined by the current operating term.
    - Must consider extended operational lifetime of SSC that have a defined lifetime limit.
    - Provide conclusions or basis for conclusion for capability of SSC to perform intended function for extended operation.

Aging Management Review - Time-Limited Aging Analysis (continued)

ENERGYSOLUTIONS

- TLAAs Discussed at 1st Pre-Submittal Meeting
  - MSB Corrosion Analysis
  - MSB Fatigue Analysis
  - MSB Helium Leakage Analysis
  - Fuel Cladding Creep Analysis
- Additional TLAAs
  - Radiation Effects Analysis
    - System materials (carbon steel, concrete, RX-277) not adversely affected by cumulative gamma and neutron radiation exposure over the 60-year extended storage period.
  - Palisades MSB-04 Crack Growth Analysis
    - Includes corrosion allowance, 60-year storage period
    - Results show no significant crack growth over 60-years and flaw stability factors satisfy ASME Code criteria

Aging Management Review – Aging Management Program

- Provided overview of process at 1/19/12 NRC meeting
  - Scope
    - In-Scope SSC
    - Aging effects that could result in loss of design function for an SSC
    - Each SSC for which the AMR identifies an aging effect that requires management
  - AMP Features/Implementation
    - 10 AMP elements (NUREG-1927)
    - AMP Methods: Prevention, mitigation, condition monitoring, performance monitoring

Aging Management Review –
Aging Management Program

- Aging Effects Subject to Aging Management
  - TLAAs credited with managing:
    - Radiation effects in the MSB, VCC, and MTC steel, concrete, and RX-277 materials
    - Fatigue of the MSB assembly
    - Corrosion of the MSB shell and bottom plate
    - Crack growth in MSB#4 shell seam weld
    - SNF cladding creep
  - AMP credited with managing:
    - Corrosion of MSB structural lid, valve covers and closure weld
    - Corrosion of the VCC steel components
    - Cracking and loss of strength of VCC concrete
    - Corrosion of the MTC steel components

ENERGYSOLUTIONS

Short Break?

Aging Management Review –
Aging Management Program

- AMP Description
  - AMP consists of 5 different examinations
    - Examination of VCC Assembly Air Inlets and Outlets
    - Examination of VCC Assembly Exterior Concrete
    - Examination of VCC Assembly Ventilation Ducts and Annulus
    - Examination of VSC Top End Steel Components
    - Examination of MTC Assembly
  - Lead Cask Inspection provides additional assurance that VCC and MSB do not experience unanticipated degradation

Examination of VCC Air Inlets/Outlets (TS 1.3.1)

Element	Activity
Scope	Inspect VCC vent screens
Parameters Monitored	Blockage of screens and screen damage or degradation
Method	Visual examination
Frequency	Daily
Sample Size	All vent screens on all in-service casks
Acceptance Criteria	Screens free of blockage
Corrective Actions	Remove blockage and/or repair or replace damaged or degraded screens. If screen breached, inspect duct for blockage, and remove if identified.
Operating Experience	Partial blockage of screens from snow/debris and some screen damage. All degraded conditions corrected.

Aging Management Review – AMP Description (Continued)

EnergySolutions

Examination of VCC Exterior Concrete (TS 1.3.2)

Element	Activity
Scope	Inspect VCC exterior concrete surfaces
Parameters Monitored	Damage/degradation of concrete surface, including cracking, loss of bond, and loss of material, and increased porosity and discoloration (efflorescence)
Method	Visual examination by qualified concrete inspectors (ASME, Section XI, Subsection IWL or ACI 349.3R)
Frequency	Yearly
Sample Size	All external concrete surfaces on all in-service casks
Acceptance Criteria	Defects < ∅½” (or width) and ¼” deep. No loss of concrete strength (i.e., ASR, leaching, rebar corrosion)
Corrective Actions	Repair unacceptable cracks by re-grouting and determine cause
Operating Experience	Small cracks and bug-holes common. Some mineral deposits/local discoloration. Grout repairs effective.

ENERGYSOLUTIONS

Examination of VCC Ventilation Ducts/Annulus (TS 1.3.3)

Element	Activity
Scope	Inspect VCC inlet/outlet ducts and annulus
Parameters Monitored	Blockage in internal ventilation path and condition of coated carbon steel surfaces on VCC ducts and liner and MSB shell
Method	Remote visual examination (e.g., borescope)
Frequency	5-year
Sample Size	1st cask loaded at each site
Acceptance Criteria	No significant blockage (>10% of cross-section area) in internal ventilation path and no corrosion that prevents SSC from performing intended functions
Corrective Actions	Remove unacceptable blockage. Evaluate VCCs with significant corrosion for continued storage.
Operating Experience	No significant blockage, only insects, minor debris, and some mineral deposits. Coated steel surfaces in good condition.

Aging Management Review – AMP Description (Continued)

EnergySolutions

Examination of VSC Top End Steel Components

Element	Activity
Scope	Inspect all accessible surfaces of VCC lid, lid gasket, lid bolts, liner flange, and shield rings and MSB top end (e.g., lid, closure weld)
Parameters Monitored	Degradation of coated CS surfaces
Method	Visual examination by qualified inspectors (IWE-2330)
Frequency	10-years, starting 20-years after 1st cask loaded
Sample Size	1 cask at each site
Acceptance Criteria	No significant coating loss on, or corrosion of, VCC lid and liner flange, and MSB top end.
Corrective Actions	Repair unacceptable coating degradation on VCC lid, liner flange, & MSB top end. Evaluate extent of condition.
Operating Experience	Initial lead cask inspection showed all coated surfaces in good condition. Coating scraped off when temporary shielding was removed, but no corrosion on underlying surface.

Examination of MTC Assembly

Element	Activity
Scope	Examination of readily accessible surfaces of MTC assembly
Parameters Monitored	Degradation of the coating and corrosion of the underlying carbon steel
Method	Visual examination
Frequency	yearly, or within 1-year prior to use for MSB loading/unloading operations
Sample Size	Each MTC assembly
Acceptance Criteria	No corrosion of the coated CS surfaces that results in significant loss of material and prevents the MTC assy from performing its intended functions
Corrective Actions	Degraded coating on exposed surfaces of MTC assembly shall be examined for significant corrosion (e.g., excessive pitting or scaling) on the underlying steel. If significant corrosion identified, evaluated the MTC assembly for continued use and the corroded surfaces shall be repaired, if required
Operating Experience	N/A (new requirement)

Aging Management Review – Aging Management Program

ENERGYSOLUTIONS

- Corrective Actions
  - VSC-24 storage system operating history reviewed to identify potential issues that could affect safe operation during extended storage period
    - Overview of 72.48 design changes (GL and CH)
    - Review of events from initial storage period, identified causes, and corrective actions to prevent recurrence
  - Review provides reasonable assurance of continued safe operation of the VSC-24 storage system during extended storage period

Aging Management Review – Corrective Actions (Continued)

ENERGYSOLUTIONS

- Overview of 72.48 design changes provided in AMR
  - Until April 2001, only GLs (not CH) permitted to make changes under 72.48 without prior NRC approval
  - GL's 72.48 changes addressed:
    - Unit-specific changes (reported to CH for evaluation as generic changes)
    - Fabrication non-conformances (repair/use as-is)
    - Commitments made in response to CALs
  - CH included generic changes in DFI amendment
    - In April 2001, CH given authorization to make 72.48 changes
    - NRC returned suspended review of DFI amendment, requesting CH make changes under 72.48
      - Some 72.48 changes made by CH, added in FSAR Rev. 4 & 5
      - Changes requiring prior NRC approval re-submitted in LAR 01-01 and approved in Amendment 4

Aging Management Review – Corrective Actions (Continued)

ENERGYSOLUTIONS

- Review of events from initial storage period
  - Three different types of events reviewed
    - MSB closure weld cracks (multiple instances)
    - Palisades MSB#4 shell seam weld RT indications
    - Point Beach hydrogen ignition event
  - All events occurred relatively early in VSC-24 cask loading timeline
  - Corrective actions taken to prevent recurrence were effective
  - Evaluations show that affected casks will continued to perform their intended functions during the extended storage period

Aging Management Review – Corrective Actions – Events (Continued)

- MSB closure weld cracks - background
  - Cracks in closures welds of 4 MSB from 3/93 to 3/97
  - Identified by NDE performed during loading process
  - NRC Inspection Report 72-1007/97-204 and CAL 97-7-001
  - SNC's response to CAL identified root causes:
    - Lamellar tearing in MSB shell
    - Improper fit-up of MSB structural lid and backing ring
    - Moisture contamination of welds
    - Hydrogen-induced weld cracking

Aging Management Review –
Corrective Actions – Events (Continued)

ENERGYSOLUTIONS

- MSB closure weld cracks: Lamellar tearing in MSB shell
  - Background
    - March 1995, Palisades MSB-05
    - Leak in shield lid-to-shell weld identified during helium leak test
    - Defect removed by grinding & repaired
  - Causes: Weld of unknown origin in MSB shell and lamellar defect in shell material (lamellar tearing)
  - Corrective Actions:
    - Acid-etched all unloaded MSB shells in region of closure welds

Aging Management Review – Corrective Actions – Events (Continued)

ENERGYSOLUTIONS

- MSB closure weld cracks: Improper fit-up of MSB structural lid and backing ring
  - Background:
    - May 1996, 2nd cask load at Point Beach
    - PT exam identified crack in root pass of shield lid-to-shell weld
    - Defect removed by grinding & repaired
  - Causes:
    - GL investigation concluded that wide gaps/insufficient backing caused lack of fusion between weld and base metal
  - Corrective Actions:
    - Pre-fit MSB components to assure tighter fit-up
    - Manually weld gaps >1/16" wide prior to starting automated welding process
    - Similar measures already used by other GLs

Aging Management Review – Corrective Actions – Events (Continued)

ENERGYSOLUTIONS

- MSB closure weld cracks: Moisture contamination of welds
  - Background:
    - May 1996, 2nd cask load at Point Beach
    - Cracking and porosity in root pass of structural lid-to-shell weld
    - Defect removed by grinding & repaired
  - Causes:
    - GL investigation concluded that cause was moisture contamination of weld from water forced up through drain line
  - Corrective Actions:
    - Remove approximately 40 gallons of water from MSB cavity
    - Pre-heat area to be welded to 200°F
    - Similar measures already used by other GLs

Aging Management Review – Corrective Actions – Events (Continued)

ENERGYSOLUTIONS

- MSB closure weld cracks: Hydrogen-induced weld cracking
  - Background:
    - December 1996, 1st ANO cask; Helium leak test identified leak in shield lid-to-shell weld (PT exam confirmed presence of 4" long crack along fusion line)
    - March 1997. 3rd ANO cask; PT exam identified similar leak in along fusion load of root pass of shield lid-to-shell weld
  - Causes:
    - GL initially identified lamellar tearing of MSB shell as cause
    - Team of welding experts later determined cause to be hydrogen-induced cracking
    - NRC identified delayed hydride cracking (DHC) as possible failure mechanism
      - Time required for DHC determined to be only a matter of hours

Aging Management Review – Corrective Actions – Events (Continued)

- MSB closure weld cracks: Hydrogen-induced weld cracking (continued)
  - Corrective Actions:
    - Use of larger tack welds and more balanced weld sequence to secure shield lid to shell before welding
    - Use welding consumables with low hydrogen levels
    - Hold 200°F temperature for 1-hour after completing weld to accelerate diffusion of hydrogen from HAZ
    - Wait 2-hour minimum after completing weld to inspect for DHC
    - UT examination of welded closures of all previously loaded MSBs to check for possible DHC-induced failure
      - Allowable flaw size for UT examination determined based on ASME Section XI criteria
      - Concluded that MSB closure welds were acceptable for continued storage

Aging Management Review – Corrective Actions – Events (Continued)

ENERGYSOLUTIONS

- Palisades MSB#4 shell seam weld RT indications
  - Background:
    - MSB-04 fabricated/inspected in 1992, loaded in July 1994
    - RT examination of MSB shell seam welds performed
    - Review of radiographs by GL's Level III inspector in 7/94 identified linear crack indication in longitudinal seam weld
    - Review by another Level III inspector in confirmed indication and identified 2 other indications in shell seam welds
  - Evaluation:
    - CSMB-04 structural sound and capable of withstanding normal operating and test loads
    - Fatigue crack-growth of bounding flaw less than 0.00001" over 50-year storage period
    - Flaw stability factors of safety greater than those required by ASME Code

Aging Management Review – Corrective Actions – Events (Continued)

ENERGYSOLUTIONS

- Palisades MSB#4 shell seam weld RT indications
  - Corrective Actions:
    - Radiological surveys performed on all 4 VSC-24 loaded casks at Palisades – no unusual dose rates or contamination levels
    - Helium leak test at VCC-04 air outlet ducts – test ineffective
    - Periodic surveys of ISFSI temporarily increased to monitor performance of MSB-04
    - Hold-point added to MSB fabrication process for independent review of all radiographs

Aging Management Review – Corrective Actions – Events (Continued)

- Point Beach hydrogen ignition
  - Background:
    - In 5/96, hydrogen gas ignited inside MSB when MSB shield lid-to-shell weld started on the 3rd cask at Point Beach
    - No personnel injured, no equipment damaged, and no increase in radiological exposure, but loading operations discontinued
    - MSB returned to SFP and SNF assemblies removed
    - NRC inspection teams sent to Point Beach and SNC office
    - NRC issued CALs to GLs and Bulletin 96-04
  - Evaluation Findings:
    - MSB internal coating reacts with SFP water, forming insoluble zinc compounds and generating hydrogen gas sufficient to produce ignitable concentrations
    - Concentration of soluble boron in the SFP not significantly reduced by the reaction

Aging Management Review – Corrective Actions – Events (Continued)

ENERGYSOLUTIONS

- Point Beach hydrogen ignition
  - Evaluation Findings (continued):
    - "White foamy precipitate" identified in SFP and on inside of MSB shield lid tested and determined to contain significant organic content - concluded that foreign material introduced to the MSB either during fabrication or loading
  - Causes:
    - Hydrogen gas from coating reaction with SFP water
  - Corrective Actions:
    - Change loading procedures to assure no FM inside MSB, minimize accumulation of combustible gas inside MSB, and monitor boron concentration of SFP water in MSB cavity
    - Corrective actions effective in preventing recurrence of this incident

Lead Cask Inspection

Element	Activity
Scope	Inspect VCC bottom surface, VCC internal ventilation flow path (i.e., inlet/outlet ducts, VCC liner and MSB shell), VSC top interior (i.e., VCC cask lid, liner flange and shield plates, and MSB structural lid and closure weld)
Parameters Monitored	Coating degradation and corrosion of VCC bottom surface; blockage of VCC internal ventilation flow path; coating degradation and corrosion of coated CS surfaces that line VCC ventilation flow path, VCC cask lid and shield plates, and MSB structural lid and closure weld.
Method	Direct visual examination of readily accessible surfaces and remote visual examination of the VCC ventilation flow path and VCC bottom surface
Frequency	20-year
Sample Size	One or more casks at one or more sites
Acceptance Criteria	• No significant blockage (>10%) of air flow paths • No significant coating degradation or corrosion on VCC internal ventilation flow path and VSC top interior (MSB shell and bottom plate include corrosion allowance)

ENERGYSOLUTIONS

Lead Cask Inspection (Continued)

Element	Activity
Corrective Actions	• Remove unacceptable blockage from VCC ventilation path • Repair unacceptable coating degradation on VCC cask lid, MSB structural lid, or MSB closure weld in accordance with the GL's procedures • If unanticipated degradation identified, determine extent of condition and evaluate cask for continued storage
Operating Experience	Results of initial lead cask inspection discussed earlier

Aging Management Review – Retrievability

- VSC-24 storage system is designed to allow ready retrieval of SNF in accordance with 10CFR72.122(l)
  - VSC-24 does not include a dual-purpose canister
  - Per ISG-2, ready retrieval requires:
    - Ability to transfer the sealed MSB assembly to a spent fuel pool
    - Ability to unload the SNF assemblies from the MSB assembly for repackaging
  - Management of MSB and MTC assembly aging effects during extended storage period ensures that MSB assembly can be transferred to a spent fuel pool after 60-years
  - No credible aging effects for low burnup fuel in the inert gas environment of the MSB cavity
  - Unloading analyses (i.e., thermal shock and MSB over-pressurization) performed by GLs remain valid and bounding for extended storage period

FSAR and TS Changes

ENERGYSOLUTIONS

- Proposed FSAR changes are discussed in Appendix A of CoC Renewal Application
  - Increase design life to 60-years
  - Revise TLAA-related sections
  - Add new Aging Management section in Chapter 9
    - Aging Management Review
    - TLAA
    - Aging Management Program
    - Retrievability
- Proposed TS changes are discussed in Appendix B of CoC Renewal Application
  - No changes proposed to TS

Schedule

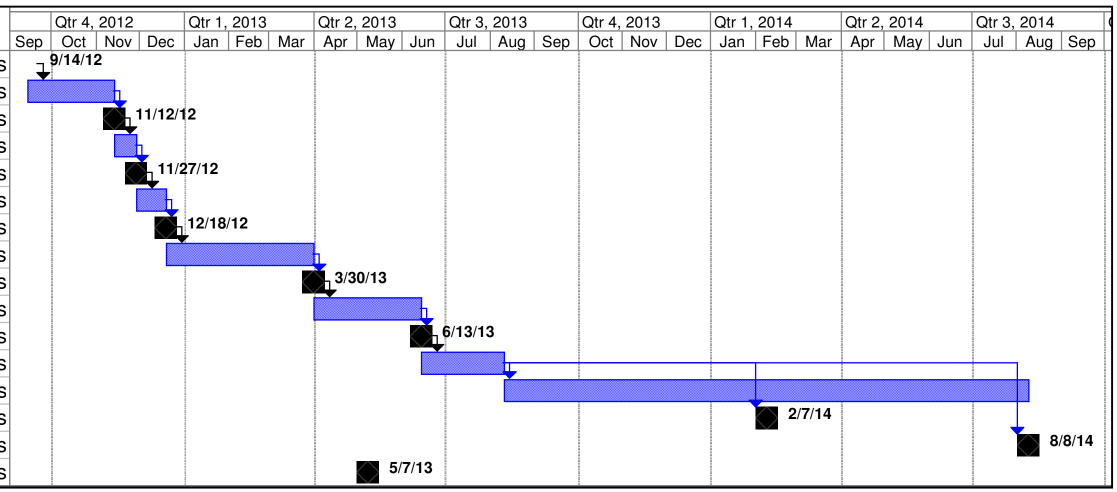
ENERGYSOLUTIONS

- Planned submittal by mid-September 2012
  - CoC expiration on May 7, 2013
  - Conditions for renewal (10CFR72.240)
    - Application must be submitted not less than 30 days before expiration date of CoC (i.e., on or before April 7, 2013)
    - Existing CoC will not expire until the application for renewal has been determined by NRC

Schedule

- Assumed NRC review schedule (for planning purposes)
  - Acceptance review durations from SFST-14 R1
  - Technical review durations from SFST-10 R3
    - High complexity casework type assumed
  - Rulemaking (direct final vs. regular)

ID	Task Name	Duration
1	ES Submit CoC Renewal Application	0 days
2	NRC Acceptance Review	60 days
3	NRC Issue RSI	0 days
4	ES Prepare RSI Response	15 days
5	ES Submit RSI Response	0 days
6	NRC Review RSI Response	21 days
7	NRC Accept CoC Renewal Application	0 days
8	NRC Technical Review	102 days
9	NRC Issue RAI	0 days
10	ES Prepare RAI Response	75 days
11	ES Submit RAI Response	0 days
12	NRC Review RAI Response	57 days
13	Rulemaking	52 wks
14	CoC Renewal Issued (Direct Final Rulemaking)	0 days
18	CoC Renewal Issued (Regular Rulemaking)	0 days
19	Current CoC Expiration Date	0 days



Summary

- VSC-24 CoC renewal application is planned for submittal to NRC by mid-September 2012
- Application format and content per NUREG-1927
  - First CoC renewal application for generic cask design

Questions?

ENERGYSOLUTIONS