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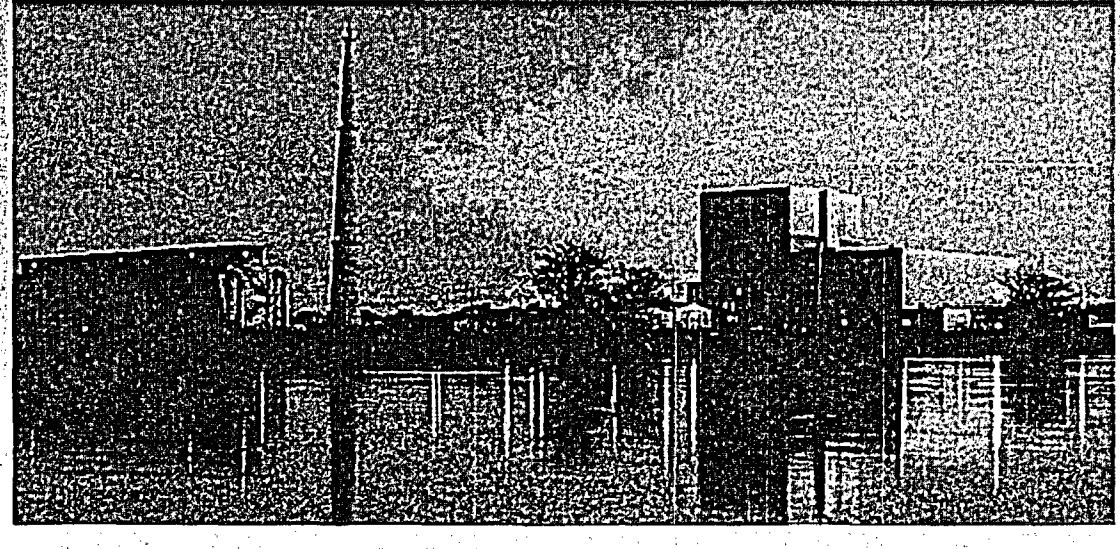
Xcel Energy

Monticello Nuclear Generating Plant License Renewal Application May 11, 2005



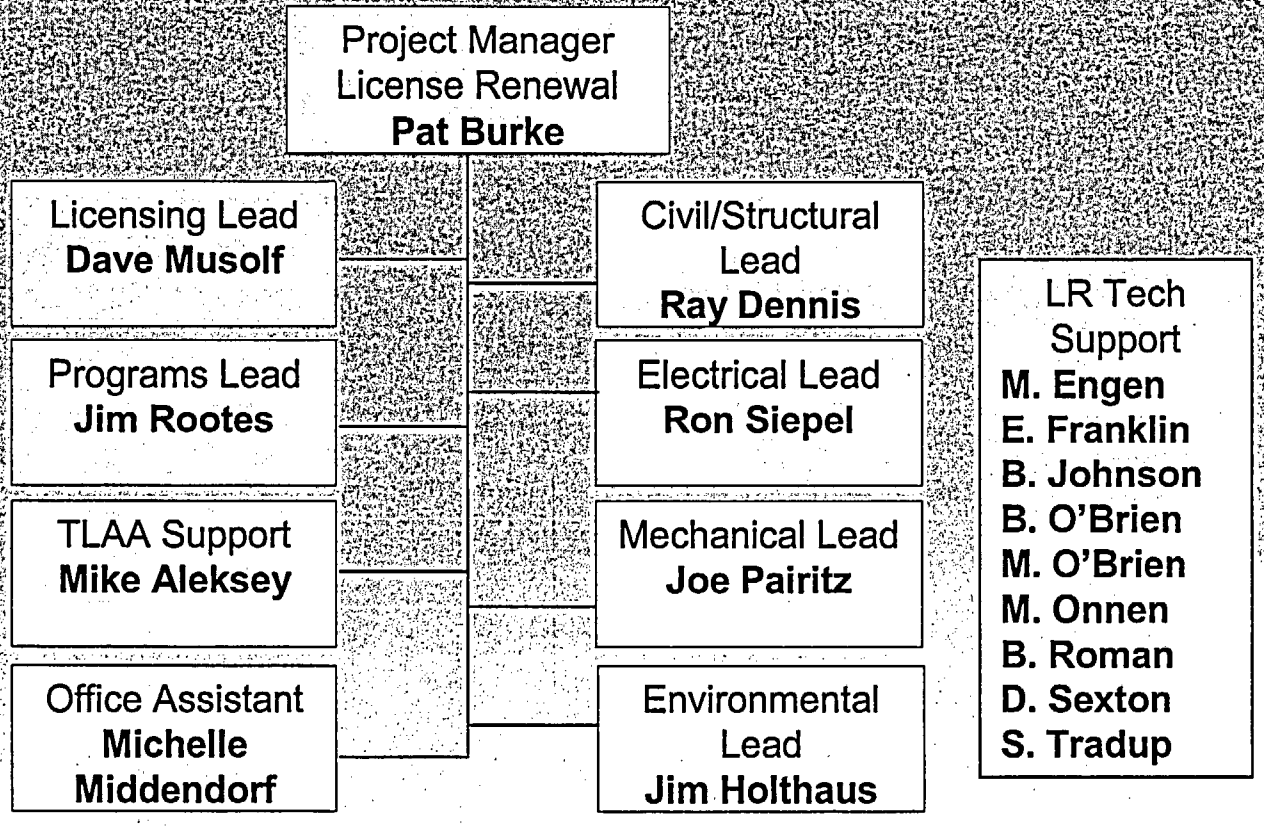
Agenda
MNGP License Renewal Application
NRC/NMC

1) Introduction of License Renewal Participants
2) Original License Expiration and Plant Overview
3) MNGP License Renewal Project Overview
4) MNGP License Renewal Application Overview
   - Scoping and Screening Methodology & Results (Section 2.0)
   - AMR Methodology & Results (Section 3.0)
   - Sections 2.0 & 3.0 Mechanical
   - Sections 2.0 & 3.0 Civil
   - Sections 2.0 & 3.0 Electrical
   - Section 4.0 TLAAs
   - LRA Appendix B Aging Management Programs
   - LRA Appendix E Environmental Report
5) Questions

NMC Core Team

- Pat Burke – Project Manager
- Joe Pairitz – Mechanical Lead
- Ray Dennis – Civil/Structural Lead
- Ron Siepel – Electrical Lead
- Mike Aleksey – TLAA Support
- Jim Rootes – Program Lead
- Marv Engen – Technical Support
- Dave Musolf – Licensing Lead
- Jim Holthaus – Environmental Lead

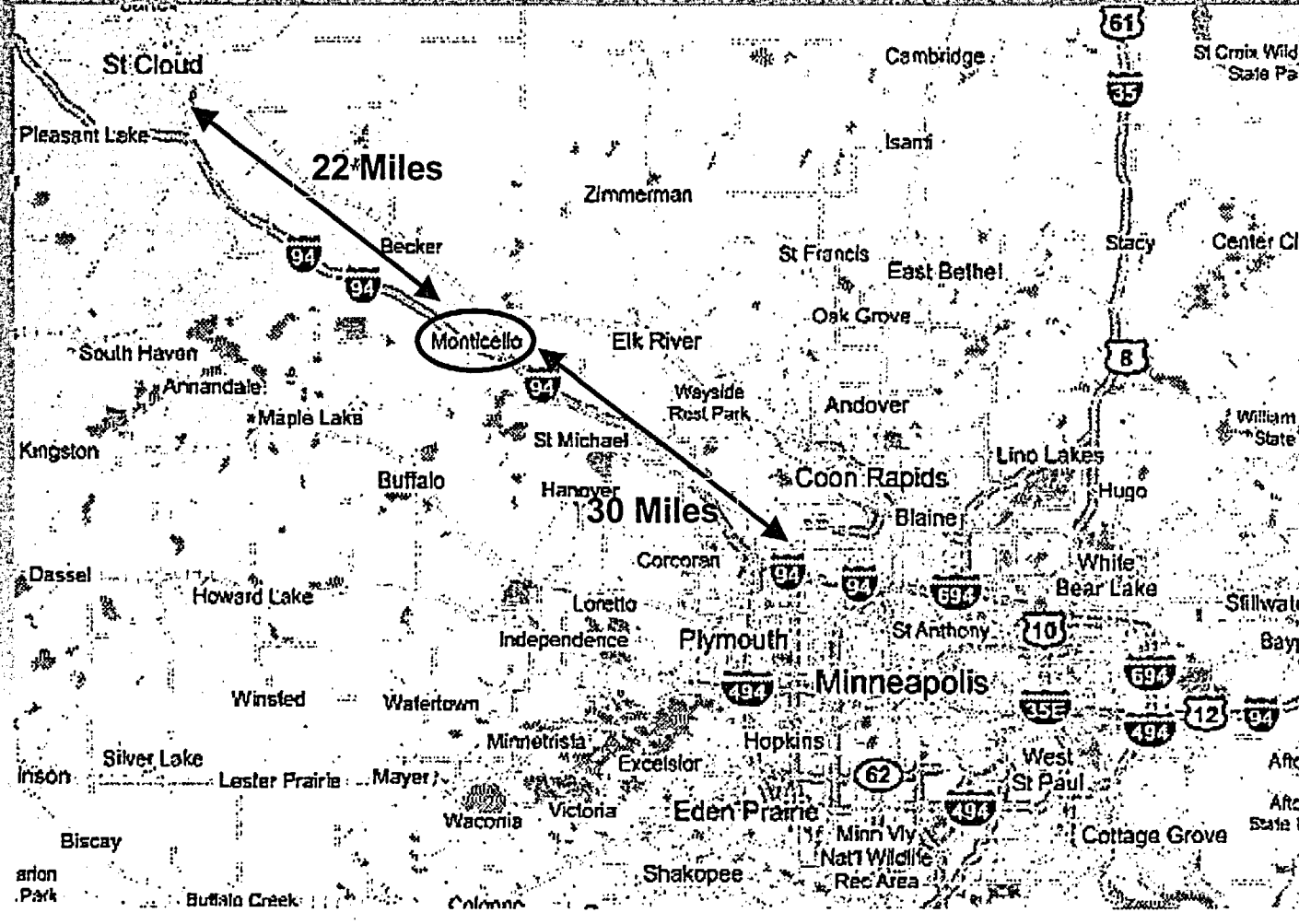
NMC Core Team



MNGP Overview

- License Expires September 8th, 2010
- Single Unit General Electric BWR-3
- Thermal Power - 1775 MWth
- Generation - 600 MWe
- General Electric Mark I Containment
  - (Torus Shaped Suppression Chamber)
- Cooling Source: Mississippi River with Forced Draft Cooling Towers
- RCIC System (versus Isolation Condenser)

MNGP Location



MNGP Location

MNGP Overview
(Continued)

- 1984 - Recirculation Pipe Replacement
- 1988 - Feedwater Heaters 11A, 11B, 12A and 12B Replaced
- 1996 - High Pressure Turbine Rotor Replacement and both Low Pressure Turbine Rotors and Inner Casings Replaced
- 1997 – ECCS Suction Strainers Replaced
- 1998 – Condensate Pumps 11 and 12 Replaced

MNGP Overview
(Continued)

- 1998 - Power Uprate
  - 6.3% increase (1670 MWth to 1775 MWth)
  - Many calculations performed at 1880 MWth
- 2005 – No. 11 Recirculation Pump Motor Replaced

MNGP Overview
(Continued)

- Pending/Potential Licensing Actions
  - Alternate Source Term (AST)
    - Selective AST (Fuel Handling Accident)
      - Submitted for NRC Review
    - Full Scope AST Submittal 3rd Qtr 2005
  - Two Year Fuel Cycle
    - Approval Expected 2nd Qtr 2005
  - Improved Tech Specs Submittal 2nd Qtr 2005
  - Independent Spent Fuel Storage Installation
    - Potential TLAA Impacts with Crane Upgrade
- Approved Amendment 138
  - Elimination of H_2 Recombiners (CGCS) and H_2/O_2 Analyzers

License Renewal Project Overview

- Core Team NMC Employees
  - 4 with Previous SRO / SRO Certifications
  - Senior Staff (min of 14 years MNGP experience)
- Supplemented by On-Site Contractor Support
- Team Retained to Support Audits/Inspections
- Contract with GE for RPV & Internals TLAAs
- Plant Personnel Engaged during AMR and AMP Development

License Renewal Project Overview

- Engaged in the Industry
  - Working Groups (NEI, BWROG, etc.)
  - GALL Draft Rev 1 Review and Comments via NEI
  - Participated in Point Beach Nuclear Plant Audits/Inspections
  - Supported Licensee Peer Reviews
  - ***Reviewed Industry RAIs (Nine Mile, Point Beach, Dresden/Quad and others)***

License Renewal Project Overview

- Point Beach LRA used as a Model and Improved Upon
- Converted MNGP Docket to Digital
  - Electronic Search Capability
  - Supported TLAA Identification & Scoping
- Precedence Review
  - Full Reconciliation to Draft GALL Revision 1
  - MNGP Consistency with GALL
    - 75%: Revision 0
    - 95%: Draft Revision 1

License Renewal Application Supporting Information

- LRA supported by the following documentation:
  - 95 Scoping and Screening Reports
  - 96 License Renewal Boundary Drawings
  - 58 AMR Reports
  - 35 Aging Management Program Basis Documents
  - 24 Technical and Topical Reports
  - Supporting Environmental Documentation
- Support Documents Developed, Reviewed and Approved per Project Procedures

License Renewal Project Overview

- Project Oversight Activities
  - Self Assessments
  - QA Audit
  - Peer Review (NMC and External Utility Peers)
  - Thorough Verification and Validation of Application
  - Legal Review
  - Onsite Review Committee Review
  - Offsite Review Committee Review
  - Regulatory Affairs Review

Section 2.0 Methodology

- Section 2.1
  - Overview of plant information sources that were used (CLB, USAR, DBEs, Q-List, drawings, etc.) (Section 2.1.3)
  - Overview of tools used (License Renewal Database, Plant Equipment Database) (Section 2.1.2)
  - Details how each scoping criteria was implemented
    - Criterion 1 SR – Used CLB, Q-List, DBE sources (Section 2.1.4.2.1)
    - Criterion 2 NSR Affecting SR – Used CLB, SR Connected, SR Spatial Interaction, drawings, walkdowns (Section 2.1.4.2.2)
    - Criterion 3 Regulated Events – Used CLB information (Sections 2.1.4.2.3 to 2.1.4.2.8)

Section 2.0 Methodology
(Cont.)

- ***System boundaries were set based on results of component-level scoping and are shown by multiple colors on the boundary drawings.***
  - **Red** – Criteria 1 and 3 Components
  - **Green** – Criterion 2 Components
  - **Black** – Not in Scope
- ***System Boundary Flags show boundary of In-scope Systems***

Section 2.0 Methodology
(Cont.)

- Screening performed per Industry Guidance (Section 2.1.5)
  - Active or Passive per NEI 95-10
  - Consumables per Table 2.1-3 of NUREG-1800
  - Short-lived – Qualified Life or Periodic Replacement
- Component Intended Functions assigned for each long-lived passive component
  - Table 2.1-1 Intended Function Definitions

Section 2.0 Results

- System Descriptions
  - Consistent with the USAR
  - Include descriptive summary of LR scoping criteria and system boundary
- System Function Listing
  - ***Comprehensive with Relation to Scoping Criteria Specified***
  - System functions generated from Maintenance Rule Data, Design Basis Documents, USAR and CLB sources

Section 2.0 Results
(Cont.)

- USAR Reference
  - Links to the appropriate section(s) of the USAR for each system
  - Provides convenient access to additional information on each system
- License Renewal Drawings
  - Links to drawings for each system
    - Drawings may be referenced by more than one system

Section 2.0 Results
(Cont.)

- Components Subject to an AMR
  - List of Component/Commodity Groups and Intended Functions (e.g., Table 2.3.2-1)
    - Same as the first two columns within the 9 column (3.X.2-Y) table for the respective system in the AMR section

Section 3.0 Methodology

- Materials and Environments determined using plant data and walkdowns
- Industry Tools and GALL used to determine aging effects
- Industry and Plant specific OE reviewed for additional AERMs

Section 3.0 Results

- Used the Standard Format
- SRP Section Questions are addressed in 3.X.1 Tables with Reference to Section Text
- Environments defined in Table 3.0-1 and 3.0-2
- ***Aging Effects with Mechanisms Provided***

Section 2.0 & 3.0 Mechanical

- (a)(2) Spaces Approach
  - ***All liquid-filled components included in scope regardless of pressure***
  - ***Equivalent Anchors identified predominately using piping analyses***
  - For pressure-retaining components, the (a)(2) Component Intended Function was identified as "Pressure Boundary"
- Steam Dryer In-Scope (Tables 2.3.1-3 & 3.1.2-3)

Section 2.0 & 3.0 Mechanical

- Reactor Coolant Pressure Boundary
  - Includes Reactor Coolant Systems in LRA Section 3.1 (RHV, RPV, REC, RVI)
  - Extends to portions of interfacing systems (HPC, RCI, MST, etc.)
    - Interfacing systems addressed in respective system and sections of LRA (3.2, 3.3, 3.4)

Section 2.0 & 3.0 Mechanical

- Table 2 Data (Tables 3.X.2-Y)
  - Identification of material type
  - Plant-Specific Notes
    - Consistent across the major system groups (RCS, ESF, AUX, SPC)

Section 2.0 & 3.0 Mechanical

Table 3.2.2-1 Engineered Safety Features - Automatic Pressure Relief System - Summary of Aging Management Evaluation

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG -1801 Volume 2 Line Item	Table 1 Item	Notes
Piping and Fittings	Pressure Boundary	Carbon Steel	Wet Air/Gas (Int)	Loss of Material - Pitting Corrosion	One-Time Inspection	V.D2.1-e	3.2.1-05	E, 203, 207
		Stainless Steel	Gas - Instrument Air (Int)	None	None			J, 227
			Plant Indoor Air (Ext)	None	None			J, 227
			Primary Containment Air (Ext)	None	None			J, 227
			Treated Water (Int)	Loss of Material - Crevice Corrosion	One-Time Inspection	VII.E4.1-a	3.3.1-08	A, 226
					Plant Chemistry Program	VII.E4.1-a	3.3.1-08	B, 226
				Loss of Material - MIC	One-Time Inspection	VII.E4.1-a	3.3.1-08	A, 212, 226
					Plant Chemistry Program	VII.E4.1-a	3.3.1-08	B, 212, 226
				Loss of Material - Pitting Corrosion	One-Time Inspection	VII.E4.1-a	3.3.1-08	A, 226
					Plant Chemistry Program	VII.E4.1-a	3.3.1-08	B, 226
			Treated Water or Steam (Int)	Loss of Material - Crevice Corrosion	One-Time Inspection	VII.E4.1-a	3.3.1-08	A, 226
					Plant Chemistry Program	VII.E4.1-a	3.3.1-08	B, 226
				Loss of Material - MIC	One-Time Inspection	VII.E4.1-a	3.3.1-08	A, 212, 226
					Plant Chemistry Program	VII.E4.1-a	3.3.1-08	B, 212, 226

Section 2.0 & 3.0 Mechanical

- Table 2 Data (Tables 3.X.2-Y)
  - GALL line items outside of the GALL Chapter annotated with Note X26

Section 2.0 & 3.0 Mechanical

- Management of Small Bore Piping (Table 3.1.1, item 3.1.1-07, Further Evaluation Section 3.1.2.2.4.1)
  - ASME Section XI ISI AMP
  - Plant Chemistry AMP
  - One-Time Inspection AMP
- Management of SCC
  - BWRSCC & Plant Chemistry AMPs

    ≥ 4-inch nominal diameter, Reactor Coolant > 200°F
  - ASME Section XI ISI, Plant Chemistry & One-Time Inspection AMPs

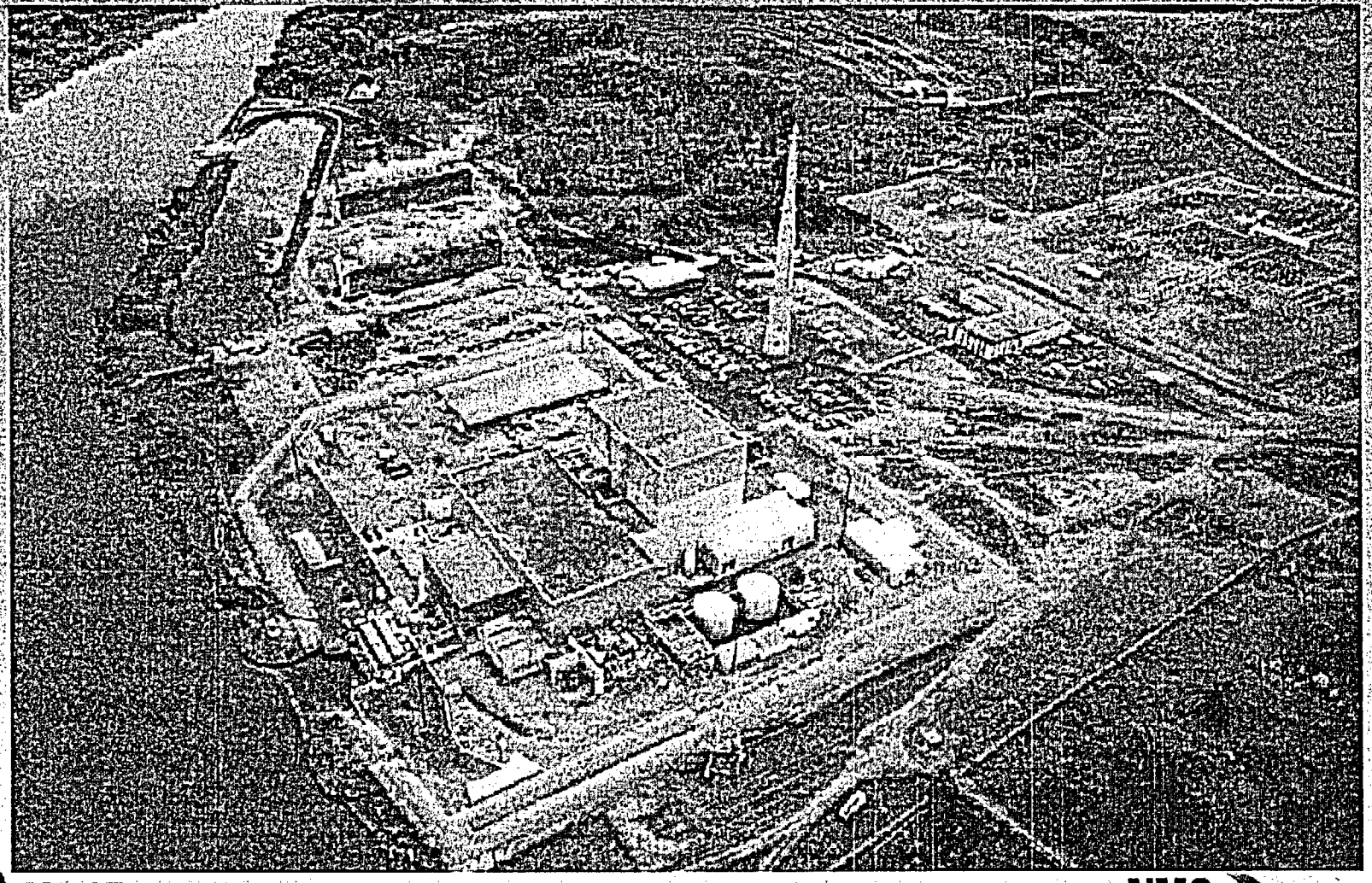
    < 4-inch nominal diameter, Reactor Coolant > 140°F
  - Plant Chemistry & One-Time Inspection AMPs

    > 140°F

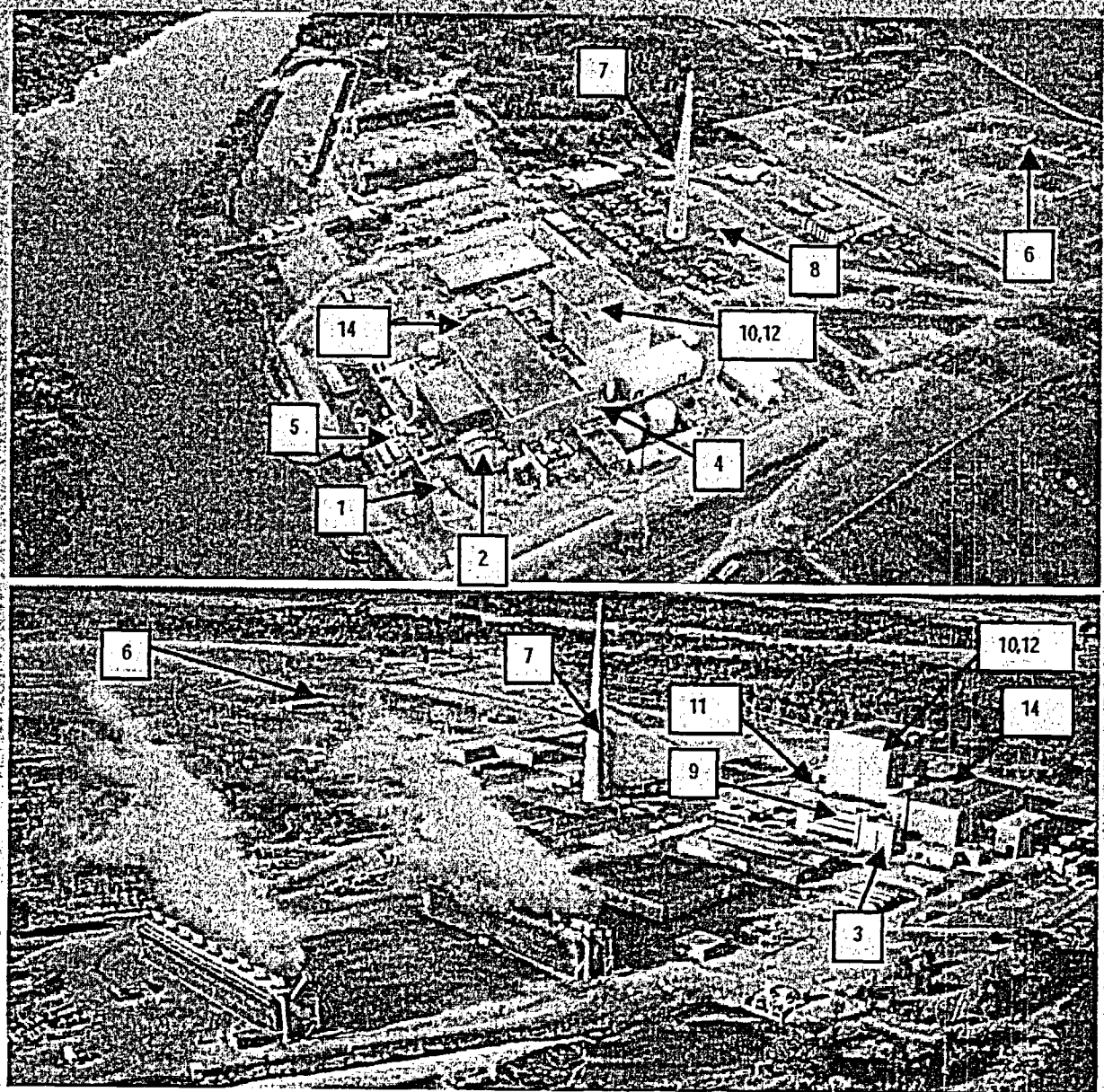
Section 2.0 & 3.0 Mechanical

- Management of Loss of Fracture Toughness
  - Thermal Aging & Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) AMP
    - RIT CASS Components
  - Reactor Vessel Surveillance AMP
    - RPV Components
  - ASME Section XI ISI AMP per GALL IV.C1.3-b
    - RHR & CSP Valve Bodies
- Bolting Integrity AMP applied consistently for all systems
  - Loss of preload is managed
  - Reactor Head Closure Bolting – Reactor Head Closure Studs AMP

Section 2.0 & 3.0 Civil



Section 2.0 & 3.0 Civil



In Scope Structures

1. Diesel Fuel Oil House
2. Emergency Diesel Generator Bldg
3. Emergency Filtration Train (EFT)
4. HPCI Bldg
5. Intake Structure
6. Misc SBO Yard Structures
7. Off Gas Stack
8. Off Gas Storage and Compressor Bldg
9. Plant Control and Cable Spreading Structure
10. Primary Containment
11. Radioactive Waste Bldg
12. Reactor Bldg
13. Structure Affecting Safety (Heating Boiler House, Non-1E Electrical Equipment Room, Hot Machine Shop, Turbine Bldg Addition, Recombiner Building, Radioactive Storage and New Shipping Building
14. Turbine Building
15. Underground Duct Bank

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Section 2.0 & 3.0 Civil

- **Component/Commodity Descriptions**
  - 3.X.2-Y Table "Component Type" includes the generic component/commodity description and the detailed component description
- **MNGP environments are Non-Aggressive**
  - Non-aggressive environments include
    - Atmosphere/Weather (exterior above grade)
    - Below Grade (exterior below grade, foundations)
    - Air/Gas (interior)
    - Raw Water
    - Treated Water
    - Embedded in Concrete
- **Aging Effects and Mechanisms**
  - Aging effect and mechanism descriptions correspond with the GALL descriptions
  - Aging effects for material/environment combinations not found in GALL are based on those provided in Industry Tools

Section 2.0 & 3.0 Civil

- **Detailed Plant-Specific Notes**
  - 3.X.2-Y Table notes are used to discuss aging effect applicability, etc.
  - In depth information on aging effect applicability is provided in MNGP Technical Reports
- **Use of USNRC Interim Staff Guidance ISG-03, "Chapters II and III of GALL Report on Aging Management of Concrete Elements"**
  - Plant-specific aging effect applicability evaluations are performed using criteria provided in GALL
  - Applicable aging effects for accessible concrete are managed for aging throughout the period of extended operation
  - Aging management of inaccessible concrete is evaluated in accordance with ISG-03 criteria

Section 2.0 & 3.0 Electrical

- ***Scoping and Screening performed on a System Basis (Section 2.5.1)***
- Commodities Based on Industry Guidance: Electrical Handbook (Four AMRs)
  - Electrical Penetrations (Section 2.5.2.1)
  - Fuse Holders (Section 2.5.2.2)
  - Non-EQ Cable and Connections (Section 2.5.2.3)
  - Offsite Power / SBO Recovery Path (Section 2.5.2.4)

Section 2.0 & 3.0 Electrical

- Aging Management Programs
  - E1 Electrical Cables & Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (Appendix B, B2.1.15)
    - Consistent with GALL
  - E2 Electrical Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrument Circuits (Appendix B, B2.1.16)
    - Neutron and Radiation Monitoring Cables
    - Consistent with proposed ISG-15 "Electrical Cables Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Used In Instrumentation Circuits" and Draft GALL Revision 1

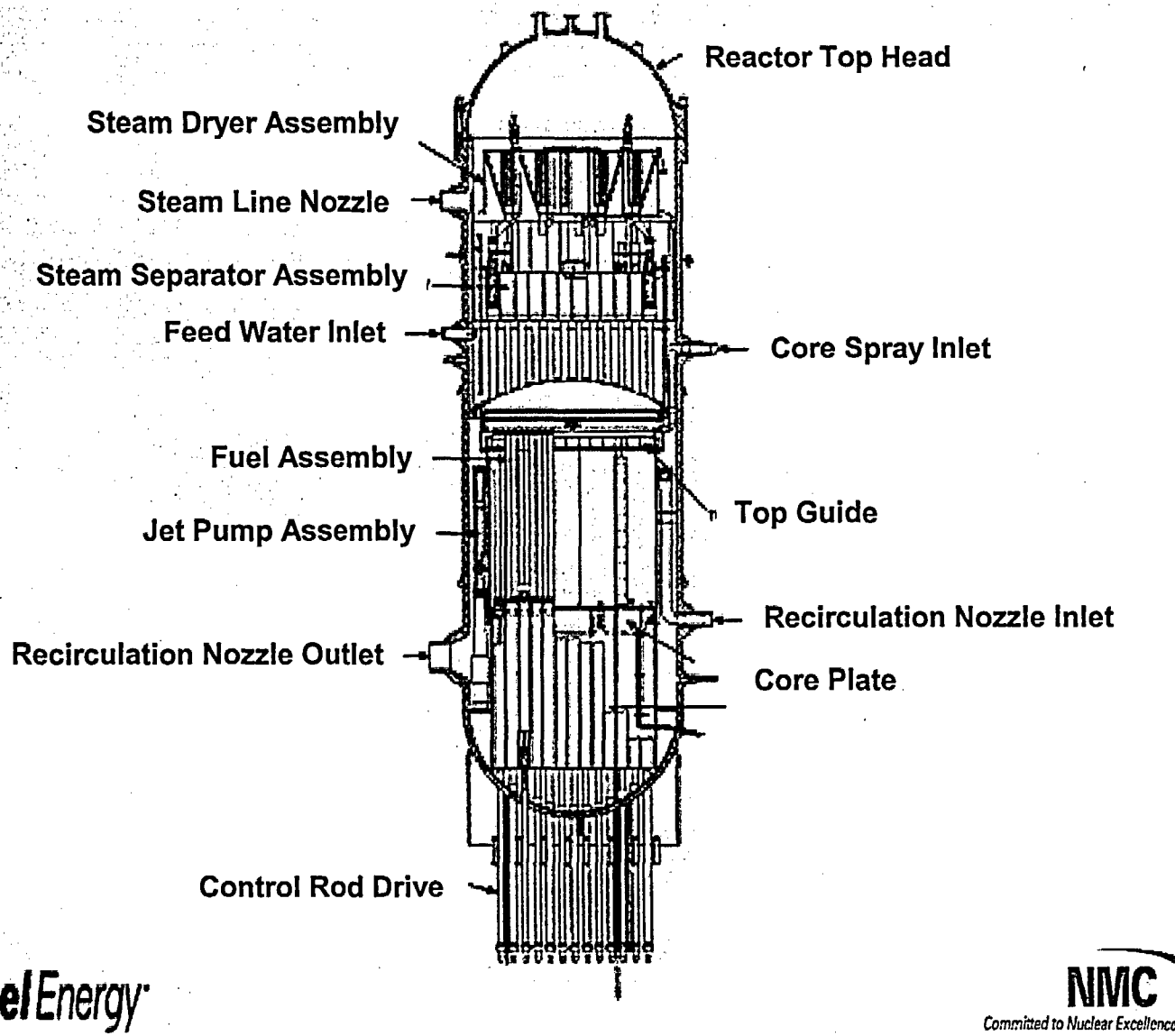
Section 2.0 & 3.0 Electrical

- Aging Management Programs
  - E3 Inaccessible Medium Voltage (2kV to 34.5kV) Cables Not Subject to 10 CFR 50.49 EQ Requirements (Appendix B, B2.1.21)
    - Consistent with Draft GALL Revision 1
    - Incorporated Manhole Inspection
  - E4 Bus Duct Inspection Program (Appendix B, B2.1.6)
    - Consistent with proposed ISG-17, "Periodic Inspection of Bus Ducts"

Section 2.0 & 3.0 Electrical

- AMR Evaluation for Fuse Holders consistent with Draft GALL Revision 1
  - AMP NOT Required
- SBO Recovery Path
  - Includes Three (3) Separate and Diverse Sources
    - Section 2.5.2.4, Site Specific Recovery Paths
  - Consistent with ISG-02, "Station Blackout Scoping"

Section 4.0 TLAAs



Section 4.0 TLAAs

- TLAA Methodology (Section 4.1)
  - Generic TLAAs & Plant Specific TLAAs
    - Reviewed/Evaluated Guidance Documents
    - Reviewed MNGP Docket/Exemptions
    - Reviewed CLB Supporting Calculations/Documentation
    - Resolved Potential TLAAs
    - Identified Final List of TLAAs
  - Reviewed Industry LRAs & RAIs for Outliers
  - Reviewed Operating Experience

Section 4.0 TLAAs

- TLAA Results
  - Twenty-Two TLAAs Identified (Table 4.1-1)
    - 10 Associated with RPV/Internals
      - 1 NUREG/CR-6260 Locations (6 Locations)
      - 9 Other Fatigue Related TLAAs
      - 1 Irradiation Assisted Stress Corrosion Cracking
      - 1 Environmental Qualification of Electrical Equipment (EQ)
  - No Exemption based TLAAs (Section 4.1.2)

Section 4.0 TLAAs

- Significant TLAA Results
  - Reactor Pressure Vessel
    - Regulatory Guide 1.190 for Neutron Fluence
    - Upper Shelf Energy (USE) and Adjusted Reference Temperature (ART) evaluated for 54 EFPY
    - USE Equivalent Margin Analysis (EMA)
    - ART shift from 156.5°F to 157°F
  - NUREG/CR-6260 Locations
    - Recalculated CUF, less than 1.0 for all NUREG locations
  - Other Fatigue Related TLAAs
    - Recalculated CUF, less than 1.0

Section 4.0 TLAAs

- BWR Vessel & Internals Project
  - BWRVIP Identified TLAAs
    - Irradiation Assisted Stress Corrosion Cracking (IASCC) (BWRVIP-26)
    - Stress Relaxation of Core Plate Rim Holddown Bolts (BWRVIP-25)
  - BWRVIP Applicant Action Items (AAIs)
    - BWRVIP-74-A, "BWR Reactor Pressure Vessel Inspection and Flaw Evaluation Guidelines for License Renewal"
      - Information provided in Appendix B, Table B1.6-11

Section 4.0 TLAAs

- Results Summary
  - 8 Acceptable by Validation of Existing Evaluation, *(i)*
  - 8 Acceptable by Analysis Revision, *(ii)*
  - 2 Acceptable Based on Aging Management, *(iii)*
  - 4 Acceptable Based on Combination of Above
- All TLAAs Acceptable Through the Period of Extended Operation

Appendix B

- 35 Aging Management Programs, includes 2 TLAA support programs
  - 29 - Existing Programs (E)
  - 6 - New Programs (N)
  - 2 - Plant-Specific Programs
- AMP Consistency with GALL
  - 10 Consistent (C)
  - 10 Consistent with Enhancement (C w/ En)
  - 9 Consistent with Exceptions (C w/ Ex)
  - 6 Consistent with Exceptions and Enhancements (C w/ En&Ex)

Appendix B

- Aging Management Programs
  - Detailed descriptions provided for each program credited for aging management
  - ***Inclusion of the 10 GALL Elements for All Programs***
  - Enhancements identified ensure Consistency with GALL

APPENDIX B
AGING MANAGEMENT PROGRAMS

1. 10 CFR 50 Appendix J (E) (C w/ Ex)
2. ASME Section XI, Subsections IWB, IWC, & IWD Inservice Inspection Program (E) (C w/ Ex)
3. ASME Section XI, Subsect. IWF Inservice Inspection Program (E)(C w/ En)
4. Bolting Integrity Program (E) (C w/ En)
5. Buried Piping and Tanks Inspection Program (E) (C w/ En)
6. Bus Duct Inspection Program (N) (C) (Plant Specific)
7. BWR Control Rod Drive Return Line Nozzle Program (E) (C w/ Ex)
8. BWR Feedwater Nozzle Program (E) (C w/ En)
9. BWR Penetrations Program (E) (C w/ Ex)
10. BWR Stress Corrosion Cracking Program (E) (C w/ Ex)
11. BWR Vessel ID Attachment Welds Program (E) (C w/ Ex)
12. BWR Vessel Internals Program (E) (C w/ En&Ex)

APPENDIX B
AGING MANAGEMENT PROGRAMS

13. Closed-Cycle Cooling Water System Surveillance Program (E) (C w/ En&Ex)
14. Compressed Air Monitoring Program (E) (C w/ En&Ex)
15. Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environment Qualification Requirements Program (N) (C)
16. Electrical Cables Not Subject to 10 CFR 50.49 Environment Qualification Requirements Used in Instrument Circuits Program (N) (C w/ Ex)
17. Fire Protection Program (E) (C w/ En&Ex)
18. Fire Water System Program (E) (C w/ En)
19. Flow-Accelerated Corrosion Program (E) (C)
20. Fuel Oil Chemistry Control Program (E) (C w/ En&Ex)
21. Inaccessible Medium Voltage (2kV to 34.5kV) Cable Not Subject to 10 CFR 50.49 EQ Requirements (N) (C)

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APPENDIX B
AGING MANAGEMENT PROGRAMS

22. Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (E) (C w/ En&Ex)
23. One-Time Inspection Program (N) (C)
24. Open-Cycle Cooling Water System Program (E) (C)
25. Plant Chemistry Program (E) (C w/ Ex)
26. Primary Containment In-Service Inspection (E) (C)
27. Protective Coating Monitoring & Maintenance Program (E) (C w/ En)
28. Reactor Head Closure Studs Program (E) (C)
29. Reactor Vessel Surveillance Program (E) (C w/ En)
30. Selective Leaching of Materials Program (N) (C w/ Ex)
31. Structures Monitoring Program (E) (C w/ En)
32. System Condition Monitoring Program (E) (C w/ En) (Plant-Specific)
33. Thermal Aging and Neutron Embitterment of Cast Austenitic Stainless Steel (CASS) Program (E) (C)

APPENDIX B
AGING MANAGEMENT PROGRAMS

- TLAA Support Activities:
  - Environmental Qualification (EQ) of Electrical Components Program (E) (C)
  - Metal Fatigue of the Reactor Coolant Pressure Boundary Program (E) (C w/ En)

Appendix E
Environmental Report

- NRC Generic Environmental Impact Statement addresses 92 environmental issues
  - 69 Category 1 issues addressed generically (56 applicable to MNGP)
  - 21 Category 2 issues plant specific (18 applicable to MNGP)
  - 2 Issues were NA and removed from the process
    - Demographic information provided for NRC Staff
- No New and Significant Issues were Identified
- 18 Environmental Issues Evaluated – Small Impact
- Outside agency contacts have been initiated
  - MNDNR, US Fish & Wildlife Service, MN Dept of Health, MN State Historical Society

Appendix E
Environmental Report

- Seven Cost Beneficial Severe Accident Management Alternatives (SAMAs) Identified
  - Combination of Six SAMAs
    - Implementation In-Progress
  - SAMA 16 (Passive Containment Overpressure Relief)
    - Implementation for Further Consideration
- MNGP Core Damage Frequency (CDF)
  - SAMA Model CDF: 4.47E-05
  - New CDF with Six SAMAs Implemented: 6.10E-06

Appendix E
Environmental Report

- Severe Accident Management Alternatives (SAMAs) Combination Implementation In-Progress
  - SAMA 2: Enhanced DC Power Availability (provide cables from Diesel Generator-13, the security diesel, or another source to directly power division II 250 Volt battery chargers or other required loads)
  - SAMA 11: Enhance Alternate Injection Reliability (include the Residual Heat Removal Service Water and Fire Service Water valves in the maintenance testing program)
  - SAMA 12: Additional Diesel Fire Pump for Fire Service Water System (proceduralize the use of a fire truck to pressurize and provide flow to the fire main)
  - SAMA 28: Refill Condensate Storage Tank (develop emergency procedures and ensure viability of refilling the Condensate Storage Tank with Fire Service Water)
  - SAMA 36: Divert Water from Turbine Building 931-foot elevation East
  - SAMA 37: Manual Reactor Core Isolation Cooling Operation

Monticello Nuclear Generating Plant License Renewal Application

- The Application includes the information to provide reasonable assurance that:
  - Aging effects will be managed for the period of extended operation
  - TLAAs have been identified and addressed
  - The applicable requirements of Subpart A of 10 CFR 51 have been satisfied
- The Application provides all necessary information for the SER and the SEIS.

Questions?