The Detroit Edison Company
One Energy Plaza, Detroit, MI 48226-1279

DTE Energy
Detroit Edison

10 CFR 52.79

November 9, 2010
NRC3-10-0049

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

References:
1) Fermi 3
Docket No. 52-033
2) Letter from Peter Smith (Detroit Edison) to USNRC, "Detroit Edison Company Response to the Fermi 3 COLA Review Schedule Milestone Changes," NRC3-10-0031, dated September 21, 2010
3) Letter from Peter Smith (Detroit Edison) to USNRC, "Updated Evaluation of R-COLA Responses to NRC Requests for Additional Information (RAIs) for Standard Applicability," NRC3-10-0044, dated September 21, 2010
4) Letter from Peter Smith (Detroit Edison) to USNRC, "Detroit Edison Company Response to NRC Requests for Additional Information (RAI) Letter No. 42 and RAI 02.04.13-11 of Letter No. 40," NRC3-10-0046 dated October 19, 2010

Subject: Updates to the Fermi 3 FSAR Reflecting Incorporation of Select Changes to DCD Rev. 7 & 8 and Adopted Dominion Responses to NRC Requests for Additional Information (RAIs) of Standard Applicability

In Reference 2, Detroit Edison commited to provide identified changes to the Fermi 3 Final Safety Analysis Report (FSAR) to reflect ESBWR DCD Revision 7 and anticipated changes of DCD Revision 8. In Reference 2, Detroit Edison also committed to provide changes to the Fermi 3 FSAR reflecting those Dominion Responses to NRC RAIs adopted in Reference 3.

In Reference 4, Detroit Edison provided proposed changes to the Fermi 3 FSAR reflecting changes from ESBWR DCD Revision 7 and Revision 8 impacting the Fermi 3 Radioactive Waste departure. Additionally, Reference 4 provided the proposed changes to the Fermi 3 FSAR

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reflecting changes from ESBWR DCD Revision 7 and Revision 8 addressing 10 CFR 20.1406 and incorporation of accepted version of the template NEI 08-08A.

Attached are those proposed changes to the Fermi 3 FSAR identified for submission by November 15th in Attachment 1 to Reference 2 not submitted in Reference 4. With the submission of these proposed changes to the Fermi 3 FSAR, all changes presented in ESBWR DCD Revision 7, except the changes to the Soil Properties in Tier 1 Table 5.1-1 and Tier 2 Table 2.0-1, have been presented. Additionally, the known changes presented by GEH through public correspondence to be incorporated in ESBWR DCD Revision 8, except the changes to the Soil Properties in Tier 1 Table 5.1-1 and Tier 2 Table 2.0-1, have also been presented.

If you have any questions, or need additional information, please contact me at (313) 235-3341.

I state under penalty of perjury that the foregoing is true and correct. Executed on the 9th day of November 2010.

Sincerely,

Peter W. Smith, Director
Nuclear Development – Licensing & Engineering
Detroit Edison Company

Attachments: 1) Markup of Fermi 3 FSAR, Revision 2

cc: Adrian Muniz, NRC Fermi 3 Project Manager
Jerry Hale, NRC Fermi 3 Project Manager
Bruce Olson, NRC Fermi 3 Environmental Project Manager
Fermi 2 Resident Inspector (w/o attachments)
NRC Region III Regional Administrator (w/o attachments)
NRC Region II Regional Administrator (w/o attachments)
Supervisor, Electric Operators, Michigan Public Service Commission (w/o attachments)
Michigan Department Natural Resourses and Environment
Radiological Protection Section (w/o attachments)

Attachment 1
NRC3-10-0049

Markup of the Fermi 3 FSAR, Revision 2

FSAR Markup	Description of FSAR Markup
Table 1.6-201	Updated reference to NEI 07-03A and NEI 07-08A for incorporation by reference of the accepted templates.
1.8.2.8	No Fermi 3 ISFSI is currently planned. Any future Fermi 3 ISFSI will be located considering the impacts of external hazards as required by the associated 10 CFR 72 license for the Fermi 3 ISFSI.
Table 1.9-203	SRP Section C.III.1 3.9.5.4 – added pointer to FSAR Subsection 3.9.2.4 which details the classification of the reactor internals. Subsection 3.9.2.4 addresses the possibility of Fermi 3 being the first reactor but also recognizes that another reactor may be the first ESBWR.
Table 1.9-204	Added ANS 57.1-1992, 57.2-1983, and 57.3-1983 as part of addressing revision to STD COL 9.1-4-A
Table 1.10-201	Added Subsection 9.1.4.18 to identified FSAR Section for COL Item 9.1-4-A. Added Subsections 10.2.2.4, 10.2.2.7, and 10.2.3.7 for COL Item 10.2-1-A.
Table 2.0-201	1) Added Note 13 to "50-year Wind Speed (3-sec gust) to be consistent with DCD Rev. 8 2) Updated Note 3 to be consistent with DCD Rev. 8 3) Inserted into the DCD Site Parameters for "Ambient Design Temperature" the "Site Characteristics" and "Evaluation" for the Maxium Average Dry Bulb Temperature for 0% Exceedance Maximum Temperature Day, Minimum Average Dry Bulb Tempeature for 0% Exceedance Minimum Temperature Day, and Minimum High Humidity Average Wet Bulb Globe Temperature Index for 0% Exceedance Maximum Wet Bulb Temperature Day given in GEH RAI 6.3-24 Supplement 2 containing proposed markup for DCD Rev. 8.

FSAR Markup	Description of FSAR Markup
2.3.1.3.5	Inserted description comparing Fermi site parameters to the DCD Control Room Habitability Analysis Parameters given in GEH RAI 6.3-24 Supplement 2 containing proposed markup for DCD Rev. 8. To support that comparison, description of the determination of the Maxium Average Dry Bulb Temperature for 0% Exceedance Maximum Temperature Day, the Minimum Average Dry Bulb Tempeature for 0% Exceedance Minimum Temperature Day, and the Minimum High Humidity Average Wet Bulb Globe Temperature Index for 0% Exceedance Maximum Tet Bulb Temperature Day
Table 2.3-10	Added Maxium Average Dry Bulb Temperature for 0% Exceedance Maximum Temperature Day, Minimum Average Dry Bulb Tempeature for 0% Exceedance Minimum Temperature Day, and Minimum High Humidity Average Wet Bulb Globe Temperature Index for 0% Exceedance Maximum Tet Bulb Temperature Day values for Detroit Metropolitan Airport
Figures 2.3-X	Added figure illustrating the hourly ambient dry bulb temperature data from Detroit Metropolitan Airport for the 24 hours before and after the historic maximum temperature to aid in understanding the analysis.
Figures 2.3-X	Added figure illustrating the hourly ambient dry bulb temperature data from Detroit Metropolitan Airport for three 24 hours before and after the historic minimum temperature to aid in understanding the analysis.
Figures 2.3-X	Added figure illustrating the hourly ambient wet bulb and dry bulb temperature data from Detroit Metropolitan Airport for the 24 hours before and after the historic maximum temperature to aid in understanding the analysis.
3.9.2.4	Revised to remove reference to previous R-COLA, North Anna, Fermi 3 could be the first ESBWR and would perform necessary testing of the reactor internal as a prototype design. Additionally provides for the option of recognizing testing at an ESBWR constructed and tested elsewhere (e.g. foreign country). Also revise to clarify COL applicant responsibilities (GEH MFN 06-464 Supplement 9, Rev. 2) consistent with DCD 3L.1 which classified the reactor as prototype per the guidance in Reg Guide 1.20.

FSAR Markup	Description of FSAR Markup
3.10.1.4	Incorporated adopted North Anna 3 (NA3) RAI 03.10-01 to provide an implementation plan that includes the level of detail that will be completed prior to procurement and the plan for competing equipment qualification as called for in Reg Guide 1.206. Schedule description of the NA3 response was adjusted to address 10 CFR 52.99(a) consistent with Detroit Edison's response to RAI 14.03.03-1.
3.11.4.4	Incorporated adopted NA3 RAI 03.11-08 to address the transition from the initial environmental qualification program to the operational aspects of the environmental qualification of mechanical and electrical equipment.
9.1.4.13	Revised commitment for fuel handling procedures [COM 9.1-001] to commit to development of fuel handling procedures consistent with ANSI/ANS 57.1-1992, ANSI/ANS 57.2-1983, ANSI/ANS 57.3-1983 and Reg. Guide 1.13, Rev. 2
9.1.4.18	Inserted new subsection to point to Subsection 9.1.4.13 for a discussion of fuel handing procedures for consistency with the DCD.
9.5.4.2	Incorporated adopted NA3 RAI 09.05.04-7 to improve the description of the additional margin of diesel fuel inventory required for COL Item 9.5.4-1-A for the standby diesel generator and the ancillary diesel generator
10.2.2.4	Inserted new subsection to address chages to COL Item 10.2-1-A as shown in Enclosure 3 of GEH Letter MFN 10-089, dated May 21, 2010.
10.2.2.7	Inserted new subsection to address chages to COL Item 10.2-1-A as shown in Enclosure 3 of GEH Letter MFN 10-089, dated May 21, 2010.
10.2.3.7	Inserted new subsection to address chages to COL Item 10.2-1-A as shown in Enclosure 3 of GEH Letter MFN 10-089, dated May 21, 2010.
10.2.5	Added pointers to Subsections 10.2.2.4, 10.2.2.7, and 10.2.3.7
11.5.4.5	Incorporated adopted NA3 RAI 11.05-05 to address analyses to be performed for batch liquid releases.

FSAR Markup	Description of FSAR Markup
12.1	Updated Subsections 12.1.1.3.1, 12.1.1.3.2, 12.1.1.3.3, 12.1.3, 12.1-1-A, 12.1-2-A, 12.1-3-A, and 12.1-4-A to add pointer to Appendix 12AA. The update to Appendix 12AA incorporates by reference the approved template NEI 07-08A.
12.5.3	Added sentence to address NEI 07-08A.
Appendix 12AA	Updated to incorporate NEI 07-08A by reference, including identifying Chapter 17 for the description of the Quality Assurance plan needed to complete Subsection 12.1.2 of NEI 07-08A.
Appendix 12BB	Updated to incorporate NEI 07-03A. Update the supplement to Subsection 12.5.3.3 of NEI 07-03A to reflect changes to the template. Incorporated adopted NA3 12.03-12.04-11 into Subsection 12.5.4.4 of NEI 07-03A to provide additional details pertaining to the access control for very high radiation areas.
13.5.2	Updated STD COL 13.5-5-A to include procedures related to refueling cavity integrity.
13.5.2.2.10	Inserted new subsection to addressed procedures related to refueling cavity integrity.

Markup of Detroit Edison COLA
(following 49 pages)

The following markup represents changes Detroit Edison intends to reflect in the next submittal of the Fermi 3 COLA Revision 3. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

Table 1.6-201 Referenced Topical Reports [EF3 SUP 1.6-1]

Report No.	Title	Section No.
NEI 06-13A	Nuclear Energy Institute, "Technical Report on Template for an Industry Training Program Description," NEI 06-13A, Revision 1, March 2008	Appendix 13 BB
NEI 06-14A	Nuclear Energy Institute, "Quality Assurance Program Description," NEI 06-14A, Revision 4, July 2007	17.5
NEI 07-02A	Nuclear Energy Institute, "Generic FSAR Template Guidance for Maintenance Rule Program Description for Plants Licensed under 10 CFR Part 52," NEI 07-02A, March 2008	17.6
NEI 07-03	Nuclear Energy Institute, "Generic FSAR Template Guidance for Radiation Protection Program Description," NEI 07-03, ~~Revision 3, October 2007~~	Appendix 12 BB
NEI 07-08	Nuclear Energy Institute, "Generic FSAR Template Guidance for Ensuring That Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA)," NEI 07-08, Revision 0, ~~September 2007~~	Appendix 12 AA
NEI 07-09A	Nuclear Energy Institute, "Generic FSAR Template Guidance for Offsite Dose Calculation Manual (ODCM) Program Description," NEI 07-09A, Revision 0, March 2009	11.5
NEI 07-10A	Nuclear Energy Institute, "Generic FSAR Template Guidance for Process Control Program (PCP)," NEI 07-10A, Revision 0, March 2009	11.4
NEI 06-12	Nuclear Energy Institute, "B.5.b. Phase 2 & 3 Submittal Guideline," NEI 06-12, Revision 3, September 2009	13.6
NEI 08-09	Nuclear Energy Institute, "Cyber Security Plan for Nuclear Power Reactors", NEI 08-09, Revision 3, September 2009	13.6
ST-56834/P	General Electric Company, "ESBWR Steam Turbine - Low Pressure Rotor Missile Generation Probability Analysis," ST-56834/P, Revision 1, June 17, 2009	10.2

A, Revision 0, May 2009

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October 2009

1.8 Interfaces with Standard Design

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

1.8.2 Identification of Balance of Plant Interfaces

Add the following paragraph after the first paragraph of this section.

STD CDI

The significant interface requirements for those systems that are beyond the scope of the DCD are identified in DCD Tier 1.

Insert 1 here.

Delete the second sentence of the second paragraph of this section.

EF3 SUP 1.8-1

1.8.3 Verification of Site Parameters

Chapter 2.0 provides information demonstrating that the site characteristics fall within the ESBWR site parameters specified in the referenced certified design.

EF3 SUP 1.8-2

1.8.4 COL Information Items and Permit Conditions

Section 1.10 identifies specific FSAR sections that address the COL Information items from the referenced certified design, and COL Action Items.

EF3 SUP 1.8-3

1.8.5 Generic Changes and Departures from the Referenced Certified Design

One site-specific departure has been identified from the referenced certified design, which is described in COLA Part 7. (Reference Table 1.8-201)

EF3 SUP 1.8-4

1.8.6 Variances from the ESP and ESPA SSAR

This supplement is not applicable to Fermi 3.

EF3 SUP 1.8-5

1.8.7 Conceptual Design Information

The referenced DCD includes conceptual design information (CDI) for certain systems, or portions of systems, that are outside the scope of the

Insert 1

EF3 SUP 1.8-7	1.8.2.8	**Independent Spent Fuel Storage Installation**
	Replace this section with the following.	
	No Fermi 3 ISFSI is currently planned. Any future Fermi 3 ISFSI will be located considering the impacts of external hazards as required by the associated 10 CFR 72 license for the Fermi 3 ISFSI.	

Table 1.9-203 Conformance with the FSAR Content Guidance in RG 1.206 (Sheet 8 of 39) [EF3 COL 1.9-3-A]

Section	Section Title	Conformance Evaluation
C.III.1 3.9.2.3	Dynamic Response Analysis of Reactor Internals Under Operational Flow Transients and Steady-State Conditions	Conforms. There are no ESBWR pressure vessel internals that the referenced certified design does not cover.
C.III.1 3.9.2.4	Pre-Operational Flow-Induced Vibration Testing of Reactor Internals	Conforms. There are no BWR pressure vessel internals that the referenced certified design does not cover. DCD Sections 3.9.2.3 and 3.9.2.4 adequately cover the analysis of potential adverse flow effects that could impact BWR vessel internals.
C.III.1 3.9.2.5	Dynamic System Analysis of the Reactor Internals Under Faulted Condition	Conforms. Addressed in DCD Section 3.9.3.1 and DCD Table 3.9-2.
C.III.1 3.9.2.6	Correlations of Reactor Internals Vibration Tests with the Analytical Results	Conforms. Addressed in DCD Section 3.9.2.6.
C.III.1 3.9.3	ASME Code Class 1, 2, and 3 Components and Component Supports, and Core Support Structures	Conforms. There are no pressure-retaining components or component supports designed or constructed in accordance with ASME Code Class 1, 2, or 3, or GDC 1,2,4,14, or 15, beyond those evaluated in the referenced certified design.
C.III.1 3.9.4	Control Rod Drive Systems	Conforms
C.III.1 3.9.5.1	Design Arrangements	Conforms
C.III.1 3.9.5.2	Loading Conditions	Conforms
C.III.1 3.9.5.3	Design Bases	Conforms
C.III.1 3.9.5.4	BWR Reactor Pressure Vessel Internals Including Steam Dryer	Conforms. There are no reactor pressure vessel internals (including the steam dryer) or other main steam system components that are not covered by the referenced certified design. ~~The reactor is classified as non-prototype.~~
C.III.1 3.9.6.1	Functional Design and Qualification of Pumps, Valves, and Dynamic Restraints	Conforms. There is no safety-related equipment beyond the scope of the referenced certified design.
C.III.1 3.9.6.2	Inservice Testing Program for Pumps	Not applicable. There are no safety-related pumps.

Classification of the reactor internals is described in Section 3.9.2.4.

Insert 1 here.

Table 1.9-204 Industrial Codes and Standards (Sheet 1 of 4) [EF3 SUP 1.9-1]

Code or Standard Number	Year	Title
		American Nuclear Society (ANS)
2.8	1992	Determining Design Basis flooding at Power Reactor Sites an American
3.1	1993	Selection, Qualification, and Training of Personnel for Nuclear Power Plants
		American National Standards Institute
N323A	1997	Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments
N323D	2002	Installed Radiation Protection Instrumentation
		American Society of Civil Engineers (ASCE)
ASCE 43-05	2005	Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities
ASCE SEI/ASCE 7-05	2005	Minimum Design Loads for Buildings and other Structures
ASCE Practice No. 70	1990	Evapotranspiration and Irrigation Water Requirements
		American Society Heating, Refrigerating, and Air-Conditioning (ASHRAE)
ASHRAE Handbook	2005	American Society Heating, Refrigerating, and Air-Conditioning Engineers Handbook
		American Society of Mechanical Engineers (ASME)
NQA-1	2004	Quality Assurance Programs Requirements for Nuclear Facilities
Boiler and Pressure Vessel Code, Section IX	2007	Qualification Standard for Welding and Brazing Procedures, Welder, Brazers and Welding and Brazing Operators
OM Code		Code for the Operation and Maintenance of Nuclear Power Plants
		American Society for Testing and Materials (ASTM)
C88-05	2005	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
C131-06	2006	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
C535-03	2003	Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
D422-63	2002	Standard Test Method for Particle-Size Analysis of Soils
D512-04	2004	Standard Test Methods for Chloride Ion in Water

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Code or Standard Number	Year	Title
57.1	1992	Design Requirements for Light Water Reactor Fuel Handling Systems
57.2	1983	Design Requirements for Light Water Reactor Spent Fuel Storage Facilities at Nuclear Power Plants
57.3	1983	Design Requirements for New Fuel Storage Facilities at Light Water Reactor Plants

Table 1.10-201 Summary of FSAR Sections Where DCD COL Items Are Addressed (Sheet 3 of 7) [EF3 SUP 1.10-1]

Item No.	Subject/Description of Item	FSAR Section
5.2-2-A	Leak Detection Monitoring	5.2.4 and 5.2.5.9
5.2-3-A	Preservice and Inserice Inspection NDE Accessibility Plan Description	5.2.4 and 5.2.4.2
5.3-2-A	Materials and Surveillance Capsule	5.3.1.8
6.4-1-A	CRHA Procedures and Training	6.4.4
6.4-2-A	Toxic Gas Analysis	6.4.5
6.6-1-A	PSI/ISI Program Description	6.6
6.6-2-A	PSI/ISI NDE Accessibility Plan Description	6.6.2
8.2.4-1-A	Transmission System Description	8.2.1.1
8.2.4-2-A	Switchyard Description	8.2.1.2.1
8.2.4-3-A	Normal Preferred Power	8.2.1.2
8.2.4-4-A	Alternate Preferred Power	8.2.1.2
8.2.4-5-A	Protective Relaying	8.2.1.2.2
8.2.4-6-A	Switchyard DC Power	8.2.1.2.1
8.2.4-7-A	Switchyard AC Power	8.2.1.2.1
8.2.4-8-A	Switchyard Transformer Protection	8.2.1.2.1
8.2.4-9-A	Stability and Reliability of the Offsite Transmission Power Systems	8.2.2.1
8.2.4-10-A	Interface Requirements	8.2.2.1
8.3.4-1-A	Safety-Related Battery Float and Equalizing Voltage Values	8.3.2.1.1
8A.2.3-1-A	Cathodic Protection System	8A.2.1
9.1-4-A	Fuel Handling Operations	9.1.4.13 and 9.1.4.19
9.1-5-A	Handling of Heavy Loads	9.1.5.6, 9.1.5.8, and 9.1.5.9
9.2.1-1-A	Material Selection	9.2.1.2
9.2.5-1-A	Post Seven day Makeup to Ultimate Heat Sink (UHS)	9.2.5
9.3.2-1-A	Post-Accident Sampling Program	9.3.2.2
9.3.9-1-A	Implementation of Hydrogen Water Chemistry	9.3.9
9.3.9-2-A	Hydrogen and Oxygen Storage and Supply	9.3.9.2
9.3.10-1-A	Oxygen Storage Facility	9.3.10.2
9.3.11-1-A	Determine Need for Zinc Injection System	9.3.11.2
9.3.11-2-A	Provide System Description for Zinc Injection System	9.3.11.4
9.5.1-1-A	Secondary Firewater Storage Source	9.5.1.4
9.5.1-2-A	Secondary Firewater Capacity	9.5.1.4

, 9.1.4.18,

Table 1.10-201 Summary of FSAR Sections Where DCD COL Items Are Addressed (Sheet 4 of 7) [EF3 SUP 1.10-1]

Item No.	Subject/Description of Item	FSAR Section
9.5.1-4-A	Piping and Instrument Diagrams	9.5.1.2, 9.5.1.4, 9.5.1.5, and Figure 9.5-201
9.5.1-5-A	Fire Barriers	9.5.1.10
9.5.1-6-A	Smoke Control	9.5.1.11
9.5.1-7-A	Fire Hazards Analysis (FHA) Compliance Review	9.5.1.12
9.5.1-8-A	Fire Protection (FP) Program Description	9.5.1.15
9.5.1-10-A	Fire Brigade	9.5.1.15.4, 13.1.2.1.5
9.5.1-11-A	Quality Assurance	9.5.1.15.9
9.5.2.5-1-A	Emergency Notification System	9.5.2.2
9.5.2.5-2-A	Grid Transmission Operator	9.5.2.2
9.5.2.5-3-A	Offsite Interfaces (1)	9.5.2.2
9.5.2.5-4-A	Offsite Interfaces (2)	9.5.2.2
9.5.2.5-5-A	Fire Brigade Radio System	9.5.2.2
9.5.4-1-A	Fuel Oil Capacity	9.5.4.2
9.5.4-2-A	Protection of Underground Piping	9.5.4.2
9A.7-1-A	Yard Fire Zone Drawings	9A.4.7
9A.7-2-A	Fire Hazards Analysis for Site Specific Areas	9A.4.7, 9A.5.7, 9A.5.8, and 9A.5.9
10.2-1-A	Turbine Maintenance and Inspection Program	10.2.3.6
10.2-2-A	Turbine Missile Probability Analysis	10.2.3.8
10.4-1-A	Leakage (of Circulating Water Into the Condenser)	10.4.6.3
11.2-1-A	Implementation of IE Bulletin 80-10	11.2.2.3
11.2-2-A	Implementation of Part 20.1406	11.2.2.3
11.4-1-A	SWMS Processing Subsystem Regulatory Guide Compliance	11.4.2.3.5
11.4-2-A	Compliance with IE Bulletin 80-10	11.4.2.3.5
11.4-3-A	Process Control Program	11.4.2.3.5
11.4-4-A	Temporary Storage Facility	11.4.1
11.4-5-A	Compliance with Part 20.1406	11.4.1
11.5-1-A	Subsystem Lower Limit of Detection	11.5.4.7
11.5-2-A	Offsite Dose Calculation Manual	11.5.4.4, 11.5.4.5, 11.5.5.8
11.5-3-A	Process and Effluent Monitoring Program	11.5 and 11.5.4.6 and Table 11.5-201

, and 10.2.3.7

10.2.2.4, 10.2.2.7,

Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics (Sheet 2 of 28) [EF3 COL 2.0-1-A]

Subject [16]	DCD Site Parameter Value[1][16]	Fermi 3 Site Characteristic	Evaluation
Other Seismic Category NS Standard Plant Structures			
(13) 50-year Wind Speed (3-sec gust)	58.1 m/s (130 mph)	40.2 m/s (90 mph) 3-second gust,	The Fermi 3 site characteristic value of 40.2 m/s (90 mph) for the 50-year wind speed (3-sec gust) falls within (is less than) the DCD site parameter value for the 50-year wind speed (3-sec gust) of 58.1 m/s (130 mph).
Maximum Flood (or Tsunami) Level [2]	0.3 m (1 ft) below plant grade		The DCD site parameter of maximum flood (or tsunami) water level of 0.3 m (1 ft) below plant grade is the same as the design flood level in DCD Table 3.4-1. The design plant grade elevation identified in DCD Table 3.4-1 is at 4650 mm, which corresponds to 179.6 m (589.3 ft) NAVD 88 for the Fermi 3. Therefore, the DCD site parameter value of 0.3 m (1 ft) below plant grade corresponds to a maximum flood water level below 179.3 m (588.3 ft) for the Fermi 3 site.
		1.2 m (3.9 ft) below design plant grade based on PMP	The Fermi 3 site characteristic value for PMF of 178.4 m (585.4 ft) NAVD 88 is provided in Subsection 2.4.5, and falls within (is less than) the DCD site parameter value. The Fermi 3 site characteristic value for maximum flood water level below design plant grade is due to the 100-year still-water level in addition to the 100-year storm surge. Therefore, the Fermi 3 site characteristic value for maximum flood water level below design plant grade falls within (is lower than) the DCD site parameter value.
Tornado			
Maximum Tornado Wind Speed[3]	147.5 m/s (330 mph)	102.8 m/s (230 mph)	The site characteristic value for design basis tornado maximum wind speed is defined as the maximum wind speed resulting from passage of a tornado having a probability of occurrence of 10^{-7} per year. The site characteristic value falls within (is lower than) the DCD site parameter value.
Maximum Rotational Speed	116.2 m/s (260 mph)	82.3 m/s (184 mph)	The site characteristic value for design basis tornado maximum rotational speed is defined as the rotation component of the maximum tornado wind speed. The site characteristic value falls within (is lower than) the DCD site parameter value.
Translational Speed	31.3 m/s (70 mph)	20.6 m/s (46 mph)	The site characteristic value for design basis tornado maximum translational speed is defined as the translational component of the maximum tornado wind speed. The site characteristic value falls within (is lower than) the DCD site parameter value.

Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics (Sheet 6 of 28) [EF3 COL 2.0-1-A]

Subject [16]	DCD Site Parameter Value[1][16]	Fermi 3 Site Characteristic	Evaluation
0% Exceedance Values			
Maximum	47.2°C (117°F) dry bulb 26.7°C (80°F) wet bulb (mean coincident)	40.1°C (104.1°F) dry-bulb with 23.3°C (73.9°F) wet bulb coincident (0% exceedance values)	The Fermi 3 site characteristic values for the 0% maximum dry bulb and wet bulb, coincident temperatures are the 100-year return period values. These values are 40.1°C (104.1°F) dry-bulb with 23.3°C (73.9°F) wet bulb coincident fall within (are less than) the DCD site parameter values for 0% exceedance.
	31.1°C (88°F) wet bulb (non-coincident)	30.0°C (86.0°F) wet-bulb (non-coincident) (0% exceedance value)	The Fermi 3 site characteristic value for the 0% maximum wet bulb temperature (non-coincident) is the 100-year return period value . This value is 30.0°C (86.0°F) wet-bulb (non-coincident) and falls within (is less than) the DCD site parameter value for 0% exceedance.
Minimum	-40°C (-40°F)	-34.9°C (-30.8°F)	The Fermi 3 site characteristic value for minimum temperature is the 100-year return period value. This value is -34.9°C (-30.8°F) and falls within (is higher than) the DCD site parameter value for 0% exceedance.
Soil Properties			
Maximum Static Bearing Demand[7]			
Reactor/Fuel Building	699 kPa (14,600 lbf/ft^2)	4,500 kPa (94,000 lbf/ft^2)	The Fermi 3 site characteristic value for allowable bearing capacity from Table 2.5.4-227 for the R/FB falls within (is greater than) the DCD site parameter value.
Control Building	292 kPa (6,100 lbf/ft^2)	14,029 kPa (293,000 lbf/ft^2)	The Fermi 3 site characteristic value for allowable bearing capacity from Table 2.5.4-227 for the CB falls within (is greater than) the DCD site parameter value.
Firewater Service Complex	165 kPa (3450 lbf/ft^2)	1,532 kPa (32,000 lbf/ft^2)	The Fermi 3 site characteristic value for allowable bearing capacity from Table 2.5.4-227 for the FWSC falls within (is greater than) the DCD site parameter value.

Insert 1 Here

Insert 1)

Maximum Average Dry Bulb Temperature for 0% Exceedance Maximum Temperature Day	39.7°C (103.5°F)	29.48°C (85.1°F)	The Fermi 3 site characteristic value for the Maximum Average Dry Bulb Temperature for 0% Exceedance Maximum Temperature Day is 29.48°C (85.1°F). This value falls within (is less than) the DCD site parameter value for Maximum Average Dry Bulb Temperature for 0% Exceedance Maximum Temperature Day.
Minimum Average Dry Bulb Temperature for 0% Exceedance Minimum Temperature Day	-32.5°C (-26.5°F)	-26.35°C (-15.4°F)	The Fermi 3 site characteristic value for the Minimum Average Dry Bulb Temperature for 0% Exceedance Minimum Temperature Day is -26.35°C (-15.4°F). This value falls within (is greater than) the DCD site parameter value for Minimum Average Dry Bulb Temperature for 0% Exceedance Minimum Temperature Day.
Maximum High Humidity Average Wet Bulb Globe Temperature Index for 0% Exceedance Maximum Wet Bulb Temperature Day	30.3°C (86.6°F)	28.78°C (83.8°F)	The Fermi 3 site characteristic value for the Maximum High Humidity Average Wet Bulb Globe Temperature Index for 0% Exceedance Maximum Wet Bulb Temperature Day is 28.78°C (83.8°F). This value falls within (is less than) the DCD site parameter value for Maximum High Humidity Average Wet Bulb Globe Temperature Index for 0% Exceedance Maximum Wet Bulb Temperature Day.

Maximum speed selected is based on Attachment 1 of Reference 2.0-5, which summarizes the NRC Interim Position on Regulatory Guide 1.76. Concrete structures designed to resist Spectrum I missiles of SRP 3.5.1.4, Rev. 2, also resist missiles postulated in Regulatory Guide 1.76, Revision 1. Tornado missiles do not apply to Seismic Category NS and Seismic Category II buildings. For the Radwaste building, the tornado missiles defined in Regulatory Guide 1.143, Table 2, Class RW-IIa apply. The hurricane missile spectrum for Seismic Category NS and Seismic Category II structures that house RTNSS equipment is consistent with the tornado missile spectrum identified in this table. See DCD Tables 19A-3 and 19A-4 for additional details.

Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics (Notes) (Sheet 1 of 2) [EF3 COL 2.0-1-A]

1. The site parameters defined in this table are applicable to Seismic Category I, II, and Radwaste Building structures, unless noted otherwise.
2. Probable maximum flood level (PMF), as defined in Table 1.2-6 of Volume III of DCD Reference 2.0-4.
3. ~~Maximum speed selected is based on Attachment I of DCD Reference 2.0-5, which summarizes the NRC Interim Position on RG 1.76. Concrete structures designed to resist Spectrum I missiles of SRP 3.5.1.4, Rev. 2, will also resist missiles postulated in RG 1.76, Revision 1. Tornado missiles do not apply to Seismic Category II buildings. For the Radwaste building, the tornado missiles defined in Regulatory Guide 1.143, Table 2, Class RW-IIa apply.~~
4. Based on probable maximum precipitation (PMP) for one hour over 2.6 km^2 (one square mile) with a ratio of 5 minutes to one hour PMP of 0.32 as found in DCD Reference 2.0-3. See also DCD Table 3G.1-2.
5. See DCD Reference 2.0-9 for the definition of normal winter precipitation and extreme winter precipitation events. The maximum ground snow load for extreme winter precipitation event includes the contribution from the normal winter precipitation event. See also DCD Table 3G.1-2.
6. Zero percent exceedance values are based on conservative estimates of historical high and low values for potential sites. They represent historical limits excluding peaks of less than one hour: which are conservative relative to DCD Reference 2.0-4. One and two percent exceedance values were selected in order to bound the values presented in DCD Reference 2.0-4 and available Early Site Permit applications.
7. At the foundation level of Seismic Category I structures. The static bearing pressure is the average pressure. The dynamic bearing pressure is the toe pressure. To compare with the maximum bearing demand, the allowable bearing pressure is developed from the site-specific bearing capacity divided by a factor of safety appropriate for the design load combination. The maximum dynamic bearing demand to be compared with the site-specific allowable dynamic bearing pressure is the larger value or a linearly interpolated value of the applicable range of shear wave velocities at the foundation level. The shear wave velocities of soft, medium and hard soils are 300 m/sec (1000 ft/sec), 800 m/sec (2600 ft/sec) and greater than or equal to 1700 m/sec (5600 ft/sec), respectively.
8. This is the minimum shear wave velocity of the supporting foundation material associated with seismic strains for lower bound soil properties at minus one sigma from the mean. The ratio of the largest to the smallest shear wave velocity over the mat foundation width of the supporting foundation material does not exceed 1.7.
9. Safe Shutdown Earthquake (SSE) design ground response spectra of 5% damping, also termed Certified Seismic Design Response Spectra (CSDRS), are defined as free-field outcrop spectra at the foundation level (bottom of the base slab) of the Reactor/Fuel and Control Building structures. For the Firewater Service Complex, which is essentially a surface founded structure, the CSDRS is 1.35 times the values shown in DCD Figures 2.0-1 and 2.0-2 and is defined as free-field outcrop spectra at the foundation level (bottom of the base slab) of the Firewater Service Complex structure.
10. Values reported here are actually design criteria rather than site parameters. They are included here because they don't appear elsewhere in the DCD.
11. If a selected site has a X/Q value that exceeds the ESBWR reference site value, the COL applicant will address how the radiological consequences associated with the controlling design basis accident continue to meet the dose reference values provided in 10 CFR 52.79(a)(1)(vi) and control room operator dose limits provided in General Design Criterion 19 using site-specific X/Q values.

Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics (Notes) (Sheet 2 of 2) [EF3 COL 2.0-1-A]

12. If a selected site has a X/Q value that exceeds the ESBWR reference site value, the release concentrations in DCD Table 12.2-17 would be adjusted proportionate to the change in X/Q values using the stack release information in DCD Table 12.2-16. In addition, for a site selected that exceeds the bounding X/Q or D/Q values, the COL applicant will address how the resulting annual average doses (DCD Table 12.2-18b) continue to meet the dose reference values provided in 10 CFR 50 Appendix I using site-specific X/Q and D/Q values.
13. ~~Value was selected to comply with expected requirements of southeastern coastal locations.~~
14. Localized liquefaction potential under other than Seismic Category I structures is addressed per SRP 2.5.4 in DCD Table 2.0-2.
15. Settlement values are long-term (post-construction) values except for differential settlement within the foundation mat. The design of the foundation mat accommodates immediate and long-term (post-construction) differential settlements after the installation of the basemat.
16. Information in this column and notes (1) through (15) are from DCD Table 2.0-1. In these notes, "DCD" was added before cited tables, figures, and references from the DCD.
17. **[START COM 2.3-204]** The atmospheric dispersion factors (X/Qs) calculated for the Control Room and Technical Support Center using ARCON96 are currently under revision as part of the effort described in Detroit Edison letter NRC3-10-003, dated February 8, 2010. Detroit Edison will provide the COLA revision to reflect the new atmospheric dispersion factors (X/Qs) calculated for the Control Room and Technical Support Center under separate correspondence to the NRC by March 25, 2010. **[END COM 2.3-204]**

Values were selected to comply with expected requirements of southeastern coastal locations, which include the consideration of hurricanes as described in ASCE 7-02. Wind speeds are considered to be at 10 m (33 ft) above ground per ASCE 7-02. Seismic Category NS buildings that house RTNSS equipment are designed to withstand hurricane Category 5 wind velocity at 87.2 m/s (195 mph), 3-second gust, and missiles generated by that wind velocity. See DCD Tables 19A-3 and 19A-4 for additional details.

return period DB temperature is considered the 0 percent exceedance value for maximum DB temperature. The 100-year return period minimum DB temperatures and 100-year return period maximum WB temperature (non-coincident) are considered the 0 percent exceedance values for the Fermi site. Table 2.3-210 displays the 0 percent exceedance values that are considered representative of the Fermi site for design purposes. In addition, the Fermi 3 specific design ambient temperature and humidity values are bounded by the values in DCD Table 2.0-1.

Insert 2 Here

2.3.1.3.6 Potential Changes in Climate

Natural climate variation is cyclical phenomenon that deviates on both a time and spatial scale. Prediction of these events over any length of time on a global scale is often speculative at best. The uncertainty is especially compounded when referring to specific areas or locations.

A large resource of historical climatic data allows for the evaluation of climate conditions and thus climate changes over the expected life span of Fermi 3. Long-term historical temperature, precipitation and storm data including both normal and extreme conditions that may affect plant operation and design are readily available for the region.

The National Climatic Data Center (NCDC) publishes "Climatography of the United States, No. 85". The publication summarizes 344 climate divisions in the lower 48 contiguous states. Trends of temperature as well as precipitation and their appropriate standard deviations have been collected over five 30-year periods and the 70-year period between 1931-2000 for each climate division in a state. Climate divisions, which typically follow county lines, are designed to represent regions within a state that have similar climates. The Fermi 3 facility is located within the Michigan-10 Climate Division.

In general the temperature data in "Climatography of the United States, No. 85" shows little in the way of change or variability over the 70-year period, with both the beginning period of 1931-1960 and the latest time period of 1971-2000 showing an average annual temperature of 9.0°C (48.3°F). Precipitation on the other hand, did show some increase during the 70-year period, especially when compared with the latest 30-year interval. The average precipitation increased from 78.0 cm (30.72 in) per year for the 1931-1960 time period to 83.5 cm (32.86 in) per year over the 1971-2000 time period.

Insert 2)

Comparison of Fermi Site Parameters to DCD Control Room Habitability Analysis Parameters

Fermi site parameters used in the comparison to DCD Control Room Habitability Analysis (CRHA) parameters are the Maximum Average Dry Bulb Temperature for 0 percent Exceedance Maximum Temperature Day, Minimum Average Dry Bulb Temperature for 0 percent Exceedance Minimum Temperature Day, and Maximum High Humidity Average Wet Bulb Globe Temperature Index for 0 percent Exceedance Maximum Wet Bulb Temperature Day. DCD Table 2.0-1 contains the ESBWR standard plant CRHA parameters that the Fermi site must be within to satisfy the DCD CRHA heat-up analysis for an ESBWR.

DCD Sections 3H.3.2.1.1 through 3H.3.2.1.3 explain the methodology to determine Fermi site parameters used in the comparison to DCD CRHA parameters. As indicated in the DCD, the 0 percent exceedance maximum and minimum dry bulb temperatures, as well as maximum wet bulb temperature (non-coincident) are used in the calculations of the Fermi site parameters. As previously stated, the 0 percent exceedance ambient design temperature site characteristic values are the more extreme of either the historic recorded values or the 100-year return period values. For the Fermi site, the 100-year return period values are more extreme for the 0 percent exceedance maximum dry bulb, 0 percent exceedance minimum dry bulb, and 0 percent exceedance maximum (non-coincident) wet bulb temperature values. 100-year return period values are calculated using a dataset of extreme values of dry bulb and wet bulb for a long term reporting period (i.e., 30 years) and do not have a date and time associated with their occurrence. As indicated in the DCD, the daily temperature range is determined by evaluating the 24 hour periods before and after the 0 percent exceedance maximum and minimum dry bulb temperatures, and six 24 hour periods before and after the 0 percent exceedance maximum wet bulb (non-coincident) temperature. For this analysis, it is assumed that the date and hour of occurrence for historic recorded values of dry bulb and wet bulb temperatures recorded at Detroit Metropolitan Airport during the 1961-2007 time period are used to set the date and hour of occurrence for the 0 percent exceedance temperature values (i.e. 100-year return period values) in order to determine the dry or wet bulb temperature resulting from a daily temperature range for the calculation of the Fermi site parameters. Using the 0 percent exceedance values (100-year return period values) in the calculations of the Fermi site parameters provides conservative values for the Fermi site. The discussion below provides the values of the corresponding site parameters for Fermi 3.

Maximum Average Dry Bulb Temperature for 0 percent Exceedance Maximum Temperature Day

As described in DCD Section 3H.3.2.1.1, the Maximum Average Dry Bulb Temperature for the 0 percent Exceedance Maximum Temperature Day is defined as the average of the 0 percent exceedance maximum dry bulb temperature and the dry bulb temperature resulting from a daily temperature range. The daily temperature range is defined as the dry bulb temperature difference between the 0 percent exceedance maximum dry bulb temperature and the dry bulb temperature that corresponds to the higher of the daily lows before and after that maximum. The 0 percent exceedance maximum dry bulb temperature is 40.05°C (104.1°F). The historic maximum dry

bulb temperature is 40.0°C (104.0°F) and occurred on June 25, 1988 (Reference 2.3-227). Hourly ambient dry bulb temperature data from Detroit Metropolitan Airport for the 24 hours before and after the historic maximum temperature are provided in the line chart in Figure 2.3-X. 18.9°C (66.0°F) is the higher of the daily lows 24 hours before and after the historic maximum dry bulb temperature. Therefore, the average of the low dry bulb temperature prior to the historic maximum temperature and the 0 percent exceedance maximum temperature is 29.48°C (85.1°F). This value is the Maximum Average Dry Bulb Temperature for the 0 percent Exceedance Maximum Temperature Day for the Fermi site and is bounded by the site parameters in Table 2.0-1 of the ESBWR DCD.

Minimum Average Dry Bulb Temperature for 0 percent Exceedance Minimum Temperature Day

As described in DCD Section 3H.3.2.1.2, the Minimum Average Dry Bulb Temperature for the 0 percent Exceedance Minimum Temperature Day is defined as the average of the 0 percent exceedance minimum dry bulb temperature and the dry bulb temperature resulting from a daily temperature range. The daily temperature range is defined as the dry bulb temperature difference between the 0 percent exceedance minimum dry bulb temperature and the dry bulb temperature that corresponds to the lower of the daily highs 24 hours before and after that minimum. The 0 percent exceedance minimum dry bulb temperature is -34.89°C (-30.8°F). The historic minimum dry bulb temperature is -29.44°C (-21.0°F) and occurred on January 21, 1984 (Reference 2.3-227). Hourly ambient dry bulb temperature data from Detroit Metropolitan Airport for the 24 hours before and after the historic minimum temperature are provided in the line chart in Figure 2.3-Y. -17.8°C (-0.04°F) is the lower of the daily highs 24 hours before and after the historic minimum dry bulb temperature. Therefore, the average of the high dry bulb temperature after the historic maximum temperature and the 0 percent exceedance maximum temperature is -26.35°C (-15.4°F). This value is the Minimum Average Dry Bulb Temperature for the 0 percent Exceedance Minimum Temperature Day for the Fermi site and is bounded by the site parameters in Table 2.0-1 of the ESBWR DCD.

Maximum High Humidity Average Wet Bulb Globe Temperature Index for 0 percent Exceedance Maximum Wet Bulb Temperature Day

As described in DCD Section 3H.3.2.1.3, the Maximum High Humidity Average Wet Bulb Globe Temperature Index for 0 percent Exceedance Maximum Wet Bulb Temperature Day is defined as the average of the Wet Bulb Globe Temperature (WBGT) index values for the 0 percent exceedance maximum wet bulb temperature and the highest of the six daily low wet bulb temperatures that occurs in each of the three 24 hour periods before and after the 0 percent exceedance maximum wet bulb temperature. The general method to calculate the WBGT index is to multiply the dry bulb temperature coincident with the wet bulb temperature by 0.3 plus the wet bulb temperature multiplied by 0.7.

The 0 percent exceedance maximum wet bulb (non-coincident) temperature is 30.0°C (86.0°F). The historic maximum wet bulb temperature is 29.44°C (85.0°F) and occurred on July 14, 1995 (Reference 2.3-228). The hourly dry bulb temperature data from the Detroit Metropolitan airport on July 14, 1995 indicates that the coincident dry bulb temperature with the historic maximum

wet bulb temperature is 36.7°C (98.1°F).. The resulting WBGT index for the 0 percent exceedance maximum wet bulb temperature is 32.01°C (89.62°F).

Hourly ambient wet bulb and dry bulb temperature data from Detroit Metropolitan Airport for the three 24 hour periods before and after the historic maximum wet bulb temperature are provided in the line chart in Figure 2.3-Z. The highest of the six daily low wet bulb temperatures that occurred in each of the three 24 hour periods before and after the historic maximum wet bulb temperature is 24.1°C (75.4°F). The dry bulb temperature occurring coincident with the highest of the six daily low wet bulb temperatures is 28.9°C (84.0°F). The resulting WBGT index for the highest of the six daily low wet bulb temperatures that occurred in each of the three 24 hour periods before and after the historical maximum wet bulb temperature is 25.54°C (77.97°F).

Using the WBGT index values for the 0 percent exceedance maximum wet bulb and the highest of the six daily low wet bulb temperatures in each of the three 24 hour periods before and after the historical wet bulb temperature, the Maximum High Humidity Average Wet Bulb Globe Temperature Index for the 0 percent Exceedance Maximum Wet Bulb Temperature Day is 28.78°C (83.80°F).

The Fermi site parameters for Maximum Average Dry Bulb Temperature for 0 percent Exceedance Maximum Temperature Day, Minimum Average Dry Bulb Temperature for 0 percent Exceedance Minimum Temperature Day, and Maximum High Humidity Average Wet Bulb Globe Temperature Index for 0 percent Exceedance Maximum Wet Bulb Temperature Day are bounded by the ESBWR Standard Plant Site Parameters in DCD Table 2.0-1.

Table 2.3-210 Ambient Temperature and Humidity Statistics for Detroit Metropolitan Airport [EF3 COL 2.0-7-A]

Minimum Annual Dry-Bulb Heating Exceedance	99.0%	5.3°F
	99.6%	0.2°F
	0.0%	-30.8°F
Maximum Annual Dry-Bulb/Wet-Bulb (Coincident) Cooling Exceedance	2.0%	84.7°F / 70.8°F
	1.0%	87.3°F / 72.2°F
	0.0%	104.1°F / 73.9°F
Maximum Annual Wet-Bulb (Non-Coincident) Cooling Exceedance	2.0%	73.1°F
	1.0%	74.8°F
	0.0%	86.0°F

Insert 3 Here

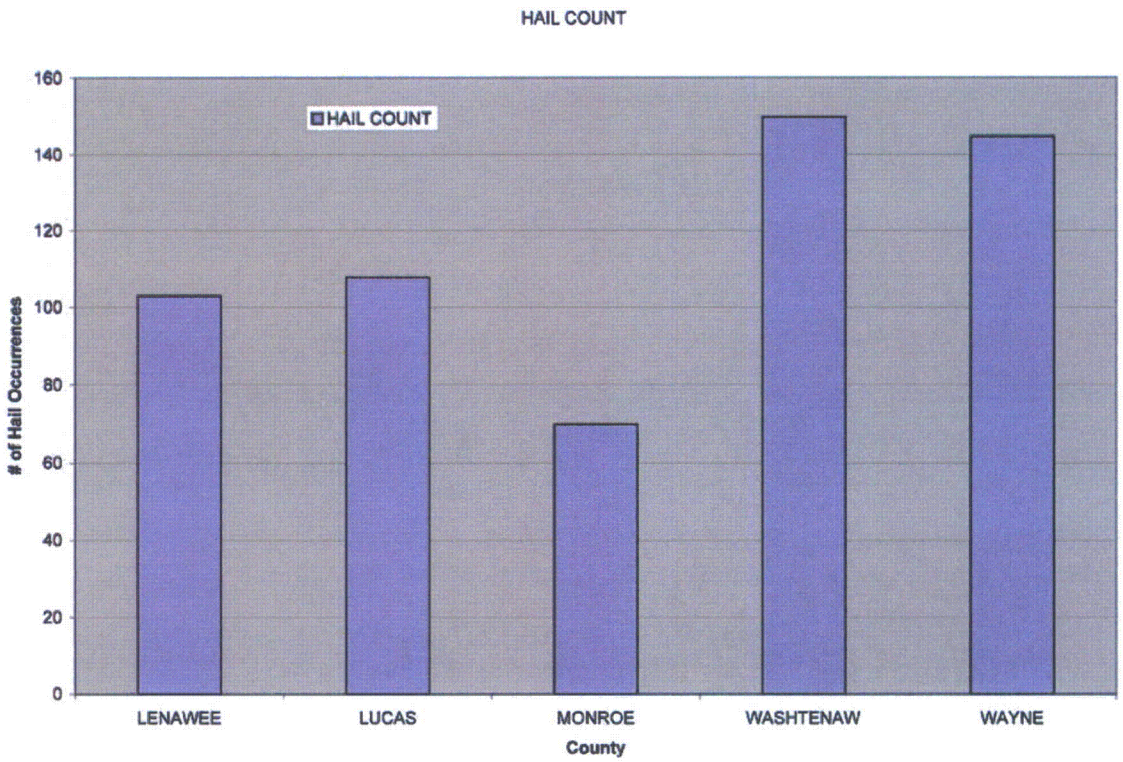
Notes:
Data for the 2% and 1% maximum and minimum annual dry-bulb and wet-bulb temperatures are taken from the 2005 ASHRAE handbook.

Source: Reference 2.3-201, Reference 2.3-227, Reference 2.3-228, Reference 2.3-234, Reference 2.3-239

Insert 3)

Maximum Average Dry Bulb Temperature for 0% Exceedance Maximum Temperature Day	85.1°F
Minimum Average Dry Bulb Temperature for 0% Exceedance Minimum Temperature Day	-15.4°F
Maximum High Humidity Average Wet Bulb Globe Temperature Index for 0% Exceedance Maximum Wet Bulb Temperature Day	83.8°F

Figure 2.3-203 Total Hail Reports for the Five-County Area (1955-2007) [EF3 COL 2.0-7-A]

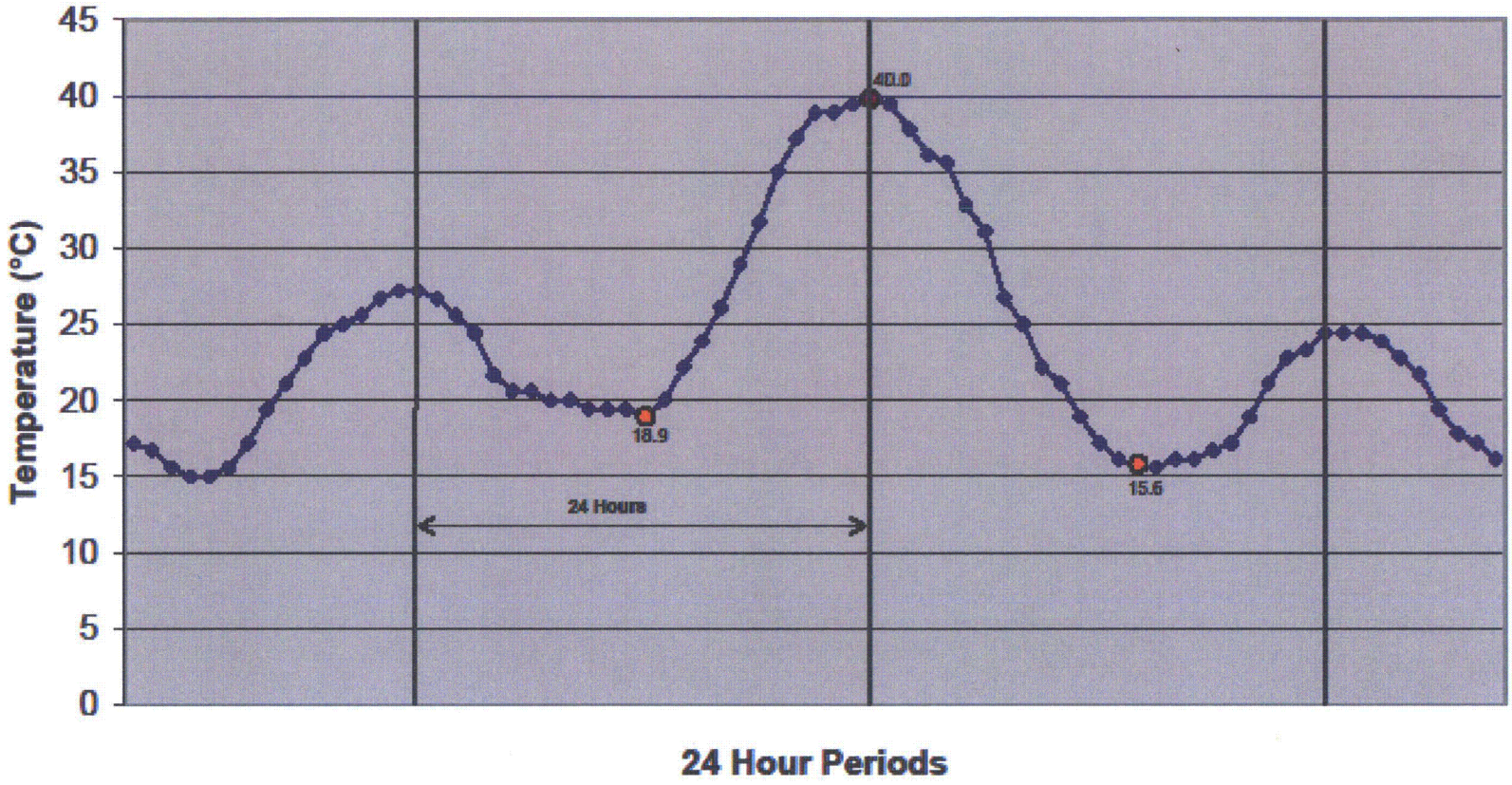


Source: Reference 2.3-220, Reference 2.3-224

Insert 4 Here

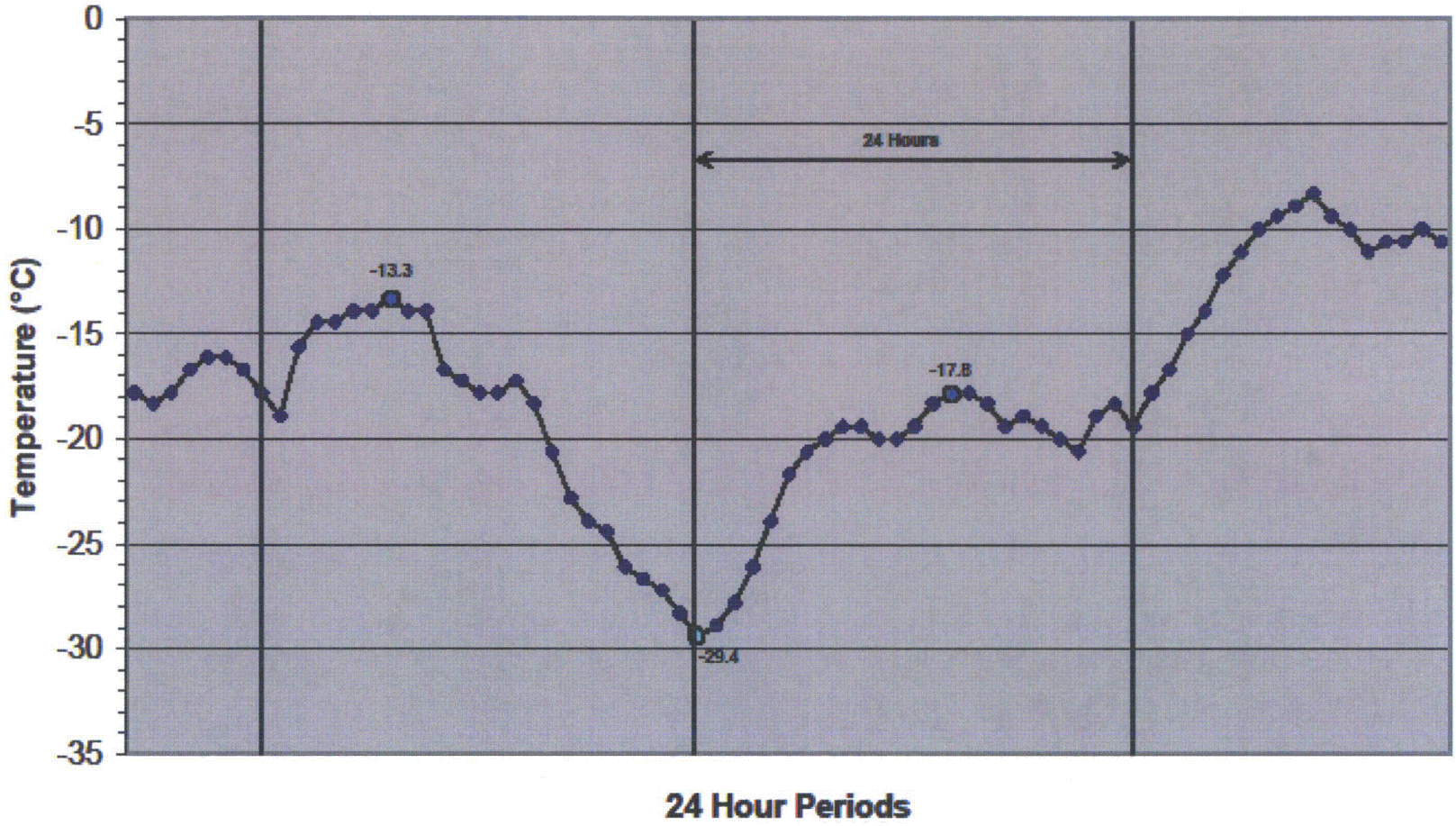
Insert 4)

Figure 2.3-X Hourly Dry Bulb Temperature from Detroit Metropolitan Airport During June 24-26, 1988



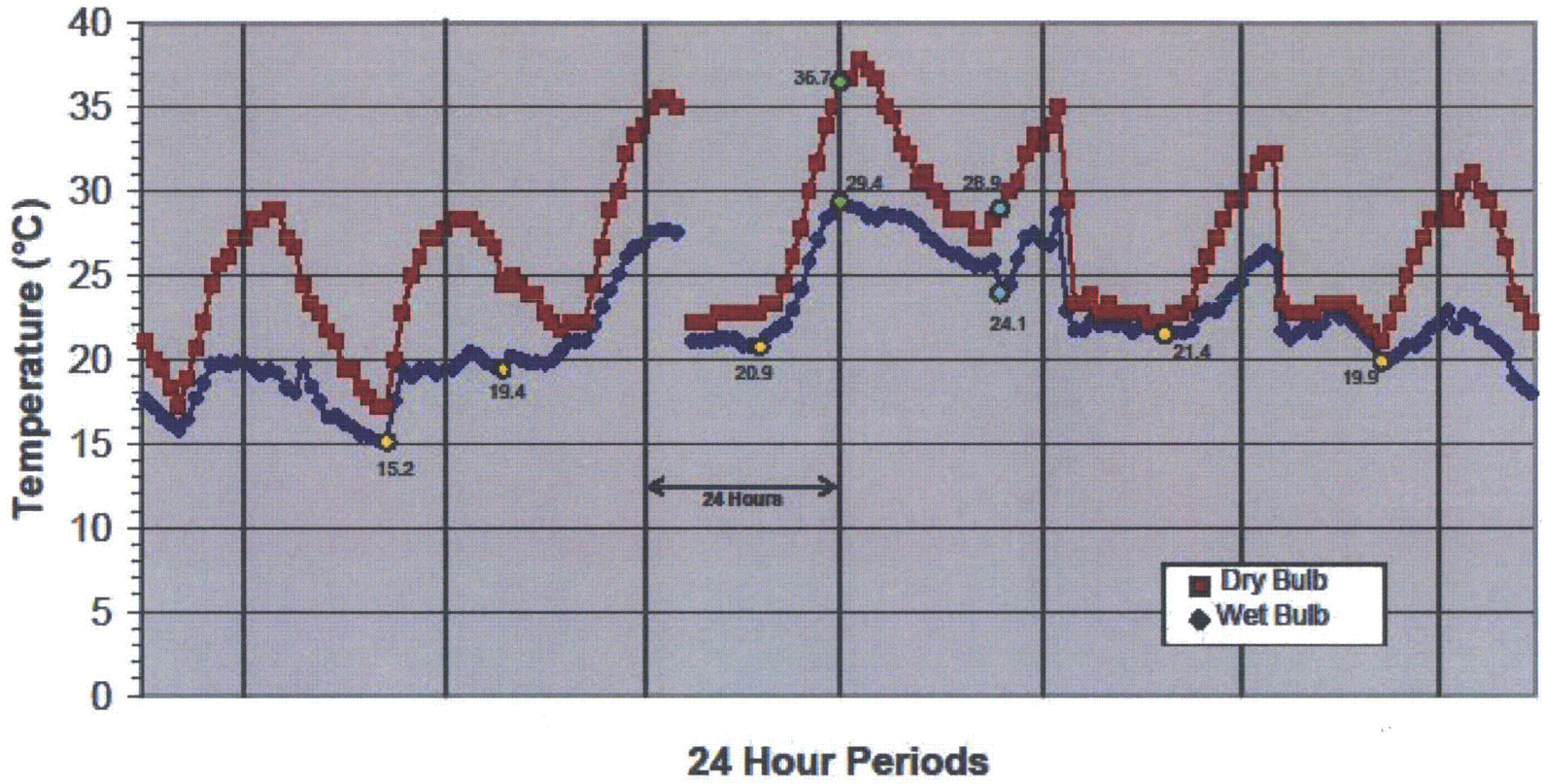
Source: Reference 2.3-228

Figure 2.3-Y Hourly Dry Bulb Temperature from Detroit Metropolitan Airport During January 20-22, 1984



Source: Reference 2.3-228

Figure 2.3-Z Hourly Dry Bulb and Wet Bulb Temperature from Detroit Metropolitan Airport During July 11-17, 1995



Source: Reference 2.3-228

EF3 SUP 3.7-6

[START COM 3.7-001] The seismic monitoring program described in this subsection, including the necessary test and operating procedures, will be implemented prior to receipt of fuel on site. **[END COM 3.7-001]**

3.8 Seismic Category I Structures

This section of the referenced DCD is incorporated by reference with no departures or supplements.

3.9 Mechanical Systems and Components

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

3.9.2.4 Initial Startup Flow-Induced Vibration Testing of Reactor Internals

Replace the last paragraph with the following.

EF3 COL 3.9.9-1-A

Insert 1 Here.

The classification of Fermi 3 under RG 1.20 will depend on the results of the vibration assessment program conducted by the lead ESBWR plant (North Anna Unit 3). North Anna Unit 3 is a "Non-prototype, Category II" plant.

[START COM 3.9-001] 1. If North Anna Unit 3 successfully completes its vibration assessment program without experiencing any adverse inservice vibration phenomena, then Fermi 3 will reference North Anna Unit 3 as the "limited valid prototype" relative to the modified reactor internals configuration. Under this scenario, Fermi 3 will be classified as a "Non-prototype, Category IV" plant. Per RG 1.20, regulatory position 3.4, the vibration measurement program will be omitted and an inspection program implemented. For this scenario, the inspection program for Fermi 3 will be developed and made available for NRC review 60 days prior to the beginning of the inspections. This inspection program will meet the guidance specified in RG 1.20 for "Non-prototype, Category I" reactor internals. The results of the inspection program will be provided to the NRC 180 days following completion of the program. **[END COM 3.9-001]**

[START COM 3.9-006] 2. If North Anna Unit 3 experiences adverse vibration phenomena during its assessment program, then Fermi 3 will be considered a "Non-prototype, Category II" plant for applicable internal

~~components. A vibration assessment program, consistent with DCD Appendix 3L, will be implemented for these internal components. Procedures for the inspection program will be made available 60 days prior to the beginning of the inspections. This inspection program will meet the guidance specified in RG 1.20 for prototype reactor internals. Under this scenario, the preliminary and final reports which together summarize the results of the vibration analysis, measurement, and inspection programs will be submitted to the NRC within 60 days and 180 days, respectively, following completion of the vibration testing and inspection. **[END COM 3.9-006]**~~

3.9.3.1 Loading Combinations, Design Transients and Stress Limits

Replace the last sentence with the following.

STD COL 3.9.9-2-A **[START COM 3.9-002]** The piping stress reports identified in this DCD section will be completed within six months of completion of DCD ITAAC Table 3.1-1. **[END COM 3.9-002] [START COM 3.9-004]** The FSAR will be revised as necessary in a subsequent update to address the results of this analysis. **[END COM 3.9-004]**

3.9.3.7.1(3)e Snubber Preservice and Inservice Examination and Testing

Preservice Examination and Testing

Add the following at the end of this section.

STD COL 3.9.9-4-A A preservice thermal movement examination is also performed; during initial system heatup and cooldown, for systems whose design operating temperature exceeds 121°C (250°F), snubber thermal movement is verified.

Additionally, preservice operational readiness testing is performed on all snubbers. The operational readiness test is performed to verify the parameters of ISTD-5120. Snubbers that fail the preservice operational readiness test are evaluated to determine the cause of failure, and are retested following completion of corrective action(s).

FSAR Insert 1

The vibration assessment program, as specified in RG 1.20, is provided in DCD Appendix 3L and the following referenced GEH Reports.

- NEDE-33259P, "Reactor Internals Flow Induced Vibration Program"
- NEDE-33312P, "Steam Dryer - Acoustic Load Definition"
- NEDE-33313P, "Steam Dryer - Structural Evaluation"
- NEDC-33408P, "ESBWR Steam Dryer - Plant Based Load Evaluation Methodology"
- NEDC-33408P, Supplement 1, "ESBWR Steam Dryer - Plant Based Load Evaluation Methodology Supplement 1"

The classification of the Fermi 3 reactor internals in accordance with RG 1.20 is dependent on ESBWR status, i.e. if Fermi 3 is the initial ESBWR to perform testing of the reactor internals, or if testing is performed at another reactor prior to Fermi 3 testing. There are two different scenarios:

1. A valid prototype for the Fermi 3 reactor internals does not exist. Under this scenario, Fermi 3 reactor internals is classified as a prototype per Regulatory Guide 1.20.

2. A valid prototype for Fermi 3 reactor internals does exist. If the prototype testing is performed outside the United States, the guidance in Regulatory Guide 1.20, Revision 3, Regulatory Position 1.2 would need to be satisfied in order for this reactor to be considered a "valid prototype". Assuming that Fermi 3 reactor internals are substantially similar to the valid prototype and that the valid prototype does not experience inservice problems that result in component or operational modifications, Fermi 3 reactor internals will be classified as non-prototype category I. If any changes to classification for Fermi 3 reactor internals are later determined to be necessary, the classification change will be addressed at the time the change is proposed with proper evaluation/justification and documented in a revision to the FSAR.

[START COM-FSAR-3.9-001] The comprehensive vibration assessment program will be developed and implemented as described in DCD Appendix 3L with no departures. The vibration measurement and inspection programs will comply with the guidance specified in RG 1.20, Revision 3, consistent with the Fermi 3 reactor internals classification. A summary of the vibration analysis program and description of the vibration measurement (including measurement locations and analysis predictions) and inspection phases of the comprehensive vibration inspection program will be submitted to the NRC six months prior to implementation. **[END COM-FSAR-3.9-001]**

[START COM-FSAR-3.9-006] The preliminary and final reports (as necessary), which together summarize the results of the vibration analysis, measurement and inspection programs will be submitted to the NRC within 60 and 180 days, respectively, following the completion of the programs. **[END COM-FSAR-3.9-006]**

Power-Operated Valves Under Design Basis Conditions, March 15, 2000.

3.10 Seismic and Dynamic Qualification of Mechanical and Electrical Equipment

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

3.10.1.4 Dynamic Qualification Report

Replace the last paragraph with the following.

Add insert "1" here

STD COL 3.10.4-1-A **[START COM 3.10-003]** ~~A schedule will be provided within 12 months after issuance of the COL that supports planning for and conducting of NRC inspections of seismic and dynamic qualification of mechanical and electrical equipment. The schedule will be updated every 6 months until 12 months before scheduled fuel loading.~~ **[END COM 3.10-003]**

Add insert "2" here

[START COM 3.10-001] ~~The Dynamic Qualification Report will be completed prior to fuel load.~~ **[END COM 3.10-001] [START COM 3.10-002]** FSAR information will be revised, as necessary, as part of a subsequent FSAR update. **[END COM 3.10-002]**

STD SUP 3.10-1 Section 17.5 defines the Quality Assurance Program requirements that are applied to equipment qualification files, including requirements for handling safety-related quality records, control of purchased material, equipment and services, test control, and other quality related processes.

3.10.4 COL Information

STD COL 3.10.4-1-A 3.10.4-1-A **Dynamic Qualification Report**

This COL item is addressed in Subsection 3.10.1.4.

3.11 Environmental Qualification of Mechanical and Electrical Equipment

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Insert 1 for
COM 3.10-003

Detroit Edison shall submit to the NRC, no later than 1 year after issuance of the combined license or at the start of construction as defined in 10 CFR 50.10(a), whichever is later, its implementation schedules for completing of the following ITAACs. Detroit Edison shall submit updates to the ITAAC schedules every 6 months thereafter and, within 1 year of its scheduled date for initial loading of fuel, and shall submit updates to the ITAAC schedules every 30 days until the final notification is provided to the NRC under paragraph (c)(1) of this section."

Insert 2 for
COM 3.10-001

The Dynamic Qualification Report and documentation that describe the seismic and dynamic qualification methods will be made available for NRC staff review, inspection, and audit. Information that verifies the seismic and dynamic qualification will be made available to the NRC to facilitate reviews, inspections, and audits throughout the process.

3.11.4.4 Environmental Qualification Documentation

Replace the last paragraph with the following.

STD COL 3.11-1-A

Insert 1 Here

~~A description of the environmental qualification program is provided in DCD Section 3.11~~

Implementation of the environmental qualification program, including development of the plant specific Environmental Qualification Document (EQD), will be in accordance with the milestone defined in Section 13.4.

3.11.7 COL Information

3.11-1-A Environmental Qualification Document

STD COL 3.11-1-A This COL item is addressed in Subsection 3.11.4.4.

STD SUP 3.12-1

3.12 Piping Design Review

Information on seismic Category I and II, and nonseismic piping analysis and their associated supports is presented in DCD Sections 3.7, 3.9, 3D, 3K, 5.2 and 5.4.

STD SUP 3.13-1

3.13 Threaded Fasteners - ASME Code Class 1, 2, and 3

Criteria applied to the selection of materials, design, inspection and testing of threaded fasteners (i.e., threaded bolts, studs, etc.) are presented in DCD Section 3.9.3.9, with supporting information in DCD Sections 4.5.1, 5.2.3, and 6.1.1.

Appendix 3A Seismic Soil-Structure Interaction Analysis

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

3A.1 Introduction

Replace the last sentence in the second paragraph with the following.

EF3 CDI

Site-specific geotechnical data is described in Chapter 2. This data is compatible with the site enveloping parameters considered in the standard design.

The documentation necessary to support the continued qualification of the equipment installed in the plant that is within the Environmental Qualification (EQ) Program scope is available in accordance with 10 CFR 50 Appendix A, General Design Criterion 1. EQ files are maintained for equipment and certain post-accident monitoring devices that are subject to a harsh environment. The files are maintained for the operational life of the plant.

Central to the EQ Program is the EQ Master Equipment List (EQMEL). The EQMEL identifies the electrical and mechanical equipment or components that must be environmentally qualified for use in a harsh environment. The EQMEL consists of equipment that is essential to emergency reactor shutdown, containment isolation, reactor core cooling, or containment and reactor heat removal, or that is otherwise essential in preventing a significant release of radioactive material to the environment. This list is developed from the equipment list provided in DCD Table 3.11-1. The EQMEL and a summary of equipment qualification results are maintained as part of the equipment qualification file for the operational life of the plant.

Administrative programs are in place to control revisions to the EQ files and the EQMEL. When adding or modifying components in the EQ Program, EQ files are generated or revised to support qualification. The EQMEL is revised to reflect these new components. To delete a component from the EQ Program requires a deletion justification to be prepared that demonstrates why the component can be deleted. This justification consists of an analysis of the component, an associated circuit review, if appropriate and a safety evaluation. The justification is released and/or referenced on the appropriate change document.

For changes to the EQMEL, supporting documentation is completed and approved prior to issuing the changes. This documentation includes safety reviews and new or revised EQ files. Plant modifications and design basis changes are subject to change process reviews, e.g., reviews in accordance with 10 CFR 50.59 or the change control requirements of the ESBWR-specific appendix to 10 CFR Part 52, in accordance with appropriate plant procedures. These reviews address EQ issues associated with the activity. Any changes to the EQMEL that are not the result of a modification or design basis change are subject to a separate review that is accomplished and documented in accordance with plant procedures.

Engineering change documents or maintenance documents generated to document work performed on an EQ component are reviewed against the

current revision of the EQ files for potential impact. Changes to EQ documentation may be due to, but not limited to, plant modifications, calculations, corrective maintenance, or other EQ concerns.

The operational aspects of the EQ program include:

- Evaluation of EQ results for design life to establish activities to support continued EQ
- Determination of surveillance and preventive maintenance activities based on EQ results
- Consideration of EQ maintenance recommendations from equipment vendors
- Evaluation of operating experience in developing surveillance and preventive maintenance activities for specific equipment
- Development of plant procedures that specify individual equipment identification, appropriate references, installation requirements, surveillance and maintenance requirements, post-maintenance testing requirements, condition monitoring requirements, replacement part identification, and applicable design changes and modifications
- Development of plant procedures for reviewing equipment performance and EQ operational activities, and for trending the results to incorporate lessons learned through appropriate modifications to the operational EQ program
- Development of plant procedures for the control and maintenance of EQ records

Chapter 9 Auxiliary Systems

9.1 Fuel Storage and Handling

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

9.1.1.7 Safety Evaluation

Structural Design

STD COL 9.1-4-A Delete the last sentence of the third paragraph.

Protection Features of the New Fuel Storage Facilities

STD COL 9.1-4-A Delete the last sentence of the third paragraph

9.1.4 Light Load Handling System (Related to Refueling)

9.1.4.13 Refueling Operations

, consistent with ANSI/ ANS-57.1-1992, 57.2-1983, 57.3-1983 and RG 1.13, Rev. 2,

Add the following at the end of this section.

STD COL 9.1-4-A Section 13.5 requires development of fuel handling procedures. Fuel handling procedures address the status of plant systems required for refueling; inspection of replacement fuel and control rods; designation of proper tools; proper conditions for spent fuel movement and storage; proper conditions to prevent inadvertent criticality; proper conditions for fuel cask loading and movement; and status of interlocks, reactor trip circuits and mode switches. These procedures provide instructions for use of refueling equipment, actions for core alterations, monitoring core criticality status, and accountability of fuel for refueling operations. **[START COM 9.1-001]** Fuel handling procedures are developed six months before fuel receipt to allow sufficient time for plant staff familiarization, to allow NRC staff adequate time to review the procedures, and to develop operator licensing examinations. **[END COM 9.1-001]**

Insert 1 Here.

Personnel qualifications and training for fuel handlers are addressed in Section 13.2.

Insert 1

	9.1.4.18 **Safety Evaluation of Fuel Handling Systems**
	Replace the second sentence of the fifth paragraph with the following sentence.
STD COL 9.1-4-A	Fuel handling procedures provided to prevent inadvertent criticality are discussed in Section 9.1.4.13.

9.5.2.5-3-A **Offsite Interfaces (1)**

EF3 COL 9.5.2.5-3-A This COL item is addressed in Subsection 9.5.2.2 and Emergency Plan Sections II.E.1 and II.F.1.

9.5.2.5-4-A **Offsite Interfaces (2)**

EF3 COL 9.5.2.5-4-A This COL item is addressed in Subsection 9.5.2.2 and Emergency Plan Sections II.E.1 and II.F.1.

9.5.2.5-5-A **Fire Brigade Radio System**

EF3 COL 9.5.2.5-5-A This COL item is addressed in Subsection 9.5.2.2.

9.5.3 **Lighting System**

This section of the referenced DCD is incorporated by reference with no departures or supplements.

9.5.4 **Diesel Generator Fuel Oil Storage and Transfer System**

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

9.5.4.2 **System Description**

Detailed System Description

Standby Diesel Generators

Replace the third to last sentence in the first paragraph with the following.

STD COL 9.5.4-1-A Procedures require that the quantity of diesel fuel oil in the standby diesel generator (SDG) fuel oil storage tanks is monitored on a periodic basis. The diesel fuel oil usage is tracked against planned deliveries. Regular transport replenishes the diesel fuel oil inventory during periods of high demand and ensures continued supply in the event of adverse weather conditions. These procedures ensure sufficient diesel fuel oil inventory is available on site so that the SDGs can operate continually for seven days with each operating at its calculated design load, with ~~appropriate design margins~~. The procedures will be developed in accordance with the milestone and processes described in Section 13.5.

margin added to account for usable fuel in the tank, level instrument uncertainty, and the potential for future load growth.

Replace the third paragraph with the following.

EF3 COL 9.5.4-2-A The only underground component of the SDGs fuel oil storage and transfer system is carbon steel piping. A corrosion protection system consistent with the guidance contained in ASME B31.1, Power Piping Code, Nonmandatory Appendix IV, Corrosion Control for ASME B31.1 Power Piping Systems, and American Petroleum Institute (API) Recommended Practice 1632, Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems is provided for external surfaces of buried piping systems. The buried sections of the piping are provided with waterproof protective coating and an impressed current type cathodic protection to control external corrosion.

STD COL 9.5.4-1-A Delete the parenthetical "(COL 9.5.4-1-A)" at the end of the last paragraph.

Ancillary Diesel Generators

Replace the third to last sentence in the first paragraph with the following.

STD COL 9.5.4-1-A Procedures require that the quantity of diesel fuel in the ancillary diesel generator (ADG) fuel oil storage tanks is monitored on a periodic basis. The diesel fuel oil usage is tracked against planned deliveries. Regular transport replenishes the fuel oil inventory during periods of high demand and ensures continued supply in the event of adverse weather conditions. These procedures ensure sufficient diesel fuel oil inventory is available on site so that the ADGs can operate continually for seven days its calculated design load, with ~~appropriate design margins~~. The procedures will be developed in accordance with the milestone and processes described in Section 13.5.

margin added to account for usable fuel in the tank, level instrument uncertainty, and the potential for future load growth.

Replace the third paragraph with the following.

EF3 COL 9.5.4-2-A The only underground component of the ADGs fuel oil storage and transfer system is carbon steel piping. A corrosion protection system consistent with the guidance contained in ASME B31.1, Power Piping Code, Nonmandatory Appendix IV, Corrosion Control for ASME B31.1 Power Piping Systems, and American Petroleum Institute (API) Recommended Practice 1632, Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems is provided for external

Chapter 10 Steam and Power Conversion System

10.1 Summary Description

This section of the referenced DCD is incorporated by reference with no departures and/or supplements.

Inserts 1 and 2 here

10.2 Turbine Generator

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

10.2.3.4 Turbine Design

Add the following at the beginning of this section.

STD SUP 10.2-1

The General Electric Company manufactures the turbine and generator. The model N3R-6F52 turbine is from General Electric's N series nuclear steam turbines.

10.2.3.6 Inservice Maintenance and Inspection of Turbine Rotors

Replace the last paragraph with the following.

and

STD COL 10.2-1-A

The turbine maintenance and inspection program that supports the Original Equipment Manufacturer's turbine missile generation probability calculation is described in DCD Sections 10.2.2.7, 10.2.3.5, 10.2.3.6, ~~and 10.2.3.7.~~ The associated turbine maintenance and inspection frequencies are established in the bounding missile probability analysis in GE-ST, "ESBWR Steam Turbine - Low Pressure Rotor Missile Generator Probability Analysis," ST-56834/P, Revision 1, submitted in Reference 10.2-201.

Insert 3 here

10.2.3.8 Turbine Missile Probability Analysis

Replace the last paragraph with the following.

STD COL 10.2-2-A

The probability of turbine missile generation has been calculated based on bounding material property values in GE-ST, "ESBWR Steam Turbine - Low Pressure Rotor Missile Generator Probability Analysis," ST-56834/P, Revision 1, submitted in Reference 10.2-201.

Insert 1

	10.2.2.4 **Turbine Overspeed Protection System**
	Replace the last sentence in the thirteenth paragraph with the following.
STD COL 10.2-1-A	Inspection programs required by the turbine missile probability analysis and implementation of the inspection, maintenance, and testing programs discussed in Sections 10.2.3.6 and 10.2.3.7 ensure operability.

Insert 2

	10.2.2.7 **Testing**
	Replace the last sentence in the second paragraph with the following.
STD COL 10.2-1-A	Non-return valves are inspected and tested in accordance with vendor recommendations as discussed in Section 10.2.3.7.

Insert 3

	10.2.3.7 **Inservice Inspection of Turbine Valves**
	Replace the last paragraph with the following.
STD COL 10.2-1-A	Inspection of all valves of one functional type or size (i.e., stop, control, intercept, non-return) are conducted for any detrimental unusual condition (as defined by the turbine valve inspection program) if one is discovered during the inspection of any single valve.
	Add the following at the end of this section.
	Associated valve and control system maintenance, inspections and test frequencies are established in the bounding missile probability analysis in GE-ST, "ESBWR Steam Turbine – Low Pressure Rotor Missile Generator Probability Analysis," ST-56834/P, Revision 2, submitted in Reference 10.2-201.

s 10.2.2.4, 10.2.2.7,

10.2.5 COL Information

10.2-1-A Turbine Maintenance and Inspection Program

STD COL 10.2-1-A This COL item is addressed in Subsection 10.2.3.6

10.2-2-A Turbine Missile Probability Analysis

, and 10.2.3.7

STD COL 10.2-2-A This COL item is addressed in Subsection 10.2.3.8.

10.2.6 References

10.2-201 GEH Letter, MFN 09-484, "Transmittal of GE-Energy Steam Turbines (GE-ST) "ESBWR Steam Turbine - Low Pressure Rotor Missile Generation Probability Analysis" ST-56834/P and ST-56834/N-P, Revision 1," dated July 28, 2009

10.3 Turbine Main Steam System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

10.4 Other Features of Steam and Power Conversion System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

10.4.5.2.1 General Description

Replace the text with the following.

EF3 CDI

The CIRC is depicted in Figure 10.4-201 and Figure 10.4-202. The CIRC consists of the following components:

- Condenser water boxes, piping, and valves
- Condenser tube cleaning equipment
- Water box drain subsystem
- Four 25 percent capacity pumps and pump discharge valves
- A removable assembly of coarse and fine screens that separate the pump forebay (suction) from the cooling tower basin
- One hyperbolic natural draft cooling tower (NDCT)

Table 10.4-3R includes the temperature range of the water delivered by the CIRC pumps to the main condenser.

11.5 Process Radiation Monitoring System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Add the following paragraph at the end of this section.

STD COL 11.5-3-A Replace text references to DCD Table 11.5-5 with Table 11.5-201.

11.5.4.4 Setpoints

Replace the first sentence in this section with the following.

STD COL 11.5-2-A The derivation of setpoints used for offsite dose monitors described in the ODCM. Refer to Subsection 11.5.4.5 for a discussion regarding ODCM development and implementation.

11.5.4.5 Offsite Dose Calculation Manual

Replace this section with the following.

STD COL 11.5-2-A The methodology and parameters used for calculation of offsite dose and monitoring are described in the ODCM. NEI 07-09A, Generic FSAR Template Guidance for Offsite Dose Calculation Manual (ODCM) Program Description, is incorporated by reference. (Reference 11.5-201) The milestone for development and implementation of the ODCM is addressed in Section 13.4. **[START COM 11.5-001]** The provisions for sampling liquid and gaseous waste streams identified in Table 11.5-201and DCD Table 11.5-6 will be included in the ODCM. **[END COM 11.5-001]**

, and the provisions for batch liquid releases identified in DCD Table 11.5-7,

11.5.4.6 Process and Effluent Monitoring Program

Replace this section with the following.

STD COL 11.5-3-A The program for process and effluent monitoring and sampling is described in the ODCM. Refer to Subsection 11.5.4.5 for a discussion regarding ODCM development and implementation.

11.5.4.7 Sensitivity or Subsystem Lower Limit of Detection

Chapter 12 Radiation Protection

12.1 Ensuring That Occupational Radiation Exposures Are ALARA

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Add the following at the beginning of this section.

STD SUP 12.1-1 The ALARA program is addressed in Appendix 12AA and Appendix 12BB.

12.1.1.3.1 **Compliance with Regulatory Guide 8.8**

Replace the first paragraph of this section with the following.

STD COL 12.1-4-A Compliance with Regulatory Guide 8.8 is addressed in Appendix 12BB.

12.1.1.3.2 **Compliance with Regulatory Guide 8.10**

Replace this section with the following.

Appendix 12AA and

STD COL 12.1-1-A Compliance with Regulatory Guide 8.10 is addressed in Appendix 12BB.

12.1.1.3.3 **Compliance with Regulatory Guide 1.8**

Replace this section with the following.

STD COL 12.1-2-A Compliance with Regulatory Guide 1.8 is addressed in Appendix 12BB.

12.1.3 **Operational Considerations**

Replace this section with the following

Appendix 12AA and

STD COL 12.1-3-A The ALARA program implementation is addressed in Appendix 12BB.

12.1.4 **COL Information**

12.1-1-A **Regulatory Guide 8.10**

STD COL 12.1-1-A This COL item is addressed in Subsection 12.1.1.3.2 ~~and Appendix 12BB.~~

12.1-2-A **Regulatory Guide 1.8**

STD COL 12.1-2-A This COL item is addressed in Subsection 12.1.1.3.3 ~~and Appendix 12BB.~~

12.1-3-A **Operational Considerations**

STD COL 12.1-3-A This COL item is addressed in Subsection 12.1.3 ~~and Appendix 12BB.~~

12.1-4-A **Regulatory Guide 8.8**

STD COL 12.1-4-A This COL item is addressed in Subsection 12.1.1.3.1 ~~and Appendix 12BB.~~

12.2 Plant Sources

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

12.2.1.5 Other Contained Sources

Replace this section with the following.

STD COL 12.2-4-A In addition to the contained sources identified above, additional contained sources which contain by-product, source, or special nuclear materials may be maintained onsite. These contained sources are used as calibration, check, or radiography sources. These sources are not part of the permanent plant design, and their control and use are governed by plant procedures. The procedures consider the guidance provided in RG 8.8 to ensure that occupational doses from the control and use of the sources are as low as is reasonably achievable (ALARA).

Various types and quantities of radioactive sources are employed to calibrate the process and effluent radiation monitors, the area radiation monitors, and portable and laboratory radiation detectors. Check sources that are integral to the area, process, and effluent monitors consist of small quantities of by-product material and do not require special handling, storage, or use procedures for radiation protection purposes. The same consideration applies to solid and liquid radionuclide sources of exempt quantities or concentrations which are used to calibrate or check the portable and laboratory radiation measurement instruments.

12.5.3 Operational Considerations

Replace this section with the following.

~~STD COL 12.5-1-A~~
~~STD COL 12.5-2-A~~
~~STD COL 12.5-3-A~~

The operational program for radiation protection is addressed in Appendix 12BB.

Insert 1 here.

12.5.4 COL Information

12.5-1-A **Equipment, Instrumentation, and Facilities**

STD COL 12.5-1-A This COL item is addressed in Appendix 12BB.

12.5-2-A **Compliance with 10 CFR 50.34(f)(2)(xxvii) and NUREG-0737 Item III.D.3.3**

STD COL 12.5-2-A This COL item is addressed in Appendix 12BB.

12.5-3-A **Radiation Protection Program**

STD COL 12.5-3-A This COL item is addressed in Appendix 12BB.

Appendix 12A Calculation of Airborne Radionuclides

This section of the referenced DCD is incorporated by reference with no departures or supplements.

Appendix 12B Calculation of Airborne Releases

This section of the referenced DCD is incorporated by reference with no departures or supplements.

A

STD SUP 12.1-1

Appendix 12AA ALARA Program

NEI 07-08, Generic FSAR Template Guidance for Ensuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA), ~~which is currently under review by the NRC staff,~~ is incorporated by reference, (Reference 12AA-201)

with the following supplemental information

Insert 2 here.

12AA.1 References

12AA-201 Nuclear Energy Institute (NEI), Generic FSAR Template Guidance for Ensuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA), NEI 07-08.

A

A

STD COL 12.1-1-A
STD COL 12.1-2-A
STD COL 12.1-3-A
STD COL 12.1-4-A
STD COL 12.5-1-A
STD COL 12.5-2-A
STD COL 12.5-3-A

Appendix 12BB Radiation Protection

NEI 07-03, Generic FSAR Template Guidance for Radiation Protection Program Description~~, which is currently under review by the NRC staff,~~ is incorporated by reference with the following supplemental information. (Reference 12BB-201)

12.5.2.4 **Radiation Protection Technicians**

Delete the third paragraph.

12.5.3.1 **Facilities**

Delete the first and second paragraphs.

12.5.3.2 **Monitoring Instrumentation and Equipment**

Delete the third paragraph.

second

12.5.3.3 **Personal Protective Clothing and Equipment**

Delete the ~~last sentence in the first~~ paragraph.

12.5.4.2 **Methods to Maintain Exposures ALARA**

Delete the second paragraph.

12.5.4.4 **Access Control**

Insert 3 here.

~~Isometric drawings of the Very High Radiation Areas (VHRA) are included in DCD Section 12.3.~~

~~Physical access controls for permanent and temporary areas include postings, barricades, physical barriers, and the use of locks that are keyed so only keys designated as VHRA can open the locks. Additionally, entry into a VHRA is allowed only with a specific (Special) radiation work permit.~~

12.5.4.12 **Quality Assurance**

Replace the bracketed text in the first paragraph with Section 17.5.

12BB.1 **References**

12BB-201 Nuclear Energy Institute (NEI), Generic FSAR Template Guidance for Radiation Protection Program Description, NEI 07-03

A

Insert 1

NEI report no. NEI 07-08A, "Generic FSAR Template Guidance for Ensuring that Occupational Radiation Exposures are as Low as is Reasonably Achievable (ALARA)" provides additional operating policy and consideration guidance for developing and implementing an ALARA program. As described in Appendix 12AA, NEI 07-08A is incorporated by reference.

Insert 2

12.1.2 **Regulatory Compliance**

Replace the bracketed text in the first paragraph with Section 17.5.

Insert 3

Table 12BB-201 identifies the Very High Radiation Areas (VHRA). The areas identified are only VHRA during the conditions specified in the table. It is anticipated that these areas are seldom if ever accessed when in a VHRA condition. In the unlikely event that access is required, entry into a VHRA is controlled in accordance with the requirements of a specific (Special) radiation work permit.

With the reactor at power, the containment upper and lower drywells are VHRA and administrative procedures prohibit personnel access. Drywells can only be accessed via airlocks. Opening an airlock causes an MCR alarm, further protecting personnel from accidental exposure.

DCD Sections 9.1.4.12 and 12.3.1.4.4 identify access controls for areas immediately adjacent to the IFTS. Barriers to these areas are verified via ITAAC as identified in DCD Tier 1 Table 2.5.10-1.

STD COL 12.5-3-A Table 12BB-201 Very High Radiation Areas (VHRA)[1]

Zone	VHRA Name	VHRA Condition	DCD Drawings
1170	Lower Drywell	During power operation	12.3-1, 12.3-2, 12.3-3, 12.3-4, 12.3-10, 12.3-11
1570	Upper Drywell	During power operation	12.3-5, 12.3-6, 12.3-7, 12.3-10, 12.3-11
1702	Inclined Fuel Transfer Tube Room	During spent fuel transfer	12.3-7, 12.3-10
	Other areas adjacent to Inclined Fuel Transfer Tube	During spent fuel transfer	12.3-10

1. Table shows dry areas only. Other areas identified as VHRA in DCD Section 12.3 drawings are submerged areas in the vicinity of spent fuel.

STD COL 13.5-2-A Operating Procedures are developed in accordance with Subsection 13.5.2.1 and Maintenance Procedures are developed in accordance with Subsection 13.5.2.2.6.1.

Replace the fifth paragraph with the following:

EF3 COL 13.5-4-A A Plant Operations Procedures Development Plan is established in accordance with Subsection 13.5.2.1.

Replace the second sentence of "Procedures for Calibration, Inspection and Testing" with the following:

STD COL 13.5-6-A Procedures for calibration, inspection, and testing are included in the Plant Operating Procedures Development Plan.

Related to Refueling Cavity Integrity

following

Replace the second paragraph ~~with~~ the heading "Procedures ~~for Handling of Heavy Loads~~" with the following:

STD COL 13.5-5-A The scope of procedures in the Plant Operating Procedures Development Plan is addressed in Subsection 13.5.2.1.

Replace the last sentence of Subsection 13.5.2 with the following:

STD COL 13.5-3-A Emergency Procedures are developed in accordance with Subsection 13.5.2.1.4.

13.5.2.1 **Operating and Emergency Operating Procedures**

This section describes the operating procedures used by the operating organization (plant staff) to conduct routine operating, abnormal, and emergency activities in a safe manner.

STD COL 13.5-6-A **[START COM 13.5-002]** Operating procedures are developed at least six months prior to fuel load to allow sufficient time for plant staff familiarization and to allow NRC staff adequate time to review the procedures and to develop operator licensing examinations. **[END COM 13.5-002]**

Procedures Related to Refueling Cavity Integrity

STD COL 13.5-5-A
STD COL 13.5-6-A

- Procedures for calibration, inspection, and testing

EF3 COL 13.5-4-A

Implementation of the Plant Operating Procedures Development Plan establishes:

- Procedures that are consistent with the requirements of 10 CFR 50 and the TMI requirements in NUREG-0737 and Supplement 1 to NUREG-0737
- Requirements that the procedures developed include, as necessary, the elements described in the QAPD
- Bases for specifying plant operating procedures including:
  - Operator actions identified in the vendor's task analysis and PRA efforts in support of the design certification
  - Standardized plant emergency procedure guidelines
  - Consideration of plant-specific equipment selection and site specific elements such as the station water intake structure and the ultimate heat sink
- The definition of the methods through which specific operator skills and training needs, as may be considered necessary for reliable execution of the procedures, are identified and documented
- Requirements that the procedures specified above are made available for the purposes of the Human Factors V&V Implementation Plan described in GE Report NEDO-33276, ESBWR Verification & Validation Implementation Plan (DCD Reference 18.11-2)
- Procedures for the incorporation of the results of operating experience and the feedback of pertinent information into plant procedures in accordance with the provisions of TMI Item I.C.5 (NUREG-0737)

STD SUP 13.5-19

13.5.2.1.1 **System Operating Procedures**

Instructions for energizing, filling, venting, draining, starting up, shutting down, changing modes of operation, returning to service following testing or maintenance (if not contained in the applicable procedure), and other

- Provisions that personnel involved in outage activities are adequately trained including operator simulator training to the extent practicable, and training of other plant personnel, including temporary personnel, commensurate with the outage tasks they are to perform
- The guidance described in NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," to reduce the potential for loss of reactor coolant system boundary and inventory during shutdown conditions (Reference 13.5-203)

Insert 1 Here

13.5.3 COL Information

13.5-1-A Administrative Procedures Development Plan

STD COL 13.5-1-A This COL item is addressed in Subsection 13.5.1.

13.5-2-A Plant Operating Procedures Development Plan

STD COL 13.5-2-A This COL item is addressed in Subsection 13.5.2.

13.5-3-A Emergency Procedures Development

STD COL 13.5-3-A This COL item is addressed in Subsection 13.5.2.

13.5-4-A Implementation of the Plant Procedures Plan

EF3 COL 13.5-4-A This COL item is addressed in Section 13.5 and Subsection 13.5.2.

13.5-5-A Procedures Included in Scope of Plan

STD COL 13.5-5-A This COL item is addressed in Subsection 13.5.2.

13.5-6-A Procedures for Calibration, Inspection, and Testing

STD COL 13.5-6-A This COL item is addressed in Subsection 13.5.2.

Insert 1

STD SUP 13.5-40	13.5.2.2.10	**Procedures Related to Refueling Cavity Integrity**

Procedures will be established and implemented for:

- Monitoring refueling cavity seal leakage,
- Responding to refueling cavity and buffer pool drain down events, and
- Performing periodic maintenance and inspection of the refueling cavity seal and the Main Steam and Isolation Condenser System plugs in accordance with vendor recommendations.