William T. O'Connor, Jr.
Vice President, Nuclear Generation

Fermi 2
6400 North Dixie Hwy., Newport, Michigan 48166
Tel: 734.586.5201 Fax: 734.586.4172

Detroit Edison

A DTE Energy Company

GL 2003-01

December 8, 2003
NRC-03-0090

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington D C 20555-0001

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) NRC Generic Letter No. 2003-01, "Control Room Habitability," dated June 12, 2003

3) Detroit Edison's Letter to NRC, "Detroit Edison's 60-Day Response to Generic Letter 2003-01, "Control Room Habitability," NRC-03-0060, dated August 11, 2003

Subject: Detroit Edison's 180-Day Response to Generic Letter 2003-01, "Control Room Habitability"

The purpose of this letter is to provide a partial 180-day response to NRC Generic Letter (GL) 2003-01 for the Fermi 2 Nuclear Power Plant.

On June 12, 2003, the NRC issued GL 2003-01 (Reference 2) requesting licensees to provide information, within 180 days of the date of the GL, confirming that the control rooms at their facilities meet the applicable habitability regulatory requirements and that the control room habitability systems are designed, constructed, configured, operated, and maintained in accordance with the facility's design and licensing bases.

In Reference 3, Detroit Edison outlined an alternative schedule for providing the requested information. The alternative schedule was based on the anticipated timing

A102

for conducting a Control Room Envelope (CRE) baseline integrated inleakage test using a currently-acceptable method. Reference 3 stated that the requested information will be provided within 180 days of the date of the GL, with the exception of information related to confirming that the most limiting unfiltered inleakage into the CRE is no more than the value assumed in the design basis radiological analyses. Enclosure 1 to this letter provides the information in accordance with the commitment made in Reference 3.

Should you have any questions or require additional information, please contact Mr. Norman K. Peterson of my staff at (734) 586-4258.

Sincerely,

William D. O'Connor Jr

Enclosures

cc: H. K. Chernoff
M. A. Ring
NRC Resident Office
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission

ENCLOSURE 1 TO
NRC-03-0090

FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43

DETROIT EDISON'S 180-DAY RESPONSE TO GENERIC LETTER 2003-01, "CONTROL ROOM HABITABILITY"

DETROIT EDISON'S 180-DAY RESPONSE TO GENERIC LETTER 2003-01, "CONTROL ROOM HABITABILITY"

Generic Letter (GL) 2003-01 requested addressees to submit information that demonstrates that the control room at each of their respective facilities complies with applicable regulatory requirements and with the current licensing and design bases. The GL also requested information on suitable design, maintenance and testing control measures in place for maintaining this compliance.

In Reference 3, Detroit Edison submitted an optional 60-day response to the GL outlining an alternate schedule for providing the requested information for the Fermi 2 Nuclear Power Plant. The response stated that all requested information will be provided in 180 days, except for information related to confirming that the most limiting unfiltered inleakage into the Control Room Envelope (CRE) is no more than the value assumed in the design basis radiological analyses for Control Room Habitability (CRH).

The remainder of this Enclosure provides the information in accordance with the commitment in Reference 3. It is organized in the same order as the information requested in the GL. Text from the GL requesting the information is included before each response for reference. The response to information meeting the exception noted in Reference 3 is not provided below but will be provided at a later date as outlined in Reference 3.

GL Requested Information:

1. *Provide confirmation that your facility's control room meets the applicable habitability regulatory requirements (e.g., GDC 1, 3, 4, 5, and 19) and that the Control Room Habitability Systems (CRHSs) are designed, constructed, configured, operated, and maintained in accordance with the facility's design and licensing bases.*

Response:

General Description

The Fermi 2 main control room is located on the north side of the third floor of the auxiliary building. The auxiliary building is located between the reactor building and the turbine building. The control center consists of the control room, office and conference rooms, computer room, relay room, cable spreading room, mechanical equipment rooms and the standby gas treatment rooms. The computer room is located on the mezzanine above the control room. The relay room and cable spreading room are located below the control room on the second floor, while the mechanical equipment rooms and standby gas treatment rooms are located on the fifth floor of the auxiliary building.

There are two divisional equipment rooms housing the redundant Control Center Air Conditioning System (CCACS) multizone air handling system. Two redundant standby gas treatment trains are located in adjacent rooms but separated from the equipment rooms with concrete walls. Radiation shielding for the control room is provided by the reinforced concrete floor, walls and roof to limit the exposure of control room personnel to radiation in the event of a radiological accident.

The normal fresh air intake and the south emergency make up air intake for CCACS are located on the south wall of the auxiliary building. The north emergency intake is located on the north wall of the auxiliary building. The emergency makeup and recirculation air filtration units are located outside the control center on the fifth floor of the auxiliary building. The CCACS provides air filtration, recirculation, temperature, and humidity control, and has sufficient redundancy to ensure the availability of the system.

The CCACS and the Control Room Emergency Filtration (CREF) system are designed to detect and limit the introduction of radioactive material into the main control room and to remove airborne radioactivity from the environment therein such that the dose to main control room personnel following a Design Basis Accident (DBA) does not exceed regulatory limits. Upon a high radiation alarm, recirculation of control center air is initiated with outside makeup air, selected from the intake with the lower radiation level, to pressurize the control room. The CCACS is designed to maintain the control center under a positive pressure of approximately 1/4 ± 1/8 inches water gage in the recirculation mode in order to minimize inleakage of contaminated air. Such outside contamination could be the result of radioactivity leakage after a Loss of Coolant Accident (LOCA).

The two redundant control center air conditioning systems have their own dedicated fans, dampers, air-handling units, and instrumentation. Both divisions, except for some common ductwork, have separate and independent controls and indications. The design is such that most components of one division can be tested and serviced without interrupting plant operation.

The computer room is supplied with 1000 cfm conditioned air from CCACS. Two redundant non safety-related auxiliary cooling units located on the fourth floor of the auxiliary building are also available for additional computer room cooling.

There are four operating modes for the control center air conditioning system:

a) Normal Mode: Fresh air is taken from the south air intake and filtered, cooled, heated and humidified by one of the redundant air handling units. The conditioned air is circulated to the various control center zones, bypassing the emergency makeup and recirculation filters. The returned air is mixed with fresh conditioned air to maintain a comfortable temperature and relative humidity. A modulating damper is provided to control the exhaust air such that control room pressure is maintained at 1/4 ± 1/8 inches water gage. During this mode the

standby gas treatment rooms are supplied with conditioned air by the CCACS.

b) Purge Mode: 100 percent outside air is circulated through the control center and exhausted to the atmosphere to purge any smoke or fumes within the control center.
c) Recirculation Mode: A maximum of 1800 cfm outside air is filtered and mixed with 1200 cfm recirculated air that is filtered again and mixed with recirculating ventilation air to prevent intrusion and to provide continuous removal of contaminants during a radiation release emergency. During an emergency, the control center is isolated from all other areas of the plant. All air supply to the standby gas treatment rooms is terminated and dampers in the normal air intake and exhaust ducts are closed.
d) Chlorine Mode (Toxic Gas Mode): All outside intake dampers are closed to prevent ingress of outside air during a toxic gas release emergency. Ventilating air is recirculated with 1200 cfm passing through the emergency recirculation filter.

Normal Operation

During normal operation, the master selector switches in the main control room activate all components in the Division 1 or Division 2 system. A mixture of return and outside air is filtered, then cooled, heated and dehumidified, as required by the multizone air conditioning supply unit. Each zone thermostat modulates zone mixing dampers to obtain the supply air temperature necessary to satisfy the zone cooling or heating requirements. Heating is supplied by an electric heating coil and is provided on demand from any one of the zone thermostats. Steam is supplied by the auxiliary boiler and controlled by humidistats located in the control room and computer room. Positive pressure is maintained in the control center by throttling the exhaust air modulating damper. This damper modulates only in the normal mode and has no essential function during emergency conditions. It opens upon loss of power to allow purge mode operation if required.

Emergency Operation

During a radiological emergency, the control center is isolated from all other areas of the plant. Air supply from CCACS to the standby gas treatment rooms is terminated. The normal operation of air intake and exhaust duct dampers is ceased and the dampers are closed. The multizone air handling unit and the return air fan continue to operate as during normal operation. The return air damper assumes a full open position. If not already operating, the chilled water pump and chiller are energized. The fan in the mechanical equipment room fan-coil cooling unit is also energized under room thermostat control. Chilled-water flow through the cooling coil of the unit continues unimpeded as during normal operation.

The emergency recirculation air fan is energized and the isolation dampers on the emergency intake air duct are opened. Pressure control dampers, which regulate the proportion of recirculated air to emergency makeup air, modulate to maintain approximately 1/4 ± 1/8 inches water gage positive pressure in the control room.

If a toxic gas is detected in the control center by control room personnel or a release is reported by offsite authorities, manual operator action shifts CCACS from normal mode to chlorine mode which will cause all system isolation dampers to automatically close. Damper position indications in the main control room allow continuous monitoring of system performance and confirm all remote manual control actions taken.

If smoke is detected in any one of the control center fire zones, an audible alarm and an annunciator indicating the fire zone will alert operators to the event. Upon confirmed actuation of the Halon system in the cable spreading room or relay room, the control center ventilation will automatically shift from normal mode to the smoke purge mode of operation. The purge mode clears smoke from the fire area and prevents smoke and Halon from being recirculated into the main control room.

Compliance with GDC 1: Quality Standards and Records

General Design Criterion (GDC) 1 states:

Structures, systems, and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. Where generally recognized codes and standards are used, they shall be identified and evaluated to determine their applicability, adequacy, and sufficiency and shall be supplemented or modified as necessary to assure a quality product in keeping with the required safety function. A quality assurance program shall be established and implemented in order to provide adequate assurance that these structures, systems, and components will satisfactorily perform their safety functions. Appropriate records of the design, fabrication, erection, and testing of structures, systems, and components important to safety shall be maintained by or under the control of the nuclear power unit licensee throughout the life of the unit.

Structures, systems, and components credited in support of CRH have been designed, fabricated, erected, tested and maintained in accordance with the Fermi 2 Quality Assurance (QA) program. The Fermi 2 QA program is described in Chapter 17 of the Updated Final Safety Analysis Report (UFSAR). The QA program ensures conformance to design bases and regulatory requirements, and adherence to applicable standards and codes. The QA program also applies to system operation and maintenance activities. Documentation of appropriate QA activities is maintained as plant records throughout the life of the unit. The Fermi 2 and principal contractors QA programs satisfy the intent of the quality related requirements of 10 CFR 50, including Appendix B.

Fermi 2 control room is in full compliance with GDC 1.

Compliance with GDC 3: Fire Protection

GDC 3 states:

Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Noncombustible and heat-resistant materials shall be used wherever practical throughout the unit, particularly in locations such as the containment and main control room. Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety. Fire-fighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components.

The control center air conditioning system zones are equipped with fire detectors. If smoke is detected by any of the early-warning ionization detectors, an audible alarm will sound in the main control room and an annunciator will illuminate, indicating the zone. The control center ventilation will automatically be aligned to the smoke purge mode of operation upon confirmed actuation of the Halon system in the cable spreading room or relay room. The ventilation systems for the computer room, cable spreading room and relay room automatically isolate when the Halon system initiates in these areas. This prevents the dilution of the Halon when the control center ventilation is placed in the purge mode of operation. The purge mode results in once-through ventilation system operation throughout the control center (approximately seven air changes per hour) with no recirculation. This operation clears smoke from the fire area and prevents smoke and Halon from being recirculated into the main control room. The smoke purge mode, however, is overridden by a LOCA signal (e.g., high radiation levels in the normal intake, high drywell pressure, etc.), which places the ventilation system into the recirculation mode.

A potential main control room fire would be extinguished by manual fire-fighting techniques. Portable Carbon Dioxide and Halon extinguishers are provided, and if needed, the normal standpipe and hose connections are located outside the main control room. Equipment in the main control room is noncombustible.

Wherever the control center ventilation supply or return ducts penetrate a fire barrier wall, a 3-hour fire damper installation is provided or a specific fire hazards analysis evaluation has been performed and documented. These fire dampers automatically close either by spring action or by gravity when a fusible link melts on high temperature. In the computer room, cable spreading room and relay room supply and return ducts, remotely resettable dampers are provided that automatically close when the gaseous system actuates. These dampers can be reset from the main control room. Position indication is provided on the remotely resettable dampers.

In the event of a fire outside the main control room but within the control center, the early-warning fire detection system will alert the operators to the problem. The fire detection system

includes all areas of the control center. A ventilation equipment room fire will be extinguished by manual fire fighting means. A relay room, computer room or cable spreading room fire will be extinguished by manual means or by the automatic Halon suppression system. The standby gas treatment system (SGTS) charcoal filters are provided with a low-pressure Carbon Dioxide flooding system.

A panel is installed in the radwaste building that satisfies the requirements of 10 CFR 50, Appendix R, Paragraph III.L, for alternative or dedicated plant shutdown. Further discussion regarding alternative shutdown capability is provided in the smoke evaluation section below.

Automatically initiated water systems are not employed on control center complex Class 1E electrical equipment because of the loss of reliability associated with the operation of fire protection equipment.

Fermi 2 control room is in full compliance with GDC 3.

Compliance with GDC 4: Environmental and Dynamic Effects Design Bases

GDC 4 states:

Structures, systems, and components important to safety shall be designed to accommodate the effects of, and to be compatible with, the environmental conditions associated with normal operation, maintenance, testing and postulated accidents, including loss-of-coolant accidents. These structures, systems, and components shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit. However, dynamic effects associated with postulated pipe ruptures in nuclear power units may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping.

Systems and controls are provided to ensure that the environment in the control center is safe and comfortable. The thermal environmental conditions are within the comfort range. The emergency operating modes of the air conditioning system are designed to meet single-failure criteria and ensure 100 percent backup for the entire system, with the exception of the common ductwork and filters. The smoke/Halon dampers to the relay room, cable spreading room or computer room will close upon confirmed actuation of the Halon system. Main control room environmental conditions, including radiation levels, are monitored. The air volume of the control center envelope (excluding the SGTS rooms) is approximately 252,731 cubic feet, which is sufficient to allow closing of the makeup air intake for a period of more than 28 days without exceeding permissible carbon dioxide concentrations when three workers occupy the main control room.

The CCACS is designed to maintain the control center under a positive pressure of approximately 1/4 ± 1/8 inches water gage in the recirculation mode in order to minimize inleakage of contaminated air. Such outside contamination could be the result of radioactivity leakage after a LOCA.

The control room is protected from potential missiles by the thick reinforced concrete floors and walls of the auxiliary building. The auxiliary building concrete slabs and walls also protect the CCACS and standby gas treatment rooms.

The main control room and other equipment required for control room habitability are also protected from environmental effects, including pressurization effects, flooding and the effluent of steam and air mixture resulting from postulated high energy pipe breaks.

Fermi 2 control room is in full compliance with GDC 4.

Compliance with GDC 5: Sharing of Structures, Systems and Components

GDC 5 states:

Structures, systems, and components important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units.

Fermi 2 is a single unit plant. There are no safety related systems or components that are shared with another unit.

Fermi 2 control room is in full compliance with GDC 5.

Compliance with GDC 19: Control Room

GDC 19 states:

A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident. Equipment at appropriate locations outside the control room shall be provided (1) with a design capability for prompt hot shutdown of the reactor, including necessary instrumentation and controls to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor through the use of suitable procedures.

Applicants for and holders of construction permits and operating licenses under this part who apply on or after January 10, 1997, applicants for design certifications under part 52 of this chapter who apply on or after January 10, 1997, applicants for and holders of combined licenses under part 52 of this chapter who do not reference a standard design certification, or holders of operating licenses using an alternative source term under §50.67, shall meet the requirements of this criterion, except that with regard to control room access and occupancy, adequate radiation protection shall be provided to ensure that radiation exposures shall not exceed 0.05 Sv (5 rem) total effective dose equivalent (TEDE) as defined in §50.2 for the duration of the accident.

In accordance with the commitment made in Reference 3, information pertaining to compliance of Fermi 2 control room with GDC 19 will be provided at a later date.

As–Built Review

- A review of plant drawings was performed by the CCACS System Engineer to confirm that CRE design and the alignment of each mode of the CCACS support the system functions and the assumptions in the design basis accident analyses. With minor discrepancies that have been documented in the Corrective Action Program, it was confirmed that system lineup in the various modes of operation provides the desired control room isolation and supports the DBA analyses assumptions.
- Schematic diagrams were also reviewed to confirm system automatic actuations in support of alignment into the recirculation mode during a radiological emergency and into the purge mode during actuation of one of the Halon fire suppression systems.
- Field walkdowns by the System Engineers confirmed that the actual system configuration is consistent with the design drawings.
- Verification of High Efficiency Particulate Air (HEPA) filter and charcoal bypass leakage, design air flows, filter differential pressure, and heater capacity are periodically performed through surveillance testing, as discussed below.

Review of Operating Procedures:

Review of operating procedures for the CCACS confirmed the following:

- Lineup of system valves, dampers, electrical components and instrumentation in System Operating Procedure (SOP) No. 23.413, "Control Center HVAC," is consistent with the design of the system and, with minor exceptions that have been documented in the Corrective Action Program, is consistent with the configuration drawings for both divisions.
- Abnormal operating procedure (AOP) No. 20.000.30, "Offsite Release of Toxic/Flammable Gas," directs operators to place the CCACS in the chlorine (toxic gas) mode upon a credible threat, notification or detection of any toxic gas or chlorine release.

- The SOP includes steps for manual entry into the chlorine, recirculation and purge modes and for restoration of the normal mode.
- The SOP includes an enclosure titled "Control Center Pressure Boundary" which shows a flow diagram of the CCACS identifying the common portions of the system.
- Alarm Response Procedure (ARP) No. 16D32, "Outside Air Intake Smoke Detected," directs operators to place the CCACS in the recirculation mode upon receiving the alarm and detecting smoke in the control room.

Breach Control Program

Breaches of the control room envelope boundary are controlled by system operating procedure in accordance with Technical Specification (TS) 3.7.3, Condition B. This TS requires restoring the control room boundary to operable status within 24 hours from entering the condition of both Control Room Emergency Filtration (CREF) subsystems being inoperable due to inoperable control room boundary in Modes 1, 2 or 3. The associated TS bases state:

> "During the period that the control room boundary is inoperable, appropriate compensatory measures (consistent with the intent of GDC 19) should be utilized to protect control room operators from potential hazards such as radioactive contamination, toxic chemicals, smoke, temperature and relative humidity, and physical security."

TS 3.7.3 also allows the control room boundary to be opened intermittently under administrative control. For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening when a need for control room isolation is indicated.

Caution signs are installed on CCACS common ducts for both divisions alerting plant personnel of the consequences of a breach in these ducts. Additionally, a maintenance barrier identification procedure provides a criterion for identifying control center pressure boundary and determining operability during breaches.

Periodic Testing:

Currently, there are several TS surveillances and testing programs performed on a periodic basis to verify CRE integrity and design functions. The following is a brief description of the major testing programs:

- TS Surveillance Requirement (SR) 3.7.3.2: Performance of required CREF filter testing in accordance with the Ventilation Filter Testing Program outlined in TS 5.5.7. Testing is performed every 18 months. The program includes testing requirements to verify HEPA

filter and charcoal bypass leakage, design air flows, filter differential pressure, and heater capacity.

- TS SR 3.7.3.3: Inspection of silicone sealant on accessible portions of CREF system duct work outside the control room that are at negative pressure during accident conditions and for which potential inleakage would not receive full filtration. This SR is performed every 12 months. The SR verifies that the silicone sealant applied to CREF system duct work outside of the Control Room envelope has not degraded.
- TS SR 3.7.3.5: Verification that each CREF subsystem can maintain a positive pressure of equal to or greater than 1/8 inches water gauge relative to the outside atmosphere during the recirculation mode of operation at a makeup flow rate of less than or equal to 1800 cfm. This SR is performed every 18 months on alternate subsystems. The SR verifies that the CCACS is capable of maintaining the control room at a positive pressure.
- TS SR 3.7.3.6: Verification that unfiltered inleakage from CREF system duct work outside the Control Room envelope that is at negative pressure during accident conditions is within limits. This SR is performed every 36 months to verify inleakage through CREF system duct work outside the control room envelope that would be under negative pressure (less than atmospheric) during accident conditions and where any inleakage would not be filtered is maintained within the limits established in the design basis analysis.

Maintenance Practices and Procedures:

The following Preventive Maintenance (PM) activities are performed on components important to the CRE:

- Damper normally-energized solenoid valves are replaced every four years
- Dampers requiring lubrication are lubricated every two years
- Instrument air pressure control valves are calibrated every 2 to 4 years
- CRE pressure control instrumentation is calibrated every 18 months
- Emergency makeup, supply and return fans PM is performed every 18 to 24 months
- Emergency makeup, supply and return fans instrumentation is calibrated every 5 to 6 years
- Control room revolving door PM is performed every 12 months
- Control relays for fans and dampers are replaced every 10 years
- Pressure boundary door seals are inspected every 2 years

The maintenance procedure for barrier identification and classification includes an enclosure for identifying control center pressure boundary and a criterion for determining operability during breaches while in different plant operating modes and work activities (e.g., handling of recently irradiated fuel).

Post Maintenance Testing (PMT) is performed based on the completed maintenance activity and is commensurate with the level of invasiveness of the work. PMT ranges from visual inspection to the performance of one or more of the TS surveillances.

Plant Modification

The configuration control, design change and independent verification processes control modifications to safety related Structures, Systems and Components (SSCs) including the CRE, CCACS and other SSCs that may impact CRH. The Fermi 2 design control and implementation of modification programs ensure that all plant modifications address any impact on CRH in the design, review and implementation phases.

GL Requested Information

Emphasis should be placed on confirming:

Item 1.(a): That the most limiting unfiltered inleakage into your CRE (and the filtered inleakage if applicable) is no more than the value assumed in your design basis radiological analyses for control room habitability. Describe how and when you performed the analyses, tests, and measurements for this confirmation.

Response:

In accordance with the commitment made in Reference 3, this information will be provided at a later date.

GL Requested Information

Emphasis should be placed on confirming:

Item 1.(b): That the most limiting unfiltered inleakage into your CRE is incorporated into your hazardous chemical assessment. This inleakage may differ from the value assumed in your design basis radiological analyses. Also confirm that the reactor capability is maintained from either the control room or the alternate shutdown panel in the event of smoke.

Response:

Hazardous Chemical Assessment

The control center in the auxiliary building is equipped with its own air conditioning system. Smoke, combustible and explosive gases, and airborne toxic contaminants in the reactor/auxiliary building atmosphere will not enter the control center because the CCACS maintains the atmosphere at a slight positive pressure with respect to the reactor/auxiliary building atmosphere.

Onsite hazardous chemical storage and use is controlled by the chemical control program. An inventory of typical onsite hazardous material is included in the non-radiological environmental protection Conduct Manual. RG 1.78, Revision 1, was also used to assess the impact of onsite hazardous chemicals on control room habitability. Most items were screened out using the screening criteria in RG 1.78, Revision 1; however, the assessment identified the need to perform additional detailed evaluations for several items. These evaluations are being tracked in the Corrective Action Program.

Section 4.3 of RG 1.78, Revision 1, outlines the requirements for a control room protection system from hazardous chemical incidents. As discussed in the smoke evaluation section below, the Fermi 2 control room is equipped with a breathing air system, sufficient SCBA units and adequate air capacity and bottle supply to ensure adequate protection of control room occupants in case of a chemical release emergency. Additionally, training requirements, procedural steps and system periodic maintenance and inspection are in place to ensure compliance with the RG requirements.

Based on the hazardous chemical assessments for both offsite stationary and mobile sources and for onsite hazardous chemical sources, no credible scenario for toxic chemical release which requires an automatic or manual operator action to isolate the control room to mitigate the consequences of the release has been identified. Therefore, although procedures include provisions for taking certain actions such as placing the CCACS in the chlorine mode and donning SCBAs, these measures are taken as extra precautions and are not part of the design basis for mitigating the consequences of a toxic gas release. There are no assumed limits on CRE inleakage in the toxic gas design basis analyses.

Smoke Evaluation

Smoke Events in the Control Center:

The control center envelope encloses a total air volume of approximately 275,960 cubic feet (during normal mode) and 252,731 cubic feet (during emergency modes). During an emergency, the control center is isolated from all other areas of the plant. All air supplies to the standby gas treatment rooms and the normal operation of air intake and exhaust ducts are dampered closed. The following areas of the control center are air conditioned as separate zones:

Zone	Area Description
1	Relay room
2	Cable spreading room
3	Main control room
4	Computer room
6	Office
7	Conference room

8 Mechanical equipment room and SGTS rooms (during normal and purge modes). However, the SGTS rooms are not part of the control center envelope during the recirculation or the chlorine mode.

Main control room habitability in the event of smoke is maintained by the ventilation system. The exhaust from each zone listed above is either partially recirculated or completely exhausted under normal operating conditions. All of the CCACS zones are equipped with ionization-type detectors or other approved types of detectors. These areas include the mechanical equipment room, computer/main control room, cable spreading room, and relay room. If smoke is detected by any of the early-warning ionization detectors, an indicating light on the area smoke, fire, and radiation protection panel in the main control room will illuminate, indicating the zone, and an audible alarm will be sounded in the main control room. The control center ventilation will automatically be placed in the smoke purge mode of operation upon confirmed actuation of the Halon system in the cable spreading room or relay room. The ventilation systems for these rooms automatically isolate when the Halon system initiates in these areas. This prevents dilution of the Halon when the control center ventilation is placed in the purge mode of operation. The purge mode results in once-through ventilation system operation throughout the control center (approximately seven air changes per hour) with no recirculation. This operation clears smoke from the fire area and prevents smoke and Halon from being recirculated into the main control room. The smoke purge mode, however, is overridden by a LOCA signal, which places the ventilation system into the recirculation mode.

In the event of a fire or smoke, control room personnel would utilize Abnormal Operating Procedure (AOP) 20.000.22, titled "Plant Fires." This AOP contains specific guidance for all necessary personnel to don respirators upon feeling the effect of smoke inhalation. The main control room includes an emergency breathing air system consisting of air cylinders, piping, and a manifold arrangement with five connections for providing breathing air to Fermi 2 control room personnel. There are seven dual use SCBA units maintained in the control room for this use. They can be supplied by hose from the manifold or used as self-contained units. These units are inspected and maintained through the use of a periodic event on the performance scheduling and tracking system and are included in a database in the radiation protection monitoring system.

Smoke Events Outside the Plant:

A fire outside the plant will not affect control room habitability because the control center will be isolated by manually placing CCACS in the recirculation mode. The operator will receive an indication of a fire outside the plant through the control center air inlet smoke detector. The sources of smoke closest to the control center outside air intake are the system service and main unit transformers ouside the turbine building. Smoke from a fire outside the plant should be detected shortly after the smoke begins to enter the control center. The control center can then be manually placed in the recirculation mode. The operators will also have immediate access to self-contained breathing apparatus.

Alternative Shutdown Capability:

The alternative shutdown system was designed and installed to meet the requirements of 10 CFR 50, Appendix R, Section III, Paragraphs G and L. The alternative shutdown system was designed to provide safe shutdown capability separate and remote from the control center complex and certain other fire zones when a fire in the complex or these other zones is assumed to significantly damage the equipment or cabling in these zones.

The alternative shutdown system provides a dedicated shutdown panel located in the radwaste building, second floor, from which an operator can monitor the reactor and keep the reactor core covered with water. The panel includes instrumentation, control switches and transfer switches necessary to operate the Standby Feedwater (SBFW) high-pressure injection system. In case the control room becomes uninhabitable, hot and cold shutdown can be achieved from the dedicated shutdown panel with additional required manual operator actions performed locally in the reactor and auxiliary buildings and in the Residual Heat Removal (RHR) complex. The required local operation includes controlling equipment at local panels, switchgear, motor control centers, distribution panels, and valves.

In certain fire scenarios, the shutdown method utilizes some of the instrumentation available on the dedicated shutdown panel to monitor critical parameters such as reactor pressure and water level, while reactor shutdown is still achieved from the main control room.

Use of the dedicated shutdown panel and the alternative shutdown method is controlled by AOP 20.000.18, titled, "Control of the Plant from the Dedicated Shutdown Panel." This procedure indicates that SCBA equipment is staged for entry into certain rooms. Two SCBAs with spare air cylinders are staged near the dedicated shutdown panel in the radwaste building for this purpose. These units are periodically inspected and could be utilized in the performance of any of the local manual operations included in the alternative shutdown method.

The radwaste building is structurally part of the turbine building, being located at the north end of the turbine building and east of the control center. It is separated from the control center by fire rated walls, and from most of the turbine building by fire rated walls, floors and doors. The dedicated shutdown control panel is remotely separated from the main control room and control center complex. The main access and egress path from the main control room to the dedicated shutdown control panel is essentially through the turbine building and radwaste building. Ventilation is provided for the dedicated shutdown panel area by the turbine building ventilation system. The remainder of the radwaste building is serviced by the radwaste building ventilation system. Both ventilation systems have their intakes and exhausts located on the east side of the high roof portion of the turbine building.

The fresh air intake for the CCACS is located approximately fifty feet above the site grade elevation at the south wall of the auxiliary building. The ventilation exhaust air from the

CCACS is discharged to the auxiliary building roof and exhausted through a stack above the roof elevation. Exhaust air from the reactor and auxiliary building ventilation system, which services the remainder of the auxiliary building and the reactor building, is also through this same exhaust stack above the roof. The fresh air intake for the reactor and auxiliary building ventilation system is also located common with the intake for the control center system.

The remote separation between the control center and the dedicated shutdown control panel ensures that any single credible fire event would not cause damage to both areas. The wide separation between the exhaust stack for the CCACS and the reactor/auxiliary building ventilation system, and the fresh air intakes for the turbine building and radwaste building ventilation systems ensures that a significant smoke event in the control center would not contaminate the area of the dedicated shutdown control panel or its access path. This separation is considerably in excess of 100 feet horizontally. Also, the wide separation between the exhaust for the turbine building ventilation system and the fresh air intake for the CCACS ensures that significant smoke from a credible fire event in the dedicated shutdown control panel area would not contaminate the area of the control center. This separation is also in excess of 100 feet horizontally.

The high roof area of the turbine building is also equipped with emergency fire/heat vents that are normally closed. However, the turbine building is equipped with several automatic sprinkler systems in the areas where lubricating and seal oil are used; therefore, the operation or opening of these emergency vents is not expected to occur in almost all credible fire events. Only a catastrophic failure/fire event could result in the opening of these vents, but the considerable horizontal and vertical separation between these roof vents and the CCACS intake would prevent a significant amount of smoke from entering the CCACS. In addition, the recirculation mode of the CCACS could be utilized to further ensure the habitability of the Main Control Room.

GL Requested Information

Emphasis should be placed on confirming:

Item 1.(c): That your technical specifications verify the integrity of the CRE, and the assumed inleakage rates of potentially contaminated air. If you currently have a ΔP surveillance requirement to demonstrate CRE integrity, provide the basis for your conclusion that it remains adequate to demonstrate CRE integrity in light of the ASTM E741 testing results. If you conclude that your ΔP surveillance requirement is no longer adequate, provide a schedule for: 1) revising the surveillance requirement in your technical specification to reference an acceptable surveillance methodology (e.g., ASTM E741), and 2) making any necessary modifications to your CRE so that compliance with your new surveillance requirement can be demonstrated.

If your facility does not currently have a technical specification surveillance requirement for your CRE integrity, explain how and at what frequency you confirm your CRE integrity and why this is adequate to demonstrate CRE integrity.

Response:

Reference 3 provided a description of the current Fermi 2 TS surveillances associated with demonstrating CRH and ensuring the design basis requirements are verified. The surveillances include:

- SR 3.7.3.3 for periodic visual inspection of silicone sealant on accessible portions of CREF system ductwork outside the control room that are at negative pressure during accident conditions and do not receive full filtration
- SR 3.7.3.5 for verifying that each CREF subsystem can maintain a positive pressure of greater than or equal to 1/8 inches water gauge relative to the outside atmosphere during the recirculation mode of operation at a makeup flow rate of less than or equal to 1800 cfm.
- SR 3.7.3.6 for verifying that unfiltered inleakage from CREF system duct work outside the CREF, that is at negative pressure during accident conditions and do not receive full filtration, is within limits.

Reference 3 also described license amendment requests proposed by Detroit Edison for revising the TS surveillance requirements to be better aligned with the latest NRC position regarding CRE testing and verification of unfiltered inleakage as published in recently issued Regulatory Guides. NRC approval of the proposed changes is still pending. Therefore, Detroit Edison has already initiated the process of revising the surveillance requirements in the TS to reference an acceptable surveillance methodology (e.g., ASTM E741) and will continue to work with NRC staff to resolve any comments regarding the proposed TS revision. It is not anticipated that any modification to the CRE would be necessary to demonstrate compliance with the new surveillance requirements.

Detroit Edison is also aware of current efforts by NRC staff to review and approve TS Task Force (TSTF) Change Traveler No. 448 and publish an associated Consolidated Line Item Improvement Process (CLIIP) and will monitor the development of both of these documents to evaluate their effect on the proposed changes to the Fermi 2 TS.

GL Requested Information

2. *If you currently use compensatory measures to demonstrate control room habitability, describe the compensatory measures at your facility and the corrective actions needed to retire these compensatory measures.*

Response:

No compensatory measures are currently in use to demonstrate control room habitability at Fermi 2.

GL Requested Information

3. *If you believe that your facility is not required to meet either the GDC, the draft GDC, or the "Principal Design Criteria" regarding control room habitability, in addition to responding to 1 and 2 above, provide documentation (e.g., Preliminary Safety Analysis Report, Final Safety Analysis Report sections, or correspondence) of the basis for this conclusion and identify your actual requirements.*

Response:

As discussed above in response to the first information request of the GL, Fermi 2 meets the intent of the GDCs associated with control room habitability. The information pertaining to compliance of Fermi 2 control room with GDC 19 will be provided at a later date.