

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
Before the Atomic Safety and Licensing Board**

In the Matter of:)	Docket No. 50-341
The Detroit Edison Company)	NRC 2014-0109
(Fermi Nuclear Power Plant, Unit 2))	August 18, 2014
License Renewal Application)	

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**PETITION FOR LEAVE TO INTERVENE AND REQUEST FOR HEARING
OF DON'T WASTE MICHIGAN, CITIZENS ENVIRONMENT
ALLIANCE OF SOUTHWESTERN ONTARIO AND BEYOND NUCLEAR**

Pursuant to 10 C.F.R. § 2.309, 10 C.F.R. § 52.21 and a notice published by the Nuclear Regulatory Commission (“NRC” or “Commission”) at 79 Fed. Reg. 34787 (June 18, 2014), Petitioners Don’t Waste Michigan, Citizens Environment Alliance of Southwestern Ontario, and Beyond Nuclear (hereinafter “Petitioners”) hereby petition and move for leave to intervene, and request a hearing in DTE Electric Company’s license renewal application proceeding for the continued commercial operation of Fermi nuclear power plant, Unit No. 2 (“Fermi 2”), for the period 2025-2045. Fermi 2 is located near Monroe, Michigan.

This petition sets forth with particularity the contentions sought to be raised by Petitioners. As demonstrated below, Beyond Nuclear (on behalf of its members, George Steinman and Shirley Steinman), Citizens Environment Alliance of Southwestern Ontario (on behalf of its members, Rick Coronado and Derek Coronado) and Don’t Waste Michigan (on behalf of its members Leonard Mandeville, Marcee Meyers, and Michael Keegan) all seek to establish representational standing through their members, in order to represent them in the

pursuit of this Petition. Petitioners have separately filed their organizational and individual declarations respecting individual standing and delegation of authority to the respective organizations.

Description of the Proceeding

This proceeding concerns the license renewal application (“LRA”) of Fermi 2's current operating license filed pursuant to 10 C.F.R. Part 54 by DTE Electric Company (“DTE”) on April 24, 2014 and supplemented thereafter. The LRA was accepted for docketing by the NRC on June 11, 2014. Notice of hearing and opportunity to petition for leave to intervene was published in the Federal Register on June 18, 2014.

Description of Petitioners

Beyond Nuclear (“BN”) is a Takoma Park, Maryland-based public education and advocacy group that aims to educate and activate the public on issues pertaining to the hazards of nuclear power, its connection to nuclear weapons and the need to abandon both. Beyond Nuclear advocates for an energy future for the State of Michigan and the United States that is sustainable, benign and democratic. Beyond Nuclear has approximately 8000 members nationally, several of whom live within 50 miles of the Fermi nuclear power plant site. Beyond Nuclear provides the declarations of George Steinman and Shirley Steinman, two of its members, both of whom live within 10 miles of Fermi 2. BN, by declaration, expresses its intent to intervene on behalf of the Steinmans.

Citizens Environment Alliance of Southwestern Ontario (“CEA”) is an organization based in the southwestern portion of the province of Ontario, Canada, headquartered in Windsor. CEA has, for more than a decade and a half worked on raising citizen awareness of various

issues related to preservation of the Great Lakes and favoring the increased deployment of environmentally benign energy sources. CEA has 50 members and has designated two of them, Derek Coronado and Richard Coronado, as members on behalf of which the organization seeks, as expressed in an organizational declaration, to intervene. Both of the Coronados live in proximity to Fermi 2, well within the 50-mile radius.

Don't Waste Michigan ("DWM") is a 25-year-old grassroots organization which works in central and southern Michigan to opposed various incarnations of nuclear energy, from commercial nuclear power plants to their radioactive waste products. DWM has some 40 members statewide, and several, including Leonard Mandeville, Marcee Meyers, and Michael Keegan, live within about 10 miles of Fermi 2. DWM seeks to intervene on behalf of these members.

Legal Standing

Pursuant to 10 C.F.R. § 2.309, a request for hearing or petition for leave to intervene must address 1) the nature of the petitioner's right under the Atomic Energy Act to be made a party to the proceeding, 2) the nature and extent of the petitioner's property, financial, or other interest in the proceeding, and 3) the possible effect of any order that may be entered in the proceeding on the petitioner's interest. In determining whether a petitioner has sufficient interest to intervene in a proceeding, the Commission has traditionally applied judicial concepts of standing. *See Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1), CLI-83-25, 18 NRC 327, 332 (1983) (citing *Portland General Electric Co.* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610 (1976)). Contemporaneous judicial standards for standing require a petitioner to demonstrate that (1) it has suffered or will suffer a distinct and palpable harm that

constitutes injury-in-fact within the zone of interests arguably protected by the governing statutes (e.g., the Atomic Energy Act of 1954 (AEA), the National Environmental Policy Act of 1969 (NEPA)); (2) the injury can be fairly traced to the challenged action; and (3) the injury is likely to be redressed by a favorable decision. *See Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plants), LBP-99-25, 50 NRC 25, 29 (1999). An organization that wishes to intervene in a proceeding may do so either in its own right by demonstrating harm to its organizational interests, or in a representational capacity by demonstrating harm to its members. *See Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), LBP-98-9, 47 NRC 261, 271 (1998). To intervene in a representational capacity, an organization must show not only that at least one of its members would fulfill the standing requirements, but also that he or she has authorized the organization to represent his or her interests. *See Private Fuel Storage, L.L.C.* (Independent Fuel Storage Installation), LBP-98-7, 47 NRC 142, 168, *aff'd on other grounds*, CLI-98-13, 48 NRC 26 (1998); *Pacific Gas & Electric Co.* (Diablo Canyon Power Plant Independent Spent Fuel Storage Installation), LBP-02-23, 56 NRC 413, 426 (2002). Standing to participate in this proceeding is demonstrated by the declarations of the organizations and individual members that have been separately-filed, contemporaneously to this Petition.

Because the members of the petitioning organizations live near the Fermi 2 site, *i.e.*, within 50 miles,¹ they have presumptive standing by virtue of their proximity. *Diablo Canyon, supra*, 56 NRC at 426-427, citing *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-01-6, 53 NRC 138, 146, *aff'd*, CLI-01-17, 54 NRC 3 (2001). In

¹Practically speaking, all of the individual member-Petitioners live within about twenty-five (25) miles of Fermi 2.

Diablo Canyon, the Licensing Board noted that petitioners who live within 50 miles of a proposed nuclear power plant are presumed to have standing in reactor construction permit and operating license cases, because there is an “obvious potential for offsite consequences” within that distance. *Id.* Here, DTE has operated Fermi 2 for nearly 30 years near Monroe, Michigan and the same standing concepts apply.

The petitioning organizations’ members seek to protect their lives and health by opposing the issuance of a license renewal to continue to operate Fermi 2 during the period 2025-2045. The organizational Petitioners seek on behalf of their members to ensure that no operating license renewal is issued by the U.S. Nuclear Regulatory Commission unless DTE demonstrates full compliance with the Atomic Energy Act and NEPA.

Moreover, *locus standi* is based on three requirements: injury, causation and redressability. The organizational Petitioners hereby request to be made parties to the proceeding because (1) continued operation of Fermi 2 presents a tangible and particular harm and threat to the health and well-being of members living within 50 miles of the site, (2) the NRC has initiated proceedings for a license extension, the granting of which would directly affect the named members and other members of the public near the plant, and (3) the Commission is the sole agency with the power to approve, to deny or to modify a license to operate a commercial nuclear power plant.

Contentions

A license renewal is authorization from the NRC to operate an existing nuclear power plant at a specific site for up to 20 years. Before issuing a license renewal, the NRC staff must complete safety and environmental reviews of the application. The LRA must comply with provisions of the Atomic Energy Act, the National Environmental Policy Act, NRC regulations

and all applicable laws.

Petitioners present their Contentions below.

***ENVIRONMENTAL) CONTENTION 1: INADEQUATE SAMA
ANALYSIS OF MARK I BWR VULNERABILITIES***

1.0 Statement of Contention

The Applicant's Fermi 2 Environmental Report fails to accurately and thoroughly conduct Severe Accident Mitigation Alternatives (SAMA) analysis to the long-recognized and unaddressed design vulnerability of the General Electric Mark I Boiling Water Reactor pressure suppression containment system and the environmental consequences of a to-be-anticipated severe accident post-Fukushima Daiichi.

1.1 Pertinent Legal Principles

This contention is within the scope of these proceedings.

Under 10 C.F.R. § 2.309, a petitioner is required to show that the issue raised in the contention is within the scope of the proceeding. The National Environmental Policy Act, NEPA, 42 UCS §4332, is the "basic charter for protection of the environment." 40 C.F.R. § 1500.1(a). Its fundamental purpose is to "help public officials make decisions that are based on understanding of environmental consequences, and take decisions that protect, restore and enhance the environment." 40 C.F.R. §1500.1(c). The NRC regulations implementing NEPA for Nuclear Power Plant license renewals are in 10 C.F.R. § 51.45(c). In its application for license renewal of Fermi 2, DTE was required under 10 C.F.R. § 51.45 to provide an analysis of the impacts on the environment that will result if it is allowed to continue beyond the initial license. The primary method by which NEPA ensures that its mandate is met is the "action-forcing" requirement for preparation of an EIS. *Robertson v. Methow Valley*, 490 U.S. 340, 348-49 (1989).

The environmental impacts that must be considered in an EIS include those which are "reasonably foreseeable" and have "catastrophic consequences, even if their probability of occurrence is low." 40 C.F.R. §1502.22(b)(1). The fact that the likelihood of an impact may not be easily quantifiable is not an excuse for failing to address it in an EIS. NRC regulations require that "to the extent that there are important qualitative considerations or factors that cannot be quantified, these considerations or factors will be discussed in qualitative terms." 10 C.F.R. § 51.71.

The regulation governing licensing renewals requires the Applicant for renewal to submit an Environmental Report. 10 C.F.R. § 51.53(c)(1). The NRC then uses the ER to prepare an EIS or Environmental Assessment, although it has an independent obligation to "evaluate and be responsible for the reliability" of the information. *Id.*

In a petition for intervention, contentions that seek compliance with NEPA must be based on the applicant's Environmental Report (ER). 10 C.F.R. § 2.309(f)(2). Under 10 C.F.R. § 51.53(c)(3)(ii) the applicant is required to provide an ER that contains analyses of the environmental impacts of the proposed action, including the impacts of refurbishment activities, if any, associated with license renewal and the impacts of operation during the renewal term for those issues identified as Category 2 issues in Appendix B to subpart A of that part. Under 10 C.F.R. § 51.53(c)(ii)(L) "if the staff has not previously considered severe accident mitigation alternatives for the applicant's plant in an environmental impact statement or related supplement or in an environmental assessment, a consideration of alternatives to mitigate severe accidents must be provided."

Severe accidents are a Category 2 issue in Subpart B to 10 C.F.R. Apx. A. The Appendix states "the probability weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to ground water, and societal and economic impacts from severe accidents are small for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives." Contentions implicating Category 2 issues ordinarily are deemed to be within the scope of license renewal proceedings. *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 & 4), LBP-01-6, 53 NRC 138, 153 (2001).

1.2 The issue raised in the contention is material to the findings of these proceedings.

10 C.F.R. § 2.309(f)(iv) requires that the petitioner "Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding." In discussing the materiality requirement, the Atomic Safety and Licensing Board considering the license renewal for Millstone Nuclear Power Station stated, "In order to be admissible, the regulations require that all contentions assert an issue of law or fact that is material to the outcome of a licensing proceeding; that is, the subject matter of the contention must impact the grant or denial of a pending license application. Where a contention alleges a deficiency or error in the application, the deficiency or error must have some independent health and safety significance." *In the Matter of Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3) Docket Nos. 50-336-LR, 50-423-LR ASLBP No. 04-824-01-LR July 28, 2004, p. 7. See *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP- 98-7, 47 NRC 142, 179-80 (1998), *affd in part*, CLI-98-13, 48 NRC 26 (1998).

The deficiency highlighted in this contention has enormous independent health and safety significance. By using probabilistic modeling in its SAMA analysis DTE arrives at a result that downplays the likely environmental consequences of a severe accident at Fermi 2, and thus incorrectly discounts demonstrated and state-of-the-art mitigation alternatives currently deployed on essentially identical technology in other countries. Moreover, Petitioners contend that the Applicant does not adequately or accurately account for long recognized design and structural vulnerabilities in the Mark I pressure suppression containment system. This has enormous adverse implications and consequences for public health and safety because a potentially cost

effective mitigation alternative is not being considered to prevent or reduce the environmental impacts of that accident. Petitioners allege the Environmental Report's SAMA analysis therefore significantly deficient, unduly incomplete and the deficiency could significantly impact health and safety with significant long-term adverse environmental consequences that includes widespread land and water radiological contamination.

1.3 There is a substantial basis for this contention

The regulatory requirement that applicants for an operating license renewal perform a Severe Accident Mitigation Alternatives analysis is broad. 10 C.F.R. § 51.53(c)(3)(ii)(L) states "If the staff has not previously considered severe accident mitigation alternatives for the applicant's plant in an environmental impact statement or related supplement or in an environmental assessment, a consideration of alternatives to mitigate severe accidents must be provided." 10 C.F.R. Part 50, Apx. B to Subpart A of this section describes the environmental effects of severe accidents due to license renewal. "The probability weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to ground water, and societal and economic impacts from severe accidents are small for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives." 10 C.F.R. Part 51, Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.

The regulation acknowledges that the "probability weighted consequences" are small, and yet the requirement to consider mitigation remains. The regulation does not mandate how these mitigation alternatives should be evaluated - but the language in Appendix B makes it clear that the applicant should consider alternatives that could mitigate the consequences listed, including "atmospheric releases, fallout onto open bodies of water, releases to ground water, and societal and economic impacts."

1.3.1 The petitioners contend that DTE's Severe Accident Mitigation Analysis (SAMA) for atmospheric radioactive releases with the associated widespread land contamination as well as the radioactive fallout and effluent into Lake Erie and other Great Lakes and other environmental, societal and economic impacts does not acknowledge, analyze or factor in and otherwise ignores the long-recognized vulnerability of the GE Mark I boiling water reactor pressure suppression containment system, now confirmed by post-Fukushima Daiichi consequences. Petitioners contend that the absence of analysis and neglect of mitigating alternatives, including engineered external high-capacity filters on hardened containment vents, for this long recognized vulnerability may result in unanalyzed, unmitigated and uncontrolled releases of radioactivity to the environment that have not been accurately or thoroughly weighed in the probability of a severe accident and its real consequences.

The Applicant's Appendix E is the environmental information which is intended to fulfill the requirements of 10 C.F.R. § 54.23 and 10 CAR § 51.53©.

The Fermi 2 General Electric Mark I Boiling Water Reactor containment system is

described in the License Renewal Application including the Environmental Report.

2.2.1.2 Containment System

“The containment consists of dual barriers: the primary containment and the secondary containment. The primary containment surrounds the reactor vessel and also houses the reactor coolant recirculation pumps and piping loops. The secondary containment is the structure that encloses the reactor and its primary containment, and spent fuel storage pool areas.

“The primary containment (Mark I containment) is a steel plate pressure vessel consisting of a light bulb-shaped drywell and a torus-shaped pressure suppression chamber. The purpose of the primary containment system is to limit releases of radioactive material to the environment in the event of a nuclear accident so that the offsite doses are below the values stated in 10 CFR 50.67 or 10 CFR Part 100. (Fermi 2012a, Section 1.2.2.9.6)

“The primary containment design employs the drywell/pressure-suppression features. If a failure should occur, reactor vessel water and steam would be released into the air space of the drywell. The resulting increase in drywell pressure would force the air/water/steam mixture to be vented into the suppression pool. The steam would be condensed in the pool to limit the pressure increase inside the primary containment.

“Cooling systems remove heat from the reactor core, the drywell, and from the suppression pool thus providing continuous cooling of the primary containment under accident conditions. The release of radioactive materials to the environment is minimized through systems provided to maintain the primary containment integrity and through isolation valves that are actuated to close off potential leakage of radioactive materials through the process lines that are connected to the primary containment structure.

“Leakage from the primary containment system is contained within the secondary containment system. The secondary containment system is designed to minimize the release of airborne radioactive materials, and to provide for the controlled, filtered release of the secondary containment atmosphere under accident conditions.

“The primary containment, which includes the drywell and suppression pool, has been designed, fabricated, and erected so as to accommodate, without failure, the pressures and temperatures resulting from the double-ended rupture (or equivalent failure) of any coolant pipe within the primary containment. The primary containment encloses the reactor coolant system and associated instrumentation and controls. During accident conditions, valves which isolate systems that penetrate the primary containment become part of the containment barrier.

“The secondary containment, a building that contains the primary containment as well as portions of the reactor process systems and refueling facilities, is maintained at a negative

pressure under accident conditions to preclude leakage from within secondary containment to external areas. The interior atmosphere is processed to control emissions to the environs so that offsite dose levels are maintained well below the requirements of 10 CAR 50.67 or 10 CAR Part 100.”

DTE Fermi 2 License Renewal Application Environmental Report, pp. 2-3.

The primary containment system is further described in Appendix A Updated Final Safety Analysis Report Supplement as follows.

The Fermi 2 primary containment is a General Electric Mark I pressure suppression containment and consists of a drywell, a torus (or suppression chamber), and a vent system connecting the drywell and the torus. The scope of the CII-IWE Program includes the steel containment vessel and its integral attachments, containment equipment hatches and airlock and moisture barriers, and pressure-retaining bolting. Visual inspections monitor loss of material of the steel containment vessel surface areas, including welds and base metal and containment vessel integral attachments, metal shell, personnel and equipment access hatches, and pressure-retaining bolting. The CII-IWE Program specifies acceptance criteria, corrective actions, and provisions for expansion of the inspection scope when identified degradation exceeds the acceptance criteria. The code of record for the examination of the Fermi 2 containment, Class MC components, and related requirements is in accordance with ASME Code Section XI, Subsections IWE, 2001 Edition with the 2003 Addenda, as mandated and modified by 10 CAR 50.55a.

Fermi 2, Appendix A, UFSAR Supplement Application, A-10.

However, the Petitioners point out that the Applicant’s description of the Mark I pressure suppression containment does not acknowledge, factor in or incorporate analysis of and otherwise ignores the long-recognized and still unresolved vulnerabilities of the General Electric Mark I boiling water reactor pressure suppression containment system. The Petitioners contend that in a post-Fukushima Daiichi world, such analysis must be incorporated into the SAMA.

The Petitioners submit supporting documentation demonstrating that from 1972 to the present, the GE Mark I pressure suppression containment design functioned unreliably under accident conditions and has been highly vulnerable to early failure to severe accidents because the containment volume is essentially too small to contain the dynamic energy generated under those conditions.

On September 29, 1972, Dr. Stephen Hanauer, a senior safety official with the U.S. Atomic Energy Commission identified in a memo to the AEC on Pressure Suppression Containments “Conclusions and Recommendations,” stating,

Recent events have highlighted the safety disadvantages of pressure-suppression

containments. While they have some safety advantages, on balance I believe the disadvantages are preponderant. I recommend that the AEC adopt a policy discouraging further use of pressure-suppression containments, and that such designs not be accepted for construction permits filed after a date to be decided (say two years after the policy is adopted).

Petitioners' Exhibit X, Memorandum of Stephen Hanauer, DRTA, September 20, 1972, p. 2.

The Atomic Energy Commission, the NRC and the Boiling Water Reactor Owners Group (BWROG) devoted much time and effort in an attempt to close out Dr. Hanauer's original concern regarding the Mark I containment's vulnerability under accident conditions including NUREG-0474 "Technical Update on Pressure Suppression Type Containment in Use in Light Water Reactor Nuclear Power Plants."

The Summary and Conclusion of NUREG-0474 stated, "Based upon its review, the NRC has concluded that licensed Mark I BWR facilities can continue to operate safely, pending completion of the comprehensive LTP [Long Term Program] evaluation. However, the NRC further concluded that the demonstrated safety margin of the containment systems for operating Mark I BWR facilities does not comply fully with the current interpretation of "sufficient margin" as prescribed in General Design Criteria of Appendix A to 10 CAR 50, therefore, should be improved for long term reactor operation." ["Technical Update on Pressure Suppression Type Containment in Use in Light Water Reactor Nuclear Power Plants," NUREG-0474, Office of Nuclear Reactor Regulation, US NRC, July 1978, p. xi]

NUREG-0474 refers to a later opinion of Dr. Steven Hanauer's on June 20, 1978 concerning the vulnerability of the Mark I pressure suppression system due to the design flaw where he states, "Thus while we may yearn for the greater simplicity of 'dry' containments, the problems of both 'dry' and pressure suppression containments are solvable, in my opinion, and the design safe and therefore licensable." [Technical Update on Pressure Suppression Type Containment in Use in Light Water Reactor Nuclear Power Plants, NUREG-0474, Office of Nuclear Reactor Regulation, US NRC, July 1978, p. 13]

However, by June 9, 1986, Dr. Harold Denton, then Director of the NRC Office of Nuclear Reactor Regulations, in fact amplified concern for the Mark I containment system design flaw and still unresolved vulnerability by stating, "There has been a lot of work done on those containments, but Mark I containment, especially being smaller with lower pressure design pressure and in spite of the suppression pool, if you look at the WASH 1400 reg safety study, you'll find something like a 90% probability of that containment failing." [Petitioners' Exhibit X, "Denton Urges Commission to Settle Doubts About Mark I Containment, Inside NRC, McGraw Hill, June 9, 1986.

Dr. Denton's public disclosure of the high probability failure rate for the Mark I containment system under severe accident conditions initiated the severe accident mitigation efforts by NRC Office of NRC Nuclear Reactor Regulation eventually leading to the issuance of

Generic Letter 89-16 “Installation of a Hardened Wetwell Vent” to reduce the vulnerability of the Mark I containment to severe accident challenges. Installation of a Hardened Wetwell Vent, Generic Letter 89-16, September 1, 1989. GL-89-16 was a voluntary initiative requested by NRC to Mark I BWR operators for the installation of a hardened containment vent on the wetwell or “torus” component of the pressure suppression system. The hardened vent mitigation strategy provided Mark I operators with the option to temporarily defeat containment during a severe accident to mitigate the consequences of a severe accident including the permanent rupture and breach of the pressure suppression containment system. The NRC provided that Mark I operators could voluntarily install the containment venting system (Direct Torus Vent System) under the provisions of 10 CAR 50.59 without going through a license amendment process that would otherwise subject the licensee to the independent scrutiny and due process afforded by the public hearing process. However, the public was at that time unduly denied an opportunity to a public hearing and an independent safety evaluation of the Fermi 2 Direct Torus Vent System under 10 CAR Part 2 Rules of Practice and Procedure.

The Petitioners now contend that the continued vulnerability of the Mark I containment performance and the tendency of the Direct Torus Vent System to fail under severe accident conditions persists. This is amply borne out by the tragic demonstration of multiple containment failures under the real versus hypothetical severe accident conditions witnessed during the March 2011 Fukushima Daiichi nuclear catastrophe. Tokyo Electric Power Companies installed the Direct Torus Vent System on the pressure suppression containment system for Fukushima GE Mark I Boiling Water Reactors as did Detroit Edison on Fermi-2.

The Petitioners contend that DTE is required to comply with 10 C.F.R. Part 50 Apx. A General Design Criteria (GDC). The NRC states, “The principal design criteria establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety; that is, structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.” 10 CAR 50, Appendix A, General Design Criteria.

This compliance includes GDC 16, Containment design which states, “Reactor containment and associated systems shall be provided to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require.” 10 CAR 50 Appendix A, Criterion 16, Containment Design.

The current operation of Fermi-2 and the requested 20-year extension of operations are not subject to any relaxation, waiver or exemption for compliance with GDC 16.

The Petitioners contend that the primary focus of containment designs as defined by GDC 16 is the demonstration that it addresses the “maximum credible accident” so as to limit the potential exposure of the public and the environment from radioactive materials beyond the reactor site. The Petitioners further contend that the Fukushima Daiichi nuclear power plant accident has now demonstrated the “maximum credible accident” by a 100% failure rate for the

Mark I pressure suppression containment system design employed for the operational Units 1, 2 and 3 despite the incorporation of the Direct Torus Vent System as is relied upon at Fermi 2. Given that Fermi 2 is a GE Mark I boiling water reactor with a pressure suppression containment system which was similarly employed at the operational Fukushima Daiichi Units 1, 2 and 3, the Petitioners contend that new information for the “maximum credible accident” needs to be updated and incorporated into the Fermi-2 license renewal request.

1.3.2 The Applicant's Environmental Report and SAMA analysis is significantly defective in that its containment performance under severe accident conditions does not provide a thorough, complete and accurate analysis of the available state-of-the-art severe accident *mitigation alternatives* as required by the regulations.

The Petitioners contend that the NRC staff has recognized that severe accident mitigation alternatives can be significantly improved by the incorporation of an external engineered filtered venting system. However, the Applicant's ER fails to take into account, analyze and consider this alternative. Its SAMA for the Fermi-2 Mark I is therefore incomplete and inadequate.

The NRC staff states:

Based on its regulatory analyses, the staff concludes that installation of engineered filtered venting systems for Mark I and Mark II containments is the option that would provide the most regulatory certainty and the timeliest implementation. The vast majority of Mark I and Mark II severe accident sequences would benefit from a containment vent, (whether the vent includes an engineered filter or not) and the addition of an engineered filter reduces the release of radioactive materials should a severe accident occur. A comparison of only the quantifiable costs and benefits of the proposed modifications, if considered safety enhancements, would not, by themselves, demonstrate that the benefits exceed the associated costs. However, when qualitative factors such as the importance of containment systems within the NRC's defense-in-depth philosophy are considered, as is consistent with Commission direction, a decision to require the installation of engineered filtered vent systems is justified.

“Consideration of Additional Requirements for Containment Venting Systems for Boiling Water Reactors with Mark I and Mark II Containments,” SECY 2012-0157, U.S. NRC, November 26, 2012, p.2.

As stated by NRC staff, “Engineered containment external filter systems deployed throughout the world have evolved considerably since the first gravel bed filter was installed at the Barsebäck Nuclear Power Plant in Sweden in the mid-1980s. Since that time, engineers have been able to significantly reduce the physical size of the filter and improve the decontamination efficiency for iodine and aerosols. In particular, designers have developed and tested the technology to better retain organic iodine, and to trap more of the most penetrating aerosol particle sizes (less than one micron), those in the mid-range referred to as ‘the filter gap.’” SECY 2012-0157, Enclosure 4, BWR Mark I and Mark II Containment Performance during Severe

Accidents, p. 12.

The Applicant's SAMA relies upon severe accident venting strategies and Decontamination Factors for Fermi-2 Mark I such as updated and published by the Electric Power Research Institute (EPRI) report titled, "Investigation of Strategies for Mitigating Radiological Releases in Severe Accidents - *BWR Mark I and Mark II Studies*," EPRI Final Report 1026539), September 24, 2012, http://my.epri.com/portal/server.pt?Product_id=00000000001026539).

However, the Petitioners contend that NRC staff has raised significant doubts about the benefit of existing severe accident mitigation strategies, including the effectiveness of wetwell scrubbing, FLEX and drywell spray systems that could extend on into the requested License Renewal period to the Applicant's exclusion of analysis of other and additional severe accident mitigation alternatives such as external engineered high-capacity hardened containment vents as recommended by NRC staff.

NRC Staff has stated, "The EPRI study also addressed strategies defined in existing Severe Accident Management Guidelines (SAMGs). The guidelines assist operators with symptom-based strategies and include provisions for active debris cooling and containment flooding by using temporary portable equipment. However, the ability of portable pumps to provide sufficient flow rates and provide even limited decontamination of radionuclides raises serious doubts. Drywell spray systems are designed for flow rates that range from 3,000 to 10,000 gallons per minute (GPM). Portable pumps normally provide a maximum flow rate of 300 GPM; however, some pumps may provide up to 500 GPM but require larger and heavier hoses that are more difficult to position for use. As discussed further in section 4.3.4, the staff is concerned that reduced capacity drywell sprays will not provide a reliable means to scrub radioactive aerosols to sufficiently limit releases during venting operations." SECY 2012-0157, Enclosure 4, BWR Mark I and Mark II Containment Performance during Severe Accidents, p.18.

Additionally, NRC staff pointed out "that because of inherent uncertainties in spray systems' capability to provide adequate decontamination factors (DFs), questions always remain as to how much, and whether or not they are reliable. The Mark I and Mark II containment drywells are highly congested areas that contain numerous piping systems (e.g., reactor recirculation, emergency core cooling). In addition to the piping itself, there are numerous piping supports, snubbers, sway struts, catwalks, and other interferences that limit the spray systems' ability to provide adequate spray coverage even under ideal conditions. Therefore, the ability of computer models to accurately calculate decontamination factors presents a significant challenge." SECY 2012-0157, Enclosure 4, p. 18.

Staff further concludes that under certain accident mitigation situations, "When the wetwell water level rises to where it prevents further wetwell vent use (approximately 18–20 hours from event start), any benefits of wetwell scrubbing is lost, a drywell vent path is needed and is subsequently cycled opened and closed for containment pressure control. Because suppression pool scrubbing is lost, radioactive releases are expected to be much greater." SECY

2012-0157, Enclosure 4, p.20.

The NRC Staff additionally states, “In summary, the study’s models focused on identifying actions that could be taken given a few plausible but specific severe accident event scenarios with existing equipment, or with modifications short of installing external vent filters, that could reduce airborne releases to levels approaching those reliably obtainable with the external filters. However, the conceptual strategy requires a high degree of confidence that current plant systems (*i.e.*, suppression pools and sprays) can achieve a reliable DF under accident conditions. There is limited availability of testing data (if any) supporting the efficacy of sprays using FLEX flow rates within crowded BWR Mark I containments. Decontamination effectiveness highly depends upon containment conditions, and DFs of 1,000 are possible only if containment conditions are controllable and controlled. The industry acknowledges that further and significant developments, including plant-specific analyses, will be required over the next two or more years before it can be confirmed that the concept strategy is even feasible.” SECY 2012-0157, Enclosure 4, p.21.

The NRC Staff further identifies that EPRI proposes severe accident mitigation strategies to the exclusion of external engineered high-capacity filters for the vulnerable Mark I containments, stating, “The [EPRI] report states that the removal of ‘very small particles has not been demonstrated with current filter designs’ (emphasis added). The staff believes this effectively ignores the significant developments and advancements made by filter design engineers and manufacturers over the past 25 years to specifically capture these hard-to-remove particle sizes. SECY 2012-0157, Enclosure 4, p. 21.

The Staff goes on to conclude that “based on its review, the staff has reason to believe that the various engineered filter designs readily available today will provide a more effective, and at a minimum, a more reliable and predictable means of capturing all particle sizes, including submicron particles, than a wetwell with an unknown temperature and length of decontamination (bubble rise) path.” SECY 2012-0157, Enclosure 4, p. 22.

The Staff further identifies in Section 5, “Passive Containment Vent Actuation Capability” of SECY 2012-0157 that “Many of the Mark I containment plants in the U.S. have a rupture disk in the hardened vent line in series with normally closed valve(s). The burst pressures range from about one-half of containment design pressure up to the containment design pressure. Some have the capability of pressurizing between the valve(s) and rupture disk and enabling early venting to better support injection via low pressure, low capacity pumps. Opening the valves requires operator action and active function of the valves. Given the unpredictability of an event and its impact on licensee’s performance, a passive activation feature may be appropriate to reduce uncertainty in successful venting when containment conditions are beyond design values. Even close physical proximity to vent valves for local opening and subsequent closing efforts may be extremely difficult or dangerous due to radiological, thermal, lighting, and sound conditions, or other access impairments due to the initiating event or to available capable personnel. Mark I and II containments typically have maximum calculated design basis accident pressures several pounds per square inch below the containment design pressure. A rupture disk

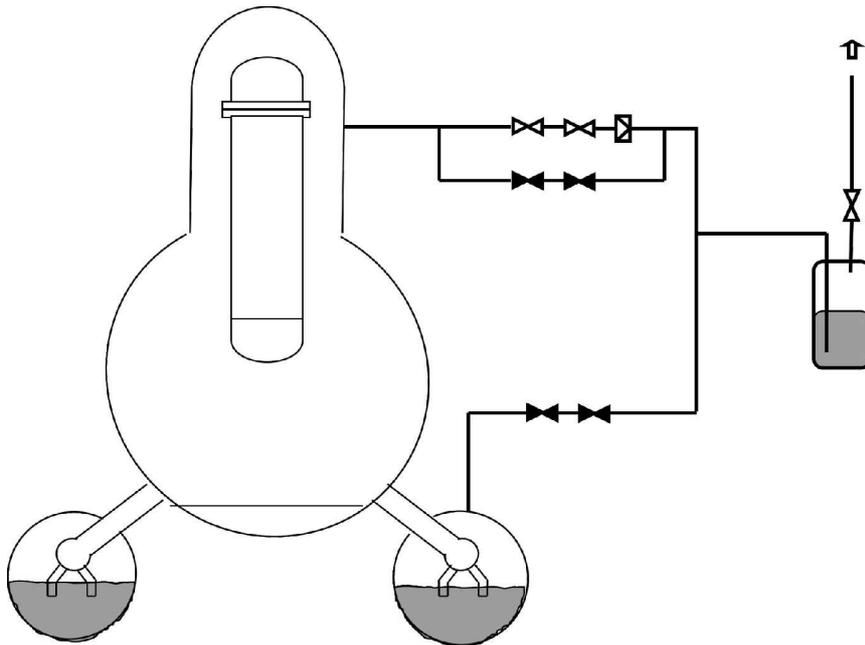
providing for design basis integrity with a burst pressure at or moderately above containment design pressure could support passive initiation of vent function. In addition, early venting may be appropriate to extend RCIC pump operation or ensure low pressure pump injection capability to maintain RPV water level above the fuel to avoid or arrest core damage in the RPV.

“Valve(s) in series with the rupture disk would normally be open, but capable of closure during or after the event. Early venting with this configuration would require closing a vent line valve, injecting nitrogen/air pressurizing the volume between the valve and rupture disk to the burst pressure. The valve would subsequently have to be opened to vent. This requires two strokes of the valve and availability and introduction of the gas to burst the rupture disk and the additional uncertainty of successful completion and personnel resources required. A simpler arrangement for both active and passive deployment involves having two branches, one passive with an exposed rupture disk and valve(s) for subsequent closure, the other with normally closed valves that could be opened for early venting. This arrangement also provides the feature of redundancy for the vent function in the case a closed valve cannot be opened.

“Having two valves in series provides for redundancy of containment function in case one of the valves cannot be closed. See Figure 8 for a simplified filtered containment vent system applied to a Mark I containment.

“Venting from the drywell after reactor vessel breach would result in a much higher release of airborne radioactivity. This potential release could be greatly reduced by addition of an external vent filter. An external filter would also support justification of exposed rupture disk for fully passive vent actuation as the impact of inadvertent initiation would likely result in a minimal release. It could also support justification for a single containment isolation valve in series with the rupture disk.

Figure 8 – Potential containment venting arrangement for BWR Mark I containments



[SECY 2012-0157, Enclosure 4, p. 23]

The Applicant’s ER provides no alternative mitigation strategy that analyzes or considers how the external engineered high-capacity filters on hardened containment vents would significantly reduce wide spread land and water radiological contamination and thus enhance environmental protection and the public health and safety. In fact, current international practice demonstrates that such state-of-the-art technology for severe accident mitigation alternates is currently available, affordable and being installed for the vulnerable Mark I containment to significantly enhance public health and safety in the event of a nuclear accident.

Under a mandate issued by Japan’s newly formed Nuclear Regulation Authority (NRA), Hitachi-GE (Japan-based), Areva and Japanese utilities began installing external engineered high-capacity filtered hardened containment vents in June 2013 on essentially identical technology as well as advanced boiling water reactor technology in a bid to restart Japan’s beleaguered nuclear industry. Exhibit X, Hitachi-GE and AREVA press release, June 4, 2013, and Exhibit X, Schematic of external engineered filtered harden containment vent for Japan’s Shimane Mark I BWR.

According to Japanese news sources, “Under the more stringent safety standards set last July by the NRA, electric power companies must install filtered vents for boiling water reactors to curb the release of radioactive substances in the event of a serious accident.” Exhibit X, “Eager to restart reactors, utilities increase spending on safety by 60%,” The Asahi Shimbun,” February 18, 2014. Prior to proposed restart of these boiling water reactors, the NRA is currently conducting its safety reviews for already installed external engineered high-capacity filtered

hardened containment vents on Japanese BWRs.

The Petitioners contend that state of the art SAMA alternatives to significantly reduce adverse radiological contamination to the environment are readily available for install today and applicable to the requested license renewal period but have not been analyzed in the Applicant's Environment Report.

1.3.3 The Applicant's SAMA alternatives for the Fermi 2 Mark I pressure suppression containment does not acknowledge, factor in, incorporate analysis of and otherwise ignores the long-recognized and unresolved vulnerabilities of the General Electric Mark I boiling water reactor pressure suppression containment system to regard and restore Fermi 2 compliance to 10 CAR 50 Appendix A General Design Criterion 16 for Containment Design for the license renewal period.

As previously stated, the Petitioners contend that the Applicant is required to comply with General Design Criterion 16. DTE has not been granted by NRC any relaxation, waiver or exemption for compliance with GDC 16. Current NRC post-Fukushima corrective actions, including EA 2013-109, do not effectively address nor actively mitigate Fermi 2's compliance with GDC 16 and the acknowledged lack of a reliable containment system for an "essentially leak tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require" for the current licensing basis nor the requested license renewal period. Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions, NRC, EA 2013-109, June 6, 2013. EA 2013-109 states that,

The requirements in this Order, in addition to providing a reliable HCVS to assist in preventing core damage when heat removal capability is lost (the purpose of EA-12-050), will ensure that venting functions are also available during severe accident conditions. Severe accident conditions include the elevated temperatures, pressures, radiation levels, and combustible gas concentrations, such as hydrogen and carbon monoxide, associated with accidents involving extensive core damage, including accidents involving a breach of the reactor vessel by molten core debris.

[EA 2013-109, p. 3]

The Order further states:

Other issues include improving licensees' severe accident management capabilities and filtering strategies to limit the release of radioactive materials when venting is necessary. For example, the importance of drywell flooding to prevent core debris that has breached the reactor vessel from causing containment failure by drywell liner melt-through in Mark I containments was discussed in SECY-12-0157 and during the related Commission meeting held on January 9, 2013. The remaining issues related to filtering strategies and severe accident management of BWR Mark I and II containments

will be addressed through the rulemaking process, as directed by the Commission in its SRM for SECY-12-0157. The rulemaking process will commence in June 2013 when the NRC staff begins a series of public meetings to support developing the regulatory basis for the proposed rulemaking.

EA 2013-109, p. 4-5.

While EA 2013-109 acknowledges that severe accident conditions include the potential release of elevated “radiation levels” to the environment, no mitigation action is being required as recommended by NRC staff Option 3 for the installation of external engineered high capacity radiation filters on enhanced hardened containment vents. The Petitioners note that EA-2013-109 significantly omits and indefinitely delays the implementation, if at all, of NRC staff recommendation for Option 3 in SECY 2012-0157 to effectively enforce compliance with GDC 16 containment for “an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment.”

As previously stated, the Petitioners contend that Fermi 2 does not currently have a reliable “essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require.” Given the long-recognized vulnerability and unreliability of the Mark I containment design, construction and operation and the continued indefinite delay and doubtful outcome for compliance with GDC 16, the Applicant has no stated basis in the application for reasonably projecting that this vulnerability and non-compliance with GDC 16 will ever be successfully mitigated for the requested license renewal period.

The Petitioners therefore contend that the severe accident that challenges the vulnerability of design integrity of the GE Mark I pressure suppression containment system is to-be-anticipated and incorporated into the ER analysis and redressed by current state of the art SAMA alternatives as documented by the Petitioners and recommended by the NRC staff in SECY 2012-0157. Simply stating that a severe accident that would challenge Fermi 2’s containment vulnerability is too remote so as to say that “it can’t happen here” is not adequate justification under NEPA to ignore or trivialize the adverse environmental consequences of a radiological catastrophe on the proportion or worse than Fukushima Daiichi. It is equally unacceptable under NEPA to otherwise dismiss out of hand readily available state of the art alternatives to mitigate those adverse environmental consequences.

1.3.4 The Petitioners contend that the Applicant’s ER SAMA is overly and unrealistically optimistic in weighting its accident analysis to not fully consider and incorporate containment venting operations during a severe accident under post-fuel damage conditions which will likely result in the uncontrolled and unfiltered radiological releases with adverse consequences to the environment.

The Petitioners contend that the “uncontrolled” nature of such radiological releases under

accident conditions commences with a loss of the fuel cladding integrity, the initial barrier against uncontrolled radiological releases, constituting a post-fuel damage accident in the reactor core. At this point, the reactor operator's efforts to control containment over pressure, temperature and an explosive hydrogen gas atmosphere inside containment by containment venting necessitate the uncontrolled and unfiltered release of radioactivity to the environment. These uncontrolled and unfiltered radiological releases and their environmental consequences are not thoroughly or adequately addressed by the Applicant's SAMA analysis.

1.3.4.1 The Petitioners contend that the Applicant's ER SAMA alternatives at Table D.1.2 are overly and unrealistically optimistic to not anticipate or mitigate for potential fuel damage in the analysis and do not thoroughly or adequately address the failure of the pressure suppression containment with the uncontrolled and unfiltered radiological releases to the environment.

EVENT NAME: DW-SHELL-RUPT

EVENT DESCRIPTION: DRYWELL SHELL RUPTURE DISRUPTS INJECTION LINES AND FAILS RV SYSTEMS

DISPOSITION "This event represents the probability that a large containment failure caused by drywell overpressure failure results in the loss of injection from feedwater/condensate, standby feedwater, control rod drive, low pressure coolant injection, and core spray. SAMA 077 evaluates upgrades to the drywell spray system. Additionally, the response to order EA-12-050 (Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents) includes additional measures to increase the likelihood of successful containment venting to prevent containment overpressure."

[Fermi 2 LRA Application, ER, Attachment D, Severe Accident Mitigation Alternative Analysis, Table D 1-2, page D-12]

EVENT NAME: CPFFRBLDFAILDUCTL1

EVENT DESCRIPTION: "COND. PROB. THAT ADVERSE This event represents the probability that a containment venting ENVIRONMENT FAILS into the reactor building causes the failure of motor driven pumps EQUIPMENT IN RB BASEMENT located in the reactor building, given a failure of the hardpipe (LEVEL 1)"

DISPOSITION: "This event represents the probability that a containment venting into the reactor building causes the failure of motor driven pumps located in the reactor building, given a failure of the hardpipe (LEVEL 1) vent isolation valve to close. The response to order EA-12-050 includes additional measures to increase the likelihood of successful containment venting to prevent containment overpressure."

[Fermi 2 LRA Application, ER, Attachment D, Severe Accident Mitigation Alternative Analysis, Table D 1-2, page D-28]

The Applicant relies upon stated upgrades including a drywell spray system and relies upon EA 2012-050 to disposition its SAMA analysis for the rupture of the drywell component of the Fermi 2 pressure suppression containment system for the venting of a severe accident. The Petitioners have previously noted at 1.3.2 of their request for leave to intervene NRC staff concerns “that because of inherent uncertainties in spray systems’ capability to provide adequate decontamination factors (DFs), questions always remain as to how much, and whether or not they are reliable.” SECY 2012-0157, Enclosure 4, BWR Mark I and Mark II Containment Performance during Severe Accidents, p.18.

The Petitioners note that EA 2012-050 is superseded by EA 2013-109. While the venting of the unreliable Mark I containment of over-pressure is addressed by the Order, EA 2013-109 does not address the adverse environmental consequences of elevated radiological releases through unfiltered hardened containment vent. There is currently no identified requirement for a filtration strategy extending into license renewal period. As such, the Petitioners contend that the radiological consequences to the environment as a result of venting containment during a severe accident without a external engineered filtration system post-fuel damage are not thoroughly or adequately analyzed in the Applicant’s SAMA.

1.3.4.2 The Petitioners contend that Applicant’s ER SAMA alternatives at Table D.1.5 are overly and unrealistically optimistic by not anticipating the potential for fuel damage in the analysis and do not thoroughly or adequately address the failure of the pressure suppression containment with the uncontrolled and unfiltered radiological releases to the environment. .Fermi 2 LRA Application, ER, Table D.1.5, page D-45.

EVENT NAME: PHPHL2DILOSSDHRF

EVENT DESCRIPTION: DW NOT INTACT FOR LOSS OF DHR EVENTS (CLASS II) (LG)

DISPOSITION “This event represents the probability of containment failure being located in the drywell, given in-vessel recovery and a loss of decay heat removal. The response to order EA-12-050 includes additional measures to increase the likelihood of successful containment venting to prevent containment overpressure.”

EVENT NAME: WWA-BE

EVENT DESCRIPTION: WETWELL WATERSPACE FAILURES RPV INTACT

DISPOSITION: This event represents the probability that a wetwell failure occurs below the water line, given low temperature, high containment pressure, and large wetwell failure. The response to order EA-12-050 includes additional measures to increase the likelihood of successful containment venting to prevent containment overpressure.

EVENT NAME: HE1FHVNTDWVT

EVENT DESCRIPTION: OPERATING STAFF FAILS TO INITIATE VENT PER

PROCEDURE

DISPOSITION: This event represents the failure of operations to vent containment according to procedure. The response to order EA-12-050 includes additional measures to increase the likelihood of successful containment venting to prevent containment overpressure.

The Petitioners note that EA 2012-050 is superseded by EA 2013-109. While the venting of the unreliable Mark I containment of over-pressure is addressed by the Order, EA 2013-109 does not address the adverse environmental consequences of radiological releases through the hardened containment vent. There is currently no identified requirement for a filtration strategy extending into license renewal period. As such, the Petitioners contend that the radiological consequences to the environment as a result of venting containment during a severe accident post-fuel damage without an external engineered filtration system are not thoroughly or adequately analyzed in the Applicant's SAMA.

1.3.5 The Petitioners contend that Applicant's ER SAMA analysis is further identified as inadequate and insufficient by the particular findings and recommendations of an expert committee of The National Academy of Sciences to anticipate and mitigate for Beyond-design-basis Events. The Applicant's SAMA analysis needs to incorporate Beyond-design-basis events that can potentially challenge the unreliable Mark I pressure suppression containment system resulting in widespread land and water radiological contamination with significant adverse public health and safety consequences. "Lessons Learned from the Fukushima Nuclear Accident for the Improving Safety of U.S. Nuclear Plants", was published on July 24, 2014 by the National Research Council of National Academy of Sciences and supported by a contract and grant between the National Academy of Sciences and the U.S. Nuclear Regulatory Commission.

The expert committee report studied the implications of the Fukushima Daiichi nuclear accident for U.S. nuclear power plants including licensing operations for the Applicant's Fermi 2 Mark I boiling water reactor. The NAS expert committee compared the Japanese boiling water reactor to U.S. boiling water reactors. Table 2.2 of the report identifies that twenty-one U.S. Mark I units are similar to the Fukushima Daiichi units. In particular, Fermi 2 GE Mark I boiling water reactor is similar to Fukushima Daiichi Units 2, 3 and 4. Exhibit XX, Lessons Learned from the Fukushima Nuclear Accident for the Improving Safety of U.S. Nuclear Plants, The National Research Council, National Academy of Sciences, Summary, Table. 2.2, p. 2-18.

The Petitioners contend that the findings of the NAS expert committee have direct bearing upon Applicant's ER and SAMA analysis for the current license renewal request for the Fermi 2 Mark I boiling water reactor. The Petitioners point to particular findings and recommendations of the expert committee:

RECOMMENDATION 5.2A: The U.S. nuclear industry and the U.S. Nuclear Regulatory Commission should strengthen their capabilities for identifying, evaluating, and managing the risks from beyond-design-basis events. Particular attention is needed to improve the identification of such events; better account for plant system interactions and

the performance of plant operators and other critical personnel in responding to such events; and better estimate the broad range of offsite health, environmental, economic, and social consequences that can result from such events.

Exhibit X, Lessons Learned from the Fukushima Nuclear Accident for the Improving Safety of U.S. Nuclear Plants, The National Research Council, National Academy of Sciences, Summary, p. 5.

RECOMMENDATION 5.2C: As the U.S. nuclear industry and the U.S. Nuclear Regulatory Commission carry out the actions in Recommendation 5.2A they should pay particular attention to the risks from beyond-design-basis events that have the potential to affect large geographic regions and multiple nuclear plants. These include earthquakes, tsunamis and other geographically extensive floods, and geomagnetic disturbances.

Id. p. 6. The NAS expert committee identified a significantly large difference (33 times) between the filtered containment vent backfit analysis for boiling water reactors and a hypothetical nuclear accident a boiling water reactor like the Fermi 2 and the still emerging but very real costs of the Fukushima nuclear accident. The expert committee concluded that the significantly large difference was due to various assumptions made in developing those hypothetical estimates. The NAS expert committee concluded,

“The total cost of the Fukushima Daiichi accident could therefore exceed ¥20 trillion (~\$200 billion).

“It is instructive to compare these costs to the estimates developed by U.S. Nuclear Regulatory Commission staff for a hypothetical accident at the Peach Bottom nuclear plant in Pennsylvania. These cost estimates were used in the staff’s backfit analysis for filtered vents:

“A collective population dose to workers and the public out to 50 miles (accounting for reductions due to evacuation) of 0.53 million rem, which, valued at \$2000/rem, translated into damage of about \$1 billion;

“A loss of the use of off-site land and property due to radioactive contamination of \$1.9 billion;

“A loss of on-site value of \$3.2 billion. This includes the loss of use of an average off 1.75 nuclear power reactors at a BWR plant site. The total estimated costs for the hypothetical accident at the Peach Bottom plant is therefore about \$6 billion. The USNRC staff estimated that most of the off-site damage (\$2.5 billion) and \$1.2 billion of the on-site damage could be prevented by the installation of filtered vents. After multiplying the savings of \$3.7 billion by a probability of 2×10^{-5} accidents per reactor year (i.e., one accident every 50,000 years on average) and by 17.6 years (the assumed remaining 25 years of reactor life discounted by 3 percent per year), the savings per reactor would amount to only \$1.3 million—much less than the estimated \$15 million

cost for installing filtered vents. Installation of filtered vents therefore failed the backfit cost-benefit test.

“The cost estimates for the accident at the Fukushima Daiichi plant (~ \$200 billion) is about 33 times higher than the USNRC cost estimate for a hypothetical accident at the Peach Bottom plant (~\$6 billion).

“The committee offers this example to demonstrate that severe accidents such as occurred at the Fukushima Daiichi plant can have large costs and other consequences that are not considered in USNRC backfit analyses. These include national economic disruption, anxiety and depression within affected populations, and deterioration of social institutions arising from a loss of trust in governmental organizations.” Exhibit XX, Lessons Learned from the Fukushima Nuclear Accident for the Improving Safety of U.S. Nuclear Plants, The National Research Council, National Academy of Sciences, L.2].

1.3.6 The Petitioners contend that NEPA requires the Applicant to incorporate the concerns, findings and recommendations of the NAS expert committee into the Fermi 2 SAMA analysis. The Third Circuit decision of *Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719 (3d Cir. 1989), is the most significant precedent which bears on the issue of whether a SAMA analysis can encompass less than full range of mitigation alternatives because the mitigation measures alternatives are barred from consideration in license renewal by safety regulations (*i.e.*, Part 54). The *Limerick* court held, pertinently:

Although NEPA imposes responsibilities that are purely procedural, *see Vermont Yankee*, 435 U.S. at 558, there is no language in NEPA itself that would permit its procedural requirements to be limited by the AEA. Moreover, there is no language in AEA that would indicate AEA precludes NEPA.

[C]ourts have repeatedly held that, as suggested by the legislative history, compliance with NEPA is required unless specifically excluded by statute or existing law makes compliance impossible. *See, e.g., Public Service Co. of New Hampshire v. NRC*, 582 F.2d 77, 81 (1st Cir.) (“The directive to agencies to minimize all unnecessary adverse environmental impact obtains except when specifically excluded by statute or when existing law makes compliance with NEPA impossible.”), *cert. denied*, 439 U.S. 1046, 99 S. Ct. 721, 58 L. Ed. 2d 705 (1978). Accordingly, “unless there are specific statutory provisions which necessarily collide with NEPA, the Commission was under a duty to consider and, to the extent within its authority, minimize environmental damage. . . .” *Public Service*, 582 F.2d at 81 (footnote omitted). On the basis, therefore, of the language of NEPA and AEA, the legislative history of NEPA, and the existing case law, we find no intent by Congress that the AEA preclude application of NEPA.

Id. at 729-730 (footnotes omitted). The *Limerick* court also reaffirmed the NRC’s obligation to take a “hard look” at alternatives to the proposed action by thoroughly discussing those alterna-

tives:

. . . to qualify, the [final environmental statement] must contain sufficient discussion of the relevant issues and opposing viewpoints to enable the decisionmaker to take a “hard look” at the environmental factors and to make a reasoned decision. *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21, 49 L. Ed. 2d 576, 96 S. Ct. 2718 (1976). The impact statement must be sufficient to enable those who did not have a part in its compilation to understand and consider meaningfully the factors involved. *Environmental Defense Fund, Inc. v. Corps of Engineers*, 492 F.2d 1123, 11367 (5th Cir. 1974). *Cf. Dunlop v. Bachowski*, 421 U.S. 560, 572, 44 L. Ed. 2d 377, 95 S. Ct. 1851 (1975) (noting that a statement by an agency of the reasons for its determination is crucial to effective judicial review). Here, as we discussed *supra* . . . the FES neither considered nor specifically rejected [severe accident mitigation design alternatives].

Id. at 737 (footnotes omitted). Failing to complete the economic analysis necessary to determine whether a mitigation measure is cost-effective prevents a “hard look” at the alternative.

1.4 Conclusion

The Petitioners have presented a substantial NEPA contention identifying that the DTE Environmental Report SAMA analysis is insufficient and inadequate because it fails to meaningfully examine alternatives to mitigate the adverse environmental consequences arising out of a potential and to-be anticipated severe accident fulfilling the worst fears from the long-recognized and still unaddressed design vulnerability of the GE Mark I Boiling Water Reactor pressure suppression containment system. The omission of SAMA candidates which thoroughly explicate the comparative economic viability of mitigation of the Mark I reactor vulnerabilities will fail NEPA’s “hard look” obligation. In light of the troubling nature of some of those vulnerabilities, an inadequate SAMA investigation could portend a serious public health and safety threat.

***(ENVIRONMENTAL) CONTENTION 2: INADEQUATE CONSIDERATION
UNDER NEPA OF DENSELY-PACKED SPENT FUEL STORAGE POOLS***

A. Statement of the Contention

The Environmental Report for Fermi 2 does not satisfy the National Environmental Policy Act (“NEPA”) or 10 C.F.R. § 51.45(c) because it does not consider a range of mitigation measures to mitigate the risk of catastrophic fires in the densely packed, closed-frame spent fuel storage pools at Fermi 2.

**B. The Contention Satisfies the NRC’s Admissibility
Requirements in 10 C.F.R. § 2.309(f)(1)**

1. Brief Summary of the Basis for the Contention

a. Background Facts

The NRC Staff generated new and significant information during its post-Fukushima Expedited Spent Fuel Transfer proceeding, in which it considered whether to order operating reactor licensees to expedite the transfer of spent fuel from high-density pool storage to dry storage. In that proceeding, the NRC confirmed for the first time that: (1) even a small nuclear reactor pool fire could render 9,400 square miles uninhabitable and displace 4.1 million Americans; (2) spent reactor fuel can be transferred out of high-density storage pools (where the fire risk is the greatest) in a cost-effective manner; and (3) the likelihood of spent fuel pool fires can be affected by reactor accidents.

Petitioners contend that the National Environmental Policy Act (“NEPA”) and NRC implementing regulations require the NRC to consider this new and significant information in a plant-specific manner with the Fermi 2 Environmental Impact Statement for License Renewal, because it could affect the analysis of the environmental impacts of high-density spent fuel storage in reactor pools and the costs and benefits of measures for avoiding or mitigating those impacts.

On May 27, 2014, the NRC published on its website a decision by the majority of Commissioners on COMSECY-13-0300 (the NRC Staff’s study and recommendation on expedited transfer of spent fuel), approving the Staff’s recommendation that it stop conducting research on the issue of whether expedited transfer of spent fuel is warranted. NRC Chairman Allison Macfarlane dissented on the ground that the Staff had not adequately studied the causes of spent fuel pool fires or an adequate range of mitigative measures. Accordingly, the Chairman disapproved the Staff’s recommendation “to eliminate further generic assessment of expedited transfer of spent fuel as it relates to broader spent fuel management alternatives that should be explored.”

Although Chairman Macfarlane’s comments on COMSECY-13-0030 were made in the

context of an Atomic Energy Act-based safety decision, they are relevant to this NEPA contention. First, the Chairman's comments confirm that the potential environmental consequences of a spent fuel pool fire are more catastrophic than previously acknowledged by the Commission, involving contamination of thousands of square miles and relocation of millions of people. Second, her comments confirm that the NRC Staff has not adequately considered the probability of pool fires for purposes of evaluating the significance of their impacts or ruling out mitigative measures. Third, the Chairman confirms that mitigation measures for spent fuel pool fires could be cost-effective.

In light of the potential consequences of a pool fire and the large uncertainties involved in predicting the likelihood of a pool fire, the Chairman concluded that "it is important to have a continued focus on the holistic benefit of spent fuel management approaches that provide a common safety and security layer of defense against all potential initiators." As she explains:

Fundamentally, spent fuel pools do not benefit from a surrounding primary containment structure to repress large releases of fission products during a loss of cooling emergency and energetic fuel damage. The consequence analysis identifies a period in which spent fuel may not be naturally air-coolable during a drain-down event without human intervention. As a result, over the life of a reactor, spent fuel pools may not have natural cooling ability for approximately 1 to 5 years of a 20-year operating life. There are additional spent fuel management measures that should be evaluated to address this vulnerable state, for all types of initiating events.¹

In her comments, the Chairman identified a range of mitigative measures that should be considered, including longer transfer times to dry storage, direct discharge into varying dispersal patterns, substitution of open-rack low-density storage racks for high-density storage racks, and alternative fuel designs.² As she observed:

[T]he staff consequence study and generic regulatory analysis . . . highlight the significant range of potential contamination events and environmental costs. These potential costs are highly influenced by the distribution of recently discharged fuel in the pool, the overall cesium content in the pool, the success of post-accident water make-up capabilities, and the successful evacuation of the surrounding population during the event sequence.

Id. at 3. This is representative of the range of mitigative measures that has not been considered

¹Chairman Macfarlane's Comments on COMSECY-13-0030 Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel at 5 (footnotes omitted), attached to Response Sheet from Chairman Allison M. Macfarlane to Annette Vietti-Cook, Secretary re: COMSECY-13-0030 etc. (April 8, 2014) ("Chairman's Comments"). See <http://www.nrc.gov/reading-rm/doccollections/commission/recent/2014/>.

²*Id.* at 6-8.

thus far in the re-licensing decision for Fermi 2 under NEPA.

Fourth, the Chairman's comments confirm that the analytical criteria used by the Staff to recommend against further investigation of the benefits of expedited spent fuel transfer do not effectively account for the significant sociological and economic effects of dislocating huge populations from large land areas that may be affected by pool fires. She observes that the NRC Staff "concluded that predicted risks [of a pool fire] were below reactor quantified health objectives (QHO)" and that therefore "the costs of 10 to 15 additional casks per reactor . . . outweighed the frequency-weighted benefits of requiring expedited transfer."³ But she noted that the QHOs alone do not present a full picture of the consequences of a pool fire: "the staff consequence study and generic regulatory analysis also highlight the significant range of potential contamination events and environmental costs."⁴

Fifth, the Chairman's comments confirm the Petitioners' position that if, as required by NEPA, the social and economic effects of pool fires are considered in addition to health effects, reducing the density at which spent fuel is stored in pools is likely justified.⁵

In sum, the NRC Staff's analysis lacked the rigor that NEPA requires for a finding that environmental impacts are insignificant or that mitigation measures are unwarranted.⁶

Chairman Macfarlane's comments support Petitioners' request that the NRC require identification and analysis under NEPA of spent fuel storage impacts and mitigation alternatives.

The NRC regulations and staff findings support admission of this Contention as a plant-specific requirement. A review of 10 C.F.R. Part 50, Appendix B to Subpart A, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant," Table B -1,⁷ reveals that no category is presently assigned for "Offsite radiological impacts of spent nuclear fuel and high-level waste disposal" because of "[u]ncertain impact. The generic conclusion on offsite radiological impacts of spent nuclear fuel and high-level waste is not being finalized pending the completion of a generic environmental impact statement on waste confidence." *Id.* Footnote 7 to this entry further elaborates that "Without the analysis in the Waste Confidence Decision and Rule regarding the technical feasibility and availability of a repository, the NRC cannot assess how long the spent fuel will need to be stored onsite." *Id.* fn. 7

³*Id.* at 2.

⁴*Id.* at 3.

⁵*Id.* at 6-8.

⁶*Id.* at 4-8.

⁷Posted online at http://www.nrc.gov/reading-rm/doc-collections/cfr/part051/part051-appb.html#N_3_51appb

Notably, in the “Revisions to Environmental Review for Renewal of Nuclear Power Plant Operating Licenses” published in the Federal Register on June 20, 2013 the NRC stated:

Although the NRC has determined that impacts from severe accidents are small for all facilities, the NRC continues to maintain that severe accidents cannot be a Category 1 issue because plant-specific mitigation measures vary greatly based on plant designs, safety systems, fuel type, operating procedures, local environment, population, and siting characteristics. Thus, severe accidents remain a Category 2 issue. Accordingly, the NRC has not changed the requirements in 10 CFR 51.53(c)(3)(ii)(L) that an applicant’s environmental report must contain a discussion that considers alternatives to mitigate severe accidents if the NRC has not previously considered this issue in an environmental impact statement or environmental assessment for the facility.

78 Fed. Reg. 37282, 37290. On the same page, under “Spent Fuel Pool Accidents”, the Commission stated:

The 1996 GEIS included a quantitative analysis of a severe accident involving a reactor operating at full power. A qualitative evaluation of SFP accidents is presented in Appendix E of the revised GEIS. Based on this evaluation, the revised GEIS concludes that the environmental impacts from accidents involving SFPs are comparable to those from the reactor accidents at full power that were evaluated in the 1996 GEIS and as such, SFP accidents do not warrant separate evaluation. Based on the continued validity of conclusions from the 1996 GEIS, as affirmed by the Commission (*see* following paragraph), the revised GEIS does not contain a quantitative evaluation of SFP accidents.

Id. In the past, the NRC never found that mitigation of pool fire impacts would be cost-effective because of the low probability of a pool fire,⁸ but that changed with (a) the 2013 final rule, which says to treat pool fires like reactor accidents, and (b) the Expedited Spent Fuel Transfer proceeding, which shows that mitigation measures for pool fires can be effective.

b. Plant-Specific Facts About High-Density Spent Fuel Storage at Fermi 2

Fermi 2 is a General Electric Mark I Boiling Water Reactor with a capacity output of 1162 MW electric, and the single largest Mark I reactor in the world, larger than the Fukushima

⁸*See, e.g.*, 73 Fed. Reg. 46204, 46212 (August 6, 2008): “The Petitioners asserted that SFP fires should be considered within the analysis of severe accident mitigation alternatives (SAMAs). While a large radiological release is still possible, and was assessed as part of Generic Issue 82, *Beyond Design Basis Accidents in Spent Fuel Pools*, and later, in NUREG–1738, the NRC considers the likelihood of such an event to be lower than that estimated in Generic Issue 82 and NUREG–1738. Based on the Sandia studies, and on the implementation of additional strategies implemented following September 11, 2001, the probability of a SFP zirconium fire is expected to be less than that reported in NUREG–1738 and previous studies. Thus, the very low probability of an SFP zirconium fire would result in an SFP risk level less than that for a reactor accident.”

units.

During its operating life, Fermi 2 has generated nearly 600 metric tons of high-level radioactive waste which is currently being held in a storage pool onsite.⁹ This amounts to some 90,000,000 curies of radiation,¹⁰ more than all of the HLRW in the damaged reactor storage pools at Fukushima Daiichi.¹¹ All of Fermi 2's irradiated fuel is stored in its pool, because the plant's structure is missing welds. There is concern that the walls and floor of Fermi 2 cannot support the combined heavy weight of a crane and storage cask for transfer operations.¹² Missing structural welds have delayed offloading of SNF from the storage pool for years.

Detroit Edison has admitted that loss of offsite power would lead to pool boiling within 4

⁹Fermi 2's HLRW storage pool content is calculated by taking the figure given in U.S. Department of Energy, Office of Civilian Radioactive Waste Management, *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, February 2002 (DOE/EIS-0250), Appendix A, "Inventory and Characteristics of Spent Nuclear Fuel, High-Level Radioactive Waste, and Other Materials," Table A-7. At "Proposed Action spent nuclear fuel inventory (MTHM)," Page A-15: by spring 2010, 523 (metric) tons of irradiated nuclear fuel had been generated at Fermi 2, and was stored in its pool. Since spring 2010, about 20 metric tons per year of additional irradiated nuclear fuel has been generated at Fermi 2, and been put into its pool for storage. To recap, 523 tons + 80 tons = around 600 metric tons of irradiated nuclear fuel currently stored in Fermi 2's pool.

¹⁰Figure 11, Spent Fuel Inventories between 10-100 Million Curies, "Spent Nuclear Fuel Stored in U.S. Reactors," Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage, Robert Alvarez, Senior Scholar, Institute for Policy Studies, Page 14 (http://www.ips-dc.org/wp-content/uploads/2011/05/spent_nuclear_fuel_pools_in_the_US-final.pdf)

¹¹The damaged reactor units at Fukushima Daiichi, Units 1 to 4, contain a total of 419 (metric) tons of irradiated nuclear fuel in their storage pools: Unit 1, 40 t; Unit 2, 97 t; Unit 3, 63 t; Unit 4, 219 t. This is documented by Hisako Sakiyama, Member, Fukushima Nuclear Accident Independent Investigation Commission, "Risk Assessment of Low Dose Radiation in Japan: What Became Clear in the Diet Fukushima Investigation Committee," The Medical and Ecological Consequences of the Fukushima Nuclear Accident, Day 1, March 11, 2013, Symposium at the New York Academy of Medicine, New York City, NY, sponsored by the Helen Caldicott Foundation and Physicians for Social Responsibility, Video Recording (136:07 of 264:55), posted online at <http://www.totalwebcasting.com/view/?id=hcf#>.

¹²Preoperational and Operational Testing of an Independent Spent Fuel Storage Installation (60854.1), SUBJECT: FERMI POWER PLANT, UNIT 2, INTEGRATED INSPECTION REPORT 05000341/2010003, w/Attachment: Supplemental Information, from M. Kunowski, Acting for R. Orlikowski, Acting Chief, Branch 4, Division of Reactor Projects, NRC Region III, U.S. NRC, to Jack M. Davis, Senior Vice President and Chief Nuclear Officer, Detroit Edison Company, Fermi 2, Docket No. 50-34, License No. NPF-43, Page 18 (22 of 32 on PDF counter), July 30, 2010, ADAMS ML102110232 ; also, "Fermi fuel transfer being delayed," by Charles Slat, *Monroe News*, June 10, 2011, posted online at: <http://m.monroenews.com/news/2011/jun/10/fermi-fuel-transfer-being-delayed/?templates=mobile>

hours 12 minutes.¹³ The spent fuel pumps do not have emergency diesel generators (EDGs) for backup power.

Fermi 2 is located roughly halfway between Toledo, Ohio and Detroit, Michigan, roughly 20 miles north of Toledo, and 25 miles south of Detroit. Toledo is situated in urban Lucas County, with a population of 500,000. The greater Detroit area population, most of which resides within 50 miles or less of Fermi 2, is over 4,296,000.

In order to maximize the capacity of the storage pool at Fermi 2, fuel assemblies are racked much more densely than was originally planned. Along with much of the rest of the industry, DTE adopted the use of high-density, closed-frame racks for storage many years ago.

A search of the Fermi 2 License Renewal Application (LRA) yields only these recitations of the term “spent fuel:”

2.2.3.6 Spent Fuel Storage

The Fermi 2 ISFSI storage pad is a 141-foot x 141-foot square reinforced concrete structure that is 2 feet thick and designed to accommodate 64 dry storage casks. (Fermi 2012a, Section 9.1.2.2.3) However, four of the positions will remain empty to accommodate cask movements, so actual capacity is limited to 60 dry storage casks. There is a subsurface drainage system surrounding the pad to help prevent the soil under the pad from being displaced as a result of freeze and thaw cycles. The subsoil in the area to the north of the pad has also been prepared for possible future expansion of the pad to allow additional placement of up to 32 dry storage casks (Fermi 2012a, Section 9.1.2.2.3), which would accommodate spent fuel generated during the license renewal period. There is currently no spent fuel being stored on the ISFSI pad (DTE 2012b).

“Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS):”

Addendum to Main Report (NUREG-1437, Volume 1, Addendum 1) (NRC 1999) noted that 10 CFR § 51.23 codifies the NRC's generic determination that storage and disposal of spent fuel during the licensed life for operation of nuclear power plants (which may include the term of a renewed license) can be accomplished safely and without significant environmental impact. In accordance with this determination, the GEIS concluded that no discussion of environmental impacts of spent fuel storage for the period following the term of a reactor operating license, including a renewed license, was required. In 2010, the Commission updated and continued the provisions in 10 CFR § 51.23 (referred to as the Waste Confidence Decision Update and Temporary Storage Rule, or Waste Confidence Decision Update and Rule) based on experience in the storage

¹³ADAMS No. ML 993440109, p. 14/33 pdf (p. 7 as numbered in text).

of spent nuclear fuel and the uncertainty in the siting and construction of a permanent geologic repository for the disposal of spent nuclear fuel (75 FR 81031).

LRA, Vol. 3, pp. 63-64.

2. The Contention is Within the Scope of the Proceeding

The contention is within the scope of this licensing proceeding because it seeks to ensure that the re-licensing of Fermi 2 complies with NEPA. In fulfilling its obligations under NEPA, the NRC may impose upon applicants and licensees conditions designed to minimize the adverse environmental effects of licensed activities. *Tennessee Valley Authority* (Phipps Bend Nuclear Plant, Units 1 & 2), ALAB-506, 8 NRC 533, 539 (1978).

3. The Issues Raised are Material to the Findings that the NRC Must Make to Support the Action that is Involved in this Proceeding

Petitioners have here raised a “contention of omission,” *i.e.*, a claim, in the words of 10 C.F.R. § 2.309(f)(1)(vi), that “the application fails to contain information on a relevant matter as required by law . . . and the supporting reasons for the petitioner's belief.” *Pa’ina Hawaii, LLC* (Material License Application), LBP 06-12, 63 NRC 403, 413 (2006), *pet. for reconsideration denied*, CLI-06-25, 64 NRC 128 (2006) (contention satisfied the requirement to provide a specific statement of the legal or factual issue sought to be raised by alleging that the application failed to describe the emergency procedures for a prolonged loss of electricity).

The NRC must make predictive safety findings and conduct an environmental analysis regarding the environmental impacts of spent fuel storage and disposal, and a range of mitigative measures, before it can legally re-license Fermi Unit 2. *Limerick Ecology Action v. NRC*, 869 F.2d 719, 737 (3rd Cir. 1989). Those findings do not appear in the Environmental Report, and Petitioners urge that they must be addressed in the NEPA documents produced by the NRC Staff. The issues raised by this contention are therefore material to the re-licensing decision for Fermi Unit 2.

4. Concise Statement of Fact or Expert Opinion Supporting the Contention

Recent pertinent changes caused by the *New York v. NRC* court decision,¹⁴ as well as an evolving NRC perception that offsite consequences of spent fuel pool accidents should be considered as potentially severe as reactor accidents if not more severe, due to the lack of containment, the much greater quantity of irradiated nuclear fuel, and the strong probability of much larger environmental releases of hazardous radioactivity. These developments have altered

¹⁴*New York v. NRC*, 681 F.3d 471 (DC Cir. 2012).

expectations and now require plant-specific treatment under NEPA. The factual history of this regulatory change is delineated in Section 1(a) above, and that information is incorporated herein by reference as though rewritten. It is essentially indisputable that only cursory discussion, at best, has been undertaken respecting spent fuel storage at Fermi 2. The changes reflect “significant new information” which must be taken into account in, for example, DTE’s and the NRC Staff’s analyses of severe accident mitigation alternatives. *See, e.g., Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 NRC 373, 379 (2002) (characterizing an originally-admissible contention as claiming that there was new, significant information that [the applicant] should have taken into account or acknowledged when performing its SAMA cost-benefit analyses).

5. A Genuine Dispute Exists with the Applicant on a Material Issue of Law or Fact

As discussed above in Section 1(b), DTE relies upon a truncated discussion of spent fuel pool arrangements, despite having a gargantuan and densely-configured inventory of HLRW within the pool, and inadequate means of removing and placing it into dry cask storage or otherwise mitigating the potential problems that can befall overly concentrated storage methods. Therefore, Petitioners have articulated a genuine dispute with DTE on a matter of fact (by virtue of disclosing facts that are not discussed in the Environmental Report), as well as a dispute of law (whether NEPA compels identification of mitigation measures and/or alternatives to the present arrangement).

(ENVIRONMENTAL AND TECHNICAL) CONTENTION 3: LACK OF SITE-SPECIFIC SAFETY AND ENVIRONMENTAL FINDINGS REGARDING STORAGE AND DISPOSAL OF SPENT FUEL

A. Statement of the Contention

The Environmental Report for Fermi 2 does not satisfy the Atomic Energy Act or NEPA because (1) it does not make any site-specific safety and environmental findings regarding the storage and ultimate disposal of the spent fuel that will be generated during the license renewal term and (2) the NRC has no valid generic findings on which the Environmental Report could rely.

B. The Contention Satisfies the NRC’s Admissibility Requirements in 10 C.F.R. § 2.309(f)(1)

1. Brief Summary of the Basis for the Contention

In *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012), the U.S. Court of Appeals vacated the NRC’s Waste Confidence Decision (75 Fed. Reg. 81,037 (Dec. 23, 2010)) and Temporary Spent Fuel Storage Rule (75 Fed. Reg. 81,032 (Dec. 23, 2010)). These documents contained the NRC’s only safety and environmental findings with respect to the storage and disposal of spent fuel after reactor operation ceases. Before the Court’s decision in *New York*, these findings were

incorporated into all reactor licensing decisions and could not be challenged in individual licensing proceedings. *New York*, 681 F.3d at 476-77; 10 C.F.R. § 51.23(b) (1990).

The NRC has not replaced the Waste Confidence Decision or the Temporary Spent Fuel Storage Rule with new regulations. The proceeding for development of the new rules and a Generic Environmental Impact Statement (“GEIS”) is pending. In the meantime, the NRC lacks any valid generic safety or environmental findings regarding the disposal and storage of the spent fuel that will be generated during the license renewal term for Fermi Unit 2. And while DTE states in its Environmental Report that it is planning to rely on the NRC’s “updated rule and supporting environmental impact statement” for “NEPA analyses of waste-confidence-related human health and environmental impacts” with respect to renewal of the Fermi 2 operating license, no such rule or environmental impact statement have been finalized. *Id.* at 2-19 - 2-20. Unless and until the NRC replaces the generic findings vacated by the Court of Appeals or DTE conducts its own analysis, the NRC has no lawful basis for re-licensing Fermi 2.

2. The Contention is Within the Scope of the Proceeding

The contention is within the scope of this licensing proceeding because it seeks to ensure that the re-licensing of Fermi 2 complies with the Atomic Energy Act and NEPA.

3. The Issues Raised are Material to the Findings that the NRC Must Make to Support the Action that is Involved in this Proceeding

The NRC must make predictive safety findings and conduct an environmental analysis regarding the safety and environmental impacts of spent fuel storage and disposal before re-licensing Fermi Unit 2. *New York*, 681 F.3d at 478; *NRDC v. NRC*, 582 F.2d 166, 169 (2nd Cir. 1978); *Minnesota v. NRC*, 602 F.2d 412, 416 (D.C. Cir. 1979). Therefore, the issues raised by this contention are material to a re-licensing decision for Fermi Unit 2.

4. Concise Statement of Fact or Expert Opinion Supporting the Contention

This contention is based primarily on law rather than facts. Petitioners have adequately supported their contention by citing *State of New York* and other precedents and discussing their legal effect on this proceeding. Petitioners also rely on the undisputed fact that at this writing, the NRC has not issued final regulations to replace the Waste Confidence Decision and Temporary Storage Rule.

5. A Genuine Dispute Exists with the Applicant on a Material Issue of Law or Fact

As discussed above in ¶ 1, DTE proposes to rely on generic waste confidence findings that do not exist. Therefore, Petitioners have a genuine dispute with DTE on a matter of law.¹⁵

¹⁵See SECY-14-0072, Memorandum to the Commissioners from Mark A. Satorius, Executive Director for Operations, re: Final Rule: Continued Storage of Spent Nuclear Fuel (RIN 3150-AJ20) and

On July 21, 2014, the NRC Staff forwarded to the NRC Commissioners final draft versions of a regulation and generic environmental impact statement (“GEIS”) pertaining to continued storage of spent fuel.

(ENVIRONMENTAL) CONTENTION 4: INSUFFICIENT SEVERE ACCIDENT MITIGATION ANALYSIS (SAMA) OF POTENTIAL FERMI 2 AND 3 COMMON-MODE FAILURES AND MUTUALLY EXACERBATING CATASTROPHES

A. Statement of the Contention

Fermi 2 and Fermi 3’s safety and environmental risks due to common mode failures, and the potential for mutually initiating/exacerbating radiological catastrophes, involving the common Transmission Corridor (TC) shared by both units’ reactors and pools, have been inadequately addressed in DTE’s Fermi 2 License Renewal Application (LRA) and Environmental Report (ER). Also, the cumulative impacts associated with the proposed new Fermi 3 reactor cannot be excluded from DTE’s Fermi 2 LRA and ER as “remote” or “speculative,” for it is DTE’s own proposal, and is advanced in the Fermi 3 COLA proceeding. Such environmental and safety analysis is required on this unique local problem specific to Fermi 2 and 3. It can, and must, be dealt with in Severe Accident Mitigation Alternatives (SAMA) analyses, and must be treated as Category 2 Issues in NRC’s forthcoming Draft Supplemental Environmental Impact Statement (DSEIS), as required by NEPA and the AEA.

B. The Contention Satisfies the NRC’s Admissibility Requirements in 10 C.F.R. § 2.309(f)(1)

1. Brief Summary of the Basis for the Contention

Petitioners have also intervened against the Fermi 3 COLA in pending litigation before the NRC’s Atomic Safety and Licensing Board (ASLB). Petitioners incorporate by reference and reallege as though written herein the contents of their various filings in the Fermi 3 COLA ASLB proceedings, in their entirety, into this Fermi 2 LRA proceeding. There are inextricably interconnected Atomic Energy Act (AEA) and National Environmental Policy Act (NEPA) impacts of the Fermi 2 and Fermi 3 atomic reactors and their various systems, structures, and components (SSCs), including a common transmission corridor (TC) connecting them to the offsite electrical grid.

DTE recently reported that the NRC Staff is ahead of its previously announced schedule for completion of the Fermi 3 COLA proceedings and associated documents:

Only certain reviews of the Advisory Committee on Reactor Safeguards

attached Federal Register Notice and Final GEIS. The NRC Commissioners have not decided whether to adopt them as final decision documents, however.

(“ACRS”) and the Commission’s mandatory hearing remain. DTE understands that the Staff’s latest schedule calls for the final ACRS meeting in September 2014, and that the NRC Staff could support completing the Final Safety Evaluation Report and initiating a mandatory hearing by December 2014... DTE understands that the NRC Staff will issue a revised schedule shortly. Remaining activities are all now well in advance of the current schedule published in 2013.¹⁶

The NRC Staff later confirmed DTE’s report that the Staff has picked up the pace to completion of the remaining Fermi 3 COLA technical reviews of documents and activities.¹⁷ Hence there is a high likelihood that, during Fermi 2’s proposed 20-year license extension from 2025 - 2045, the proposed Fermi 3 Hitachi-GE ESBWR reactor and its associated transmission line corridor (TC) will be constructed and operated. Significantly increased break-in phase risks associated with a new reactor, and even a new reactor design (Hitachi-General Electric’s so-called Economic Simplified Boiling Water Reactor), will be relevant, from start-up/shake-down problems, design flaws, construction flaws, operator inexperience, Quality Assurance violations (broadly alleged by these same Petitioners in the Fermi 3 COLA proceeding), *etc.*, at both the Fermi 3 ESBWR and its associated TC.

In addition to the significantly increased risks represented by a breakdown phase reactor (the age-degraded Fermi 2 General Electric Mark I BWR) being located immediately adjacent to a break-in phase reactor (the new, untested Fermi 3 ESBWR), both reactors will be vulnerable to disruptions in the Transmission Corridor, which will, *de facto*, function as a single TC which is common to both reactors: both Fermi 2 and Fermi 3’s TCs will run parallel, effectively a single corridor, for 18.6 miles:

Detroit Edison expects that the proposed new transmission line would be built within the existing Fermi 2 transmission corridor for approximately 18.6 mi extending outward from the Fermi site boundary.¹⁸

¹⁶ “Applicant’s Opposition to *Sua Sponte* Consideration of Transmission Corridor Issues,” filed in DTE Electric Company (Fermi Nuclear Power Plant, Unit 3), Docket No. 52-033 COL, July 28, 2014, p.19 and fn. 60, ADAMS No. ML14209B059.

¹⁷ [Part] III. A revised scheduling letter has been issued, “NRC Staff Reply to Other Parties’ Pleadings Related to the Board’s Request for Approval to Conduct *Sua Sponte* Review of Contention 23 (Transmission Lines),” Counsel for NRC Staff, *DTE Electric Company* (Fermi Nuclear Power Plant, Unit 3), Docket No. 52-033-COL, August 7, 2014, pp. 5-6 (ADAMS No. ML14219A731).

¹⁸LBP-14-09, Memorandum (Determining Issues Related to Intervenors’ Proposed Contention 23 Merit *Sua Sponte* Review Pursuant to 10 C.F.R. § 2.340(b) and Requesting Commission Approval), ASLBP No. 09-880-05-COL-BD01, DTE Electric Company (Fermi Nuclear Power Plant, Unit 3), Docket No. 52-033-COL, July 7, 2014, ADAMS Accession No. ML14188C420, p. 5 fn. 5, citing Final Environmental Impact Statement (FEIS) for the Combined Licensed (COL) for Enrico Fermi Unit 3,

Thus from 2025 to 2045, both Fermi 2 and Fermi 3 would be dependent on offsite electricity flowing through the same TC, for both the primary Alternating Current (AC) electricity supply needed to run safety and cooling systems on both reactors, as well as both safety-significant high-level radioactive waste (HLRW) storage pools.

Whether the initiating scenario involves a terrorist attack, act of sabotage, natural disaster (such as an earthquake or tornado), fire and/or explosion at Fermi's various connected electrical switchyards, an airplane crash during takeoff from or landing at the nearby Detroit Metro airport, a disruption of the common TC for Fermi 2 and Fermi 3 could unleash a common mode failure serving as a severe accident precursor at Fermi 2 and/or Fermi 3. Catastrophic releases of hazardous radioactivity are recognized to be entirely possible and potentially inescapable under certain conditions, and should rather be called disasters, or catastrophes. "Accident" falsely implies having no forewarning of the risks, and catastrophic consequences. From Three Mile Island, to Chernobyl, to Fukushima Daiichi, and beyond, these are no longer "accidents," but calculated risks gone horribly wrong.

DTE, Hitachi-General Electric, and NRC staff have claimed that the Fermi 3 ESBWR design is "inherently safe," with core cooling water "gravity-driven," and thus loss of offsite electricity, and even on-site EDGs, to run safety and cooling systems would be manageable, and reactor core meltdown, and radiological catastrophe, could be averted. Petitioners contest this overly simplistic, overly optimistic assertion and emphasize that no such overconfidence can be claimed at Fermi 2. The Fukushima Daiichi nuclear catastrophe has shown clearly what can happen at a several-decades-old GE Mark I BWR, the very design at Fermi 2.

Dr. Edwin Lyman, Senior Scientist with the Global Security Program at Union of Concerned Scientists, challenges the notion that the Fermi 3 ESBWR really doesn't need offsite electricity from the common TC, nor even EDGs, to run safety and cooling systems. See section 4 (concise statement of support) below. The loss of power from the common offsite TC electrical grid would represent a loss of "defense-in-depth" at the multi-unit Fermi nuclear power plant. Defense-in-depth is:

An approach to designing and operating nuclear facilities that prevents and mitigates accidents that release radiation¹⁹ or hazardous materials. The key is creating multiple independent and redundant layers of defense to compensate for potential human and mechanical failures so that no single layer, no matter how robust, is exclusively relied upon. Defense-in-depth includes the use of access controls, physical barriers, redundant and diverse key safety functions, and emergency response measures. For further

NUREG-2015, at 2-10.

¹⁹ "Radiation" links to: <http://www.nrc.gov/reading-rm/basic-ref/glossary/radiation-ionizing.html>.

information, see Speech No. S-04-009,²⁰ "The Very Best-Laid Plans (the NRC's Defense-in [sic] Depth Philosophy)."²¹

The common TC shared by Fermi 2 and Fermi 3 represents a serious violation of the NRC's "defense-in-depth" on its face. DTE should have addressed such issues in the Fermi 3 COLA, ER, and FSAR, but did not. The NRC Staff should have addressed such issues in the Fermi 3 EIS and FSER, but did not. And now, DTE omits to address these issues in the Fermi 2 LRA, ER, and FSAR, while the NRC Staff should address them in the Fermi 2 DSEIS and FSER. NEPA and the AEA require nothing less.

A large-scale radioactivity release from Fermi 2's reactor and/or HLRW storage pool, and/or from Fermi 3's reactor and/or HLRW storage pool, could well lead to the evacuation of the entire Fermi nuclear power plant site - of the workforces for both plants, and even of emergency responders (such as firefighters, or military personnel) brought in from offsite to deal with a disaster. This possibility was contemplated by Tokyo Electric Power Company (TEPCO) during the darkest hours of the Fukushima Daiichi nuclear crisis and catastrophe in mid-March, 2011. In fact, Japanese Prime Minister Naoto Kan had to personally intervene in the middle of the night to prevent such a wholesale surrender, retreat, and abandonment of the multiple melting down reactors, and the nearby storage pools containing many hundreds of tons of irradiated fuel, themselves at risk of catching fire.²²

What DTE deems to be "offsite" versus "onsite" in the LRA constitutes arbitrary differences without a distinction.

The hard to imagine but real risks that flow from the interconnection of the on-site, admittedly in-scope transmission corridor and the offsite TC (excluded from scope by 10 C.F.R. Part 50, Appendix B to Subpart A, Table B-1, fn. 4²³) must be addressed. The common TC and its primary offsite electricity supply to run vital safety, cooling, and monitoring SSCs at Fermi 2 and Fermi 3, wherever situated, must all be considered as in-scope. There are potentially

²⁰ Ironically, despite the "very best-laid plans," this link leads to a "Page Not Found" error message.

²¹ Posted online at: <http://www.nrc.gov/reading-rm/basic-ref/glossary/defense-in-depth.html>.

²² Martin Fackler, "Japan Weighed Evacuating Tokyo in Nuclear Crisis," *New York Times*, February 27, 2012, posted online at http://www.nytimes.com/2012/02/28/world/asia/japan-considered-tokyo-evacuation-during-the-nuclear-crisis-report-says.html?_r=3&hp&

²³ "This issue applies only to the in-scope portion of electric power transmission lines, which are defined as transmission lines that connect the nuclear power plant to the substation where electricity is fed into the regional power distribution system and transmission lines that supply power to the nuclear plant from the grid."

catastrophic impacts from several loss-of-power scenarios to public health, safety, the environment, and the common defense which must be identified and discussed under both NEPA and the AEA. Fukushima Daiichi has demonstrated the genuine prospect of disaster when off-site electricity is lost, in conjunction with the simultaneous loss of on-site EDGs. It is even more likely at Fermi 2, given the horrendous record of EDG reliability not only at Fermi 2, but across industry, as set forth below in section 4 (expert or documentary support for contention).

Moreover, the proposed Fermi 3 reactor and its associated TC represent a bundle of potential cumulative effects (including construction impacts) which must be included within the scope of Fermi's 20-year LRA. Such comprehensive environmental and safety analysis under NEPA and the AEA are essentially absent from Fermi 2's 20-year license extension ER and LRA. DTE has adopted an impermissibly narrow scope to avoid dealing with these significant matters. But the conditions driving such analysis are uniquely local characteristics of Fermi 2 and 3 which must be identified and treated within Severe Accident Mitigation Alternatives (SAMA) analyses, and approached as Category 2 Issues in the NRC's forthcoming Draft Supplemental Environmental Impact Statement (DSEIS).

2. The Contention is Within the Scope of the Proceeding

The contention is within the scope of this licensing proceeding because if Petitioners prevail, the license extension of Fermi 2 will comply with the Atomic Energy Act (AEA) and National Environmental Policy Act (NEPA).

As noted, the NRC's license extension regulations allow for site-specific review of postulated accidents and severe accidents by the authority of 10 C.F.R. Part 50, Appendix B to Subpart A, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant." Table B -1, titled "Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants,"²⁴ provides this guidance:

Severe accidents	2	SMALL. The probability-weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are small for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives.
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In addition, at "Cumulative Impacts," NRC has assigned the following Issue/Category/Findings:

²⁴Posted online at http://www.nrc.gov/reading-rm/doc-collections/cfr/part051/part051-appb.html#N_3_51appb

Cumulative impacts	2	Cumulative impacts of continued operations and refurbishment associated with license renewal must be considered on a plant-specific basis. Impacts would depend on regional resource characteristics, the resource-specific impacts of license renewal, and the cumulative significance of other factors affecting the resource.
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The White House Council on Environmental Quality (CEQ) defines "cumulative impacts" as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7.

The proposed new Fermi 3 ESBWR, and its associated transmission corridor lines, are "reasonably foreseeable future action(s)," especially considering the fact that they are proposed by none other than DTE itself, the Applicant, for the 20-year license extension at Fermi 2. In fact, the Fermi 3 COLA ASLB proceeding is well along the path to completion, as explained above.

Fermi 3 and its TC must be considered to be within the Fermi 2 LRA and its associated ER, and the NRC Staff's DSEIS because its supposedly "out of scope" impacts ("out of scope" beginning mere inches away) could well cumulatively affect all that which is considered within the scope of the Fermi 2 LRA. Yet, Fermi 3 and its TC are essentially unconsidered in the LRA and ER. Fermi 3's supposedly "offsite" and "out-of-scope" cumulative impacts on Fermi 2's safe and environmentally-protective operations cannot be divorced from a serious analysis of the Fermi 2 project. Presently, DTE has inadequately analyzed the combined, inextricably inter-linked TC risks of a severe accident causing disaster or catastrophe associated with a 20-year license extension at Fermi 2 (2025 to 2045), overlapping for years or even decades on end with a yet-to-be-specified 40-year operational license at Fermi 3.

As Table B-1's footnotes explain:

Category 2: For the issue, the analysis reported in the Generic Environmental Impact Statement has shown that one or more of the criteria of Category 1 [resolved issues for all plants] cannot be met, and *therefore additional plant-specific review is required.* (Emphasis added)

Such severe accident and cumulative impacts analyses are currently lacking.

3. The Issues Raised are Material to the Findings that the NRC Must Make to Support the Action that is Involved in this Proceeding

The NRC must make predictive safety findings and conduct an environmental analysis regarding the safety and environmental impacts of the common TC - as well as

associated reactor and storage pool - risks according to the AEA and NEPA. Therefore the issues raised by this contention are material to an operational license extension decision for Fermi Unit 2.

“[T]he Commission is under a dual obligation: to pursue the objectives of the Atomic Energy Act and those of the National Environmental Policy Act. ‘The two statutes and the regulations promulgated under each must be viewed *in pari materia*.’” *Tennessee Valley Authority* (Phipps Bend Nuclear Plant, Units 1 & 2), ALAB-506, 8 NRC 533, 539 (1978) (Emphasis in original). In fulfilling its obligations under NEPA, the NRC may impose upon applicants and licensees conditions designed to minimize the adverse environmental effects of licensed activities. *Id.*

Under NEPA, when several proposals for actions that will have a cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together. *Sequoyah Fuels Corp.* (Gore, OK, Site Decommissioning), LBP-99-46, 50 NRC 386 (1999). The term “synergistic” refers to the joint action of different parts - or sites - which, acting together, enhance the effects of one or more individual sites. *Id.*

Petitioners are requesting the Commission to find that under both statutes, NEPA and the AEA, the cumulative and/or synergistic effects, and conceivable environmental consequences, of various accident possibilities be considered together.

4. Concise Statement of Fact or Expert Opinion Supporting the Contention

This contention is based on the following facts and expert opinions.

David Lochbaum, Nuclear Safety Director at Union of Concerned Scientists (UCS) has long spoken of the “bathtub curve” of aging atomic reactor “accident” risks related to their age.²⁵ “Bathtub curve” refers to the graph’s shape. It shows elevated safety risks during the early break-in phase with new atomic reactors, as well as during the breakdown phase risks, which worsen with age-related degradation of systems, structures, and components. After serious age-related degradation “accidents” occurred - such as Indian Point, NY’s steam generator tube rupture in 2000, and Davis-Besse, OH’s hole-in-the-head reactor lid corrosion fiasco in 2002, Lochbaum added those breakdown phase

²⁵ Such as Figure 2, “Bathtub” Curve of Failure Rate, Page 9 in *Nuclear Plant Risk Studies: Failing the Grade*, by David Lochbaum, UCS, 2000, posted online at: http://www.ucsusa.org/assets/documents/nuclear_power/nuc_risk.pdf; as well as Figure 3, Bathtub Curve, Page 4 of 6 in “Headaches at Palisades: Broken Seals & Failed Heals,” by David Lochbaum, UCS, July 16, 2010, posted online at http://www.ucsusa.org/assets/documents/nuclear_power/20100716-pal-ucs-brief-leaking-crd-seals.pdf.

“data points” to the bathtub curve, alongside demonstrated break-in phase disasters at new reactors, namely Three Mile Island Unit 2 in 1979, and Chernobyl in 1986.²⁶

As widely documented²⁷, the Fukushima Daiichi nuclear catastrophe in Fukushima Prefecture, northeast Japan, was ultimately initiated by the 9.0 Great East Japan Earthquake on March 11, 2011, which destroyed the electrical grid, cutting off primary power to the multi-unit nuclear power plant for the operation of safety, cooling, and monitoring systems, structures, and components (SSCs).

As thoroughly documented by the same sources, the meltdowns and explosions at certain reactors significantly set back, and repeatedly hindered, emergency interventions and mitigations at adjacent reactors and storage pools on the Fukushima Daiichi nuclear power plant site.

Although Fermi 2 and Fermi 3 are required to be equipped with emergency backup diesel generators, to provide another source of AC power, these cannot be regarded as fail-safe. In fact, it was revealed in 2006 that the Fermi 2 atomic reactor had unreliable emergency diesel generators (EDGs), due to faulty testing procedures, for two decades (1986 to 2006). In an emergency, if looked to for AC power for the running of vital safety and cooling systems, the EDGs at Fermi 2 could well have malfunctioned.²⁸

²⁶ Posted online at <http://www.beyondnuclear.org/storage/bath%20tub%20curve%20.jpg>.

²⁷ See, for example: “The accident,” beginning at Page 12, in National Diet [Parliament] of Japan, *Official Report of the Fukushima Nuclear Accident Independent Investigation Commission*, Executive Summary, posted online at <http://warp.da.ndl.go.jp/info:ndljp/pid/3856371/naic.go.jp/en/report/>; Chapter 1, “A Fukushima Diary, March 11-16, 2011,” beginning at Page 1, in *The Fukushima Daiichi Nuclear Power Station Disaster: Investigating the Myth and Reality*, by the Independent Investigation Commission on the Fukushima Nuclear Accident, Mindy Kay Bricker, Editor, published in association with the Bulletin of the Atomic Scientists and the Rebuild Japan Initiative Foundation, Rutledge, London and New York, 2014; Chapter 1, “March 11, 2011: ‘A Situation That We Had Never Imagined,’” beginning on Page 1, in *Fukushima: The Story of a Nuclear Disaster*, by David Lochbaum, Edwin Lyman, Susan Q. Stranahan, and the Union of Concerned Scientists, The New Press, New York and London, 2014.

²⁸ David Lochbaum, Nuclear Safety Director, Union of Concerned Scientists, *Futility at the Utility: How use of the wrong answer key for safety tests went undetected for 20 years at Fermi Unit 2*, February, 2007, posted online at: http://www.ucsusa.org/assets/documents/nuclear_power/20070200-f2-ucs-futility-at-the-utility.pdf.

Fermi 2 just recently had a large-scale (2,500 gallon) diesel fuel spill from a gas turbine generator.²⁹ Apart from the risk of environmental harm that could be caused by such a diesel fuel spill, EDGs cannot operate without diesel fuel. Not only is a diesel fuel spill from an EDG possible, if DTE managed to have one on a gas turbine generator, but in fact, the combustion gas turbine generator (CTG) is the backup to the EDGs.

And it's not just Fermi 2 that has suffered EDG failures. At the FirstEnergy Nuclear Operating Company (FENOC) Davis-Besse atomic reactor, just 30 miles across Lake Erie from Fermi, a nuclear disaster was narrowly averted on June 24, 1998 due to the near fatal failure of EDGs. Davis-Besse's off-site electricity supply was lost for 27 hours, due to destruction of the surrounding electric transmission grid as well as plant switchyard, caused by a direct hit from a tornado that passed between the Shield Building and cooling tower. One of its EDGs initially would not start, and then had to be declared inoperable more than once over the course of the next day, due to the room housing it overheating. Its second - and last - EDG would later be declared inoperable due to a problem with its governor control.³⁰

As explained by UCS's Lochbaum in congressional testimony:

In June 1998, a tornado disabled the normal power supply for the Davis-Besse nuclear plant in Ohio, just as the earthquake had done for Fukushima Dai-Ichi. Outside air temperatures exceeding 90°F caused the backup power supply to overheat and fail, just as the tsunami had done at Fukushima Dai-Ichi. The difference was that workers restored the normal power supply for Davis-Besse *an hour before the backup power supply failed* while more extensive

²⁹ "Offsite Notification Due to Diesel Fuel Oil Leak," Power Reactor, Facility: FERMI, Event Number: 50264, Event Notification Report, Notification Date: 07/08/2014, posted online at NRC's website at: <http://www.nrc.gov/reading-rm/doc-collections/event-status/event/2014/20140709en.html#en50264>; "Diesel fuel leaks at Fermi," *Monroe News*, July 9, 2014, posted online at <http://www.monroenews.com/news/2014/jul/09/diesel-fuel-leaks-fermi/>

³⁰ "Direct hit by tornado, June 24, 1998," *"Davis-Besse Atomic Reactor: 20 MORE Years of Radioactive Russian Roulette on the Great Lakes Shore?!"* Kevin Kamps, Radioactive Waste Watchdog, Beyond Nuclear, Corrected Version, Dec. 28, 2010, posted at <http://www.beyondnuclear.org/storage/Davis%20Besse%2020%20More%20Years%20of%20Radioactive%20Russian%20Roulette%20Nov%202010%20corrected%20Dec%2028%202010.pdf>, citing: NRC news releases, both dated June 25, 1998, "NRC Team Dispatched to Davis-Besse Nuclear Plant," (<http://permanent.access.gpo.gov/lps11598/www.nrc.gov/reading-rm/doc-collections/news/1998/98-40iii.html>), and "NRC Inspection Team Monitoring Davis-Besse Plant Response to Tornado Damage and Loss of Offsite Power," (<http://permanent.access.gpo.gov/lps11n598/www.nrc.gov/reading-rm/doc-collections/news/1998/98-40aiii.html>); see also Licensee Event Report (LER) 1998-006-00, "Tornado Damage to Switchyard Causing Loss of Offsite Power," EVENT DATE 6/24/98, REPORT DATE 08/21/1998.

damage prevented workers at Fukushima Dai-Ichi from restoring its normal power supply for nearly a week, days too late to prevent fuel damage.³¹ (Emphasis added)

Davis-Besse's near-brush with disaster, due to the near-failure of its EDGs, is not an isolated case. U.S. Representative Ed Markey (D-MA) reported in 2011: "In the past eight years there have been at least 69 reports of EDG inoperability at 33 nuclear power plants. A total of 48 reactors were affected, including 19 failures lasting over two weeks and 6 that lasted longer than a month."³²

Fermi 2 and FENOC, as well as numerous other U.S. atomic reactors, were implicated in the second biggest power outage in history, the Northeast Blackout that began on August 14, 2003. An untrimmed tree branch in FirstEnergy's service area came into contact with a TC line, setting off a domino effect that resulted in 50 million North Americans losing their electricity, and numerous U.S. atomic reactors being forced to shutdown for safety reasons due to the unstable grid. As described by Lochbaum of UCS:

A widespread electrical grid outage affected nine operating and one shut down nuclear power reactors in the US, including Fermi Unit 2. The NRC analyzed the risk implications of the grid outage on these nine reactors. Of the eight nuclear power reactors operating at the time, Fermi Unit 2 went the longest time without power – 6 hours and 19 minutes. The second longest power outage was experienced at the FitzPatrick nuclear plant in New York at 2 hours and 49 minutes – 3 ½ hours less outage time than Fermi Unit 2. The NRC reported that the recovery at Fermi Unit 2 was complicated by problems with the backup to the emergency diesel generators:

The combustion gas turbine generator (CTG) failed to start from

³¹ Written Testimony before the U.S. House of Representatives Committee on Science, Space, and Technology, Energy & Environment and Investigations & Oversight Subcommittees, by David Lochbaum, Director, Nuclear Safety Project, Union of Concerned Scientists, May 13, 2011, posted online at http://www.ucsusa.org/assets/documents/nuclear_power/lochbaum-house-testimony-05-13-2011.pdf.

³² "Emergency Diesel Generators: Decades of Reliability and Maintenance Problems," Page 9, and Table 2, "Summary of Emergency Diesel Generator (EDG) Inoperability 2002-2010," Pages 25-28, *Fukushima Fallout: Regulatory Loopholes at U.S. Nuclear Power Plants*, prepared by the staff of Congressman Edward J. Markey (D-MA), May 12, 2011, posted online at <http://democrats.naturalresources.house.gov/sites/democrats.naturalresources.house.gov/files/documents/05-12-11reportfinalsmall.pdf>.

the control room due to the failure of a battery-powered inverter. The CTG was manually started 3 hours into the event using a portable generator as an alternate source of starting power.³³

Lochbaum quoted an NRC senior manager on the cover of his *Futility at the Utility* report, writing in February, 1990: “It was only fortuitous that no safety problems resulted from the operation of Fermi with inaccurate technical specifications.” As Lochbaum commented, “Fermi would operate for at least sixteen more years with inaccurate technical specifications.” This would include during the historic August 2003 Northeast Blackout, “complicated by problems [at Fermi 2] with the backup to the emergency diesel generators.”

The Fukushima Daiichi nuclear catastrophe in Japan resulted from not only the loss of offsite AC due to loss of the power grid from the earthquake, but also the loss of on-site EDGs when the tsunami waves hit the low-lying site beginning less than an hour later.³⁴ It need not be an earthquake and giant wave at the Fermi site to simultaneously take out both the electric grid and the EDGs – any such loss, no matter the cause(s), of both the grid and EDGs at Fermi 2 and/or 3 – such as disruption of the common TC, combined with failure of the EDGs – could plunge the Fermi 2 and 3 complex into an inescapable Fukushima Daiichi-like catastrophe.

Fermi 2 is the largest GE BWR Mark I design in the world, nearly as big as Fukushima Daiichi Units 1 and 2 put together.³⁵ Fermi 2’s HLRW storage pool also

³³Lochbaum, UCS, *Futility at the Utility*, citing Ader, C. E., 2006. Transmittal of final ASP analyses (August 14, 2003, grid disturbance events). Memo to Catherine Haney, director, division of operating reactor licensing, Nuclear Regulatory Commission, February 17. Charles E. Ader was director, division of risk analysis and applications for the Nuclear Regulatory Commission.

³⁴ It is also important to point out that the Japanese Diet, or Parliament, investigation concluded that the Fukushima Daiichi nuclear catastrophe was not solely the result of natural disasters, but rather was “manmade”: “The TEPCO Fukushima Nuclear Power Plant accident was the result of **collusion between the government, the regulators and TEPCO**, and the lack of governance by said parties. They effectively betrayed the nation’s right to be safe from nuclear accidents. Therefore, we conclude that the accident was clearly “manmade.” We believe that the root causes were the organizational and regulatory systems that supported faulty rationales for decisions and actions, rather than issues relating to the competency of any specific individual.” (emphasis added) Conclusions, Page 16, National Diet of Japan, *Official Report of the Fukushima Nuclear Accident Independent Investigation Commission*, Executive Summary, posted online at <http://warp.da.ndl.go.jp/info:ndljp/pid/3856371/naic.go.jp/en/report/>

³⁵ Fermi 2 is rated at 3,486 Megawatts-thermal, as posted at <http://www.nrc.gov/info-finder/reactor/ferm2.html>. Thus, Fermi 2 generates around 1,150 Megawatts-electric. Tokyo Electric Power Company reports that Fukushima Daiichi Unit 1 generated 460 MWe, while Unit 2 generated 784 MWe, or 1,244 MWe together. See: <http://www.tepco.co.jp/en/challenge/energy/nuclear/pdf/plants-e.pdf>.

holds around 600 metric tons of irradiated nuclear fuel, significantly more than the 419 tons stored in Fukushima Daiichi's damaged Units 1, 2, 3, and 4 pools put together.³⁶

Petitioners' filings in the related Fermi 3 COLA proceeding shed further light on these serious matters. The relevant part, "The Transmission Corridor as Envisioned Poses Dangerous Prospects From Loss of Offsite Power,"³⁷ is reproduced in its entirety here:

The FEIS record contains the Limited Appearance statement of Farouk D. Baxter, PE (Expert/Specialist, Nuclear Power Plant Electrical Systems) (ML13294A355). The vulnerability which he suggests is found in the transmission lines which will traverse the corridor; they must be considered and analyzed within a FEIS/SEIS on the transmission corridor.

The text of Baxter's limited statement is reproduced as follows:

LIMITED STATEMENT FOR ASLB HEARING ON PROPOSED
FERMI NEW REACTOR

³⁶ The damaged reactor units at Fukushima Daiichi, Units 1 to 4, contain a total of 419 (metric) tons of irradiated nuclear fuel in their storage pools: Unit 1, 40 t; Unit 2, 97 t; Unit 3, 63 t; Unit 4, 219 t. This is documented by Hisako Sakiyama, Member, Fukushima Nuclear Accident Independent Investigation Commission, "Risk Assessment of Low Dose Radiation in Japan: What Became Clear in the Diet Fukushima Investigation Committee," The Medical and Ecological Consequences of the Fukushima Nuclear Accident, Day 1, March 11, 2013, Symposium at the New York Academy of Medicine, New York City, NY, sponsored by the Helen Caldicott Foundation and Physicians for Social Responsibility, Video Recording (136:07 of 264:55), posted online at <http://www.totalwebcasting.com/view/?id=hcf#>. Fermi 2's HLRW storage pool content is calculated by taking the figure given in U.S. Department of Energy, Office of Civilian Radioactive Waste Management, *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, February 2002 (DOE/EIS-0250), Appendix A, Inventory and Characteristics of Spent Nuclear Fuel, High-Level Radioactive Waste, and Other Materials, Table A-7. Proposed Action spent nuclear fuel inventory (MTHM), Page A-15: by spring 2010, 523 (metric) tons of irradiated nuclear fuel had been generated at Fermi 2, and was stored in its pool. Since spring 2010, about 20 metric tons per year of additional irradiated nuclear fuel has been generated at Fermi 2, and been put into its pool for storage. 523 tons + 80 tons = around 600 metric tons of irradiated nuclear fuel currently stored in Fermi 2's pool.

³⁷ Section 6, The Transmission Corridor as Envisioned Poses Dangerous Prospects From Loss of Offsite Power, Page 10, and following, of Intervenors' Motion for Commission Approval of LBP-14-09 (Memorandum Determining That Issues Related to Intervenors' Proposed Contention 23 Merit *Sua Sponte* Review Pursuant to 10 C.F.R. § 2.340(B) And Requesting Commission Approval), *DTE Electric Company* (Fermi Nuclear Power Plant, Unit 3), Docket No. 52-033-COL, July 28, 2014, ADAMS Accession No. ML14211A444.

by FAROUK D. BAXTER, PE (Expert/Specialist, Nuclear Power Plant Electrical Systems)

The following two contentions outline inadequate and unsatisfactory review and resolution by the NRC Staff in addressing and resolving Safety Related issues related to Fermi 3's Offsite Power Transmission System.

1) The routing of the three transmission lines is technically flawed, and as a result is susceptible to many single failure events that could remove all the three lines from service.

Fermi 3 FSAR Chapter 8.2 states: *“There are no single failures that can prevent the Fermi offsite power system from performing its function to provide power to EF3.”* However, all three transmission lines from Fermi are routed in a common corridor (right of way), and as a consequence are susceptible to various severe weather and man made single failure events, such as tornadoes, ice storms, brush fires, galloping conductors, severe solar disturbances, light aircraft impingement, and the like; each of these events has the potential for independently removing all three transmission lines in this common corridor for an extended period of time through structural damage to conductors or hardware, or both.

Conclusion: The routings of the transmission lines are flawed, thus making them susceptible to multiple types of single failure occurrences that could prevent the Fermi transmission system from providing offsite power to EF3 for extended periods of time.

The FSAR statement that “There are no single failures that can prevent the Fermi offsite power system from performing its function to provide power to EF3” is without any technical merit, and contradicts even common sense. There is an immediate need for the NRC Staff to reanalyze and resolve this issue prior to approving Fermi 3 design.

2. FSAR Section 8.2 states: “The normal preferred and alternate preferred circuits are fed from separate transmission systems, each capable of supplying the shutdown loads”.

Technically, these lines cannot be considered separate because they are routed in a common corridor (right of way) and are susceptible to various severe weather and man-made single failure events, such as tornadoes, ice storms, brush fires, galloping conductors, severe solar disturbances, light aircraft impingement, and the like; each of these events could remove both circuits for an extended period of time through

structural damage to multiple transmission line conductors and hardware simultaneously. In addition, both the 'normal preferred' and 'alternate preferred' circuits have the same termination points (the Switchyard at one end and the Milan Substation at the other), which further challenge the claim that they "are fed from separate transmission systems".

Conclusion: there is no diversity between the 'normal preferred' and 'alternate preferred' transmission systems circuits from one end to the other, to demonstrate that they are separate transmission systems. There is an immediate need for the NRC Staff to reanalyze and resolve this issue prior to approving Fermi 3 design.

There has been no NEPA analysis of the Transmission Corridor within the Fermi 3 FEIS, nor has any analysis been undertaken within the FSAR of the potential for the loss of offsite A/C power. See FSAR Chapter 8. Request for Additional Information (RAI) letters No. 6, No. 18, No. 80 (ML091890740, ML093350182, ML12300A404), and the corresponding DTE responses (ML092450483, ML100331450, ML12346A449) confirm that the loss of offsite A/C power has never been addressed by DTE, and that NRC staff review has somehow allowed DTE and General Electric-Hitachi to avoid the question of offsite A/C power loss. While one argument by way of mitigation is that Fermi 3 as an Economically Simplified Boiling Water Reactor, or ESBWR would be a passive plant which is gravity-driven, and that no arrangements for the interruption of offsite A/C power need be made, the most recent Fermi 3 FSAR Chapter 8 (ML14055A112) and ESBWR DCD Chapter 8 (ML14100A525) substantiate that these concerns, echoed by Farouk D. Baxter, P.E., have not been resolved.

The Union of Concerned Scientists' staff physicist, Dr. Edwin Lyman, has previously commented on the untested assumptions of the ESBWR design:

4. The proposed ESBWR design relies primarily on natural forces such as gravity to provide emergency water in the event of a loss of coolant instead of on "active" equipment such as motor-driven pumps. ...

5. However, the "passive" safety systems used by the ESBWR design are based on largely unproven technologies and are more complex and problematic than represented by GE-Hitachi in its public relations materials. While such systems may sound good in theory because passive safety systems can work without AC electric power or operator intervention, in reality they are not that simple. One problem is that gravity provides a much weaker driving force for coolant flow than the suction provided by pumps. This means that it is harder to predict whether a passive system will work as well as an active system under the full range of potential dangers, including a terrorist attack or severe weather event....

Declaration of Dr. Edwin S. Lyman (October 31, 2008), ML083090806 (in Victoria COL proceedings).

5. A Genuine Dispute Exists with the Applicant on a Material Issue of Law or Fact

a. Deficient SAMA discussions in LRA

As discussed above in § 1 of this contention, DTE has largely omitted Fermi 3 and common TC-related severe accident and cumulative impacts analyses from its Fermi 2 LRA, ER, and SAMAs.

In its *Applicant's Environmental Report*,³⁸ DTE lists the following SAMA analyses related to this TC/loss of AC power contention:

- > SAMA 012: Improve 4.16-kV bus cross-tie ability;
- > SAMA 014: Install an additional, buried off-site power source;
- > SAMA 016: Install tornado protection on gas turbine generator;
- > SAMA 018: Improve uninterruptible power supplies;
- > SAMA 023 - Develop procedures to repair or replace failed 4 kV breakers;
- > SAMA 024: In training, emphasize steps in recovery of off-site power after an SBO;
- > SAMA 026: Bury off-site power lines
- > SAMA 151: Provide a diverse swing diesel generator air start compressor;
- > SAMA 154: Modify procedures to allow switching of the combustion turbines to buses while running;
- > SAMA 155: Protect transformers from failure;
- > SAMA 175: Operator procedure revisions to provide additional space cooling to the EDG room via the use of portable equipment;
- > SAMA 176: Develop procedure to open the door to the EDG buildings upon the high temperature alarm;
- > SAMA 203: Improve EDG maintenance procedures to decrease unavailability time.

However, DTE determined that none of the TC SAMAs were cost-beneficial.³⁹ This, despite the fact that, of those SAMAs listed above, the highest Fermi Cost Estimate (\$) was for SAMA 016: Install tornado protection on gas turbine generator, at \$2.1 million. Two million dollars represents a few days' worth of net profit at Fermi 2. Many of the rest were even significantly less expensive fixes, such as SAMA 018 at \$100,000

³⁸ “[D]escription of the analyses used in the Phase II [SAMA] analysis,” DTE LRA, Part 5 [ER], Page D-111 to D-128 (252 to 268 of 292 on PDF counter).

³⁹ This is documented in Table D.2-1 -- Summary of Phase II SAMA Candidates, Pages D-132 to D-144 (272 to 284 of 292 on PDF counter), Part 5 of DTE LRA (ER).

cost, or SAMA 023 at \$50,000 cost, to name but a couple examples – representing mere hours, or less, of net profit at Fermi 2.

In Table D.2-1, just one SAMA analysis yields potentially cost-beneficial results, and this was unrelated to the TC/loss of AC power issue. A longer listing of TC/loss of AC power related SAMAs,¹ shows many TC/loss of AC power related SAMAs that DTE did not even advance to a Phase II SAMA analysis. These included:

<u>EVENT NAME</u>	<u>EVENT DESCRIPTION</u>
%LOSP	TOTAL LOSS OF OFFSITE POWER
HE1FHVNTACVT--	Failure to Vent Locally without AC power
LOOP-IE-GR	COND.PROBABILITY LOOP DUE TO GRID RELATED
EVENT LOOP-IE-SW	COND. PROBABILITY DUE TO WEATHER RELATED LOOP EVENT
OSPR4HR-GR	FAILURE TO RECOVER OSP WITHIN 4 HRS (GRID RELATED LOOP EVENT
OSPR4HR-SW	FAILURE TO RECOVER OSP WITHIN 4 HRS (WEATHER RELATED EVENT)
HEIFCTGBHEGT1B	OPERATOR FAILS TO BLACK START CTG UNIT IN 4 HOURS
PHPHCTG1WEATHERLOSP	CTG FAILS DUE TO WEATHER RELATED EVENT TOTAL LOSP
%PLOOP301	PARTIAL LOSP FOR DIV. 2
%BS301	LOSS OF BUS #301 INITIATING EVENT
HE1D-D-CTG-480	OP FAILS TO START CTG, 480 XTIE, AND ALT. CHARGER
CPFFACP2-COND-WE	CONDITIONAL PARTIAL LOSP FOR DIV. 2 DUE TO WEATHER
CPFFLOSPLOCA	CONDITIONAL LOOP GIVEN TRANSIENT WITH LOCA SIGNAL
HE1RXMXTPLNT4H	Operator fails to align 4160V maint X-tie 65T/64T in 4 Hours
OSPR30MIN-GR	FAILURE TO RECOVER GRID LOOP W/IN 30 MIN.
%BS101	LOSS OF BUS #101 INITIATING EVENT
HEIFBPDCLDSHED	OPERATOR FAILS TO PERFORM BOP BATTERY LOAD SHEDDING
HE1RX480PLNT4H	Operator fails to crosstie 480VAC buses within 4 hours
CPFFACP2-COND-YD	CONDITIONAL PARTIAL LOSP FOR DIV. 2 DUE TO SWITCHYARD FAILURE
CPFFLOSPTRAN	CONDITIONAL LOOP GIVEN TRANSIENT W/O LOCA SIGNAL
ZMUADG14S004	MAINTENANCE R3001S004 UNAVAILABLE
HEID-D-SBOLT	Common Failure to Respond to LOSP/SBO
%PLOOP101	PARTIAL LOSP FOR DIV. 1
HE1 D-D-SBO--	Common Failure to Respond to LOSP/SBO
CPFFACP1-COND-YD	CONDITIONAL PARTIAL LOSP FOR DIV. 1 DUE TO SWITCHYARD FAILURE

(continued)

<u>EVENT NAME</u>	<u>EVENT DESCRIPTION</u>
CPFFTF64BS101	CONDITIONAL PROBABILITY
BS101	FAILURE IS DUE TO TF64 FAILURE
ZMUADG12S002	MAINTENANCE R3001S002 UNAVAILABLE
CHFCCTG1S011BA6	BUS 1-2B CIRCUIT BREAKER R1400S011B-A6 FAILS TO CLOSE ON DEMAND.

While this long list shows the many diverse ways that AC electricity could be lost at Fermi 2 to vital safety and cooling systems on the reactor and HLRW storage pool, it is likely not exhaustive. And as revealed above,⁴⁰ even the small number of these Phase I SAMAs that advanced to Phase II analyses were considered to not be cost-beneficial to carry out, despite their relatively low cost, at least compared to how much money Fermi 2 makes in electricity sales on a daily basis.

Such minimal costs are also dwarfed by the potential human and economic costs related to a reactor or pool catastrophe at Fermi 2. For example, the CRAC-II report (more formally known as the 1982 Sandia Siting Study or as NUREG/CR-2239) revealed that a reactor catastrophe at Fermi 2 could cause 8,000 peak early fatalities; 340,000 peak early injuries; 13,000 peak cancer deaths; and \$136 billion in property damage.

However, as revealed by the AP in 2011, populations have “soared” around Fermi 2 since the 1982 NUREG/CR-2239 was published.⁴¹ Actually, CRAC-II was based on 1970 U.S. Census data, so even the CRAC-II report itself had neglected over a decade of population growth by the time it was initially published in 1982. Thus, CRAC-II’s casualty figures are significantly underestimated. Merely adjusting for inflation would increase CRAC-II’s estimates of property damage at Fermi 2 to nearly \$325 billion, expressed in Year 2013 dollar figures.⁴²

Thus, these numerous pathways to loss of vital safety and cooling system functions at Fermi 2 remain at risk. While Petitioners assert that the probability of such disasters is more frequent than DTE acknowledges, they also assert that the consequences of such catastrophes are far greater than DTE is willing to acknowledge.

Petitioners have demonstrated the existence of a genuine dispute with DTE on matters of fact and law, under NEPA.

The Supreme Court has found that a cumulative EIS must be prepared when “several proposals for actions that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency.” *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-02-14, 55 NRC 278, 294 (2002), citing *Kleppe v. Sierra Club*, 427 U.S. 390(1976). The

⁴⁰ In Table D.2-1 -- Summary of Phase II SAMA Candidates -- Summary of Phase II SAMA Candidates, Pages D-132 to D-144 (272 to 284 of 292 on PDF counter), Part 5 of DTE LRA (ER).

⁴¹ “Aging Nukes,” a four-part series by the Associated Press; PART III: AP IMPACT: Populations around US nuke plants soar; by Jeff Donn; June 2011. Post online at <http://www.ap.org/company/awards/part-iii-aging-nukes>.

⁴²Using the Inflation Calculator at <http://www.westegg.com/inflation/infl.cgi>.

Court further stated agencies need not consider “possible environmental impacts of less imminent actions when preparing the impact statement on proposed actions.” The Commission reads post-*Kleppe* rulings to indicate that to bring NEPA into play a possible future action must at least constitute a “proposal” pending before the agency (*i.e.*, ripeness), and must be in some way interrelated with the action that the agency is actively considering. *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-02-14, 55 NRC 278, 295 (2002).

Petitioners have shown that Fermi 3 is a Combined Operating License “proposal” actively pending before the Nuclear Regulatory Commission, and that at this point the Commission must consider that it is more likely than not that Fermi 3 will be built and operated during the 2025-2045 period of the Fermi 2 license extension. In light of the circumstances and the synergistic or cumulative effects of shared plant features and the overall proximity of the two nuclear plants to one another, DTE must be required to comply fully with the safety mandate of the Atomic Energy Act, and the “hard look” imposed by NEPA, by accounting for these facts, risks and possibilities in the planning documents.

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**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
Before the Atomic Safety and Licensing Board**

In the Matter of)	Docket No. 50-341
The Detroit Edison Company)	August 18, 2014
(Fermi Nuclear Power Plant, Unit 2))	
)	

* * * * *

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing “PETITION FOR LEAVE TO INTERVENE AND REQUEST FOR HEARING OF DON’T WASTE MICHIGAN, CITIZENS ENVIRONMENT ALLIANCE OF SOUTHWESTERN ONTARIO AND BEYOND NUCLEAR” were served by me upon the parties to this proceeding via the NRC’s Electronic Information Exchange system this 18th day of August, 2014.

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