1.0 INTRODUCTION AND INTERFACES

This chapter of the safety evaluation report (SER) is organized as follows:

- Section 1.1 provides an overview of the entire combined license (COL) application.
- Section 1.2 provides the regulatory basis for the COL licensing process.
- Section 1.3 provides an overview of the principal review matters in the COL application and where the staff's reviews of the ten parts of the COL application are documented.
- Section 1.4 documents the staff's review of Chapter 1 of the Final Safety Analysis Report (FSAR).
- Section 1.5 documents regulatory findings that are in addition to those directly related to the staff's review of the FSAR.

1.1 Summary of Application

In a letter dated September 18, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML082730763), the Detroit Edison Company (Detroit Edison, DTE)[1] submitted an application to the United States Nuclear Regulatory Commission (NRC or the Commission) for a COL to construct and operate an Economic Simplified Boiling-Water Reactor (ESBWR) pursuant to the requirements of Section 103 and 185(b) of the Atomic Energy Act of 1954 as Amended, Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications and Approval for Nuclear Power Plants," and the associated material licenses under 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material"; 10 CFR Part 40, "Domestic Licensing of Source Material"; and 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material." This reactor will be identified as Fermi 3 and will be located on the existing Fermi site in Monroe County, Michigan.

In a letter dated October 15, 2014 (ADAMS Accession No. ML14295A354) DTE Electric Company submitted Revision 7 of the Fermi 3 FSAR. Subsequent to the submission of Revision 7, in a letter dated October 31, 2014 (ADAMS Accession No ML14308A337), DTE Electric Company submitted Revision 8 of the Fermi 3 FSAR. This revision incorporates by reference the codified version of the ESBWR design certification rule (DCR) which is contained in 10 CFR Part 52, Appendix E, "Design Certification Rule for the U.S. Economic Simplified Boiling Water Reactor." The ESBWR DCR was published on October 15, 2014 (79 FR 61944) and is effective November 14, 2014. This revision only affected the content of the Chapter 1 FSAR and supports the closure of Confirmatory Item 01-1 in Section 1.2.2 of this SER. The NRC staff's findings and conclusions for the other chapters based on Revision 7 of the Fermi 3 FSAR remain valid for Revision 8. The ESBWR DCR references Revision 10 of the ESBWR design control document (DCD). The ESBWR nuclear reactor design is a 4,500-megawatt thermal reactor that uses natural circulation for normal operations and has passive safety features.

[1] By letter dated December 21, 2012, the Detroit Edison Company informed the NRC that effective January 1, 2013, the name of the company would be changed to "DTE Electric Company." The legal entity will remain the same (see ADAMS Accession No. ML12361A437).

In developing the Final Safety Evaluation Report (FSER) for Fermi 3, the staff reviewed the ESBWR DCD to ensure that the combination of the information in the DCD and the information in the COL application represents the complete scope of information relating to a particular review topic.

There is a Fermi 3 FSER chapter that was issued without a corresponding ESBWR DCD chapter. Specifically, Fermi 3 FSER Chapter 20, "Requirements Resulting from Fukushima Near-Term Task Force Recommendations," does not have a corresponding ESBWR DCD Chapter 20. The FSER Chapter 20 describes the staff's evaluation and findings for the requirements resulting from the Fukushima Near-Term Task Force recommendations that are applicable to the Fermi 3 COL. The applicable recommendations address the following four topics:

- A reevaluation of the seismic hazard (related to Recommendation 2.1).
- Mitigation strategies for beyond-design-basis external events (related to Recommendation 4.2).
- Spent fuel pool instrumentation (related to Recommendation 7.1).
- Emergency preparedness staffing and communications (related to Recommendation 9.3).

For more information on the staff's review of the above four topics, see Chapter 20 of this FSER.

The Fermi 3 COL application is organized as follows:

- **Part 1 General and Administrative Information**

Part 1 provides an introduction to the application and includes certain corporate information regarding Detroit Edison pursuant to 10 CFR 50.33(a)–(d).

- **Part 2 Final Safety Analysis Report**

Part 2 contains information pursuant to the requirements of 10 CFR 52.79 "Contents of applications; technical information in final safety analysis report," and, in general, adheres to the content and format guidance in Regulatory Guide (RG) 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)."

- **Part 3 Environmental Report**

Part 3 contains environmental-related information pursuant to the requirements of 10 CFR 52.80 and 10 CFR 51.50(c).

- **Part 4 Technical Specifications and Bases**

Part 4 addresses how the ESBWR generic technical specifications (TS) and bases of the design are incorporated by reference into the Fermi 3 plant-specific TS and bases.

- **Part 5 Emergency Plan**

Part 5 contains the Fermi Emergency Plan with supporting information such as evacuation time estimates for the Fermi plume exposure pathway and applicable offsite state and local emergency plans.

- **Part 6 [Not Used - reserved for Limited Work Authorization/site redress information]**

- **Part 7 Departures Report**

Part 7 contains information from the applicant regarding departures and exemptions. The Fermi 3 application contains one departure (EF3 DEP 11.4-1) titled "Long-Term, Temporary Storage of Class B and C Low-Level Radioactive Waste." The staff evaluated and reviewed this departure in SER Chapter 11. Part 7 also includes requests for exemptions from 10 CFR 70.22(c); 70.32(c); 74.31, "Nuclear material control and accounting for special nuclear material of low strategic significance"; 74.41, "Nuclear material control and accounting for special nuclear material of moderate strategic significance"; and 74.51, "Nuclear material control and accounting for strategic special nuclear material." The staff evaluated these exemptions in Section 1.4.5 of this SER chapter.

- **Part 8 Safeguards and Security Plans**

Part 8 was submitted concurrent with the application to the NRC as separate licensing correspondence in order to fulfill the requirements of 10 CFR 52.79(a)(35) and 10 CFR 52.79(a)(36). Part 8 contains the Fermi 3 Security Plan and Safeguards Information that is withheld from public disclosure pursuant to 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements." The information in Part 8 consists of the Physical Security Plan, the Training and Qualification Plan, the Safeguards Contingency Plan, and the Cyber Security Plan.

- **Part 9 Proprietary and Sensitive Information**

Part 9 identifies sensitive information that is withheld from public disclosure under 10 CFR 2.390, "Public inspections, exemptions, requests for withholding." Part 9 also includes sensitive, unclassified, and non-safeguards information (SUNSI); figures from Part 2 of the application that meet the SUNSI guidance for information withheld from the public; the withheld portions of the Cyber Security Plan required by 10 CFR 73.54, "Protection of Digital Computer and Communication Systems and Networks"; and the withheld portions of Mitigative Strategies Description and Plans covering the loss of large areas of the plant from explosions or fire, as required in 10 CFR 52.80(d).

- **Part 10 ITAAC**

Part 10 states that the ESBWR DCD, Tier 1 is incorporated by reference and contains the Fermi 3 Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC). The Fermi 3 COL ITAAC are addressed in four parts: (1) Design Certification (DC) ITAAC, (2) Emergency Planning ITAAC, (3) Physical Security ITAAC, and (4) Site-Specific ITAAC. In addition, Part 10 includes a list of proposed license conditions from the applicant.

1.2 Regulatory Basis

1.2.1 Applicable Regulations

10 CFR Part 52, Subpart C, "Combined Licenses," establishes the requirements and procedures applicable to the Commission-issued COL for nuclear power facilities. The following requirements are of particular significance:

- 10 CFR 52.79, "Contents of applications; technical information in final safety analysis report," identifies the technical information required in the FSAR.
- 10 CFR 52.79(d) provides additional requirements for a COL referencing a standard certified design.
- 10 CFR 52.80, "Contents of applications; additional technical information," provides additional technical information outside of the FSAR (ITAAC and the environmental report).
- 10 CFR 52.81, "Standards for review of applications," provides standards for reviewing the application.
- 10 CFR 52.83, "Finality of referenced NRC approvals; partial initial decision on site suitability," provides for the finality of the referenced NRC approvals (e.g., standard DC approvals).
- 10 CFR 52.85, "Administrative review of applications; hearings," provides requirements for administrative reviews and hearing.
- 10 CFR 52.87, "Referral to the Advisory Committee on Reactor Safeguards (ACRS)," provides for referral to the ACRS.

NRC staff reviewed this application according to the following requirements:

- 10 CFR Part 20, "Standards for Protection Against Radiation"
- 10 CFR Part 30
- 10 CFR Part 40
- 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities"
- 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions"
- 10 CFR Part 52
- 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants"
- 10 CFR Part 55, "Operators' Licenses"

- 10 CFR Part 70
- 10 CFR Part 73, “Physical Protection of Plants and Materials”
- 10 CFR Part 74, “Material Control and Accounting of Special Nuclear Material”
- 10 CFR Part 100, “Reactor Site Criteria”
- 10 CFR Part 140, “Financial Protection Requirements and Indemnity Agreements”

The staff evaluated the application against the guidance and acceptance criteria in the following:

- NUREG–0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)”
- NUREG–1520, “Standard Review Plan for the Review of a Licensing Application for a Fuel cycle Facility”
- NUREG-1555, Revision 1: “Standard Review Plans for Environmental Reviews for Nuclear Power Plants”
- NUREG–1556, “Consolidated Guidance About Materials Licenses”
- NUREG–1577, “Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance”

In addition, the staff considered the format and content guidance in RG 1.206 for the COL application.

1.2.2 Finality of Referenced NRC Approvals

In accordance with 10 CFR 52.83, “Finality of referenced NRC approvals; partial initial decision on site suitability,” if the application for a COL references a DCR, the scope and nature of matters resolved for the application and any COL issued are governed by the applicable relevant provisions. For the ESBWR DCR, finality is specifically addressed in 10 CFR 52.63, “Finality of standard design certifications.” Based on the finality afforded to referenced certified designs, the scope of this COL application review as it relates to the referenced certified design is limited to items that fall outside the scope of the certified design (e.g., COL information items, design information replacing conceptual design information (CDI), and programmatic elements that are the responsibility of the COL).

The contents of the FSAR are specified in 10 CFR 52.79(a), which requires the information submitted in the FSAR to describe the facility; identify the design bases and the limits on its operation; and present a safety analysis of the structures, systems, and components (SSCs) of the facility as a whole. For a COL application that references a DC, Section 52.79(d) requires the DCD to be included in or incorporated by reference into the FSAR. Additionally, a COL application that references a DC must also contain the information and analysis required to be submitted within the scope of the COL application but is outside the scope of the DCD. This combined information addresses plant- and site-specific information and includes all COL action or information items; design information that replaces CDI; and programmatic information that

was not reviewed and approved in connection with the DC rulemaking. The initial step in the NRC staff's evaluation of the COL application is to confirm that the complete set of information required to be addressed in the COL application is also in the DC supplemented by the COL application or completely included in the COL application. Following this confirmation, the staff's review of the COL application is limited to the COL review items.

This FSER is based on the applicant's Revision 8 of the Fermi 3 FSAR, which incorporates by reference ESBWR DCD, Revision 10. Although the referenced version of the ESBWR design was docketed but not yet certified, 10 CFR 52.55(c) allows an applicant to take a risk to incorporate by reference a design that is not yet certified. The results of the staff's technical evaluation of the ESBWR DCD application are in NUREG–1966 (ADAMS Accession No. ML14100A304), and it's Supplement 1 (ADAMS Accession No. ML14265A084). Because the ESBWR DC was not yet certified, the applicant had not incorporated the codified version of the DC into the application. The incorporation of the ESBWR DCR into the Fermi 3 COL application was being tracked as Confirmatory Item 01-1. The staff verified that FSAR Revision 8 incorporates by reference the ESBWR DCR. Therefore, Confirmatory Item 01-1 is resolved.

1.2.3 Overview of the Design-Centered Review Approach

The design-centered review approach (DCRA) is described in Regulatory Issue Summary 2006-06, "New Reactor Standardization Needed to Support the Design-Centered Licensing Review Approach." The DCRA is endorsed by the Commission's Staff Requirements Memorandum SECY-06-0187, "Semiannual Update of the Status of New Reactor Licensing Activities and Future Planning for New Reactors," dated November 16, 2006. The DCRA is the Commission's policy intended to promote a standardization of COL applications; it is beyond the scope of information included in the DC. This policy directs the staff to perform one technical review for each standard issue outside the scope of the DC and to use this decision to support decisions on multiple COL applications. In this context, "standard" refers to essentially identical information and may include information provided by the applicant(s) to resolve plant-specific issues.

The first COL application submitted for NRC staff to review is designated in a design center as the referenced COL (R-COL) application, and the subsequent applications in the design center are designated as subsequent COL (S-COL) applications. The North Anna Unit 3 COL application was originally designated as the R-COL application for the ESBWR design center, and the staff issued an SER with open items that documented a review of both standard and site-specific information. In a letter dated May 18, 2010, Dominion Energy, Inc. informed the NRC that it had changed reactor technology and had selected the U.S. Advanced Pressurized-Water Reactor (US-APWR) for its North Anna Unit 3 COL application. As a result of Dominion's decision, Detroit Edison responded to all of the open items in the staff's North Anna Unit 3 SER that related to standard content on behalf of the ESBWR design center and consistent with its new position as the R-COL for the ESBWR design center.[2] Thus, this SER documents the staff's review of both standard and site-specific information and is the first complete SER for a COL application in the ESBWR design center.

[2] By letter dated April 25, 2013 (ADAMS Accession No. ML13120A016), the applicant for the North Anna Unit 3 COL application informed the NRC that it had revised its technology selection and selected the General Electric (GEH) ESBWR nuclear technology for the North Anna Unit 3 project. The applicant submitted a revised North Anna Unit 3 COLA to the NRC on July 31, 2013 (ADAMS Accession No. ML13221A504). However, the Fermi COL application remains as the ESBWR design center R-COL.

To ensure that the staff's findings on standard content that were documented in the SER with open items issued for the North Anna Unit 3 COL application are equally applicable to the Fermi 3 COL application, the staff undertook the following reviews:

- The staff compared the North Anna Unit 3 COL FSAR, Revision 1, to the Fermi 3 COL FSAR. In performing this comparison, the staff considered changes to the Fermi 3 COL FSAR (and other parts of the COL application, as applicable) resulting from requests for additional information (RAIs) and open and confirmatory items identified in the North Anna Unit 3 SER with open items.

- The staff confirmed that all responses to RAIs identified in the corresponding standard content evaluation (the North Anna Unit 3 SER) were endorsed.

- The staff verified that the site-specific differences are not relevant.

Where there were differences between the information provided by the Fermi 3 applicant and that provided by the North Anna Unit 3 applicant regarding details in the application for the standard content material, the staff evaluated the differences and determined whether the standard content material of the North Anna Unit 3 SER was still applicable to the Fermi 3 application. These evaluations are in the SERs that reference the standard content.

This standard content material is identified in this SER by using italicized, double-indented formatting. This SER also documents the staff's findings with respect to the closure of all open items related to standard content, which will be used as the R-COL reference for other ESBWR S-COL application reviews. Finally, this SER documents the staff's findings with respect to site-specific issues related only to the Fermi 3 site.

1.3 Principal Review Matters

The staff's evaluations related to the COL application review are addressed as follows:

- **Part 1 General and Administrative Information**

The staff's evaluation of the corporate information regarding DTE that is pursuant to 10 CFR 50.33, "Contents of applications; general information," is in Section 1.5.1 of this SER.

- **Part 2 Final Safety Analysis Report**

The staff's evaluation of information in the Fermi 3 FSAR is in the corresponding sections of this SER.

- **Part 3 Environmental Report**

The staff's evaluation of environmental information pursuant to the requirements of 10 CFR 51.50(c) addressed in the environmental report is in the staff's Final Environmental Impact Statement in NUREG–2105, "Final Environmental Impact Statement for Combined License (COL) for Enrico Fermi Unit 3."

- **Part 4 Technical Specifications**

Chapter 16 of this SER contains the staff's evaluation of the Fermi 3 plant-specific TS (PTS), and the associated PTS bases.

- **Part 5 Emergency Plan**

Chapter 13 of this SER includes the staff's evaluation of the Fermi 3 Emergency Plan, including related ITAAC, and the Federal Emergency Management Agency's review of State and local emergency plans.

- **Part 6 [Not Used - reserved for Limited Work Authorization/site redress information]**

- **Part 7 Departures Report**

The staff's evaluation of departures and exemptions is provided in the applicable chapters of this SER (i.e., Chapters 1 through 19). The staff's review of the requested exemptions is included in Section 1.4.5 of this SER. In addition, any associated exemptions are granted separately from this SER.

- **Part 8 Safeguards and Security Plans**

The staff's evaluation of the Fermi 3 Security Plan and Safeguards Information is documented separately from this SER and is withheld from the public in accordance with 10 CFR 73.21. A non-sensitive summary of the staff's evaluation is in Section 13.6 of this SER.

- **Part 9 Proprietary and Sensitive Unclassified Non-Safeguards Information**

The staff's evaluation of the sensitive information, withheld information in Part 9 occurs in the context of the specific subject being reviewed and is documented by the staff accordingly throughout the staff's SER. In addition, the applicant has included withheld portions of the applicant's Cyber Security Plan as required by 10 CFR 73.54. The staff's evaluation of the cyber security-related plans is included in SER Section 13.8. Furthermore, the applicant has provided withheld portions of the Mitigative Strategies Description and Plans for the loss of large areas of the plant due to explosions or fire, as required by 10 CFR 52.80(d). A summary of the staff's evaluation of this information is in Appendix 19A of this SER. The staff's complete evaluation is documented separately from this SER and is withheld from the public in accordance with 10 CFR 2.390, "Public inspections, exemptions, requests for withholding."

- **Part 10 ITAAC and Proposed License Conditions**

Chapter 14 of this SER contains the staff's evaluation of the ITAAC, except for the Physical Security ITAAC in SER Section 13.6. In addition, Part 10 of the application includes a list of proposed license conditions that are evaluated by the staff throughout this SER. At the completion of the staff's Fermi 3 COL application review, the staff will identify all proposed license conditions and ITAAC for recommendation that the Commission should impose if a COL is issued to the applicant.

Organization of this SER

The staff's SER is structured as follows:

- The SER adheres to the "finality" afforded to COL applications that incorporate by reference a standard certified design. As such, rather than repeat any technical evaluation of material incorporated by reference, this SER points to the corresponding review findings of NUREG-1966. However, the referenced ESBWR DCD and the Fermi 3 COL FSAR are considered in the staff's safety evaluation—to the extent necessary—to ensure that the expected scope of information to be included in a COL application is adequately addressed in the DCD and/or in the COL FSAR.

- For sections that were completely incorporated by reference without any supplements or departures, the SER simply points to the ESBWR DCD and the related NUREG–1966 to confirm that all relevant review items are addressed in the ESBWR DCD and the staff's evaluation is documented in NUREG–1966.

- For subject matter within the scope of the COL application that supplements or departs from the DCD, this SER generally follows a six-section organization as follows:

    - "Introduction," which provides a brief overview of the specific subject matter.

    - "Summary of Application," which identifies whether portions of the review have received finality and clearly identify the scope of the COL review.

    - "Regulatory Basis," which identifies the regulatory criteria for the information addressed by the COL application.

    - "Technical Evaluation," which focuses on the information addressed by the COL application.

    - "Post Combined License Activities," which identifies the proposed license conditions, the ITAAC, or the FSAR information commitments that are post COL activities.

    - "Conclusion," which summarizes how the technical evaluation resulted in a reasonable assurance determination by the staff on the basis that the relevant acceptance criteria have been met.

1.3.1 Staff Review of Fermi COL FSAR Chapter 1

1.3.2 Introduction

There are two types of information in Chapter 1 of the Fermi 3 COL FSAR:

- General information that enables the reviewer or reader to obtain a basic understanding of the overall facility without having to refer to the subsequent chapters. A review of the remainder of the application can then be completed with a better perspective and recognition of the relative safety significance of each individual item in the overall plant description.

- Specific information relating to qualifications of the applicant, construction impacts, and regulatory considerations that applies throughout the balance of the application (e.g., conformance with the acceptance criteria in NUREG–0800).

This section of the Chapter 1 SER (1) identifies the information in Chapter 1 incorporated by reference, (2) summarizes all of the new information, and (3) documents the staff's evaluation of the sections addressing regulatory considerations.

1.3.3 Summary of Application

The information related to COL/SUP items included in Chapter 1 of the Fermi 3 COL FSAR includes either statements of fact or information recommended in RG 1.206. No staff technical evaluation was necessary where the statements were strictly background information. However, where technical evaluation of these COL/SUPs was necessary, the evaluation is not in this SER section, but in subsequent sections as referenced below.

Section 1.1 – Introduction

Section 1.1 of the Fermi 3 FSAR, Revision 8, incorporates by reference Section 1.1 of the ESBWR DCD, Revision 10. In addition, in COL FSAR Section 1.1, the applicant provides the following:

COL Item

EF3 COL 1.1-1-A

The applicant provides information regarding the site-specific values for plant output.

Supplemental Information

EF3 SUP 1.1-1 and EF3 SUP 1.1-2

The applicant provides supplemental information that includes general information regarding format and content of the application. The applicant also identifies systems and structures outside the scope of the ESBWR standard plant that are discussed in the applicable chapter (i.e., Chapters 2 through 19) of this SER.

EF3 SUP 1.1-3

The applicant indicates that the Detroit Edison Company was submitting the application to the NRC under Section 103 of the Atomic Energy Act to construct and operate a nuclear plant to be located on the existing Enrico Fermi Atomic Power Plant (Fermi) site in Monroe County, Michigan.

EF3 SUP 1.1-4

The applicant provides a description of the Fermi 3 plant location.

EF3 SUP 1.1-5

The applicant provides the anticipated schedule for the construction and operation of the Fermi 3 plant.

Conceptual Design Information

EF3 CDI

The applicant indicates that FSAR Figure 2.1-204 provides the orientation of the principal Fermi 3 plant structures.

Section 1.2 – General Plant Description

Section 1.2 of the Fermi 3 COL FSAR, Revision 8, incorporates by reference Section 1.2 of the ESBWR DCD, Revision 10. In addition, in COL FSAR Section 1.2, the applicant provides the following:

Departures Not Requiring NRC Approval:

EF3 DEP 11.4-1

The applicant states that the radwaste building is configured to accommodate at least 10 years of packaged Class B and Class C waste and approximately three months of packaged Class A waste based on routine operations and anticipated operational occurrences. The applicant also provides the revised radwaste building elevation plans in Figures 1.2-21 to 1.2-25, which contain security-related information and are therefore withheld under 10 CFR 2.390. This departure is reviewed in Chapter 11 of this SER.

Supplemental Information:

STD SUP 1.2-1

The applicant provides the following commitment:

> COM 1.2-001: To the extent practical, modular construction techniques that have been applied during ABWR construction projects will be adapted and/or modified for use during ESBWR construction. Modularization reviews will be performed to develop a plan for bringing the ABWR experience into the ESBWR.

Once completed, the results of the modularization reviews will be used as guidance to develop the detailed design of the areas affected by modularization.

Conceptual Design Information:

STD and EF3 CDI

The applicant provides general plant descriptions of the main turbine, main condenser, hydrogen water chemistry system, zinc injection system, and freeze protection as well as other building structures. This information is discussed in the applicable chapter (i.e., Chapters 2 through 19) of this SER.

Section 1.3 – Comparison Tables

Section 1.3 of the Fermi 3 COL FSAR, Revision 8, incorporates by reference Section 1.3, "Comparison Tables", of the ESBWR DCD, Revision 10. In addition, in COL FSAR Section 1.3 the applicant provides the following:

COL Item

EF3 COL 1.3-1-A

The applicant states that there are no updates to DCD Tier 2, Table 1.3-1 based on unit-specific information.

Section 1.4 – Identification of Agents and Contractors

Section 1.4 of the Fermi 3 COL FSAR, Revision 8, incorporates by reference Section 1.4, "Identification of Agents and Contractors", of the ESBWR DCD, Revision 10. In addition, in COL FSAR Section 1.4, the applicant provides the following:

Supplemental Information

EF3 SUP 1.4-1

The applicant provides additional information to identify Detroit Edison[1] (the applicant) as the operator of the Fermi 3 plant. Detroit Edison also identifies GE-Hitachi Nuclear Energy Americas, LLC (GEH) as the reactor technology vendor for the design of the unit and the specialized consulting firm that assisted in preparing the COL application for Fermi 3. The contractors for the construction of the turbine island and the nuclear island have not yet been selected. However, the applicant states that the contractors will be selected based on their previous work in the nuclear industry; ongoing nuclear business; ability to deliver integrated engineering and construction services; and available resources. In addition, the applicant provides the following commitment:

[1] By letter dated December 21, 2012, the Detroit Edison company informed the NRC that effective January 1, 2013, the name of the company would be changed to "DTE Electric Company." The legal entity will remain the same (see ADAMS Accession No. ML12361A437).

COM 1.4-001: The primary contractor for site engineering has not been selected at the time of COLA submittal; this information will be supplied in an FSAR update following selection.

Section 1.5 Requirements for Further Technical Information

Section 1.5 of the Fermi 3 COL FSAR, Revision 8, incorporates by reference Section 1.5 of the ESBWR DCD, Revision 10.

STD SUP 1.5-1

The applicant provides information regarding Post-Fukishima Near-Term Task Force Recommendations.

Section 1.6 – Material Incorporated by Reference

Section 1.6 of the Fermi 3 COL FSAR, Revision 8, incorporates by reference Section 1.6, "Material Incorporated By Reference", of the ESBWR DCD, Revision 10. In addition, in COL FSAR Section 1.6, the applicant provides the following:

Supplemental Information

EF3 SUP 1.6-1

Table 1.6-201 lists topical reports not included in DCD Section 1.6 that are incorporated by reference in whole or in part into the Fermi 3 FSAR.

Section 1.7 – Drawings and Other Detailed Information

Section 1.7 of the Fermi 3 COL FSAR, Revision 8, incorporates by reference Section 1.7 of the ESBWR DCD, Revision 10. In addition, in COL FSAR Section 1.7, the applicant provides the following:

Supplemental Information

EF3 SUP 1.7-1

FSAR Table 1.7-201 supplements DCD Table 1.7-2 for those portions of the electrical system configuration drawings outside the scope of the DCD. FSAR Table 1.7-202 supplements DCD Table 1.7-3 for those portions of the mechanical system configuration drawings outside the scope of the DCD. In addition, COL Item 1.7-1-H was deleted from the referenced DCD.

Section 1.8 – Interfaces with Standard Design

Section 1.8 of the Fermi 3 COL FSAR, Revision 8, incorporates by reference Section 1.8, "Interfaces with Standard Design", of the ESBWR DCD, Revision 10. In addition, in COL FSAR Section 1.8, the applicant provides the following:

Supplemental Information

EF3 SUP 1.8-1

The applicant states that information in FSAR Chapter 2 demonstrates that the site characteristics fall within the ESBWR site parameters specified in the referenced certified design.

EF3 SUP 1.8-2

The applicant states that Section 1.10 identifies specific FSAR sections that address the COL information items from the referenced certified design and the COL action items.

EF3 SUP 1.8-3

The applicant states that one site-specific departure (EF3 DEP 11.4-1) from the referenced certified design was identified, which is described in Part 7 of the COL application and listed in FSAR Table 1.8-201. This departure is evaluated in Chapter 11 of this SER.

EF3 SUP 1.8-5

The applicant includes FSAR Table 1.8-202, which identifies systems that either adopt the CDI in the DCD as the actual system design information or replace the CDI in the DCD with site-specific design information. Information adopted from the DCD is evaluated by the NRC in NUREG–1966. Information replaced by site-specific design information is evaluated in the applicable chapters of this SER (i.e., Chapters 2 through 19).

EF3 SUP 1.8-6

The FSAR states that the applicant reviewed site- and plant-specific information that included site meteorological data, site-specific population distribution, and plant-specific design information that replaced conceptual design information described in the DCD with respect to the DC probabilistic risk assessment (PRA). FSAR Section 19.5 documents the conclusion that there is no significant change from the certified design PRA. The staff's evaluation is in Section 19.5 of this SER.

EF3 SUP 1.8-7

The applicant states that there are no current plans for an independent Fermi 3 spent fuel storage installation (ISFSI), and considerations for the location of a future ISFSI will include the impacts from external hazards as required by the associated 10 CFR 72 license for the ISFSI.

Conceptual Design Information

STD CDI

The applicant states that DCD Tier 1 identifies significant interface requirements for those systems that are beyond the scope of the DCD.

Section 1.9 – Conformance with Standard Review Plan and Applicability of Codes and Standards

Section 1.9 of the Fermi 3 COL FSAR, Revision 8, incorporates by reference Section 1.9, "Conformance with Standard Review Plan and Applicability of Codes and Standards", of the ESBWR DCD, Revision 10. In addition, in COL FSAR Section 1.9, the applicant provides the following:

COL Items

EF3 COL 1.9-3-A

The applicant adds three FSAR tables. Table 1.9-201 evaluates conformance with the SRP sections and the Branch Technical Positions (BTPs) that were in effect 6 months before submitting the COL application. Table 1.9-202 evaluates conformance with Division 1, 4, 5, and 8 RGs in effect 6 months before submittal of the COL application. Table 1.9-203 evaluates conformance with FSAR content information and format guidance in RG 1.206.

Supplemental Information

EF3 SUP 1.9-1

The applicant provides FSAR Table 1.9-204, which identifies the industrial codes and standards applicable to those portions of the Fermi 3 design that are beyond the scope of the DCD and to the operational aspects of the facility.

EF3 SUP 1.9-2

The applicant provides FSAR Table 1.9-205, which addresses operational experience information as described in the applicable NUREG reports, for those portions of the Fermi 3 design and operation that are beyond the scope of the ESBWR DCD. The comment column of Table 1.9-205 includes a reference to the applicable FSAR section that provides further discussion of the operational experience.

Section 1.10 – Summary of COL Items

Section 1.10 of the Fermi 3 COL FSAR, Revision 8, incorporates by reference Section 1.10, "Summary of COL Items", of the ESBWR DCD, Revision 10. In addition, in COL FSAR Section 1.10, the applicant provides the following:

Supplemental Information

EF3 SUP 1.10-1

The applicant includes FSAR Table 1.10-201, which lists the FSAR locations that address the individual COL items from the DCD.

Section 1.11 – Technical Resolutions of Task Action Plan Items, New Generic Issues, New Generic Safety Issues, and Chernobyl Issues

Section 1.11 of the Fermi 3 COL FSAR, Revision 8, incorporates by reference Section 1.11, "Technical Resolutions of Task Action Plan Items, New Generic Issues, New Generic Safety Issues and Chernobyl Issues", of the ESBWR DCD, Revision 10. In addition, in COL FSAR Section 1.11, the applicant provides the following:

COL Items

EF3 COL 1.11-1-A

The applicant provides FSAR Table 1.11-201, which supplements DCD Table 1.11-1 to address the site-specific aspects of activities required by the action plan that the COL applicant must complete (i.e., Note 2) and environmental issues that are outside the scope of the DCD (i.e., Note 7).

Supplemental Information

EF3 SUP 1.11-1

The applicant adds FSAR Table 1.11-202, which supplements DCD Table 1.11-1 with references to FSAR locations that provide additional information on specific issues. It was discovered that Table 1.11-202 references EF3 SUP 1.11-2. By letter dated May 30, 2014, the applicant identified this as a typographical error and included a proposed FSAR change to correct Table 1.11-202 to reference EF3 SUP 1.11-1. The staff will track the applicant's revision to this FSAR section as Confirmatory Item 01-2. The staff verified that FSAR Revision 7 corrected Table 1.11-202 to reference EF3 SUP 1.11-1. Therefore, Confirmatory Item 01-2 is resolved.

Section 1.12 – Impact of Construction Activities on Fermi 2

The applicant includes a supplemental information section not provided in the referenced DCD, which addresses an evaluation of the impacts from Fermi 3 construction activities on Fermi 2.

Supplemental Information

EF3 SUP 1.12-1

The applicant provides FSAR Section 1.12, which summarizes the applicant's evaluation of the potential impact from the construction of Fermi 3 on Fermi 2 SSCs important to safety. Section 1.12 also describes the managerial and administrative controls used to provide assurance that Fermi 2 limiting conditions for operation (LCOs) will not be exceeded as a result of Fermi 3 construction activities. This evaluation involved the following sequential steps:

- Identification of potential construction activity hazards
- Identification of SSCs important to safety
- Identification of LCOs applicable to Fermi 2
- Identification of impacted SSCs and LCOs
- Identification of applicable managerial and administrative controls

In addition, the applicant provides the following commitment:

> COM 1.12-001: Managerial and administrative controls are utilized to identify preventive and mitigative measures and provide notification of hazardous activity initiation in order to prevent or minimize exposure of SSCs to the identified hazards. Applicable managerial and administrative controls are listed in Table 1.12-203.

1.3.4 Regulatory Basis

The regulatory basis of the information incorporated by reference is in NUREG–1966. In addition, the relevant requirements of the Commission regulations for the information in FSAR Chapter 1, and the associated acceptance criteria, are in Section 1.0 of NUREG–0800.

The applicable regulatory requirements are as follows:

- 10 CFR 50.43(e), as it relates to requirements for approving applications for a DC, COL, manufacturing license, or operating license that proposes nuclear reactor designs that differ significantly from light-water reactor designs licensed before 1997 or that use simplified, inherent, passive, or other innovative means to accomplish their safety functions.

- 10 CFR 52.77 and 10 CFR 52.79, as they relate to general introductory matters.

- 10 CFR 52.79(a)(17) ,as it relates to compliance with technically relevant positions of the Three Mile Island requirements.

- 10 CFR 52.79(a)(20), as it relates to proposed technical resolutions of those unresolved safety issues and medium- and high-priority generic safety issues that are identified in the current version of NUREG–0933, “A Prioritization of Generic Safety Issues," on the date up to 6 months before the docket date of the application and that are technically relevant to the design.

- 10 CFR 52.79(a)(31), as it relates to nuclear power plants that will be operated on multiunit sites and to an evaluation of potential hazards to the structures, systems, and components important to safety of operating units resulting from construction activities; in addition to providing a description of the managerial and administrative controls to be used to provide assurance that the limiting conditions for operation will not be exceeded as a result of construction activities at the multiunit sites.

- 10 CFR 52.79(a)(37), as it relates to the information necessary to demonstrate how operating experience insights are incorporated into the plant design.

- 10 CFR 52.79(a)(41), as it relates to an evaluation of the application against the applicable NRC review guidance in effect 6 months before the docket date of the application.

- 10 CFR 52.79(d)(2), which requires that for a COL referencing a standard DC, the FSAR must demonstrate that the interface requirements established for the design under 10 CFR 52.47 have been met.

- 10 CFR 52.97(a)(1)(iv), which states that an applicant is technically and financially qualified to engage in the activities authorized.

The related acceptance criteria are as follows:

- There are no specific SRP acceptance criteria associated with the general requirements.

- For regulatory considerations, acceptance is based on addressing the regulatory requirements discussed in FSAR Chapter 1 or in the FSAR section referenced in Chapter 1. The SRP acceptance criteria associated with the referenced section will be reviewed within the context of that review.

- For the performance of new safety features, the FSAR information should be sufficient to provide reasonable assurance that (1) the new safety features will perform as predicted in the applicant's FSAR; (2) the effects of system interactions are acceptable; and (3) the applicant's data are sufficient to validate analytical codes. The design qualification testing requirements may be met with either separate effects or integral system tests; prototype tests; or a combination of tests, analyses, and operating experience.

- For conformance with regulatory criteria, RG 1.206 states that an applicant should perform an evaluation for conformance with the RGs that were in effect six months before the submittal of the COL application.

1.3.5 Technical Evaluation

As documented in NUREG–1966, the staff reviewed and approved Chapter 1 of the certified ESBWR DCD. The staff also reviewed Chapter 1 of the Fermi 3 COL FSAR, Revision 8, and checked the referenced ESBWR DCD to ensure that the combination of the information in the COL FSAR and the information in the ESBWR DCD represents the complete scope of information relating to this review topic. The staff's review confirms that information in the application and information incorporated by reference address the required information related to this chapter.

The staff notes that the information in the following sections of Fermi 3 FSAR Chapter 1 is for general informational purposes, and no specific technical or regulatory findings are made within the review scope of SER Chapter 1. The applicant's information in these sections is used as reference material to support the staff's technical reviews in Chapters 2 through 20 of this SER.

The staff reviewed the information in the Fermi 3 COL FSAR:

<u>Section 1.1 – Introduction</u>

In this section, the applicant briefly discusses the principal aspects of the overall application. There are no specific NUREG–0800 acceptance criteria related to the general information in Section 1.1 and no specific regulatory findings. The applicant's information gives the reader a basic overview of the nuclear power plant and the construct of the Fermi 3 FSAR itself.

Supplemental Information

EF3 SUP 1.1-5

The staff notes the following for EF3 SUP 1.1-5 identified in this section:

The applicant previously provided the anticipated schedule for construction and operation of the Fermi 3 nuclear plant. However, in a letter dated April 18, 2013 (ADAMS Accession No. ML13109A427), the applicant removed this schedule and opted to provide the following commitment (COM 1.1-001) in order to provide construction and startup schedules after the issuance of a COL license and per RG 1.206, Regulatory Position C.I.1.1.5.

> COM 1.1-001: Construction and startup schedules will be provided after issuance of the COL once a positive decision to construct the plant has been made.

Revision 8 of the Fermi 3 COL application incorporates this proposed FSAR change. In conclusion, the staff finds that COM 1.1-001 and the information provided by the applicant in FSAR Section 1.1 is acceptable within the review scope of Chapter 1 and satisfies RG 1.206, Section C.I.1.1.

Section 1.2 – General Plant Description

In this section, the applicant summarizes the principal characteristics of the site and describes the facility. There are no specific NUREG–0800 acceptance criteria related to the general information in FSAR Section 1.2 and no specific regulatory findings. The applicant's information gives the reader a general plant description.

Departure Not Requiring NRC Approval:

EF3 DEP 11.4-1

The staff notes the following for Departure EF3 DEP 11.4-1 identified in this section:

The applicant states that the radwaste building is configured to accommodate at least 10 years of packaged Class B and Class C waste and approximately three months of packaged Class A waste based on routine operations and anticipated operational occurrences. The applicant also provides the revised radwaste building elevation plans in Figures 1.2-21 to 1.2-25, which contain security-related information and are therefore withheld under 10 CFR 2.390. This departure is reviewed in Chapter 11 of this SER.

Supplemental Information

STD SUP 1.2-1

The staff notes that STD SUP 1.2-1 provides the following commitment:

> COM 1.2-001: To the extent practical, modular construction techniques that have been applied during ABWR construction projects will be adapted and/or modified for use during ESBWR construction. Modularization reviews will be performed to develop a plan for bringing the ABWR experience into the ESBWR.

> Once completed, the results of the modularization reviews will be used as guidance to develop the detailed design of the areas affected by modularization.

In conclusion, the staff finds that the applicant's commitment (COM 1.2-001) and the departure information in FSAR Section 1.2 are acceptable within the review scope of Chapter 1 and satisfy RG 1.206, Regulatory Position C.I.1.2.

Section 1.3 – Comparison Table

In this section, the applicant provides a comparison with other facilities of a similar design and comparable power level. There are no specific NUREG–0800 acceptance criteria related to the general information in Section 1.3 and no specific regulatory findings.

COL Item

EF3 COL 1.3-1-A

The applicant provided EF3 COL 1.3-1-A, which states that there are no updates to DCD Table 1.3-1 based on unit-specific information. The staff finds that the applicant's information satisfies COL Item 1.3-1-A, and the information in FSAR Section 1.3 is acceptable within the review scope of Chapter 1 and satisfies RG 1.206, Regulatory Position C.I.1.3.

Section 1.4 – Identification of Agents and Contractors

This section identifies primary agents or contractors for the design, construction, and operation of the nuclear power plant. There are no specific NUREG–0800 acceptance criteria related to the general information in Section 1.4 and no specific regulatory findings.

Supplemental Information

EF3 SUP 1.4-1

The staff notes the following for EF3 SUP 1.4-1 identified in this section:

In accordance with RG 1.206, Regulatory Position C.I.1.4, "Identification of Agents and Contractors," the applicant's supplemental information identifies the primary agents for the design, construction, and operation of the proposed facility with the exception of contractors for the site engineering and for the construction of the turbine island and nuclear island. However, the applicant states that the contractors (for the construction of the turbine island and nuclear island) will be selected based on their previous work in the nuclear industry; ongoing nuclear business; ability to deliver integrated engineering and constructions services; and available resources. The applicant delineates the division of responsibility among the contractors cited in the FSAR.

In addition, the applicant provides the following commitment (COM 1.4-001) in EF3 SUP 1.4-1:

> COM 1.4-001: The primary contractor for site engineering has not been selected at the time of COLA submittal; this information will be supplied in an FSAR update following selection.

With respect to commitment (COM 1.4-001), the staff notes the following:

Fermi 3 FSAR Chapter 17, “Quality Assurance,” and the Fermi 3 Quality Assurance Program Description (QAPD) describe the DTE QA Program and QA controls for contractors performing safety-related work activities associated with the Fermi 3 COL application. The COL applicant commits to ASME NQA-1-1994 edition as a method of meeting the requirements of Appendix B to 10 CFR Part 50. The COL applicant is responsible for meeting regulatory requirements and typically imposes applicable technical and quality assurance requirements through purchase orders (POs) with contractors. These contractors are then contractually required to meet the requirements imposed by the PO. The COL applicant typically performs QA audits of these contractors to verify their compliance with PO requirements. The NRC may also perform inspections of DTE contractors with Appendix B-compliant QA programs to verify compliance with regulatory requirements. The staff finds this supplemental information acceptable. The staff also finds that commitment (COM 1.4-001) is acceptable as a post-licensing activity because contractors performing safety-related work activities would have to meet the applicable Chapter 17 requirements, as specified in the applicant’s purchase order. The staff’s evaluation of Chapter 17 of the Fermi 3 FSAR is in Chapter 17 of this SER.

In addition, the NRC staff evaluated DTE’s technical qualification to hold a 10 CFR Part 52 license in accordance with 10 CFR 52.97(a)(1)(iv). The financial qualifications that are also a requirement of 10 CFR 52.97(a)(1)(iv) are evaluated in Section 1.5.1 of this SER.

DTE owns and operates Fermi 2 which is a General Electric boiling water reactor (BWR), rated at 3430 MWt. Because DTE holds a 10 CFR Part 50 license for a nuclear power plant and has demonstrated its ability to build and operate a nuclear plant, the staff finds that DTE is technically qualified to hold a 10 CFR Part 52 license.

In conclusion, based on the above, the staff finds that the applicant’s commitment (COM 1.4-001) and the supplemental information in FSAR Section 1.4 are acceptable within the review scope of Chapter 1 and satisfy RG 1.206, Regulatory Position C.I.1.4. Additionally, based on DTE’s experience with nuclear power plants and the staff’s evaluation of DTE’s QA program, the staff finds that DTE is technically qualified to hold a 10 CFR Part 52 license in accordance with 10 CFR 52.97(a)(1)(iv).

Section 1.5 – Requirements for Further Technical Information

In this section, an applicant who does not reference a certified design should provide information to demonstrate the performance of new safety features. The Fermi 3 application references the ESBWR DCD application. There are no specific NUREG–0800 acceptance criteria related to the general information in Section 1.5 and no specific regulatory findings. The applicant incorporates by reference Section 1.5 of the ESBWR DCD. Per RG 1.206, Regulatory Position C.I.1.5, only an applicant who does not reference a certified design would need to provide additional information for this section. The staff finds that the applicant’s information in FSAR Section 1.5 is acceptable within the review scope of Chapter 1 and satisfies RG 1.206, Regulatory Position C.I.1.5.

STD SUP 1.5-1

The applicant provides information regarding Post-Fukishima Near-Term Task Force Recommendations. The staff’s evaluation of Fukishima Recommendations 2.1, 4.2, 7.1, and 9.3 are provided in Chapter 20 of the SER stated in Section 1.1, Summary of Application, above.

Section 1.6 – Material Incorporated by Reference

In this section, an applicant provides a tabulation of all topical reports that are incorporated by reference as part of the application. There are no specific NUREG–0800 acceptance criteria related to the general information in Section 1.6 and no specific regulatory findings.

COL Item

EF3 SUP 1.6-1

In site-specific COL Item EF3 SUP 1.6-1, the applicant includes FSAR Table 1.6-201 which lists the topical reports that are incorporated by reference in whole or in part into the FSAR that were not included in ESBWR DCD, Section 1.6. The staff finds that the applicant's information in FSAR Section 1.6 is acceptable within the review scope of Chapter 1 and satisfies RG 1.206, Regulatory Position C.I.1.6.

Section 1.7 – Drawings and Other Detailed Information

In this section, the applicant provides a tabulation of all instrument and control functional diagrams cross-referenced to the related application sections. There are no specific NUREG-0800 acceptance criteria related to the general information in Section 1.7 and no specific regulatory findings.

Supplemental Information

EF3 SUP 1.7-1

EF3 SUP 1.7-1, includes FSAR Tables 1.7-201 and 1.7-202, which list the supplemental drawings of electrical system and mechanical system configurations, in addition to the information in ESBWR DCD, Tables 1.7-2 and 1.7-3. The staff finds that the applicant's information in FSAR Section 1.7 is acceptable within the review scope of Chapter 1 and satisfies RG 1.206, Regulatory Position C.I.1.7.

Section 1.8 – Interfaces with Standard Design

In this section, an applicant who references a certified design has to satisfy interface requirements established for the certified design. There are no specific NUREG–0800 acceptance criteria related to the general information in Section 1.8 and no specific regulatory findings. The applicant provides the following supplemental information and CDI:

Supplemental Information

EF3 SUP 1.8-1

The applicant states that FSAR Chapter 2 provides information demonstrating that site characteristics fall within the ESBWR site parameters specified in the referenced certified design. The review of the site characteristics is in Chapter 2 of this SER.

EF3 SUP 1.8-2

The applicant states that FSAR Section 1.10 identifies specific sections that address the COL information items from the referenced certified design and the COL action items. The review of the COL items listed in Table 1.10-201 is in the applicable chapter (i.e., Chapters 1 through 19) of this SER.

EF3 SUP 1.8-3

The applicant identifies one site-specific departure (EF3 DEP 11.4-1) from the referenced certified design, which is described in Part 7 of the COL application. The applicant provides Table 1.8-201 to identify FSAR sections affected by this departure. Chapter 11 of this SER evaluates this departure.

EF3 SUP 1.8-5

The applicant provides FSAR Table 1.8-202, which identifies systems that either adopt the CDI in the DCD as the actual system design information or replace the CDI in the DCD with site-specific design information. The table also includes cross references to FSAR sections that address the CDI. The DCD conceptual design information that the applicant replaced with site-specific design information is reviewed in the applicable chapters of this SER (i.e., Chapters 1 through 19).

EF3 SUP 1.8-6

As stated above, the applicant's review of site- and plant-specific information is in FSAR Section 19.5. The staff's review of the applicant's PRA conclusion is evaluated in Section 19.5 of this SER.

EF3 SUP 1.8-7

As stated above, the applicant does not provide information pertaining to the ISFSI because no Fermi 3 ISFSI is currently planned. Therefore, the staff is not reviewing information associated with this supplemental information item.

Conceptual Design Information

STD CDI

As indicated above in the evaluation of Supplemental Information EF3 SUP 1.8-5, the system design information is in FSAR Table 1.8-202.

In conclusion, the staff finds that the applicant's information in FSAR Section 1.8 is acceptable within the review scope of Chapter 1 and satisfies RG 1.206, Regulatory Position C.I.1.8.

Section 1.9 – Conformance with Standard Review Plan and Applicability of Codes and Standards

This FSAR section provides the information required by 10 CFR 52.47(a)(9) showing conformance with the Standard Review Plan (SRP) and applicable codes and standards. The section summarizes deviations from each SRP section and regulatory criteria (i.e., Division 1, 4,

5, and 8 RGs; RG 1.206; and industrial codes and standards). In addition, this section provides information on the applicability of operational experience.

COL Item

EF3 COL 1.9-3-A

The applicant provides additional information in FSAR Tables 1.9-201 through 1.9-203 that evaluate the conformance of technical information in the Fermi 3 FSAR with the SRP and applicable regulatory criteria. The staff reviewed the information in these tables and evaluated the contents against the guidance in Chapter 1 of NUREG–0800. The staff also evaluated the information in Section 1.9 as part of the technical evaluations in Chapters 2 through 19 of this SER, as needed.

The staff's review of Table 1.9-201 noted that the applicant did not always clarify why a section or acceptance criterion was not considered applicable. The staff also found discrepancies in version and/or publication dates and inconsistent referencing to a specific acceptance criterion. The staff issued RAI 01-8 (ADAMS Accession No. ML13011A014) requesting the applicant to resolve these issues. On February 8, 2013 (ADAMS Accession No. ML13043A011), and February 22, 2013 (ADAMS Accession No. ML13057A016), the applicant responded to RAI 01-8 with proposed FSAR revisions that clarified the discrepancies the staff had found in Table 1.9-201. The staff finds this information acceptable, and RAI 01-8 is resolved. The staff confirmed that the applicant incorporated these changes into Revision 7 to the FSAR.

The staff's review of Table 1.9-202 found missing references to three RGs and discrepancies in versions and publication dates for eight listed RGs. In addition, the staff required justification for three RGs that the applicant had determined were not applicable. The staff's review of Table 1.9-203 found that the applicant did not clarify why two regulatory positions were not considered applicable to Fermi 3. To address these issues, the staff issued RAI 01-9. On February 8, 2013 (ADAMS Accession No. ML13043A011), and February 22, 2013 (ADAMS Accession No. ML13057A016), the applicant responded to RAI 01-9 with proposed FSAR revisions that clarified the discrepancies the staff had found in Tables 1.9-202 and 1.9-203. The staff finds this information acceptable, and RAI 01-9 is resolved. The staff confirmed that the applicant incorporated these changes into Revision 7 to the FSAR.

Supplemental Information

EF3 SUP 1.9-1

As stated earlier, the applicant provides additional information in FSAR Table 1.9-204 that lists the industrial codes and standards applicable to those portions of the Fermi 3 design that are beyond the scope of the ESBWR DCD and are applicable to the operational aspects of the facility. The staff reviewed the information in this table against the guidance in Chapter 1 of NUREG–0800. In comparisons to ESBWR DCD, Tier 2, Table 19-22, the staff found that FSAR Table 1.9-204 lists recent versions of the codes and standards that were in effect 6 months before the docket date of the application. This table also identifies additional codes and standards referenced in various chapters of the COL application. The staff's technical evaluations of the additional industrial codes and standards are in the relevant chapters of this SER.

EF3 SUP 1.9-2

In FSAR Table 1.9-205, the applicant provides additional information on the operational experience applicable to Fermi 3. The staff finds that the applicant has provided sufficient information to address conformance with the operational experience information, as described in applicable NUREG reports, for those portions of the Fermi 3 design and operation that are beyond the scope of the ESBWR DCD and are in accordance with the guidance in SRP Chapter 1 and RG 1.206, Regulatory Position C.I.1.9.4. The staff's technical evaluations of the applicable operational experience are in the relevant chapters of this SER.

In conclusion, the staff finds that the applicant's information in FSAR Section 1.9 is acceptable within the review scope of Chapter 1 and satisfies RG 1.206, Regulatory Position C.I.1.9.

Section 1.10 – Summary of COL Items

The applicant's supplemental information in this section specifies EF3 SUP 1.10-1 and provides FSAR Table 1.10-201, which lists COL items that include site-specific information; information related to operational program descriptions; and other required information to support the construction and operation of an ESBWR standard design at the Fermi site. The ESBWR DCD describes the information for each COL item that the COL applicant needs to provide in the application. FSAR Table 1.10-201 lists the COL items and the proper references to the FSAR sections that describe each item. The COL items listed in this table are reviewed in the applicable chapter (i.e., Chapter 1 through Chapter 19) of this SER. There are no specific NUREG–0800 acceptance criteria related to the general information in Section 1.10 and no specific regulatory findings. The staff finds that the applicant's supplemental information in FSAR Section 1.10 is acceptable within the review scope of Chapter 1.

Section 1.11 – Technical Resolutions of Task Action Plan Items, New Generic Issues, New Generic Safety Issus, and Chernobyl Issues

In accordance with 10 CFR 52.79(a)(20), this FSAR section provides technical resolutions of unresolved safety issues (USIs); new generic issues (GI); medium- and high-priority generic safety issues (GSIs); human factor issues (HFIs); and Chernobyl issues identified in NUREG-0933 and its supplements.

COL Item

EF3 COL 1.11-1-A

In FSAR Section 1.11.1, the applicant provides Table 1.11-201 to supplement DCD Table 1.11-1 (Notes 2 and 7) and to address the site-specific aspects of activities required by the action plan that the COL applicant must complete (i.e., Note 2) and environmental issues that are outside the scope of the DCD (i.e., Note 7).

ESBWR DCD, Table 1.11-1 identifies Task Action Items (i.e., GI and USI) A-33, B-1, B-28, B-37 through B-43, and C-16 and the new GSI 184 requiring site-specific information. These issues are mainly associated with the site-specific environmental concerns addressed in the site

environmental report. The applicant provides the required information in Table 1.11-201 with appropriate references to various sections in Parts 2, 3, and 4 of the COL application. The staff's technical evaluations of these GSI topics are in the final Environmental Impact Statement (FEIS) as NUREG–2105, "Final Environmental Impact Statement for Combined License (COL) for Enrico Fermi Unit 3," and the relevant sections of this SER.

The staff's review of FSAR Table 1.11-201 also noted that in ESBWR DCD, Table 1.11-1, the last new GSI evaluated was Issue 200. In mid- and late 2006, the staff added three additional GSIs (GSI 201 through 203), but all of these were eventually dropped as GSIs and required no further evaluation. However, these issues are not identified and included in FSAR Table 1.11-201 as dropped issues. For FSAR Table 1.11-201 to be complete, the staff issued RAI 01-10 requesting the applicant to revise Table 1.11-201 by adding these three latest GSIs with the applicable note that is similar to that used in ESBWR DCD, Table 1.11-1 or by justifying their exclusions.

On February 8, 2013 (ADAMS Accession No. ML13043A011), and February 22, 2013 (ADAMS Accession No. ML13057A016), the applicant responded to RAI 01-10 with FSAR revisions that clarified the noted discrepancies in FSAR Table 1.11-201. The staff finds the information acceptable, and RAI 01-10 is resolved. The staff confirmed that the applicant incorporated these changes into Revision 7 to the FSAR.

Supplemental Information

EF3 SUP 1.11-1

In Table 1.11-202, the applicant provides supplemental information to DCD Table 1-11 on the issues in the Three Mile Island (TMI) Action Plan that relate to staffing, qualifications, quality assurance, post-accident sampling, in-plant radiation monitoring, and shift staff HFI. The table identifies the FSAR sections where each issue is discussed. The staff's evaluations of these issues are in Chapters 12, 13, and 17 of this SER.

In conclusion, based on its review of the information discussed above, the staff finds that the applicant's COL Item EF3 COL 1.11-1-A and supplemental information EF3 SUP 1.11-1 in FSAR Section 1.11 are acceptable and consistent with the guidance in NUREG–0800 and NUREG–0933 and the requirements of 10 CFR 52.79(a)(20). The staff finds that the applicant's information in FSAR Section 1.11 is acceptable within the review scope of Chapter 1 and satisfies RG 1.206, Regulatory Position C.I.1.9.3.

Section 1.12 – Impact of Construction Activities on Fermi 2

In this section of the SER, the applicant evaluates the potential hazards to the SSCs important to safety of the Fermi 2 operating unit that would result from future construction activities of Fermi 3. The applicant also describes the managerial and administrative controls to be used to provide assurance that the limiting conditions for operation (LCO) will not be exceeded as a result of construction activities, in accordance with 10 CFR 52.79(a)(31).

Supplemental Information

EF3 SUP 1.12-1

The applicant provides FSAR Section 1.12 as supplemental information. Based on the Interim Staff Guidance (ISG) COL ISG-22, "Interim Staff Guidance on Impact of Construction (under a Combined License) of New Nuclear Power Plants Units on Operating Units at Multi-Unit Sites," the staff issued RAI 01-5 (ADAMS Accession No. ML111880181) requesting the applicant to address the requirements of 10 CFR 52.79(a)(31) with respect to ISG-22.

The requirements in 10 CFR 52.79(a)(31) can be viewed as having two subparts:

1. The COL applicant must evaluate the potential hazards from constructing new plants on SSCs important to safety for existing operating plants located at the site (i.e., Fermi 2).

2. The COL applicant must evaluate the potential hazards from constructing new plants on SSCs important to safety for newly constructed plants that begin operation at the site. This subpart will not be applicable to Fermi 3.

The applicant was requested to provide a construction impact evaluation plan that contains the following six elements discussed in the ISG:

- A discussion of the construction activity identification process and the impact evaluation criteria used to evaluate the construction activities that may pose potential hazards to the SSCs important to safety for operating unit(s).

- A table of those construction activities and the potential hazards that are identified using that construction impact evaluation plan, the SSCs important to safety for the operating unit potentially impacted by the construction activity, and proposed mitigation methods.

- Identification of the managerial and administrative controls, such as proposed license conditions that may involve construction schedule constraints or other restrictions on construction activities, that are credited to manage the safety/security interface and to preclude and/or mitigate the impacts of potential construction hazards to the SSCs important to safety for the operating unit(s).

- A discussion of the process for communications and interactions planned and credited between the construction organization and the operations organization to ensure appropriate coordination and authorization of construction activities and implementation of the prevention or mitigation activities as necessary.

- A memorandum of understanding or agreement (MOU or MOA) between the COL applicant and the operating unit(s) licensee as a mechanism for communications, interactions, and coordination to manage the impact of the construction activities.

- An implementation schedule corresponding to construction tasks or milestones to ensure the plan is reviewed on a recurring basis and maintained current as construction progresses.

On July 13, 2011 (ADAMS Accession No. ML11195A330), the applicant provided the following responses and FSAR revisions with respect to each of the above six elements:

- A discussion of the construction activity identification process and the impact evaluation criteria used to evaluate the construction activities that may pose potential hazards to the SSCs important to safety for operating unit(s).

The process and criteria used to evaluate potential Fermi 3 construction hazards associated with Fermi 2 SSCs important to safety are discussed in FSAR Section 1.12. Section 1.12.1 specifically outlines a series of sequential steps that are discussed in further detail in FSAR Sections 1.12.2 through 1.12.6. These steps include the identification of potential construction activity hazards, SSCs important to safety, limiting conditions for operation (LCOs), impacted SSCs and LCOs, and applicable managerial and administrative controls.

- A table of those construction activities and the potential hazards that are identified using that construction impact evaluation plan, the SSCs important to safety for the operating unit potentially impacted by the construction activity, and proposed mitigation methods.

Using the identification and evaluation process described above, the applicant developed FSAR Table 1.12-201, "Potential Hazards to Fermi 2 from Fermi 3 Construction Activities," which delineates the Fermi 3 construction activities; identifies the potential hazards using this evaluation; and describes the potentially impacted Fermi 2 SSCs. The applicant also developed FSAR Table 1.12-202, "Potential Consequences to Fermi 2 Due to Potential Hazards Resulting from Fermi 3 Construction Activities," which describes the potential hazards and consequences specifically related to Fermi 2 SSCs. In addition, the applicant developed FSAR Table 1.12-203, "Managerial and Administrative Controls for Fermi 3 Construction Activity Hazards," which delineates the proposed mitigation methods.

- Identification of the managerial and administrative controls such as the proposed license conditions that may involve construction schedule constraints or other restrictions on construction activities that are credited to manage the safety/security interface and to preclude and/or mitigate the impacts of potential construction hazards to the SSCs important to safety for the operating unit(s).

The managerial and administrative controls to manage the safety/security interface and to mitigate the impacts of potential Fermi 3 construction hazards to the Fermi 2 SSCs important to safety and security are discussed in Section 1.12.6, "Managerial and Administrative Controls," and in FSAR Table 1.12-203, "Managerial and Administrative Controls for Fermi 3 Construction Activity Hazards." FSAR Section 1.12.6 also states that there are additional controls established during construction as described and addressed in FSAR Section 13AA.1.9, "Management and Review of Construction Activities."

In addition, in FSAR Section 1.12, the applicant identifies commitment (COM 1.12-001), which states:

> COM 1.12-001: Managerial and administrative controls are utilized to identify preventive and mitigative measures and provide notification of hazardous activity initiation in order to prevent or minimize exposure of SSCs to the identified hazards. Applicable managerial and administrative controls are listed in Table 1.12-203.

As outlined in 10 CFR 52.79(a)(31), managerial and administrative controls are used to provide assurance that Fermi 2 LCOs are not exceeded as a result of Fermi 3 construction activities. Therefore, the staff finds COM 1.12-001 acceptable since it will ensure compliance with 10 CFR 52.79(a)(31).

- A discussion of the process for communications and interactions planned and credited between the construction organization and the operations organization to ensure appropriate coordination and authorization of construction activities and implementation of the prevention or mitigation activities as necessary.

FSAR Table 1.12-203 provides the managerial and administrative controls for preventative and mitigation activities that outline the planned interactions between Fermi 2 and Fermi 3. In addition, FSAR Subsection 13.AA.1.9 includes a description of the process for Fermi 2 and Fermi 3 communications and interactions to ensure organizational coordination and authorization requirements for construction activities with potential Fermi 2 impacts, as well as implementation plans for the mitigation controls identified.

- A memorandum of understanding or agreement (MOU or MOA) between the COL applicant and the operating unit(s) licensee as a mechanism for communications, interactions, and coordination to manage the impact of the construction activities.

The Fermi 3 COL applicant and the Fermi 2 operating unit licensee are the same entity. Therefore, an MOU or MOA is not considered necessary.

- An implementation schedule corresponding to construction tasks or milestones to ensure the plan is reviewed on a recurring basis and maintained current as construction progresses.

FSAR Section 1.12.6 describes the identification of specific hazards, impacted SSCs, and managerial and administrative controls including safety/security interfaces to be developed and implemented as work progresses on the site. FSAR Table 1.12-201 describes the work progression via identification of construction activities. FSAR Subsection 13.AA.1.9 states that assessments will be performed to facilitate an implementation schedule for the administrative and managerial controls that correspond with the scheduled construction activities. The applicant also describes periodic assessments involving both Fermi 2 and Fermi 3 organizations to identify Fermi 2 SSCs that could be reasonably expected to be impacted by scheduled construction activities.

In conclusion, based on a review of the information discussed above, the staff finds that the applicant's Supplemental Information EF3 SUP 1.12-1 in FSAR Section 1.12 is acceptable and consistent with the six program elements of 10 CFR 52.79(a)(31) as expressed in COL ISG-22. Therefore, RAI 01-5 is resolved and closed.

In addition, the staff notes that other mechanisms will be used by the licensee of the operating unit (Fermi 2) to address these considerations and to ensure that potential impacts from the construction of a new Fermi 3 unit are precluded and/or mitigated. Examples include the 10 CFR 50.59 change process, the 10 CFR 50.65 risk assessment process, the 10 CFR 73.58 safety/security interface process, the technical specification change process, the emergency preparedness (EP) change process, and the FSAR update process.

Appendix 1A – Response to TMI Matters

This FSAR Appendix supplements ESBWR DCD, Table 1A-1 with STD SUP 1A.1-1, which provides assessments of the TMI Action Plan items listed in 10 CFR 50.34(f). There are no specific NUREG–0800 acceptance criteria related to the general information in FSAR Appendix 1A. The applicant provides supplemental information to DCD Table 1A-1 that addresses site-specific items related to construction, operations, and quality assurance. The detailed technical evaluations of these items are in Chapters 13 and 17 of this SER. The staff finds that the applicant's information in FSAR Appendix 1A is acceptable within the review scope of Chapter 1.

Appendix 1B – Plant Shielding To Provide Access to Areas and To Protect Safety Equipment for Post-Accident Operation [II.B.2]

The applicant has incorporated by reference this section of the DCD with no departures or supplements.

Appendix 1C – Industry Operating Experience

This FSAR Appendix supplements ESBWR Tables 1C-1 and 1C-2 with FSAR Tables 1C-201 and 1C-202. The DCD tables review industry operating experience issued in the Generic Letters (GL) and Bulletins (BL) that are potentially applicable to the ESBWR design or operation. These tables address GLs and BLs that were in effect/issued up to six months before a COL application submittal, and after the SRP revisions that are applicable to the FSAR. They also address GL 82-39 and IE BL 2005-02, which were identified in the DCD as the responsibility of the COL applicant. There are no specific NUREG–0800 acceptance criteria related to the general information in Appendix 1C and no specific regulatory findings; however, the applicant provides its evaluation results in Table 1C-201. The applicant states that GL 82-39 is not applicable and is an administrative communication. The site has an approved procedure for handling Safeguards Information including how to mail such information to authorized recipients. IE Bulletin 2005-02 is discussed in COLA Part 5, Emergency Plan. The staff's evaluation of the Emergency Plan is in Section 13.3 of this SER.

Departures Not Requiring NRC Approval

EF3 DEP 11.4-1

In FSAR Table 1C-201, the applicant states under GL 81-38 that the radwaste building includes space for processing and storing low-level radioactive wastes. The radwaste building provides storage space for at least 10 years of packaged Class B and Class C wastes and approximately 3 months of packaged Class A waste. FSAR Section 11.4 provides additional information regarding the onsite storage of low-level radioactive wastes. This departure is reviewed in Chapter 11 of this SER.

COL Items

STD COL 1C.1-1-A

In FSAR Table 1C-201, the applicant states that the site has an administrative procedure for handling safeguards information that meets the requirements of 10 CFR 73.21, "Protection of

Safeguards Information: Performance requirements." This procedure also includes how to mail safeguards information to authorized recipients.

The staff finds that this response adequately addresses COL Item STD COL 1.C.1-1A, because the Fermi site has a procedure for handling safeguards information. However, the staff's review noted that ESBWR DCD, Table 1C-1 conforms to the applicable GLs up to June 2006. The staff's review of the GLs in effect 6 months before the submittal date of the Fermi 3 COL application identified GL 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients," as not listed in FSAR Table 1C-201. The staff's review finds that SER Section 8.2 evaluates the applicability of this GL to Fermi 3. According to SER Section 8.2, the applicant revised FSAR Section 17.6.4 to include the underground cable monitoring program regardless of the voltage. This FSAR section states that the condition monitoring underground or inaccessible cables is in the Maintenance Rule (MR) Program. The cable condition monitoring program incorporates lessons learned from industry operating experience (e.g., GL 2007-01); addresses regulatory guidance; and utilizes information from detailed design and procurement documents to determine the appropriate inspections, tests, and monitoring criteria for underground and inaccessible cables within the scope of the MR (10 CFR 50.65).

Based on the above information, the staff concludes that the applicant has already considered GL 2007-01 in the COL application. For Table 1.C-201 to be complete, the staff issued RAI 01-11 (ADAMS Accession No. ML13011A014) requesting the applicant to include GL 2007-01 in Table 1C-201 or justify its exclusion. On February 8, 2013 (ADAMS Accession No. ML13043A011), and February 22, 2013 (ADAMS Accession No. ML13057A016), the applicant responded to RAI 01-11 and provided FSAR revisions that added the requested item to FSAR Table 1.C-201 regarding GL 2007-01. The staff finds the information acceptable, and RAI 01-11 is resolved.

STD COL 1C.1-2-A

In FSAR Table 1C-202, the applicant states that COL application Part 5 provides the Fermi 3 Emergency Plan. The staff finds that this response adequately addresses COL Item STD COL 1C.1-2-A. The staff's evaluation of the Fermi 3 Emergency Plan is in Section 13.3 of this SER.

STD SUP 1C-1 encompasses both STD COL 1C.1-1-A and STD COL 1C.1-2-A

In conclusion, the staff finds that the applicant's supplemental information in FSAR Appendix 1.C is acceptable within the review scope of Chapter 1 and satisfies RG 1.206, Regulatory Position C.I.1.9.4.

1.3.6 Post Combined License Activities

The applicant identifies the following FSAR commitments that the staff finds acceptable:

- Commitment (COM 1.1-001) – Construction and startup schedules will be provided after the issuance of the COL once there is a positive decision to construct the plant.

- Commitment (COM 1.2-001) – To the extent practical, modular construction techniques that were applied during ABWR construction projects will be adapted and/or modified for use

during the ESBWR construction. Modularization reviews will be performed to develop a plan for bringing the ABWR experience into the ESBWR. Once completed, the results of the modularization reviews will be used as guidance to develop the detailed design of the areas affected by modularization.

- Commitment (COM 1.4-001) - The primary contractor for the site engineering was not yet selected at the time of the COLA submittal; this information will be supplied in the FSAR update following the selection.

- Commitment (COM 1.12-001) – Managerial and administrative controls are utilized to identify preventive and mitigative measures and to provide notification of hazardous activity initiation, in order to prevent or minimize exposure of SSCs to the identified hazards. Applicable managerial and administrative controls are listed in Table 1.12-203.

1.3.7 Conclusion

The NRC staff's finding related to information incorporated by reference is in NUREG–1966. NRC staff reviewed the application and checked the referenced DCD. The staff's review confirms that the applicant has addressed the required information; and no outstanding information is expected to be addressed in the COL FSAR related to these sections. Pursuant to 10 CFR 52.63(a)(5), all nuclear safety issues relating to these sections that were incorporated by reference have been resolved.

1.4 Additional Regulatory Requirements

1.4.1 Financial Qualifications

Pursuant to 10 CFR 52.97(a)(1)(iv) and 10 CFR 52.77, the application must contain all of the information required in 10 CFR 50.33.

1.4.1.1 Introduction

In September 2008, DTE submitted a COL application for the proposed Fermi 3 pursuant to 10 CFR Part 52, Subpart C. In this COL application, DTE requested the NRC to issue one Class 103 COL for the construction and operation of Fermi 3 to be located in the State of Michigan. DTE will be the licensed owner and operator of Fermi 3.

The COL application incorporates by reference the DCD for an ESBWR provided by GEH, the applicant for the ESBWR DC documented in the most current NRC review.

According to the COL application, DTE is located in Detroit, Michigan and is a wholly owned subsidiary of the DTE Energy Company with $23 billion in assets. DTE owns and operates 11,020 megawatts of generating capacity across a mix of electricity from fossil fuel, nuclear, and hydroelectric pumped storage power plants.

1.4.1.2 Regulatory Evaluation

The applicant's request for the NRC to issue one Class 103 COL for construction and operation is subject to (among other criteria) the requirements of the Atomic Energy Act of 1954 as amended; 10 CFR Part 52, Subpart C; 10 CFR Part 50; and 10 CFR Part 140. This section

reviews issues related to (1) financial qualifications, (2) decommissioning funding assurance, (3) antitrust, (4) foreign ownership, and (5) nuclear insurance and indemnity.

1.4.1.3 Construction Costs

Pursuant to 10 CFR 50.33(f)(1):

> [T]he applicant[s] shall submit information that demonstrates that the applicant[s] possess or [have] reasonable assurance of obtaining the funds necessary to cover estimated construction costs and related fuel cycle costs. The applicant[s] shall submit estimates of the total construction costs of the facility and related fuel cycle costs, and shall indicate the source(s) of funds to cover these costs.

Under 10 CFR Part 50, Appendix C, Section I.A.1, "Estimate of construction costs":

> [E]ach applicant's estimate of the total cost of the proposed facility should be broken down as follows and be accompanied by a statement describing the bases from which the estimate is derived:
>
> (a) Total nuclear production plant costs
>
> (b) Transmission, distribution, and general plant costs
>
> (c) Nuclear fuel inventory cost for first core
>
> Total estimated cost
>
> If the fuel is to be acquired by lease or an arrangement other than a purchase, the application should state this. The items to be included in these categories should be the same as those defined in the applicable electric plant and nuclear fuel inventory accounts prescribed by the Federal Energy Regulatory Commission or an explanation given as to any departure therefrom.

As stated in the COL application, the projected overnight costs[3] for the construction of one ESBWR nuclear unit at the Fermi 3 site is outlined in Table 1-1.

Table 1-1 Projected Project Cost of Fermi 3

	Billions in 2008 $
Total Nuclear Production Plant Costs	3.8–4.6
Transmission, Distribution, and General Plant Costs	1.5–2.3

[3] Overnight cost is the cost of a construction project that did not incur an escalation in either interest or cost during construction, as if the project was completed "overnight." An alternate definition is the present value cost that would have to be paid as a lump sum up front to completely pay for a construction project. The overnight cost is frequently used when describing power plants.

Nuclear Fuel Inventory and Cost for the First Core	0.3
Total (Overnight Cost)	5.6–7.2

The applicant describes the basis for the above cost estimates. According to the COL application, the estimates were derived from the 2003 Massachusetts Institute of Technology interdisciplinary study, "The Future of Nuclear Power"; the 2004 examination of nuclear power plant costs by the Energy Information Agency of the U.S. Department of Energy (DOE) as part of its "2004 Annual Energy Outlook"; the 2005 Nuclear Energy Agency update on "Projected Costs of Generating Electricity"; and the 2007 Keystone Center published report, "Nuclear Power Joint Fact-Finding." DTE calculated a reasonable estimate based on the above studies and then added a contingency of more than 30 percent for the reactor. Fermi 3 is expected to operate at an estimated gross electrical power output of approximately 1,535 megawatts electric (MWe). Therefore, the total overnight cost range of $5.6 billion to $7.2 billion is $3,500/kilowatt electric (kWe) to $4,500/kWe.

The staff reviewed studies from independent sources[4] and collected projected cost estimates of projects from all COL applications as they are submitted for comparisons and reasonableness.[5] According to these studies, the cost of constructing a plant comparable to Fermi 3 is in the range of $3,222/kWe to $5,072/kWe installed.

The applicant's overnight cost estimate is within the range derived from the studies developed by independent sources and the construction cost estimates reviewed to date for comparable plants. Accordingly, the staff finds that the applicant's overnight cost estimate is reasonable.

1.4.1.4 Sources of Construction Funds

Pursuant to 10 CFR Part 50, Appendix C, Section I.A.2, "Sources of construction costs," the application should include a brief statement of the applicant's general plan for financing the facility that identifies the sources the applicant will rely on for the construction funds (e.g., internal sources, such as undistributed earnings and depreciation accruals, or external sources, such as borrowings).

According to the COL application, DTE plans to finance the costs to construct Fermi 3 through a combination of debt and equity. The relative amount of debt and equity may depend on the availability of federal loan guarantees under the provisions of the Energy Policy Act of 2005. If loan guarantees are available with satisfactory terms, DTE may limit its required equity to 20 percent of the costs by issuing federally guaranteed debt for the remaining 80 percent. If the

[4] For example, see the 2009 Massachusetts Institute of Technology study, "Update on the Cost of Nuclear Power"; the 2003 Massachusetts Institute of Technology interdisciplinary study, "The Future of Nuclear Power"; the U.S. Department of Energy, Energy Information Agency "2004 Annual Energy Outlook"; the Nuclear Energy Agency of the Organization for Economic Cooperation and Development 2005 update, "Projected Costs of Generating Electricity"; and the Keystone Center 2007 report, "Nuclear Power Joint Fact-Finding."

[5] The staff's consideration of the costs submitted by the applicant focuses on the estimated production plant costs and on the estimated cost of fuel. Because the NRC has clear oversight of the plant and the fuel, unreasonably low plant construction and fuel cost estimates may have a nexus to a possible reduction in safety. The NRC does not have regulatory authority over transmission and distribution assets, which do not entail radiological safety issues. Thus, any cost estimate provided is deemed to be true and accurate under 10 CFR 50.9 and no further assessment of that estimate will be performed.

loan guarantees are not available with satisfactory terms, an equity contribution of up to 50 percent could be required to maintain investment-grade ratings for the debt. In either case, DTE has sufficient capacity from a combination of internal and external funds for the equity and debt. The traditional capital markets will serve as sources for the funding.

Also, according to the COL application, DTE expects to be able to recover interest costs associated with construction of Fermi 3 through rate adjustments. Legislation enacted by the State of Michigan in November 2008 (*2008 Public Act No.286*) includes provisions for recovering interest costs during construction and establishes before beginning plant construction a certificate of need (process) that will determine how construction costs as well as the projected amount will be recovered.

Financial Statements

Pursuant to 10 CFR Part 50, Appendix C, Section I.A.3, "Applicant's financial statements":

> The application should also include the applicant's latest published annual financial report, together with any current interim financial statements that are pertinent. If an annual financial report is not published, the balance sheet and operating statement covering the latest complete accounting year together with all pertinent notes thereto and certification by a public accountant should be furnished.

Detroit Edison

At the time of the application submittal, DTE provided current financial statements that have been filed with the Securities and Exchange Commission. The filed financial statements can also be viewed at http://phx.corporate-ir.net/phoenix.zhtml?c=68233&p=irol-sec.

Pursuant to 10 CFR Part 50, Appendix C, Section I.A.3, the applicant submitted annual financial statements to the NRC. The staff did not identify any data in DTE's financial statements that warranted further inquiry.

Operating License

Pursuant to 10 CFR 50.33(f)(3):

> If the application is for a combined license under Subpart C of Part 52 of this chapter, the applicant shall submit the information described in paragraphs (f)(1) and (f)(2) of this section.

Pursuant to 10 CFR 50.33(f), each application shall state:

> Except for an electric utility applicant for a license to operate a utilization facility of the type described in 10 CFR 50.21(b) or 50.22, information sufficient to demonstrate to the Commission the financial qualification[s] of the applicant to carry out, in accordance with the regulations in this chapter, the activities for which the permit or license is sought.

10 CFR 50.2, "Definitions" states, in part, what an electric utility is:

> [A]ny entity that generates or distributes electricity and which recovers the cost of this electricity, either directly or indirectly, through rates established by the entity itself or by a separate regulatory authority.

According to the COL application, DTE's business is subject to the regulatory jurisdiction of various agencies, including, but not limited to, the Michigan Public Service Commission (MPSC); the Federal Energy Regulatory Commission (FERC); and the NRC. MPSC considers rates, the recovery of certain costs including those of generating facilities and regulatory assets, conditions of service, accounting, and operating-related matters. The MPSC-approved rates charged to DTE customers have historically been designed to allow for the recovery of costs and an authorized rate of return on investments.

According to the COL application, DTE is an electric utility as defined in 10 CFR 50.2. DTE generates and distributes electricity and recovers the cost of this electricity through cost-of-service based rates established by the MPSC.

Based on the above information, the NRC staff finds that the applicant is an electric utility and is not subject to financial qualifications pursuant to 10 CFR 50.33(f).

1.4.1.5 Decommissioning Funding Assurance

Regulatory Requirements

Pursuant to 10 CFR 50.33(k)(1):

> [A]n application for [a …] combined license for a production or utilization facility, information in the form of a report, as described in § 50.75, indicating how reasonable assurance will be provided that funds will be available to decommission the facility.

Under 10 CFR 50.75, the financial report must certify that the applicant will provide financial assurance for decommissioning no later than 30 days after the Commission publishes the notice in the *Federal Register* (*FR*) under 10 CFR 52.103(a) using one or more of the methods allowed in 10 CFR 50.75(e). In addition, the amount of the financial assurance may be more but not less than the amount stated in the Table in 10 CFR 50.75(c)(1), as adjusted per 50.75(c)(2). Under 10 CFR 50.75(b)(4), a COL applicant does not need to obtain a financial instrument appropriate to the method to be used or submit a copy of the instrument to the Commission. Once the COL is granted, the holder of a COL must submit an instrument as provided in 50.75(e)(3).

Decommissioning Funding Estimate

The proposed plant is a simplified passive advanced light-water reactor that is being licensed in accordance with the General Electric ESBWR, which is currently under review by the NRC. This design has a per unit thermal power rating of 4,500 MWt.

The applicant intends to provide decommissioning funding assurance in the amount of $524,852,067 (2008 dollars). NRC staff calculated the minimum acceptable funding under 10 CFR 50.75(c) and finds the applicant's amount acceptable.

Decommissioning Funding Mechanism

The applicant intends to use an external sinking fund as the method for providing decommissioning funding assurance. Under 10 CFR 50.75(e)(1)(ii), an external sinking fund may be used as an exclusive method by the following:

> a licensee that recovers, either directly or indirectly, the estimated total cost of decommissioning through rates established by 'cost of service' or similar ratemaking regulation.

NRC staff will assess the acceptability of the decommissioning funding mechanism and prospective financial instrument in the future consistent with the schedule, per 10 CFR 50.75(e)(3), for the submission of reports by a holder of the COL.

Therefore, at this time, the NRC staff finds that Fermi 3 has complied with the applicable decommissioning funding assurance requirements.

1.4.1.6 Antitrust Review

The Energy Policy Act of 2005 (EPAct) removed the antitrust review authority in Section 105.c of the AEA regarding license applications for the production or utilization of facilities submitted under Sections 103 or 104.b of the Atomic Energy Act of 1954, after the date of enactment of the EPAct. Accordingly, the NRC is not authorized to conduct an antitrust review in connection with this COL application.

1.4.1.7 Foreign Ownership, Control, or Domination

Section 103 of the Atomic Energy Act of 1954 prohibits the Commission from issuing a license for a nuclear power plant under Section 103(d) to the following:

> an alien or any corporation or other entity if the Commission knows or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corporation or a foreign government.

10 CFR 50.38 is the regulatory provision that implements this statutory prohibition.

DTE is a corporation organized under the laws of the State of Michigan and is a wholly-owned subsidiary of DTE Energy Company. The COL application contains the names and addresses of the directors and officers of DTE and indicates that all are United States citizens. According to the COL application, DTE is not owned, controlled, or dominated by any alien, foreign corporation, or foreign government. The staff does not know or have reason to believe otherwise.

1.4.1.8 Nuclear Insurance and Indemnity

The provisions of the Price-Anderson Act (Section 170 of the Atomic Energy Act, as amended, of 1954) and the Commission's regulations in 10 CFR Part 140 require each holder of a license issued under 10 CFR Parts 50, 52, or 54 to operate a nuclear reactor to maintain financial protection. Power reactor licensees are also required to maintain onsite property insurance per 10 CFR 50.54(w). In Part 1, "General and Administrative Information," Attachment A, of the Fermi 3 COL application, DTE provided primary financial protection for the Fermi site and

onsite property insurance. By letter dated November 29, 2012 (ADAMS Accession No. ML12334A318), DTE also provided satisfactory evidence that it has the financial ability to pay for deferred premiums for the Fermi site. Upon issuance of the license, the NRC staff will issue DTE an amended indemnity agreement to include Fermi 3.

1.4.1.9 Conclusion

Based on the above information, NRC staff finds reasonable assurance that DTE is financially qualified to engage in the proposed activities regarding the Fermi Unit 3 Nuclear Power Plant, as described in the application. There are no problematic decommissioning funding assurance issues, foreign ownership issues, or nuclear insurance and indemnity issues.

1.4.2 Nuclear Waste Policy Act

Section 302(b) of the Nuclear Waste Policy Act of 1982, as amended, states:

> The Commission, as it deems necessary or appropriate, may require as a precondition to the issuance or renewal of a license under Section 103 or 104 of the Atomic Energy Act of 1954 [42 U.S.C. 2133, 2134] that the applicant for such license shall have entered into an agreement with the Secretary for the disposal of high-level radioactive waste and spent nuclear fuel that may result from the use of such license.

In a letter dated September 12, 2011 (ADAMS Accession No. ML11257A134), the applicant stated that:

> On August 18, 2011, The Detroit Edison company entered into a contract with the United States Department of Energy (DOE) establishing the terms and conditions associated with DOE's responsibility for disposal of spent nuclear fuel and high-level radioactive waste generated at the proposed Fermi Unit 3 plant. The DOE contract number applicable to Fermi 3 is DE-CR01-11GC1126.

Because DTE has entered into contracts with the DOE for the disposal of high-level radioactive waste and spent nuclear fuel for Fermi 3, the staff accepts that DTE has met the applicable requirements of Section 302(b) of the Nuclear Waste Policy Act of 1982.

1.4.3 Consultation with Department of Homeland Security and Notifications

In accordance with Section 657 of the Energy Policy Act of 2005, the NRC consulted with the Department of Homeland Security.

As required by Section 182c of the AEA and 10 CFR 50.43(a), the NRC took the following actions. On March 14, 2013, the NRC notified the MPSC (ADAMS Accession No. ML13044A458) and FERC (ADAMS Accession No. ML13044A394) regarding the Fermi 3 COL application. In December 2008 and January 2009, the NRC published notices of the application in the local newspapers: *Detroit Free Press*, *Toledo Blade*, *Monroe Evening News*, and *Windsor Star*. In addition, the staff also published a notice of the application in the *FR* on (April 9, April 16, April 23, and April 30, 2014 (79 FR 19659, 79 FR 21493, 79 FR 22706, and 79 FR 24457).

Based on the staff's completion of notifications to regulatory agencies and the public notices described above, the staff concludes that, for the purposes of issuing a COL for Fermi 3, all required notifications to other agencies or bodies have been duly carried out.

1.4.4 Evaluation of Exemptions Associated with the Special Nuclear Material (SNM) Material Control and Accounting (MC&A) Program

In a letter dated July 15, 2011 (ADAMS Accession No. ML11200A042), the applicant proposed to update Part 7 of the application to include exemption requests from 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51. The provisions of 10 CFR 70.22(b) require an application for a SNM license to include a full description of the applicant's program for MC&A of SNM under 10 CFR 74.31, 10 CFR 74.33, 10 CFR 74.41; and 10 CFR 74.51[6]. The provisions of 10 CFR 70.32(c) require a license authorizing the use of SNM to include and be subject to a condition requiring the licensee to maintain and follow an SNM MC&A Program, a measurement control program, and other material control procedures that include corresponding record management requirements. However, 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 contain exceptions for nuclear reactors licensed under 10 CFR Part 50. The regulations applicable to the MC&A of SNM for nuclear reactors licensed under 10 CFR Part 50 are in 10 CFR Part 74, Subpart B and 74.11 through 74.19, except for 74.17. The applicant states that the purpose of this exemption request is to seek similar exceptions for this COL under 10 CFR Part 52, so that the same regulations applicable to nuclear reactors licensed under 10 CFR Part 50 will apply to the SNM MC&A Program.

The applicant also states that that there is no technical or regulatory reason to treat nuclear reactors licensed under Part 52 differently from reactors licensed under Part 50, with respect to MC&A for SNM provisions in 10 CFR Part 74. The staff finds the applicant's justifications in Part 7 of the application acceptable in that nuclear reactors licensed under 10 CFR Part 52 should be treated the same as reactors licensed under 10 CFR Part 50 regarding MC&A for SNM.

For 10 CFR Part 52, an exemption request is evaluated under 10 CFR Part 52.7, which incorporates the requirements of 10 CFR 50.12 and states that the Commission may grant exemptions from the requirements of the regulations in 10 CFR 50.12 if (1) the exemption is authorized by law and will not present an undue risk to public health and safety and is consistent with common defense and security; and 2) special circumstances are present as specified in 10 CFR 50.12(a)(2). According to 10 CFR 50.12(a)(2)(ii), special circumstances are present whenever the application of the regulation in particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule. In addition, the criteria in 10 CFR 50.12 encompass the criteria for an exemption in 10 CFR 70.17(a) and 10 CFR 74.7, the specific exemption requirements for 10 CFR Part 70 and 10 CFR Part 74, respectively. Therefore, by demonstrating that the exemption criteria in 10 CFR 50.12 are satisfied, these exemption requests also demonstrate that the exemption criteria in 10 CFR 52.7, 10 CFR 70.17(a), and 10 CFR 74.7 will be satisfied.

NRC staff reviewed the subject exemption requests that will allow the applicant to have similar exceptions for the COL under 10 CFR Part 52. The same regulations applied to nuclear reactors licensed under 10 CFR Part 50 (i.e., the regulations under Part 74 Subpart B) will apply

[6] Although it does not include an explicit exception for 10 CFR Part 50 reactors, 10 CFR 74.33 applies only to uranium enrichment facilities and thus is not directly impacted by this exemption request.

to the SNM MC&A Program. The staff determined that (1) these requested exemptions are consistent with the AEA and are authorized by law; (2) the exemptions will not present an undue risk to public health and safety; (3) these exemptions are consistent with common defense and security; and (4) special circumstances may exist so that the application of the regulations is not necessary to achieve the underlying purpose of the rule.

Because the staff finds that the applicant has satisfied the exemption criteria in 10 CFR 50.12, the staff considers these exemption requests to also satisfy the exemption criteria in 10 CFR 52.7, 70.17(a) and 74.7. Therefore, the staff finds that the exemptions from 10 CFR 70.22(b), 70.32(c), 74.31, 74.41 and 74.51 are justified.

1.4.5 Receipt, Possession, and Use of Source, Byproduct, and Special Nuclear Material Authorized by 10 CFR Part 52, Subpart C

1.4.5.1 Introduction

The reviews conducted for compliance with the requirements of 10 CFR Part 52 to support the issuance of the COLs encompass those requirements necessary to support granting 10 CFR Parts 30, 40, and 70 licenses. As a result, the 10 CFR Part 52 COL for Fermi 3 will be consistent with the licensing requirements in 10 CFR Parts 30, 40, and 70 for nuclear power plant licenses in accordance with 10 CFR Part 50.

In SECY-00-0092, “Combined License Review Process,” dated April 20, 2000, the Commission approved generic license conditions for 10 CFR Parts 30, 40, and 70. In addition, per the memorandum dated December 9, 2008, from the Director of the Division of New Reactor Licensing in the Office of New Reactors (ADAMS Accession No. ML083030065); holders of a COL under 10 CFR Part 52 will also be authorized to receive, possess, and use source, byproduct, and SNM in accordance with Commission regulations in 10 CFR Parts 30, 40, and 70 including 10 CFR Sections 30.33, 40.32, 70.23, and 70.31 under their 10 CFR Part 52 COL. Licensees will be required to comply with all applicable regulations in 10 CFR Parts 30, 40, and 70, as well as the regulations in 10 CFR Parts 20, 50, and 52.

In order to meet these requirements, the applicant needed to supplement the COL application with a request to receive, possess, and use source, byproduct, and SNM accordingly and provide sufficient information to support compliance with the applicable portions of 10 CFR Parts 30, 40, and 70. The staff reviewed this information and detailed the privileges to be granted under 10 CFR Parts 30, 40 and 70 licenses in the proposed “License Conditions” section specified below.

1.4.5.2 Parts 30, 40, and 70 License Requests

Pursuant to 10 CFR 52.8 Part 1, “General and Administrative Information”; Section 2 (e), “Information Required by 10 CFR 50.33,” of the Fermi 3 COL application, DTE requested additional Parts 30, 40 and 70 licenses to be incorporated into the COL to receive, possess and use source, special nuclear, and byproduct material in connection with the operation of Fermi 3.

Pursuant to 10 CFR 52.8, this application also seeks licenses that would be incorporated into the COL to receive, possess, and use source, special nuclear, and byproduct material in connection with the operation of Fermi 3. Specifically, as the proposed operator of Fermi 3, DTE seeks authority for the following:

- To receive, possess, and use at any time special nuclear material as reactor fuel.

- To receive, possess, and use at any time any byproduct, source, and special nuclear material, as sealed neutron sources for reactor startup, sealed sources for instrumentation, and radiation monitoring equipment calibration and as fission detectors in the required amounts.

- To receive, possess, and use in the required amounts any byproduct, source, or special nuclear material without restriction to chemical or physical form, for a sample analysis or instrument and equipment calibration, or associated with radioactive apparatus or components.

- To possess, but not separate, such by-product, and special nuclear material, as may be produced by the operation facility.

1.4.5.3 Parts 30, 40, 70 License Request Clarifications

In order to support the staff's review of the additional 10 CFR Parts 30, 40 and 70 license requests, the staff issued RAI 01-2 on July 29, 2009 (ADAMS Accession No. ML092100072). In this RAI, the staff acknowledged that the additional license requests specified above would be in accordance with Commission regulations in 10 CFR Parts 30, 40 and 70. The staff thus requested the application to (1) determine whether the proposed standard license conditions outlined in the RAI for 10 CFR Parts 30, 40, and 70 are appropriate for the Fermi 3 COL application; and (2) address program elements ensuring that DTE will have in place the necessary controls to allow the receipt of byproduct and source materials before the 10 CFR 52.103(g) finding.

In the applicant's response dated September 24, 2009 (ADAMS Accession No. ML092720656), the applicant agreed that the proposed 10 CFR Parts 30, 40, and 70 license conditions were appropriate. Revision 8 lists the updated license conditions in Part 10 as described above. However, the staff notes that these initial license conditions have evolved based on the staff's review of information in the application. The full set of applicable license conditions in Parts 30, 40, and 70 proposed by the staff for Fermi 3 are listed below in Subsection 1.4.5.6, Parts 30, 40, and 70 License Conditions. The staff finds this information acceptable, and RAI 01-2 is resolved.

1.4.5.4 Exemptions from Part 70 License Request

In a letter dated June 21, 2011 (ADAMS Accession No. ML111720620), the staff requested the applicant to complete a table of cross-referenced regulations and regulatory guidance in support of the staff's review for the Parts 30, 40, and 70, as it relates to the staff's SNM MC&A review in RAI 01-4. As part of the applicant's Parts 30, 40, and 70 license request clarifications, the applicant responded to RAI 01-4 on July 15, 2011 (ADAMS Accession No. ML11200A042) to update Part 7 of the application to include requests for exemptions from 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51. The staff's review for the SNM MC&A is provided below and discusses these exemptions.

1.4.5.5 Parts 30, 40, and 70 Materials and Use Clarifications

In a letter dated November 9, 2011(ADAMS Accession No. ML113120325), the staff issued RAI 01-7 requesting the applicant to clarify the specific types of sources, byproducts, and SNMs; the chemical or physical forms; and the maximum amount at any one time of the requested material licenses under 10 CFR Parts 30, 40, and 70. The licensee responded in letters dated December 7, 2011 and February 1, 2012 (ADAMS Accession Nos. ML11343A014 and ML12034A064, respectively). Per 10 CFR 30.32 and 10 CFR 40.31, the staff requested the applicant to include specific information about the requested nuclear materials and their use or purpose for the licenses. In addition, in accordance with 10 CFR 70.22(a)(4), the applicant is required to include the name, amount, and specifications (including the chemical or physical form and isotopic content where applicable) of the SNM the applicant is requesting to possess and use under a 10 CFR Part 70 license.

In a letter dated December 7, 2011 (ADAMS Accession No. ML11343A014), the applicant indicated that the SNM shall be in the form of reactor fuel and spent fuel in accordance with the limitations for storage and the amounts required for reactor operation as described in the FSAR. Additionally, the byproduct, source, and SNM shall be in the form of sealed neutron sources for reactor startup and sealed sources for reactor instrumentation; radiation monitoring equipment; calibration; and fission detectors in the required amounts. In the supplemental response to RAI 01-7 dated June 28, 2013 (ADAMS Accession No. ML13183A145), the applicant revised FSAR Section 12.2 to reclassify californium (Cf)-252 as a 10 CFR Part 30 material instead of a 10 CFR Part 70 non-fuel SNM, as stated in the initial December 7, 2011, response to RAI 01-7. In preparation for the initial fuel loading, limitations on byproduct materials and Part 40 specifically licensed source materials are described below:

<u>10 CFR Part 30 Materials</u>

With respect to the amount of Part 30 materials specified by the applicant between the issuance of the COL and before the 10 CFR 52.103(g) finding, the applicant stated that the quantity of any sealed calibration and referenced sources of byproduct material with the atomic numbers 1 through 93 would not exceed 100 millicuries for a single source and 5 curies total. The maximum for americium-241 would not exceed 300 millicuries for a single source and a total of 500 millicuries. In the supplemental response to RAI 01-7, the applicant added STD SUP 12.2-1 to Subsection 12.2.1.1.2 of the Fermi FSAR. STD SUP 12.2-1 provides additional information on the Cf-252 reactor startup source, which is a sealed source that provides the total number of required curies to be contained in the six Cf-252 startup sources.

The applicant stated that this information remains in effect between the issuance of the COL and the 10 CFR 52.103(g) finding. The applicant included this information as Table 12.2-208 in FSAR Chapter 12. Further clarifications of the licensing for the receipt, possession, and use of Part 30 materials are outlined below in Subsection 1.4.5.6, Parts 30, 40, and 70 License Conditions.

<u>10 CFR Part 40 Materials</u>

The applicant states that no 10 CFR Part 40 specifically licensed material—including natural uranium, depleted uranium, and uranium hexafluoride—will be received, possessed, or used during the period between the issuance of the COL and the 10 CFR 52.103(g) finding. Accordingly, the license conditions described below only grant licenses for Parts 30 and 70

materials between the issuance of the COL and the 10 CFR 52.103(g) finding. Further clarifications of the licensing for the receipt, possession, and use of Part 40 materials after a 10 CFR 52.103(g) finding are outlined below in Subsection 1.4.5.6, Parts 30, 40, and 70 License Conditions.

10 CFR Part 70 Materials (non-fuel)

To specify these materials, the applicant states that the radioactive materials identified in the table below represent nominal values of known non-fuel SNM specifically required for use in Fermi 3 fission chambers and on Fermi 3 neutron source wires. Table 1-2 includes the following data from Table 12.2-209 of the Fermi 3 COL FSAR:

Table 1-2 Non-Fuel Special Nuclear Material for Use

(a) Element and Mass Number	(b) Chemical or Physical Form	(c) Maximum Amount
U-234 (approx. 78%) U-235 (approx. 22%)	Local Power Range Monitor Assemblies – Each assembly includes four fission chambers (64 assemblies and 4 spares)	0.0104 grams of uranium per assembly. Total of approx. 0.71 grams.
U-234 (approx. 78%) U-235 (approx. 22%)	Startup Range Nuclear Monitor Assemblies – Fission chambers (12 installed assemblies and 1 spare)	0.0129 grams of uranium per assembly. Total approx. 0.17 grams.

The above information is in FSAR Revision 8 Subsection 12.2.1.5, “Other Contained Sources,” addressing STD COL Item 12.2-4-A. The staff reviewed this information in SER Chapter 12 and finds it acceptable. In the supplemental response to RAI 01-7, the applicant proposes to remove the listing of Cf-252 from FSAR Table 12.2-209 because Cf-252 is a non-fuel SNM and adds it to Fermi 3 FSAR, Revision 8, Subsection 12.2.1.1.2, under STD SUP 12.2-1. STD SUP 12.2-1 describes the Cf-252 reactor startup source as a sealed source and states that six of these sources will be required. The staff confirmed that these changes are in Fermi 3 FSAR Revision 8. Further clarifications of the licensing for the receipt, possession, and use of Part 70 materials as a non-fuel are outlined below in Subsection 1.4.5.6, Parts 30, 40, and 70 License Conditions.

10 CFR Part 70 Materials (fuel)

The receipt, possession, and use of Part 70 SNMs as fuel are fully described in accordance with the limitations for storage and in the amounts necessary for reactor operation in the applicant’s FSAR, as supplemented and amended. Further clarifications of the licensing for the receipt, possession, and use of Part 70 materials as fuel are outlined below in the license conditions.

1.4.5.6 Parts 30, 40, and 70 License Conditions

Based on the discussions above and the reviews outlined below, the staff proposes to include the following license conditions for the Fermi 3 COL as they relate to authorization pursuant to the regulations in 10 CFR Parts 30, 40, and 70:

- License Condition (1-1) – Subject to the conditions and requirements incorporated herein, the Commission hereby licenses DTE:

  (a) (i) Pursuant to the AEA and 10 CFR Part 70, to receive and possess at any time special nuclear material as reactor fuel in accordance with the limitations for storage and in the amounts necessary for reactor operation, as described in the FSAR as supplemented and amended.

  (ii) Pursuant to the AEA and 10 CFR Part 70, to use special nuclear material as reactor fuel, after a Commission finding under 10 CFR 52.103(g) has been made, in accordance with the limitations for storage and in amounts necessary for reactor operation, described in the FSAR, as supplemented and amended;

  (b) (i) Pursuant to the AEA and 10 CFR Parts 30 and 70, to receive, possess, and use, at any time before a Commission finding under 10 CFR 52.103(g), such byproduct and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts, as necessary;

  (ii) Pursuant to the AEA and 10 CFR Parts 30, 40, and 70, to receive, possess, and use, after a Commission finding under 10 CFR 52.103(g) any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as necessary;

  (c) (i) Pursuant to the AEA and 10 CFR Parts 30 and 70, to receive, possess, and use, before Commission finding under 10 CFR 52.103(g), in amounts not exceeding those specified in 10 CFR 30.35(d) and 10 CFR 70.25(d) required for establishing decommissioning financial assurance, any byproduct or special nuclear material that is (1) in unsealed form; (2) on foils or plated surfaces, or (3) sealed in glass, for sample analysis or instrument calibration or other activity associated with radioactive apparatus or components;

  (ii) Pursuant to the AEA and 10 CFR Parts 30, 40, and 70, to receive, possess, and use, after a Commission finding under 10 CFR 52.103(g), in amounts as necessary, any byproduct, source, or special nuclear material without restriction as to chemical or physical form, for sample analysis or instrument calibration or other activity associated with radioactive apparatus or components but not uranium hexafluoride; and

  (d) Pursuant to the AEA and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

- License Condition (1-2) – Before the initial receipt of special nuclear materials (SNM) onsite, the licensee shall implement the SNM Material Control and Accounting Program. No later than 12 months after issuance of the COL, the licensee shall submit to the Director of Office of New Reactors (NRO) a schedule that supports planning for and conduct of NRC inspections of the SNM Material Control and Accounting program. The schedule shall be update every 6 months until 12 months before scheduled fuel loading, and every month thereafter until the SNM Material Control and Accounting program has been fully implemented.

- License Condition (1-3) – The fire protection measures in accordance with RG 1.189 for designated storage building areas (including adjacent fire areas that could affect the storage area) shall be implemented before initial receipt of byproduct or special nuclear materials that are not fuel (excluding exempt quantities as described in 10 CFR 30.18).

- License Condition (1-4) – The fire protection measures in accordance with RG 1.189 for areas associated with new fuel (including all fuel handling, fuel storage, and adjacent fire areas that could affect the new fuel) shall be implemented before receipt of fuel onsite.

- License Condition (1-5) – Before the receipt of fuel onsite, a formal letter of agreement shall be in place with the local fire department specifying the nature of arrangements in support of the Fire Protection Program.

- License Condition (1-6) – All fire protection program features shall be implemented before initial fuel load.

1.4.5.7 Operational Programs to Support 10 CFR Parts 30, 40, and 70

The staff notes that Fermi 3 COL FSAR Table 13.4-201, "Operational Programs Required by NRC Regulations," provides milestones and commitments for the implementation of various operational programs. Important milestones for the portions of operational programs applicable to radioactive materials that support the issuance of licenses and requirements relative to 10 CFR Parts 30, 40, and 70 are included in the following programs:

- Item 8: Fire Protection Program
- Item 10: Radiation Protection Program
- Item 11: Non-Licensed Plant Staff Training Program
- Item 15: Security Program
- Item 23: SNM Control and Accounting Program

1.4.5.8 Part 70 License Staff Review

The applicant's compliance with several applicable 10 CFR Part 70 requirements regarding radiation protection, nuclear criticality safety, and environmental protection are already encompassed by the design information incorporated by reference from the ESBWR DCD. In addition, the staff evaluated the applicant's compliance with these requirements as part of the DC review. Other applicable 10 CFR Part 70 requirements to be addressed by the COL applicant are outlined below. In order to satisfy NRC regulations and requirements for licensing under 10 CFR Part 70 so as to receive, possess, and use SNM as fuel and non-fuel, the applicant addressed the following areas for review per the guidance in NUREG–1520 and NUREG–0800:

- General Information – Applicant identifications, location, licenses sought, financial qualifications, exemption requests, site layout, population, geography, nearby facilities, meteorology, hydrology, geology, and seismicity
- Organization and Administration – Structure, management, functions, qualifications, experience, communications, and turnover of the construction to operation
- Radiation Protection
- Criticality Safety
- Fire Safety
- Emergency Preparedness
- Environmental Protection
- SNM MC&A–Exemptions, MC&A, and Fixed Site Security Review
- Physical Security

General Information

The legal identities of the applicant and the site location are described in Part 1, Sections 1, 2(a-d), and Part 2, Subsection 1.1.2.2. The license action types requested by the applicant are described in Part 1, Section 2(e). However, the staff has further clarified the 10 CFR Parts 30, 40, and 70 licenses to be granted in the license conditions listed above and throughout this review. Financial qualifications are in Part 1, Section 2(f), which the staff reviewed in SER Section 1.5.3. The exemption requests for Part 70 licensing are in Part 7 of the application, which the staff reviewed in Section 1.5.6. The facility layout, property boundaries, geography, and population are described in FSAR Section 2.1. Locations of nearby facilities are described in FSAR Section 2.2. Meteorology is described in FSAR Section 2.3, and site hydrology is described in FSAR Section 2.4. Site geology and seismicity are described in FSAR Section 2.5. Based on the above information, the staff finds that the applicant has satisfactorily addressed general information.

Organization Information

The applicant's organizational structure and charts are in FSAR Section 13.1 and Appendix 17AA. This information includes functional descriptions of the organizational groups—including those responsible for managing the design, construction, operations, and modifications of the facility; in addition to responsibilities, reporting hierarchy, and communications. FSAR Subsection 13.1.1.4 discusses the education and experience qualifications for managers, supervisors, and technicians. FSAR Appendix 13AA describes the activities required to transition the unit from the construction phase to the operation phase. Based on the above information, the staff finds that the applicant has satisfactorily addressed organizational information.

Radiation Protection

The staff's safety review under 10 CFR Part 52 for radiation protection (RP) programs and systems for the construction and operation of Fermi 3 is in SER Chapter 12. The staff finds the applicant's RP programs and systems acceptable for construction and operation.

In FSAR Table 13.4-201, the applicant states that the following four commitments will be implemented for the RP Program at Fermi 3:

- Before the initial receipt of byproduct, source, or SNMs (excluding exempt quantities described in 10 CFR 30.18) for those elements of the RP Program necessary to support such receipt.

- Before the receipt of fuel for those elements of the RP Program necessary to support receipt and storage of fuel onsite.

- Before fuel load for those elements of the RP Program that are necessary to support fuel load and plant operation.

- Before the first shipment of radioactive waste for those elements of the RP Program that are necessary to support a shipment of radioactive waste.

The above commitments correspond to the four milestones for the Radiation Protection Program that is specified in NEI Template 07-03, "Generic FSAR Template Guidance for Radiation Protection Program Description". NEI 07-03 is incorporated by reference by Fermi in Chapter 12, Appendix 12BB, of the Fermi FSAR. By letter dated March 18, 2009 (ADAMS Accession No. ML090510379), the staff determined that NEI 07-03 provides an acceptable template for assuring that the RP program meets applicable NRC regulations and guidance. Therefore, the staff finds these commitments acceptable.

The staff also performed additional radiation protection reviews of 10 CFR Part 70 license. The regulatory basis for the review of the Fermi 3 RP Program that is applicable to the fresh fuel assemblies for the first reactor core before the commencement of operation is in 10 CFR Parts 19, 20, and 70. The purpose of this review is to determine whether the DTE Fermi 3 proposed RP Program is adequate to protect the radiological health and safety of workers, the public, and the environment during fresh fuel handling and storage operations under 10 CFR Part 70.

The applicable acceptance criteria for the NRC Part 70 review of the Fermi 3 RP Program are in Section 4.4 of NUREG–1520, Revision 1, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility. Although some portions of the acceptance criteria in NUREG–1520, Section 4.4 are relevant to this incremental review, other portions are not. For example, certain RGs and other documents referenced in NUREG–1520, Section 4.4 are specific to fuel cycle facilities and are not applicable to reactor reviews. Also, reactors are not one of the engagements that require an integrated safety analysis per 10 CFR 70.60.

Operations pertaining to Part 70 include uncrating and inspecting fuel assemblies and storing them in the new fuel and spent fuel storage pool before loading into the reactor. As the fuel assemblies are effectively contained/sealed material with little associated external radiation, the radiological risks associated with this operation are considered minimal.

The review documented here is not applicable for determining the acceptability of the described program with respect to operations under 10 CFR Part 52. The RP methods and estimated occupational radiation exposures to operation and construction personnel during normal and anticipated operational occurrences will be reviewed with respect to the issuance of the combined construction permit and operating license in SER Chapter 12 for the Fermi 3 license application.

In general, the NUREG-1520 acceptance criteria require descriptions to ensure that the following topics will be adequately addressed at the facility: RP Program implementation; radiation exposures as low as reasonably achievable (ALARA); RP organization and qualifications; written procedures; training; ventilation and respiratory protection programs; radiation survey and monitoring programs; radiological risks associated with accidents; and additional programs that normally impact the RP functions. In the applicant's FSAR, Section 12.1 describes the operational RP Program. The program incorporates by reference Nuclear Energy Institute (NEI) Template 07-03A, "Generic FSAR Template Guidance for Radiation Protection Program Description, Revision 0" (ADAMS Accession No. ML091490684), with site-specific supplements or substitutions included elsewhere in the FSAR or the ESBWR DCD as the operational RP Program description. NEI 07-03A is the final accepted version of the NRC-reviewed NEI-07-03, Revision 7. NRC staff completed the review and safety evaluation of NEI 07-03, Revision 7, as documented in "Safety Evaluation Regarding the Nuclear Energy Institute Technical Report 07-03 'Generic FSAR Template Guidance for Radiation Protection Program Description, Revision 7' " (ADAMS Accession No. ML083380347). Table 13.4-201 in the applicant's FSAR indicates that all necessary aspects of the Fermi 3 RP Program will be implemented before the receipt of any byproduct, source, SNM (except as described in 10 CFR 30.18), or fuel.

The generic RP program template commits an applicant to NRC regulatory requirements and guidance; the acceptance criteria listed in RG 1.206; and Section 12.5 of NUREG–0800. Although NUREG–0800 is not as prescriptive regarding the required information for an RP program as NUREG–1520 is, the staff believes that a program established to address Part 52 operations will adequately address Part 70 operations as well. The staff reviewed NEI 07-03A and the modifications and supplements to that information described in the FSAR. The staff finds that the information adequately addresses the topics evaluated in Section 4 of the NUREG–1520 with the exceptions of ALARA, ventilation, and radiological risks associated with accidents.

With respect to ALARA, the applicant states in Appendix 12AA and Appendix 12BB of the FSAR that NEI 07-08A (ADAMS Accession No. ML093220178), "Generic FSAR Template Guidance for Ensuring That Occupational Radiation Exposures are As Low As Is Reasonably Achievable (ALARA), Revision 0," is incorporated with modifications or supplements as noted in the aforementioned appendices. Similar to NEI 07-03A, NRC staff previously reviewed NEI 07-08, Revision 3 and found it acceptable as documented via a letter dated October 15, 2009 (ADAMS Accession No. ML091130034). The template, in conjunction with template NEI 07-03A, generally describes operational policies; regulatory compliance; and operational considerations applicable to the ALARA program. Compliance with the template, when considering the minimal risks associated with the storage and handling of fresh fuel under Part 70, is adequate to ensure that operations will be ALARA. The applicant's RP program to achieve occupational doses ALARA also addresses regulatory requirements for radiation protection found in 10 CFR Part 20.

Regarding ventilation, NEI 07-03A did not contain sufficient detail regarding the facility's ventilation program for staff to fully evaluate. However, as mentioned previously, the materials of interest for this license are expected to be contained and pose little airborne potential for or risk of internal exposure. For this reason, the staff did not find it necessary to evaluate the facility's ventilation systems.

The Integrated Safety Analysis requirements for controlling the radiological risks discussed in Section 4.4.8 of NUREG–1520 are not applicable to Fermi 3, because the proposed operations are excluded from the list of activities defined in 10 CFR 70.60 to which 10 CFR Part 70, Subpart H applies. The applicant did submit an emergency plan (Part 5 of the application) that addresses responses to accident situations involving potential radiological exposures. As stated previously, the expectation is that the unirradiated uranium contained in the fuel will pose little radiological risk to the operations per Part 70.

The staff finds that DTE will establish and maintain an acceptable RP Program for Fermi 3, which addresses operations under 10 CFR Part 70 and includes the following:

- An effective documented program to ensure that occupational radiological exposures are ALARA.
- An organization with adequate qualification requirements for RP personnel.
- Approved and written RP procedures and radiation work permits for RP activities.
- RP training for all personnel who have access to restricted areas.
- A program to control airborne concentrations of radioactive material with engineering controls and respiratory protection.
- A radiation survey and monitoring program that includes requirements for controlling radiological contamination within the facility; requirements for monitoring external and internal radiation exposures.
- Other programs to correct upsets at the facility, maintain records, and generate reports in accordance with 10 CFR Parts 20 and 70.

The staff concludes that the applicant's RP Program for Fermi 3—with respect to the initial fresh fuel elements for the first reactor core as described in its License Application—complies with regulatory requirements in 10 CFR Parts 19, 20, and 70; and adequately addresses the applicable acceptance criteria in Section 4.4 of NUREG–1520, Revision 1. The staff finds that the applicant's RP Program for Fermi 3 is therefore acceptable.

Criticality Safety

The assessment of criticality safety of fresh and spent fuel storage and handling is based, in part, on the information in the ESBWR DCD. The applicant has incorporated by reference Sections 9.1.1 and 9.1.2 of the ESBWR DCD. The ESBWR DCD, Tier 2, Subsection 9.1.1.7, "Safety Evaluation," for criticality control designates DCD COL Item 9.1-4-A for the applicant to describe the programs that address criticality safety of fuel handling operations. The staff's safety review of fuel handling is in SER Section 9.1.4. The applicant has included commitment

COM 9.1-001, which specifies that fuel handling procedures will be developed 6 months before the receipt of fuel to allow sufficient time for familiarization by plant staff, to allow NRC staff adequate time to review the procedures, and to develop licensing examinations for operators. The staff finds this commitment acceptable. The staff therefore finds that the applicant has satisfactorily addressed fuel handling operations, including criticality safety.

In addition, in SER Section 13.3B, the staff finds that the applicant's request for a Part 70 SNM license did not involve an authorization to possess enriched uranium or plutonium for uranium hexafluoride in excess of 50 kilograms in a single container or 1,000 kilograms total; or in excess of 2 curies of plutonium in an unsealed form or on foils or plated sources. Therefore, a criticality alarm system is not required and implementation of the emergency plan before receipt of the SNM is also not required.

With respect to additional nuclear criticality safety review of 10 CFR Part 70 licenses, the staff performed the following review. The regulatory basis for the review of Fermi 3 nuclear criticality safety (NCS) is in 10 CFR 70.22, "Contents of applications"; 10 CFR 70.23, "Requirements for the approval of applications"; 10 CFR 70.24, "Criticality accident requirements"; and 10 CFR 70.52, "Reports of accidental criticality." The purpose of this review is to determine whether the Fermi 3-proposed NCS Program is adequate to protect the radiological health and safety of workers, the public, and the environment during fresh fuel handling and storage operations under 10 CFR Part 70. The acceptance criteria for the Part 70 review by the NRC of the Fermi 3 NCS Program are in Section 5.4 of NUREG–1520. However, the staff determined that few of those acceptance criteria are applicable to the proposed Fermi 3, Part 70 operations. The staff therefore limited the review to what was necessary to assure compliance with the applicable 10 CFR Part 70 requirements noted previously.

DTE submitted a combined construction permit and operating license application for one new ESBWR designated as Fermi 3. This review focused on criticality safety of the receipt, possession, inspection, and storage of SNM in the form of fresh fuel assemblies as applicable under 10 CFR Part 70. The operations relevant to the Part 70 portion of the license include uncrating and inspecting the fuel assemblies and storing them in the new fuel racks and spent fuel storage pool before loading into the reactor. FSAR Section 9.1 discusses criticality safety of fresh and spent fuel storage and handling.

The staff reviewed the criticality safety summaries, evaluations, and conclusions in ESBWR FSER Sections 9.1.1, and 9.1.2. These sections present the staff's criticality safety reviews of the ESBWR fuel storage and handling capabilities for fresh fuel and spent fuel. Included in the evaluation were seismic considerations, dropped loads, and fuel placement outside of the designated storage locations as well as the evaluations required to be compliant with 10 CFR 50.68. The evaluations presented encompass criticality safety considerations for fresh fuel handling and storage under Part 70. The staff's general conclusion is that subcriticality will be assured during fresh fuel handling and storage operations because the applicant meets General Design Criterion 62, as it relates to the prevention of criticality by physical systems or processes using geometrically safe configurations that will be compliant with 10 CFR 50.68.

Sections 9.1.1 and 9.1.2 of NUREG–1966 include statements that either verify or satisfy compliance with regulatory requirements under 10 CFR 50.68. As specified in 10 CFR 70.24(d)(1) and 10 CFR 50.68(a) and because Fermi 3 elected to comply with 10 CFR 50.68(b), the staff concludes that the requirements of 10 CFR 70.24 regarding criticality accident alarms

will not apply. In accordance with 10 CFR 50.68(b)(6), radiation monitors will be provided in the storage and associated handling areas when fuel is present.

Finally, the staff has determined that reporting compliant with 10 CFR 70.52 would be self–evident since the licensee will comply with 10 CFR 50.68; and no elaboration in the application should be required to assure compliance with those regulations.

The staff reviewed the applicant's information ensuring that the applicant's equipment, facilities, and procedures will be adequate to assure subcriticality of the fresh fuel consistent with 10 CFR 70.23(a)(3) and (4), thus adequately protecting health and minimizing danger to life or property.

Fire Safety

The staff completed the safety review of the fire protection programs (FPPs) and systems under 10 CFR Part 52 for the licensing and operation of Fermi 3. This review is in SER Chapter 9, Section 9.5.1. FSAR Table 13.4-201 includes two commitments to establish operational program for the FPP:

1. Before initial receipt of byproduct, source, or SNM (excluding exempt quantities as described in 10 CFR 30.18) for portions of the FPP applicable to radioactive material.

2. Before the receipt of fuel for the elements of the FPP necessary to support the receipt and storage of fuel onsite.

The NRC staff finds that these commitments contribute to the reasonable assurance that adequate fire protection will be provided and maintained to meet the criteria of 10 CFR 70.23. Therefore, the staff finds these commitments acceptable.

The purpose of the staff's 10 CFR Part 70 licenses fire safety review is to determine, with reasonable assurance, that Fermi 3 has (1) designed a facility that provides adequate protection against fires and explosions, which could affect the safety of licensed materials and thus present an increased radiological risk; (2) considered the radiological consequences of fires; and (3) instituted suitable safety controls to protect workers, the public, and the environment.

The regulatory basis for the fire safety review includes the general and additional contents of the application, as required by 10 CFR 70.22. In addition, the fire safety review must provide reasonable assurance of compliance with 10 CFR 70.23(a)(3) and 10 CFR 70.23(a)(4). The acceptance criteria that the NRC uses for fire safety reviews of licensed materials are in Subsections 7.4.3.1 through 7.4.3.5 of NUREG–1520.

The fire protection review was performed relative to the guidance in NUREG–1520. The information to support this review was obtained from Revision 8 of the COL application. The facility and its fire protection systems are designed and will be constructed to industrial standards currently in effect. The licensee commits to meeting the prevailing codes whenever facilities are expanded or modified. Facilities are generally noncombustible masonry or metal construction. Lightning protection is incorporated into the facility design. Facility exit routes are posted throughout and are unimpeded by physical security requirements. In addition, workers are trained in evacuation and periodic drills are conducted to verify the adequacy of egress. Within the fuel building, which is a seismic Category I structure, new fuel bundles are brought in uncrated through the rail car bay; raised to the refueling floor; and transferred for storage on

racks in the buffer pool within the reactor building, which is also a seismic Category I structure. The process itself utilizes methods and materials that have no fire safety concerns.

The fire protection equipment in the fuel handling area of the fuel building includes fire detection, portable fire extinguishers, and hose stations for manual firefighting.

Site procedures for the maintenance and surveillance testing of the equipment listed above include the fire pump, fire mains, standpipes, and hoses that were developed and will perform as described in the FPP. In addition, the compensatory actions described in the FPP will be used if any of the listed fire equipment becomes unavailable.

The staff has proposed the following license conditions regarding the FPP that require:

- Fire protection measures in accordance with RG 1.189 for designated storage building areas (including adjacent fire areas that could affect the storage area) shall be implemented before the initial receipt of byproduct or SNMs that are not fuel (excluding exempt quantities as described in 10 CFR 30.18).

- The fire protection measures in accordance with RG 1.189 for areas associated with new fuel (including all fuel handling, fuel storage, and adjacent fire areas that could affect the new fuel) shall be implemented before the onsite receipt of fuel.

- Before the onsite receipt of fuel, a formal letter of agreement shall be in place with the local fire department specifying the nature of arrangements in support of the FPP.

- All FPP features shall be implemented before initial fuel load.

These license conditions are included in Subsection 1.4.5.6, Parts 30, 40, and 70 License Conditions, above.

Effective handling of fire emergencies is accomplished by trained and qualified emergency responders. The fire response organization is staffed and equipped for firefighting activities. The fire brigade is composed of a fire brigade leader and four fire brigade members. The fire brigade does not include the Shift Manager or other members of the minimum shift crew necessary for a safe shutdown of the unit, nor any personnel required for other essential functions during a fire emergency. Additional support is available when needed through an agreement with the local fire department.

Training ensures that the capability of fire brigades to combat fires is established and maintained. The training program consists of initial (classroom and practical) training and recurrent training that includes periodic instruction, fire drills, and annual fire brigade training.

Firefighting equipment is provided throughout the plant. Fire emergency procedures and pre-fire plans specify the actions to be taken by the individual discovering the fire and by the emergency responders. A discussion of this pre-fire plan is included in the periodic classroom instruction training program provided for the emergency responders.

Combustibles are controlled to reduce the severity of a fire that might occur in a given area and to minimize the amount and type of material available for combustion. The use and application of combustible materials at Fermi 3 are controlled with the following methods:

- Instructions/guidelines provided during general employee training/orientation programs.
- The chemical control program.
- Periodic plant housekeeping inspections/tours by management and/or the fire protection organization for the plant.
- The design/modification review and installation process.
- Administrative procedures (e.g., Transient Combustible Control Program).

The use of ignition sources such as welding, flame cutting, brazing, grinding, arc gouging, torch-applied roofing, and open flame soldering within safety-related areas are controlled through the approval and issuance of an ignition source permit. Permits are reviewed and approved by appropriate plant personnel. The ignition source permit is valid for one job, and at the start of each shift with a permitted ignition source activity a job area inspection will be performed and documented.

The Fire Hazards Analysis (FHA) is part of the FPP. FHA results are documented on a fire area basis; they are broken down into separate discussions of classical fire protection features and a safe shutdown analysis for each fire area. The FHA is required to be updated before the receipt of the new fuel, as part of the license conditions above. The FHA includes the following:

- A summary of the evaluation performed to determine the adequacy of the fire protection features for each fire area.
- A discussion of the ability to achieve a safe shutdown in case of a fire in each fire area.

The fire hazards and safe shutdown evaluation are performed by qualified nuclear, mechanical, electrical, and fire protection engineers. FHA and pre-fire plans conform to the applicable guidance in NFPA 801, "Standard for Fire Protection for Facilities Handling Radioactive Materials."

The staff concludes that the applicant's capabilities meet the criteria in Chapter 7 of NUREG-1520. The staff has determined that the applicant's equipment, facilities, and procedures provide reasonable assurance that adequate fire protection will be provided and maintained to meet the criteria of 10 CFR 70.23.

Emergency Preparedness

The staff's evaluation of the application for emergency planning with respect to Parts 30, 40, and 70 licenses is in SER Section 13.3B.9. In this review, the staff finds that the applicant has met the requirements of 10 CFR 70.22(i)(1).

The staff finds that the applicant's stated request for a Part 70 license does not involve the authorization to possess enriched uranium that requires a criticality accident alarm system, uranium hexafluoride in excess of 50 kilograms in a single container or 1,000 kilograms total, or in excess of 2 curies of plutonium in an unsealed form or on foils or plated sources. Hence, an emergency plan that meets 10 CFR 70.22(i)(3) is not required. Therefore, the implementation of the Emergency Plan before the receipt of SNMs was removed from FSAR Table 13.4-201,

"Operational Programs Required by NRC Regulations," in Revision 7 to the FSAR. Additionally, Chapter 12 FSAR Subsection 12.2.1.5 includes a requirement addressing the limitations during the period before the implementation of the emergency plan (before the initial fuel loading) following the finding that the acceptance criteria in the COL have been met, as provided in 10 CFR 52.103(g). The applicant's Emergency Planning for Byproduct, Source, and Special Nuclear Material Licenses is evaluated in Section 13.3B.9 of this SER.

In addition, in SER Section 13.3B, the staff finds that the applicant's request for Part 70 SNM did not involve an authorization to possess enriched uranium or plutonium for uranium hexafluoride in excess of 50 kilograms in a single container or 1,000 kilograms total; or in excess of 2 curies of plutonium in an unsealed form or on foils or plated sources. Therefore, a criticality alarm system would not be required, and the implementation of an emergency plan before the receipt of the SNM is not required.

Environmental Protection

The staff's complete review of environmental protection for the licensing and operation of Fermi 3 under 10 CFR Parts 51 and 52 is in the Final Environmental Impact Statement in NUREG–2105.

With respect to environmental protection for 10 CFR Part 70 licenses, the staff performed the following review. The regulatory basis for the review of the Fermi 3 Environmental Protection Program applicable to the fresh fuel assemblies for the first reactor core before beginning operation is in 10 CFR Parts 20, 51, and 70.

The Fermi 3 facility will also use fission chamber detectors containing SNM for the reactor startup and neutron flux monitoring during reactor operations. NRC staff evaluated the use and handling of these fission chamber detectors for compliance against the applicable requirements in 10 CFR Parts 20, 51, and 70.

The acceptance criteria for the NRC Part 70 review of the portion of the Fermi 3 Environmental Protection Program described above are outlined in Section 9.4 of NUREG–1520, Revision 1. Although most portions of the acceptance criteria in Section 9.4 of NUREG–1520 are directly applicable to this review, other portions are not because of the scope of the proposed activities. For example, a review of an applicant's Integrated Safety Analysis of accidents is conducted for fuel cycle facilities but not for reactors. In addition, certain regulatory guides and other documents referenced in Section 9.4 of NUREG–1520 are specific to fuel cycle facilities.

The radiological impacts assessment is based, in part, on information in the ESBWR DCD, Revision 10. The DCD is incorporated by reference into Revision 8 of the FSAR, which was prepared to be consistent with the guidance in NUREG–0800. This staff review focused on the incremental impact, if any, to the Fermi 3 Environmental Protection Program related to the receipt; possession; inspection; and storage of the SNM in the form of fresh fuel assemblies for the first reactor core loading; as applicable under 10 CFR Part 70. This review also evaluated the receipt, storage, use, and disposal of fission chamber detectors containing SNM. These detectors will be used for the reactor start-up and neutron flux monitoring during reactor operations.

DTE also prepared an environmental report that was submitted as Part 3 of the COL application. The report addressed the environmental impacts from constructing, operating, and decommissioning the proposed facility. NRC staff issued the Final Environmental Impact Statement (FEIS) as NUREG–2105. The transportation impacts from unirradiated fuel are discussed in this FEIS.

NRC staff reviewed FSAR Sections 11.4, 11.5, 12.1, 12.2, and 13.1, in addition to FSAR Table 13.4-201. These sections describe the radiation protection and waste management program to be used for the entire facility, which includes the proposed activities that are within the scope of this review. The staff noted that several elements of DTE's environmental protection strategy will be in place before the onsite receipt of fuel or initial fuel loading. These elements include but are not limited to the radiological environmental monitoring program, waste management program, offsite dose calculation manual, and the process and effluent monitoring and sampling program. The staff also noted that the incremental effects related to the fresh fuel assemblies for the first core loading, and the use of fission chamber detectors, do not change DTE's ALARA goals or controls for liquid or air effluents. These goals include an analysis of the total effective dose equivalent to the maximally exposed individual member of the public who would receive the greatest radiation dose. Population dose estimates are also unaffected. DTE's monitoring of liquid and air discharges, including monitoring locations and samples, will not be affected by the proposed activities.

DTE's plant personnel includes those involved in the proposed activities who will be qualified to meet the requirements in American National Standard Institute (ANSI)/American Nuclear Society (ANS) 3.1-1993 "American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plant" as endorsed by RG 1.8, "Qualification and Training of Personnel for Nuclear Power Plants." FSAR Section 13.2 references the NRC-approved NEI guidance NEI 06-13A, "Template for an Industry Training Program Description." The staff recognizes that compliance with these documents is an acceptable method for ensuring that the facility's staff will have adequate education and training to engage in the proposed activities.

NRC staff finds that the quality control procedures related to the collection and analyses of environmental monitoring samples will not be affected by the proposed activities. ALARA reviews and reports to management will not be affected by activities involving the fresh fuel assemblies or the fission chamber detectors. Because the fresh fuel assemblies and fission chamber detectors contain SNM in the form of encapsulated material (i.e., not dispersible), they result in a low risk of environmental releases. DTE's implementation of the Environmental Protection Program as described in the Fermi 3 FSAR provides reasonable assurance that any releases or waste generated during the proposed activities will be adequately handled to protect the public health and safety and the environment.

NRC staff also evaluated the environmental impacts related to the transportation of unirradiated fuel assemblies to and from the Fermi 3 facility using a representative route. Section 6.2 of NUREG–2105 documents the findings in this area. DTE provided dose projections for the maximally exposed individuals under different transportation scenarios, including accident conditions. The staff independently verified the dose projections, which were found to be below the regulatory limits in 10 CFR 51.52. Therefore, the staff has reasonable assurance that the environmental impacts associated with the transportation of unirradiated fuel to the Fermi 3 facility will not pose an undue risk to public health and safety and to the environment. DTE has committed to adequate environmental protection measures including (1) environmental and effluent monitoring, (2) effluent controls to maintain public doses ALARA as part of the Radiation

Protection Program, and (3) waste management programs. NRC staff concludes, with reasonable assurance that DTE's conformance to the application and license conditions is adequate to protect the environment and public health and safety and complies with the regulatory requirements imposed by the Commission in 10 CFR Parts 20, 51, and 70. NRC staff finds that DTE's Environmental Protection Program for the proposed activities as described in the COL application and the environment report, adequately addresses the applicable acceptance criteria in Subsection 9.4.3.2 of NUREG–1520, Revision 1, and is therefore acceptable.

Special Nuclear Materials Material Control and Accounting Review

The staff conducted a review of the applicant's MC&A Program description. The purpose of this review was to determine that the applicant had provided a description of an MC&A Program that would be capable of satisfying the regulatory requirements in 10 CFR Part 74, Subpart B.

In accordance with 10 CFR 70.22(b), current applicants requesting a license to possess SNM must submit a full description of their program for the control and accounting of SNM in the applicant's possession and to show compliance with 10 CFR 74.31, 74.33, 74.41, or 74.41, as applicable. Also in accordance with 10 CFR 70.32(c), applicants requesting a license to possess SNM are subject to a license condition to maintain and follow a program for controlling and accounting for source material and SNM. Decreases in the program's effectiveness will be submitted as an amendment pursuant to 10 CFR 70.34. However, the requirements in 10 CFR 70.22(b) and 70.32(c) contain an exclusion for licensees governed by 10 CFR Part 50, "Domestic Licensing of Production and utilization Facilities"; including existing nuclear power plants. Moreover, the DTE Fermi 3 COL application was submitted and accepted as a licensing action for a nuclear power plant under 10 CFR Part 52 instead of 10 CFR Part 50.

The 10 CFR Part 70 and 74 exclusions described above do not include 10 CFR Part 52 applicants, even though for purposes of the requirement, the applicants are the same facility type. For both 10 CFR Parts 50 and 52 applicants, 10 CFR Part 74, Subpart B (excluding 74.17) contains the appropriate MC&A performance requirements. An adequate applicant submittal would describe the licensee program elements that would meet the 10 CFR Part 74 requirements. Additionally, because the primary roles of the MC&A Program are to control and account for SNM, the licensee program elements would have to be developed and implemented before receiving SNM and be maintained as long as any SNM was onsite.

Regulatory Guide 5.29, issued June 2013 (ADAMS Accession No. ML13051A421), provides American National Standard (ANSI) publication, N15.8-2009, as an acceptable approach to the NRC staff for complying with the NRC's regulations regarding material control and accounting requirements in Subpart B of 10 CFR Part 74 at nuclear power plants (Draft Regulatory Guide DG-5028 was issued May 2012 (ADAMS Accession No. ML113550062)). This approach will result in the MC&A description providing assurance that the implemented program would meet the performance requirements of 10 CFR Part 74, Subpart B (excluding 10 CFR 74.17).

Exemption Requests from 70.22(b), 70.32(c), 74.31, 74.41, and 74.51

In order for the applicant to have the same requirements applied to their SNM MC&A Program as are applied to other reactors licensed under 10 CFR Part 50, the applicant submitted requests for exemption from 10 CFR Parts 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 that are

detailed in Part 7 of the application. The staff finds that these exemptions are justified and should be granted. The staff's reviews of these exemption requests are in SER Section 1.4.5.

MC&A Review

In a letter dated June 21, 2011 (ADAMS Accession No. ML111720620), the staff requested the applicant to complete a table of cross-referenced regulations and regulatory guidance in support of the staff's review for the Parts 30, 40, and 70, as it relates to the staff's SNM MC&A review in RAI 01-4.

In a letter dated July 15, 2011 (ADAMS Accession No. ML11200A042), the applicant provided the following items:

- Completed cross-referenced tables.
- An update to FSAR Table 13.4-201 that includes a milestone for implementing the SNM MC&A Program.
- An updated FSAR that includes a new Subsection 13.5.2.2.11 with SNM MC&A Procedures.
- An update that includes a new description of the SNM MC&A Program as Appendix 13CC in FSAR Chapter 13.
- An updated COL application Part 7 that includes a request for exemptions from 10 CFR 70.22(b), 70.32 (c), 74.31, 74.41, and 74.51.

The staff finds the following responses acceptable:

- The complete cross-referenced tables provided the staff with a useful guide to portions of the application that pertained to Parts 30, 40, and 70.
- The SNM MC&A Program will be implemented as an operational program before the receipt of SNM; and the program and its implementation will be fully described in the updated application in Appendix 13CC, which is included as an operational program and commitment in Table 13.4-201.
- The applicant has proposed an update to FSAR Subsection 13.5.2.2.11 that will include STD SUP 13.5-41 (missing from 13 SER), which will briefly describe the procedures detailed in the applicant's SNM MC&A Program and will serve as a pointer to Appendix 13CC.

As stated above, the staff finds this information acceptable. Therefore, RAI 01-4 is resolved.

In order for the staff to continue the review of the MC&A plans, the staff issued RAI 01-7 as discussed above in Subsection 1.5.5.5, Parts 30, 40, and 70 Materials and Use Clarifications, per 70.22 (a)(4). The applicant's response dated December 7, 2011 (ADAMS Accession No. ML11343A014) describes the other types of non-fuel SNM typically required of ESBWR units and identifies them as fission chambers and neutron source wires. In addition to this information, the applicant submitted a supplemental response to RAI 01-7 dated February 1, 2012 (ADAMS Accession No. ML12034A064) that specifies definitions per 10 CFR 70.4 and further clarifies that the SNM in the form of new reactor fuel for Fermi 3 is a Category III SNM of

low strategic significance. In addition, this response clarifies that the new reactor fuel will not exceed the U-235 isotope enrichment of 10 percent. With this information, the applicant adequately addresses the requirements in 70.23(a)(4). Therefore, RAI 01-07 is resolved.

The review of the applicant's proposed SNM MC&A Program in Appendix 13CC encompassed requirements in 70.22(a)(4); 74.11, "Reports of loss or theft or attempted theft or unauthorized production of special nuclear material"; 74.13, "Material status reports"; 74.15, "Nuclear material transaction reports"; and 74.19, "Recordkeeping." The staff concludes the programs as described are acceptable and meet the regulatory requirements for:

- notification
- material balance and inventory listing reports
- nuclear material transaction reports
- records retention
- established procedures
- conducting a physical inventory and maintaining associated records

The staff finds that the applicant's changes to the application acceptable in that the MC&A Program will be an operation program, and the development of MC&A procedures is formally annotated in FSAR Appendix 13CC. The staff proposes the following license condition as it relates to the MC&A requirements in Part 74:

> **License Condition** – Prior to initial receipt of special nuclear materials (SNM) onsite, the licensee shall implement the SNM Material Control and Accounting program. No later than 12 months after issuance of the COL, the licensee shall submit to the Director of Office of New Reactors (NRO) a schedule that supports planning for and conduct of NRC inspections of the SNM Material Control and Accounting program. The schedule shall be update every 6 months until 12 months before scheduled fuel loading, and every month thereafter until the SNM Material Control and Accounting program has been fully implemented.

This license condition is included in the Subsection 1.4.5.6, Parts 30, 40, and 70 License Conditions, above.

<u>Fixed Site and Transportation Security for SNM in Regards to the 10 CFR 73.67 Review</u>

This portion of the Part 70 materials review pertains to 10 CFR 73.67, "Licensee fixed site and in-transit requirements for the physical protection of special nuclear material of moderate and low strategic significance."

In Item 15 of FSAR Table 13.4-201, the applicant states that the protected area will be established before the onsite fuel delivery. Therefore, the staff finds that a Special Nuclear Material Physical Protection Plan (SNMPPP) that describes how the fixed site requirements of 10 CFR 73.67 will be met would not be required. In order to complete the review, the staff issued RAI 01-6 on August 2, 2011 (ADAMS Accession No. ML112140062), requesting the applicant to provide a transportation security plan that addresses the security requirements for shipping and receiving SNM (new fuel) in accordance with 10 CFR 73.67(g). On August 15, 2011, the applicant submitted the response to RAI 01-6 (ADAMS Accession No. ML11229A165) that included a description of the New Fuel Shipping Plan as Appendix 13DD in FSAR Chapter 13. In addition, the applicant updated FSAR Subsection 13.5.2.2.8 to address the

addition of the new fuel shipping plan as part of the security procedures. The staff verified that the applicant incorporated the FSAR markups identified in the RAI response into Revision 7 of the application.

NRC staff also reviewed the applicant's New Fuel Shipping Plan for SNM low strategic significant (SNM-LSS) shipments originating from or arriving at the facility. The plan states that the reactor licensee will not develop its own transportation security plan and will make arrangements with an SNM-qualified licensee for transport under its own transportation security plan. These arrangements carried out in this manner for in-transit physical protection are acceptable per 10 CFR Part 73.67(g)(1)(v). The approaches and procedures as outlined in the New Fuel Shipping Plan satisfy the requirements specified in 10 CFR 73.67(a), 73.67(f) and (g)(1)-(3), and 73.71. NRC staff concludes that the facility New Shipping Plan is acceptable and provides reasonable assurance that the requirements for the physical protection of SNM-LSS in transit will be met.

Physical Protection Program in FSAR Section 13.6 in Regards to the 10 CFR 73.55 Review

Part 8 of the application contains the Fermi 3 security plan that is referenced in Part 2, FSAR Chapter 13, Section 13.6. This information includes the Physical Security Plan that contains safeguards information as defined by 10 CFR 73.21; its disclosure to unauthorized individuals is prohibited in Section 147 of the AEA. The staff's safety review of this information under 10 CFR Part 52 for the licensing and operation of Fermi 3 is in SER Chapter 13, Subsection 13.6. Those persons with the correct access authorization and a need to know basis may view the safeguards information version of the Fermi COL application, SER Section 13.6.

Per 10 CFR 73.55, "Requirements for physical security protection of licensed activities in nuclear power reactors against radiological sabotage," the staff reviewed the applicant's proposed security plan in Part 2 of FSAR Chapter 13, Subsection 13.6 and Part 8 of the application. The staff finds that the applicant has satisfied the regulatory requirements and provided the required information relating to physical security. The staff concludes that the applicant has provided the necessary programmatic elements in the physical security plan, the training and qualification plan, and the safeguards contingency plan, which provide a high assurance that activities involving SNM are not inimical to common defense and security and do not constitute an unreasonable risk to public health and safety.

1.4.5.9 Parts 30 and 40 License Staff Review

In order to satisfy NRC regulations and requirements for the receipt, possession, and use of byproduct and/or source materials, the applicant needed to address the following main areas for review per the guidance in NUREG–1556, Volume 7, Section 8:

- General Information – License action type, legal identities, address, points of contact.
- Materials to be possessed and used.
- Financial assurance and recordkeeping.
- Individuals responsible for the radiation safety program and training and experience, etc.
- Training for workers in restricted areas.
- Facilities and equipment.
- Radiation Safety Program.
- Waste management.
- Physical security.

- Emergency preparedness.

General Information

The Part 30 and 40 licenses requested by the applicant are described above in Subsection 1.4.5.3, Parts 30, 40 and 70 License Request Clarifications, and in Subsection 1.4.5.6, Parts 30, 40, and 70 License Conditions. The legal identities, addresses, and points of contact are described in Part 1 of Section 2(a-d). The staff finds that the applicant has adequately addressed this information.

Materials To Be Possessed and Used

The possession and proposed uses of Parts 30 and 40 materials are described above in the Subsection 1.4.5.5, Parts 30, 40, and 70 Materials and Use Clarifications; in addition to the Subsection on 1.4.5.3, Parts 30, 40, and 70 License Request Clarifications. The staff finds that the applicant has adequately identified the possession and proposed uses of materials.

Financial Assurance and Recordkeeping for Decommissioning

The applicant describes this information in the Decommissioning Funding Report in Part 1, Section 2(f), including Appendix C. This information is discussed and reviewed in Section 1.5.1 of this SER. In addition, the QAPD in FSAR Appendix 17AA describes the decommissioning record keeping processes. The QAPD is reviewed in SER Chapter 17. The staff finds that the applicant has adequately addressed these items.

Individuals Responsible for the Radiation Safety Program: Qualifications, Training, and Experience

The RP Program for Fermi 3 is described in FSAR Section 12.5, Appendices 12AA and 12BB. In SER Chapter 12, the staff finds the applicant's programs acceptable. In regards to radiation protection managers, supervisors, and technicians, FSAR Section 13.1 describes the job and function for these positions. In addition, qualifications and training for these positions are described in FSAR Sections 13.1 and 13.2. The staff reviewed this information in SER Chapter 13 and finds it acceptable.

Training for Workers in Restricted Areas

The RP Program for Fermi 3 is described in FSAR Section 12.5, Appendices 12AA and 12BB. In SER Chapter 12, the staff finds the applicant's programs acceptable. The training criteria for workers in restricted areas are described in FSAR Section 13.2. The staff reviewed this information in SER Chapter 13 and finds it acceptable.

Facilities and Equipment

The physical arrangement and design features for radiation protection is described in FSAR Section 12.3. In addition, in FSAR Sections 12.5, Appendices 12AA and 12BB describe the facilities, instrumentation, and equipment provided to support the implementation of the radiation protection program. The staff reviewed this information in SER Chapter 12 and finds it acceptable.

Radiation Safety Program

The applicant describes the RP Program in FSAR Section 12.5. The staff finds the applicant's RP Program acceptable in SER Chapter 12. Qualifications, training, and experience for managers, supervisors, and technicians are described in FSAR Sections 13.1 and 13.2. The staff reviewed this information in SER Chapter 13. Radiation control procedures and the maintenance of radiation records will be established by the applicant's QAPD, as presented in FSAR Appendix 17AA. The QAPD is reviewed in SER Chapter 17. In addition, FSAR Table 13.4-201 provides the applicant's commitments to implement the radiation protection programs. The staff reviewed this information in SER Chapters 12 and 13 and finds it acceptable. The staff finds that the applicant has adequately addressed these items.

Waste Management

The radioactive waste management system includes the liquid waste management system (LWMS, Section 11.2); gaseous waste management system (GWMS, Section 11.3); solid waste management system (SWMS, Section 11.4); and process effluent radiation monitoring and sampling systems (PERMS, Section 11.5) as described in the FSAR. The staff evaluated these systems and associated programs and information supplied by the applicant. The staff concludes that the information pertaining to the applicant's waste management systems and programs in Chapter 11 are acceptable.

Physical Security

The applicant's physical security program is described in FSAR Section 13.6. The staff reviewed the Physical Security Program in SER Section 13.6 and finds it acceptable.

Emergency Preparedness

The staff's evaluation of the application for emergency planning with respect to Parts 30, 40, and 70 licenses is in Section 13.3B.9 of the staff's SER. In this review, the staff finds that the applicant has met the requirements of 10 CFR 30.32(i) and 40.31(j).

The applicant states that no byproduct material in an unsealed form on foils or plated sources, or sealed in glass, in excess of the quantities in Schedule C of 10 CFR 30.72, would be received, possessed, or used at the Fermi 3 site. Because the quantities do not exceed Schedule C, an emergency plan that meets the requirements of 10 CFR 30.32(i)(3) is not required. Therefore, the implementation of the emergency plan before the receipt of byproduct material has been removed from FSAR Table 13.4-201.

The applicant states that the Part 40 license will not involve authorization to receive, possess, or use uranium hexafluoride in excess of 50 kilograms in a single container or 1,000 kilograms total. Because these quantities will not exceed the values listed above, an emergency plan for

responding to radiological hazards from an accidental release of source material and to any associated chemical hazards related to the material is not required. Therefore, the implementation of the emergency plan before the receipt of source material has been removed from FSAR Table 13.4-201. Chapter 12 of the FSAR includes a requirement addressing these limitations during the period before the implementation of the emergency plan—before the initial fuel loading following the finding that the acceptance criteria in the COL have been met as provided in 10 CFR 52.103(g).

The applicant acknowledges that these limitations on Parts 30 and 40 materials, with respect to the period before the implementation of the emergency plan and in preparation for the initial fuel loading following a 10 CFR 52.103(g) finding, will be addressed in a revision to Subsection 12.2.1.5 of the FSAR. However, as discussed above, the staff notes that in response to RAI 01-7, the applicant further clarifies that no 10 CFR Part 40 specifically licensed material including natural uranium, depleted uranium, and uranium hexafluoride will be received, possessed, or used during the period between the issuance of the COL and the 10 CFR 52.103(g) finding. This limitation is addressed in Subsection 1.4.5.6, Parts 30, 40, and 70 License Conditions, above.

Therefore, based on the above, the staff finds that the applicant has met the requirements of 10 CFR 30.32(i) and 40.31(j).

1.4.5.10 Part 37 Staff Review

On March 19, 2013, a new 10 CFR Part 37 rule was published in the FR. The NRC amended its regulations to establish security requirements for the use and transport of Category 1 and Category 2 quantities of radioactive material. The NRC considers these quantities to be risk significant and, therefore, to warrant additional protection. Category 1 and Category 2 thresholds are based on the quantities established by the International Atomic Energy Agency (IAEA) in its Code of Conduct on the Safety and Security of Radioactive Sources, which the NRC endorses. The objective of the 10 CFR Part 37, “Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material,” rule is to provide reasonable assurance of preventing the theft or diversion of Category 1 and Category 2 quantities of radioactive material. The regulations also include security requirements for the transportation of irradiated reactor fuel that weighs 100 grams or less in net weight of irradiated fuel. The 10 CFR Part 37 rule affects any licensee that possesses an aggregated Category 1 or Category 2 quantity of radioactive material, any licensee that transports these materials using ground transportation, and any licensee that transports small quantities of irradiated reactor fuel. The 10 CFR Part 37 rule compliance date was March 19, 2014.

By letter dated January 16, 2014 (ADAMS Accession No. ML14022A165), the NRC issued RAI 89 for the Fermi 3 COL application. RAI 89 requested the applicant to provide descriptions in the FSAR, (e.g. Chapter 13), to address how the applicant, prior to taking possession of an aggregated Category 1 or Category 2 quantity of radioactive material will implement the requirements of 10 CFR Part 37, by establishing, implementing, and maintaining a security program for Fermi 3. By letter dated February 12, 2014 (ADAMS Accession No. ML14051A707), the applicant provided a response to RAI 89.

Upon further review by the staff, it was determined that the regulations of 10 CFR Part 37 do not require COL applicants to address 10 CFR Part 37. After COL issuance, a COL licensee becomes subject to the requirements of this regulation upon taking possession of an

aggregated Category 1 or Category 2 quantity of radioactive material. Therefore, the NRC withdrew RAI 89 as stated in letter dated April 24, 2014 (ADAMS Accession No. ML14097A323). By letter dated April 30, 2014 (ADAMS Accession No. ML14121A371), the applicant withdrew its response to RAI 89. Since the RAI response resulted in changes that were incorporated into Revision 7 of the Fermi 3 COLA, the applicant included a proposed FSAR change to remove this information. The staff will track the applicant's revision to this FSAR section as Confirmatory Item 01-3. The staff verified that FSAR Revision 7 does not include the response to RAI 89. Therefore, Confirmatory Item 01-3 is resolved.

Conclusion

Based on the reviews discussed above, the staff finds that the applicant has used a combination of the information in the referenced ESBWR DCD and the information in the COL application, including supplemental COL information, in order to demonstrate compliance with the requirements of 10 CFR Part 52. The applicant's compliance with 10 CFR Part 52 licensing encompasses the necessary requirements to support granting 10 CFR Parts 30, 40, and 70 licenses consistent with operating licenses for nuclear power plants licensed in accordance with 10 CFR Part 50. The staff used the guidance in NUREG–0800, NUREG–1520, and NUREG-1566.

The privileges to be granted under the 10 CFR Parts 30, 40, and 70 licenses are detailed by the staff in the proposed License Conditions specified above. Therefore, the applicant for the Fermi 3 COL will also be authorized to receive, possess, and use source, byproduct, and special nuclear material in accordance with the Commission's regulations in 10 CFR Parts 30, 40, and 70; including 10 CFR Sections 30.33, 40.32, 70.23, and 70.31. The applicant complies with all applicable regulations of 10 CFR Parts 30, 40, and 70; as well as the regulations in 10 CFR Parts 20, 50, and 52.