

DRAFT RECORD OF DECISION
U.S. NUCLEAR REGULATORY COMMISSION
DOCKET NO. 52-033
COMBINED LICENSE APPLICATION FOR
ENRICO FERMI NUCLEAR PLANT UNIT 3

BACKGROUND:

On September 18, 2008, the U.S. Nuclear Regulatory Commission (NRC or Commission) received an application from Detroit Edison Company (Detroit Edison or Applicant), for a combined license (COL) for one Economic Simplified Boiling Water Reactor (ESBWR) for Enrico Fermi Nuclear Plant Unit 3 (Fermi 3), located on the Detroit Edison Enrico Fermi Atomic Power Plant (Fermi) site in Monroe County, Michigan. In a letter dated December 21, 2012, Detroit Edison informed the NRC that effective January 1, 2013, the name of the company would be changed to "DTE Electric Company" (ADAMS Accession No. ML12361A437). DTE Electric Company is a wholly owned subsidiary of DTE Energy and would be the owner of Fermi 3. DTE Electric Company is the licensed operator of the existing Fermi 2 nuclear power plant and would be responsible for building and operation of the proposed project. The new unit will be capable of providing an additional 1535 ± 50 megawatts of electricity (MW(e)) as a baseload source.

Section 102 of the National Environmental Policy Act of 1969, as amended (NEPA), directs that an environmental impact statement (EIS) be prepared for major Federal actions significantly affecting the quality of the human environment. The NRC's regulations in Title 10 of the *Code of Federal Regulations* (CFR) Part 51, were developed to implement the agency's responsibilities under Section 102 of NEPA. Pursuant to 10 CFR 51.20(b)(2), the NRC defines issuance of a COL as an action for which the agency will prepare an EIS.

The NRC published a notice of acceptance of the Fermi 3 COL application for docketing on December 2, 2008 (73 FR 73350) and subsequently published a notice of intent to prepare an EIS and conduct a scoping process (73 FR 75142). Detroit Edison would also require permits from the U.S. Army Corps of Engineers (USACE) in order to perform certain site preparation activities associated with building the proposed facility.¹ To enable each agency to most efficiently meet its NEPA responsibilities for its license or permit decision, the NRC agreed to serve as the lead agency for preparing the EIS, with the USACE as a cooperating agency.

On January 14, 2009, the NRC held two public meetings in Monroe, Michigan to obtain public input on the scope of the environmental review. The staff reviewed the oral and written comments received during the scoping process and contacted Federal, State, Tribal, regional and local agencies to solicit comments. A Scoping Summary Report was issued on July 2, 2009 (ADAMS Accession No. ML091520145).

The NRC and USACE developed a draft environmental impact statement (DEIS), and on October 28, 2011, a 75-day comment period began to allow members of the public and agencies to comment on the results of the environmental review (76 FR 66925). On December 15, 2011, the NRC conducted two public meetings at the Monroe County Community College, in

¹ These site preparation activities fall within the USACE's jurisdiction under Section 10 of the Rivers and Harbors Appropriations Act of 1899 and Section 404 of the Clean Water Act.

Monroe, Michigan to describe the results of the environmental review, respond to questions, and accept public comments. In January 2013, the NRC issued the “Final Environmental Impact Statement for the Combined License (COL) for Enrico Fermi Unit 3” (NUREG-2105), Volumes 1, 2, 3, and 4 (ADAMS Accession Nos. ML12307A172, ML12307A176, ML12307A177, and ML12347A202, respectively) (final EIS). All comments related to the environmental review during the comment period are included in appendix E of the final EIS.

Pursuant to 10 CFR 51.102 and 51.103(a)(1)-(4), the NRC staff has prepared this Record of Decision (ROD) to accompany its action on the combined license application. This ROD incorporates by reference materials contained in the final EIS. See 10 CFR 51.103(c).

DECISION:

[If the Commission’s mandatory hearing decision authorizes the NRC staff to issue the license, this Decision section will state:]

The NRC makes the decision to grant or deny the combined license application based on whether the applicant has met all applicable requirements, including the NRC’s safety and environmental regulations. The NRC’s safety review of the application is documented in the final safety evaluation report (FSER) issued on [November DAY, 2014] (ADAMS Accession No. ML14296A540).

The final EIS presents the staff’s environmental review of the application. As documented in the final EIS and in the Commission’s Order dated [date], after weighing the environmental, economic, technical, and other benefits of the facility against environmental and other costs and considering reasonable available alternatives, the NRC concluded that issuance of the COL subject to the conditions for protection of the environment set forth in the license, is in accordance with NEPA and the NRC’s implementing regulations in Subpart A of 10 CFR Part 51, and that all applicable requirements have been satisfied.

Accordingly, on [date], the NRC issued Combined License [#], authorizing the construction and operation of Fermi Unit 3, at the Fermi site in Monroe County, Michigan. The license is effective as of [date], and extends for 40 years from the date that the Commission finds that the acceptance criteria in the combined license are met in accordance with 10 CFR 52.103(g).

AGENCIES’ ROLES AND RESPONSIBILITIES:

The final EIS includes information on a broad range of issues that may be regulated by other Federal, State, Tribal, or local authorities. As documented in the final EIS, the COL applicant must obtain and maintain permits from other Federal, State, Tribal, and local authorities in order to construct and operate Fermi 3.

Role of the NRC

The NRC was the lead agency for the environmental review of the Fermi 3 COL application, including the development of a final EIS. In the final EIS, the NRC evaluated the impacts of building and operating one ESBWR at the Fermi site. The NRC contacted Federal, State, Tribal, regional, and local agencies to solicit comments. The NRC ensured that the NEPA process was properly conducted and completed before recommending approval for this project. In addition to considering the environmental effects of the proposed action, NRC considered

alternatives to the proposed action, including the no-action alternative, alternative energy sources, the building and operation of new reactors at alternative sites, and alternative technologies. The NRC also documented applicable requirements and necessary permits of other Federal, State, Tribal, and local agencies in considering the environmental monitoring and mitigation that DTE Electric Company may implement.

Role of USACE

The USACE participated with the NRC in the preparation of the final EIS as a cooperating agency and participated collaboratively on the review team. As part of the review team, the USACE was included in all aspects of the environmental review, including scoping, public meetings, and public comment resolution.

USACE can issue permits, after notice and opportunity for public hearings, for the discharge of dredged or fill material into the navigable waters at specified disposal sites. With respect to the Fermi site, the USACE's action concerned whether to issue a permit pursuant to the requirements in Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Appropriation Act of 1899. The requested permit would authorize impacts on waters of the U.S., including wetlands, for the building of the Fermi 3, and various associated, integral project components, including electrical transmission lines and associated structures, access roads, a barge slip, and cooling water intake and discharge structures. Therefore, the USACE conducted an independent review and assessment in the preparation of the final EIS to provide the necessary environmental information required to meet its NEPA obligations, to make findings of compliance with the guidelines for Section 404(b)(1) of the Clean Water Act, and to meet the review criteria for the Department of the Army (DA) permit, including its Public Interest Review. After its review and analysis, the USACE adopted the final EIS to satisfy those independent regulatory obligations.

PURPOSE AND NEED:

As identified in Section 1.3, "Purpose and Need for the Proposed Actions," of the final EIS, the purpose and need for the proposed action is to provide additional large baseload electrical generation capacity to address Michigan's expected future peak electric demands. The Applicant noted that the new unit would help to compensate for the expected retirement of aging baseload generating units and diminishing availability for the Midwest Independent Service Operator region's baseload generation capacity. In 2007, the State of Michigan, through its Michigan Public Service Commission (MPSC), concluded that by 2025, Fermi 3 would meet 46 percent of the forecasted required additional power capacity.

PROPOSED FEDERAL ACTION:

The proposed NRC Federal action is issuance, under the provisions of 10 CFR Part 52, of a COL authorizing the building and operation of one ESBWR at the Fermi site. The location for the proposed Fermi 3 is on the Fermi site in Monroe County, Michigan.

The EIS provides the NRC staff's analyses of the environmental impacts that could result from building and operating the proposed unit at the Fermi site or at one of the four alternative sites. These impacts are analyzed by NRC to determine if the proposed site is suitable for the unit and whether any of the alternative sites is considered to be obviously superior to the proposed site.

In addition, NRC assessed mitigation measures available for reducing or avoiding adverse environmental effects.

Environmental impacts that may arise from the building and operation of Fermi 3 were examined for the following resource areas: land use; surface water and groundwater hydrology; terrestrial and aquatic ecology; socioeconomics; environmental justice; historic and cultural resources; meteorology and air quality; geology; public and occupational health; radiological health; noise; transportation; and transmission systems. These resource areas were also considered within a defined region of influence with other developments or activities that affect the resources cumulatively.

NRC EVALUATION OF THE PROPOSED ACTION:

Section 102(2)(C)(iii) of NEPA states that EISs are to include a detailed statement analyzing alternatives to the proposed action. Accordingly, the NRC and USACE evaluated the proposed action and numerous alternatives to the proposed action in order to make independent determinations according to each agency's regulatory authority. Evaluation criteria included land use, air quality, water use and quality, ecology, waste management, socioeconomics, human health, historic and cultural resources, and environmental justice. Alternatives were evaluated against the proposed action to determine if any of the alternatives presented was obviously superior.

To guide its assessment of the environmental impacts of the proposed action and alternatives, the NRC has established a standard of significance for impacts based on Council on Environmental Quality guidance (40 CFR 1508.27). Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, provides the following definitions of the three significance levels established by the NRC:

SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

The final EIS presents the review team's analysis, which considers and weighs the environmental impacts of the proposed action at the Fermi site. Impacts from building and operating the facility were considered to be SMALL for most resource areas with the exception of impacts to terrestrial and wetlands resources from building activities (SMALL to MODERATE), socioeconomic impacts to infrastructure and services from increased traffic during building activities (SMALL to MODERATE) and MODERATE effects on historic and cultural resources due to the decommissioning of Fermi 1. Mitigation of environmental impacts is discussed in more detail below. Additionally, a range of SMALL to LARGE beneficial impacts was identified due to the increase of tax revenue in the region.

Evaluation of Alternatives:

Chapter 9, “Environmental Impacts of Alternatives,” of the EIS addresses the following four categories of alternatives to the proposed action: (1) the no-action alternative, (2) energy source alternatives, (3) alternative sites, and (4) system design alternatives. As summarized below, none of the potential alternatives is environmentally preferable to the proposed action.

i. No-Action Alternative

The No-Action alternative, discussed in Section 9.1 of the final EIS, refers to a scenario in which the NRC would deny the COL requested by DTE Electric Company, which would result in the proposed unit not being built. Likewise, the USACE would also take no action or deny the DA Individual Permit request. Upon such a denial by the NRC or USACE, the building and operation of Fermi 3 at the Fermi site in accordance with 10 CFR Part 52 would not occur and the predicted environmental impacts associated with the project would not occur. If no other facility would be built or strategy implemented to take its place, the electrical capacity to be provided by the proposed project would not become available. If no additional conservation measures were enacted to decrease the amount of electrical capacity that would otherwise be required for power in the ROI, the need for power discussed in Chapter 8 would not be met. Therefore, the purpose of and need for this project would not be satisfied if the no-action alternative was chosen and the need for power was not met by other means.

ii. Alternative Energy Sources

The purpose and need for the proposed project identified in Section 1.3 is to provide additional baseload electrical generation capacity for use in DTE Electric Company’s current markets. Chapter 9 of the final EIS examines the potential environmental impacts associated with alternatives to building and operation of a new baseload nuclear generating facility.

To compare different types of energy plants with the proposed Fermi 3, NRC analyzed other power-generation sources, a combination of sources, and power-generation technologies that are technically reasonable and available. The three primary energy sources for generating baseload electric power in the U.S. are coal, natural gas, and nuclear energy. Coal-fired plants are the primary source of baseload generation in the U.S. Natural-gas combined-cycle power-generation plants are often used as intermediate generation sources, but can also be used for baseload power. These alternatives requiring new generating capacity are discussed in Section 9.2.2 of the final EIS.

In the coal-fired plant analysis, the EIS assumed building and operation of supercritical pulverized coal (SCPC) units with a net electrical generation equivalent to Fermi 3. Air emissions effects would be greater for the SCPC units than for Fermi 3 due to the release of carbon dioxide gas and other air pollutants. Coal combustion generates waste in the form of ash. Disposal of the waste could noticeably affect land use, because of the acreage needed, and could affect groundwater quality. Other environmental effects and cumulative effects would be similar to those described for the proposed Fermi nuclear plant.

For the combined cycle natural-gas-fired plant analysis, the EIS assumed that appropriately sized combustion turbines, heat recovery steam generators, and steam turbine generators will be required to generate the same baseload power as Fermi 3. Air emissions are similar to those for a coal-fired plant, but in lower amounts. Building a new underground gas pipeline to the site would result in permanent loss of some ecological resources, but the distance to

connect to natural-gas distribution systems would be minimal, and ecological impacts would otherwise be similar to those for Fermi 3. Other environmental and cumulative effects would be similar to those described for the Fermi site.

Renewable energy sources such as wind and solar power were considered, but current technologies for these energy sources are not capable of reasonably producing baseload power, which Fermi 3 could. The western shore of Lake Erie, where the Fermi site is located, and Huron, Tuscola, and Sanilac Counties (known as the Thumb Area) possesses wind resources of sufficient value to support utility-scale wind generation. As of 2009, only two wind farms were operative in the Thumb Area, with a capacity of 122 MW(e) as compared to the Fermi 3 capacity of 1535 MW(e). Solar thermal technologies would require a large land area over six to twelve times larger than the land used for the Fermi site. Water sources would also be required for solar power generation and would presumably use sources similar to those described for Fermi site. Wind and solar alternatives, and the basis for determining they were not viable alternatives to the proposed action, are discussed in Section 9.2.3 of the final EIS.

The NRC also evaluated alternatives not requiring new generating capacity, as well as other alternative energy sources. Alternatives not requiring new generating capacity that the NRC considered, but determined not to be viable alternatives, were: purchasing power from other electricity suppliers, reactivating retired power plants, extending the life of existing power plants, and implementing conservation or demand-side management programs. Each alternative determined not to be a viable alternative, and the basis for this determination, is provided in Section 9.2.1 of the final EIS. Other alternative energy sources that the NRC considered, but determined not to be viable alternatives, were: oil-fired power generation, hydroelectric power, geothermal energy, municipal solid waste, other biomass-derived fuels, fuel cells, and wood waste. Each alternative energy source eliminated from detailed study and the basis for its removal is provided in Section 9.2.3 of the final EIS.

Therefore, the review team concluded that none of the alternative energy options were both consistent with DTE Electric Company's objective of building baseload generation units and environmentally preferable to the proposed action.

iii. Alternative Sites

The NRC independently evaluated DTE's process for screening the potential sites, which followed a prescriptive methodology by applying exclusionary criteria appropriate to the proposed ESBWR nuclear power plant unit. NRC's site-selection process guidance calls for identification of a Region of Interest (ROI), followed by successive screening to identify candidate areas, potential sites, candidate sites, and the proposed site. The ROI is the geographic area considered by the applicant in searching for candidate areas and potential sites for a new nuclear power plant. The ROI is typically the State in which the proposed site is located or the relevant service area for the proposed plant.

The staff evaluated DTE Electric Company's methodology for selecting its ROI, candidate areas and evaluating potential sites, candidate sites, and alternative sites. For its ROI, DTE Electric Company chose its traditional service territory which is consistent with guidance in NRC's Environmental Standard Review Plan. The staff also concluded that the method used to identify candidate areas, potential sites, candidate sites, and alternative sites was reasonable and logical and adequately satisfied applicable NRC guidance.

Candidate areas for siting of Fermi 3 were chosen after considering areas based on the proximity to transmission lines, rail, transportation corridors, and water supply. Further review of the candidate areas looked for sites with adequate size for a nuclear power plant, adequate water supply, and locations that would not significantly change the character of the area. DTE Electric Company considered both environmental criteria and technical criteria in its scoping of the candidate sites. Ultimately, five candidate sites were chosen for additional site suitability analyses, which resulted in the Fermi site being chosen as the preferred site. The remaining four sites examined are listed as alternative sites in Section 9.3 of the final EIS:

- Belle River-St. Clair, located in St. Clair County;
- Greenwood, located in St. Clair County;
- South Britton, located in Lenawee County; and
- Petersburg, located in Monroe County.

Although there are differences between the cumulative environmental impacts of building and operating a nuclear generating unit at the proposed Fermi site and the alternative sites, the review team concluded that none of the alternative sites would be environmentally preferable or obviously superior to the proposed Fermi site.

iv. Alternative System Designs

The NRC considered a variety of alternatives for heat-dissipation systems and cooling-water systems. About two-thirds of the heat from a commercial nuclear reactor is rejected as heat to the environment. The remaining one-third of the reactor's generated heat is converted into electricity. Normal heat-dissipation systems transfer this rejected heat into the atmosphere as evaporation and/or heated discharge water to mix with nearby water bodies.

Cooling-water systems withdraw water from the source waterbody and return water to the receiving waterbody. A closed-cycle cooling-water system, such as the one proposed for Fermi 3, is preferred over the once-through cooling systems that have been used traditionally in the past. The closed-cycle cooling-water systems require less overall intake water than the older once-through technology and, as a result, fewer aquatic organisms are affected by cooling-water system operations. A natural draft cooling tower for use as the normal power heat sink was determined by the review team to cause the fewest environmental effects for Fermi 3. Heat from the plant service water system would be dissipated to the natural draft cooling towers or to two mechanical draft cooling towers which would serve as the auxiliary heat sink.

The NRC considered a range of heat dissipation systems, including a once-through cooling system, several alternative closed-cycle cooling system configurations, dry cooling systems and wet/dry hybrid systems. The NRC also considered alternative intake and discharge designs. None of these systems was considered by the staff to be environmentally preferable to the proposed system. The alternative system designs considered are discussed in Section 9.4 of the final EIS.

MITIGATION MEASURES

The NRC has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected. The final EIS describes measures to avoid and minimize environmental harm from the building and operation of the proposed plant. The build and operation of Fermi 3 will have effects on multiple environmental and regional

resources. The EIS considers the potential for impacts to each resource. Many of the SMALL impacts described above are considered minimal because monitoring and use of environmental practices and safeguards will reduce any negative effects to an environmental resource. However, as explained in the EIS, some of the impacts greater than SMALL can be reduced or compensated, or prevented from becoming disruptive. An environmental protection plan (EPP) included in the license ensures compliance with the terms and conditions of any Biological Opinions issued pursuant to the Endangered Species Act of 1973 and ensures that the NRC is kept informed of other environmental matters. The EPP applies to the licensee's actions affecting the protected environmental resources evaluated in the final EIS and the licensee's actions that may affect any newly discovered protected environmental resources. The EPP is intended to be consistent with Federal, State, and local requirements for environmental protection. The NRC is not otherwise imposing any license conditions in connection with mitigation measures or requiring any new environmental monitoring programs. Below are mitigation measures described in the final EIS with respect to individual resource areas.

Water Use and Quality

The National Pollutant Discharge Elimination System (NPDES) permit for the existing Fermi 2 would regulate sediment discharge from Fermi 3 building activities. DTE Electric Company will comply with Federal, State, and local laws, ordinances, and regulations intended to prevent or minimize erosion and sediment control, stormwater management, and spill response and cleanup. DTE Electric Company will comply with the cooling-water discharge permit limits and monitoring requirements for discharges to Lake Erie.

Land Use

Land that is temporarily disturbed by the activities involved in building Fermi 3 will be restored after those activities are finished. Approximately 63 percent of the new transmission lines will be placed in existing transmission-line right-of ways with the remaining 27 percent in new, undeveloped right-of-way. DTE Electric Company expects to largely restore existing land uses, other than forest, in the transmission line corridor once the transmission line is built.

Terrestrial Ecosystems

In determining the site layout for Fermi 3, DTE Electric Company has made efforts to avoid or minimize impacts to wildlife habitat, wetlands, and local wildlife and habitat. DTE Electric Company has stated its intention to avoid adverse impacts on bald eagle by not performing most work within 660 ft of bald eagle nest sites during the nesting season. DTE Electric Company will also take measures to minimize impacts on the Indiana bat, American lotus plants, and Eastern Fox Snake. DTE Electric Company has proposed to compensate for the unavoidable loss of aquatic function on the Fermi site by reestablishing comparable aquatic functions at an offsite location at a ratio of 3:1. Habitat loss would be mitigated by restoring appropriate natural vegetation through planting of native species appropriate to each cleared area and any mitigation measures proposed by DTE Electric Company would be evaluated by the USACE as part of its permit evaluation.

Aquatic Ecosystem

No additional mitigation measures, beyond those that may be identified in the required NPDES storm water building permit for Fermi 3, the existing Fermi 2 NPDES permit, and in any current

or future permits issued by the USACE and the Michigan Department of Environmental Quality (MDEQ) would be needed to reduce potential impacts on water quality and aquatic resources.

Socioeconomics and Environmental Justice

Unsatisfactory traffic conditions resulting from building activities at Fermi 3 could be mitigated by roadway or traffic-flow improvements. The State of Michigan will be responsible for reviewing and approving site plans as the plans affect area roadways during the site plan review and approval process for a building permit. DTE Electric Company will implement the roadway improvements that are determined by the State of Michigan to address traffic issues.

Historic and Cultural Properties

Fermi 1 has been recommended as eligible for listing in the National Register of Historic Places (NRHP). Fermi 1 was deactivated in 1972 and decommissioning begun in 1975. Because access to Fermi 1 site is restricted, the public will have an increased opportunity to learn about and understand Fermi 1's attributes because mitigation measures, which consist of recordation of documents and a public exhibit, have been implemented.

Consistent with the Memorandum of Agreement (MOA) prepared in consultation with the State Historic Preservation Officer under the National Historic Preservation Act (NHPA), the approved documentation has been delivered to the Monroe County Library and Reference Center. In addition, pursuant to Stipulation II of the MOA, DTE Electric Company established a public exhibit regarding the history of Fermi 1 at the Monroe County Community College. The exhibit was opened to the public on August 26, 2013. DTE Electric Company has contacted a number of potentially interested parties with regard to permanent retention or display of the remaining archival items associated with Fermi 1. DTE Electric Company is currently working to facilitate the possible transfer of items associated with Fermi 1 to Argonne National Laboratory. By letter dated January 31, 2014, DTE Electric Company documented completion of the stipulations in the MOA (ADAMS Accession No. ML14041A012).

Human Health

With respect to radiological health impacts, doses to construction workers, the public, and wildlife will be maintained below Federal standard public dose limits.

With respect to impacts from nonradioactive waste, solid, liquid, and gas wastes generated will be handled according to county, State, and Federal regulations.

Wetlands Impacts

A total of 34.5 acres of wetlands at the Fermi site will be affected by the building and operation of Fermi 3. Of this area, approximately 23.7 acres would experience only temporary impacts; DTE Electric Company would restore the contours, hydrology, and vegetation of temporarily impacted wetlands after building. Approximately 8.3 acres of disturbed wetlands would be permanently lost. Both USACE and MDEQ require compensatory mitigation for the unavoidable loss of wetlands that are regulated by these agencies.

Protected Species

Nine Federally protected animal and plant species are known or could have the potential to occur on the Fermi site. Protected species within the Fermi site include the American Lotus and the Eastern Fox Snake. Impacts on important species on the Fermi site are projected to be minimal. However, as explained in the final EIS, impacts on Eastern Fox Snake population levels could be noticeable unless mitigation measures contained in DTE Electric Company's Habitat and Species Conservation Plan, such as site worker education, surveys to locate eastern fox snakes, and relocation of eastern fox snakes from disturbed areas, are implemented. As previously discussed, the EPP will ensure compliance with the terms and conditions of any Biological Opinions issued pursuant to the Endangered Species Act of 1973.

DETERMINATION:

Based on an independent review, analysis and evaluation contained in the final EIS; careful consideration of all the identified social, economic, and environmental factors and input received from other agencies, organizations and the public; the factors and mitigation measures outlined above; and the input received during the mandatory hearing, it is determined that the standards for issuance of a combined license, as described in 10 CFR 52.97, have been met and the requirements of Section 102 of NEPA have been satisfied.

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