

Joseph H. Plona  
Site Vice President

6400 N. Dixie Highway, Newport, MI 48166  
Tel: 734.586.5910 Fax: 734.586.4172

**DTE Energy**



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NRC-11-0043

U. S. Nuclear Regulatory Commission  
Attn.: Document Control Desk  
Washington, D.C. 20555

- References: 1) Enrico Fermi Atomic Power Plant, Unit 1  
NRC Docket No. 50-16  
NRC License No. DPR-9
- 2) Detroit Edison Letter to USNRC,  
“Enrico Fermi Atomic Power Plant Unit 1  
Fermi 1 Decommissioning Project Schedule and Cost  
Changes”, NRC-11-0040 dated August 16, 2011

Subject: Enrico Fermi Atomic Power Plant, Unit 1  
Annual Report Period Ending June 30, 2011

Pursuant to Section F.7 (Reporting Requirements) of the Technical Specifications for Provisional Operating License No. DPR-9, the annual report for the period ending June 30, 2011 for the SAFSTOR Fermi 1 facility is enclosed.

Should you have any questions, please contact Lynne S. Goodman, Manager, Fermi 1 at 734-586-1205.

Sincerely,

A handwritten signature in cursive script that reads "Joseph H. Plona".


Enclosure

cc: NRC Regional Administrator, Region III  
T. Smith, NRC (Washington, D.C.)  
NRC Resident Inspector- Fermi 2  
P. Lee, NRC Region III  
Michigan Department of Natural Resources & Environment  
(yalek@michigan.gov)

**DETROIT EDISON COMPANY**  
**ENRICO FERMI ATOMIC POWER PLANT, UNIT 1**

**Docket No. 50-16**  
**License No. DPR-9**

**Annual Report for Period**  
**July 1, 2010 through June 30, 2011**

Approved by:   
Lynne S. Goodman  
Custodian

Date: 8/30/11

**ENRICO FERMI ATOMIC POWER PLANT, UNIT 1  
ANNUAL REPORT  
JULY 1, 2010 THROUGH JUNE 30, 2011**

**1.0 PREFACE**

This report provides a summary of the activities performed and the results of the facility surveillance program of the Enrico Fermi Atomic Power Plant, Unit 1 Decommissioning Project, during the past twelve (12) months ending June 30, 2011.

In summary, required activities were conducted in accordance with the Operating License and Technical Specifications. Fermi 1 continued decommissioning activities with the removal of contaminated components and commencement of final status surveys to achieve license termination. Based on a review performed during this period, Detroit Edison has decided to return the project to a passive monitoring SAFSTOR status late in 2011.

**2.0 SAFSTOR STATUS**

**2.1 Health Physics**

**2.1.1 Personnel Exposure**

From July 1, 2010 through June 30, 2011, all monitored Fermi 1 personnel wore Thermoluminescent Dosimeters (TLDs) as dosimetry of record. Electronic Dosimeters (EDs) were worn from July 1, 2010 through June 30, 2011 as secondary dosimetry at Fermi 1. All visitors were appropriately escorted and wore EDs as a minimum when entering all Radiologically Restricted Areas (RRA).

The cumulative whole body dose from activities associated with Fermi 1 was 21,889 millirem for this reporting period. This is based on TLD readings for the whole period except for July 2010, which is based on ED readings. Electronic dosimeter readings were used for July 2010, since TLD readings for the second quarter of 2010 overlapped through July.

**2.2 Surveillance Program**

**2.2.1 Environmental Surveys**

No liquid radiological releases occurred during this period; therefore, environmental monitoring samples were not required.

**2.2.2 Weekly Tests and Inspections**

- **General area** - The Fermi 1 staff performed walk through and visual inspections as required by Technical Specifications. No issues were identified during the inspections.

### **2.2.3 Monthly Inspections**

- **Controlled Area Inspections** - During the specified interval, Fermi 1 staff conducted visual inspections of the fences, gates, and doors and surveyed the sump water levels from the top access points of all active sumps. Only minor issues requiring replacement of sump pumps and a door seal were identified during the inspections.

### **2.2.4 Quarterly Surveillances**

Radiological Surveys - The Radiation Protection technicians checked the Reactor Building and the Fuel and Repair Building (FARB) for presence of gamma radiation, as well as beta, gamma, and alpha contamination. There were no unexpected radiation readings detected. The results of the quarterly contamination surveys indicated general area walkways remain <500-dpm/100 cm<sup>2</sup> beta/gamma and <20-dpm/100-cm<sup>2</sup> alpha.

## **3.0 DECOMMISSIONING PROJECT**

The Fermi 1 Decommissioning Project continued during this period including equipment removal, decontamination, and commencement of final status surveys. Details are discussed below.

Based on a review performed this year, Detroit Edison has decided to return the project to a passive monitoring SAFSTOR status from the active final decontamination phase of SAFSTOR. Selected activities will be completed later this year prior to returning to passive SAFSTOR. Details are discussed in Reference 2.

The Fermi 1 staff collected groundwater monitoring well samples and installed five (5) new wells to obtain information for license termination planning. No radioactive isotopes were detected above background levels, with the exception of Radium (226 and 228) levels in one bedrock well that was slightly above background bedrock radium levels. Radium is a naturally-occurring radioactive metal and while included in the groundwater monitoring program, it is not included in the final suite of isotopes for the License Termination Plan.

The following activities were conducted during this period:

- Cut the reactor vessel into three (3) sections: Conical Section, Cylindrical Section, and Lower Reactor Vessel (LRV).
- The Conical and Cylindrical Sections were segmented into smaller pieces to facilitate packaging. These segmented pieces were packaged and shipped off site.
- Removed the bases and stands from the three (3) Primary Sodium Pumps and three (3) Intermediate Heat Exchangers.
- Removed additional graphite shielding from on and around reactor to facilitate cutting the reactor into sections. Some graphite remains and will be removed only as needed for access to allow for the shielding effect as long as possible.
- Began cutting the Transition Deck free of the LRV at the end of the period.

- Removed fuel pool sump pumps 6 and 7 and associated piping.
- Pumped out water from Maintenance Pit Sump, cleaned pit and removed decontamination chamber.
- Removed slightly contaminated silt from the bottoms of Sumps 10, 4, and 1.
- Evaporated plant water using drum dryers.
- Removed abandoned equipment in Reactor Building lower level.
- Cleaned out Fuel and Repair Building (FARB) Dump Tank Room.
- Began neutralizing caustic and removing liquid and sludge in primary sodium 30" lines at the end of the period.
- Removed abandoned hot sump equipment.
- Removed Steam Cleaning Chamber equipment and sealed floor penetrations.
- Removed abandoned pipe and cables in the NaK Room.
- Removed equipment from the Cold Trap Room.
- Removed abandoned pipe and cables from the New Fuel Loading Tunnel.
- Began removal of abandoned pipes and cables in the FARB.
- Removed bottom portion of Sodium Tunnel liner.
- Removed steel shot from FARB Pump Room.
- Decontaminated Dump Tank Room, East Sodium Gallery, Decay Pool, and Waste Tank Room.
- Prepared for Final Status Surveys (FSS).

Some of the removed components have already been shipped offsite. As discussed in Reference 2, the majority of accumulated low level radioactive waste will be shipped offsite for disposal prior to the return to passive monitoring SAFSTOR status.

### **Radiological Surveys**

Radiological surveys were conducted in accordance with plant procedures. Unexpected radiological conditions were encountered only in one area during this reporting period. Sodium Tunnel survey found contamination in concrete joints underneath the steel liner. The bottom portion of the liner was removed for further survey, and fixed contamination was found in the concrete structure. Remediation is being performed.

### **3.1 Radiological Shipments**

The Fermi 1 team shipped the following materials offsite without incident from Fermi 1 during the reporting period. Tools and equipment shipped to Fermi 2 are not included in this table.

Shipment Number	Material Description	Destination	Shipment Category	Activity (mCi)	Volume Gross (ft3)	Weight Gross (lbs)
EF1-10-018	Cutting Equipment	Waltz Mill Madison, PA	Exempt	7.03E-02	56.8	790
EF1-10-019	Contaminated Laundry	UniTech, Morris IL	LQ	5.26	295	5140
EF1-10-020	Samples	GEL Laboratories, Charleston SC	LQ	1.20E-02	0.6	4.3
EF1-10-021	Contaminated Laundry	UniTech, Morris IL	LQ	6.61	354	6485
EF1-10-022	DAW/Metal Waste & Asbestos Waste	Energy Solutions BWF, Clive UT	LSA	4.78E+01	4830.7	207,760
EF1-10-023	Samples	GEL Laboratories, Charleston SC	LQ	1.99E-02	0.5	5
EF1-10-024	Contaminated Laundry	UniTech, Morris IL	LQ	5.28	295	5310
EF1-10-025	Contaminated Laundry	UniTech, Morris IL	LQ	5.17	295	4880
EF1-11-001	Contaminated Laundry	UniTech, Morris IL	LQ	6.35	354	5740
EF1-11-002	Contaminated Laundry	UniTech, Morris IL	LQ	6.32	354	5700
EF1-11-003	Contaminated Laundry	UniTech, Morris IL	LQ	4.94	236	3800
EF1-11-004	Samples	GEL Laboratories, Charleston SC	LQ	3.21E-02	0.1	2
EF1-11-005	Contaminated Laundry	UniTech, Morris IL	LQ	6.17	295	4740
EF1-11-006	DAW/Metal Waste	Energy Solutions BWF, Clive UT	LSA	3.66	690	24,000
EF1-11-007	DAW/Metal Waste/Steel Shot & Asbestos Waste	Energy Solutions BWF, Clive UT	LSA	3.69E+01	4760	157,560

<b>Shipment Number</b>	<b>Material Description</b>	<b>Destination</b>	<b>Shipment Category</b>	<b>Activity (mCi)</b>	<b>Volume Gross (ft3)</b>	<b>Weight Gross (lbs)</b>
EF1-11-008	Activated Steel	Energy Solutions BWF, Clive UT	LSA	2.81E+03	770.4	253,200
EF1-11-009	Contaminated Laundry	UniTech, Morris IL	LQ	6.96	354	5980
EF1-11-010	Contaminated Laundry	UniTech, Morris IL	LQ	8.88	354	7200
EF1-11-011	Contaminated Laundry	UniTech, Morris IL	LQ	4.45	177	3600

BWF – Bulk Waste Facility  
 DAW – Dry Active Waste  
 LQ – Limited Quantity  
 LSA – Low Specific Activity

### **3.2 License Termination Plan**

Final Status Surveys were performed in the following areas or survey units:

- Control Building (interior and roof)
- Fission Product Detector Building
- Fuel and Repair Building (FARB) Decay Pool
- FARB Uranium Room
- FARB Cold Trap Room
- FARB exterior and roof
- East Sodium Gallery
- Inert Gas Building tunnel and tank room, roof, and exterior (excludes mezzanine and compressor pits)
- Sodium Building roofs and exterior
- Land outside Controlled Area fence
- Portions of the land areas inside the Controlled Area fence
- Ventilation Building exterior walls and roof
- Waste Gas Building

### **4.0 RADIOLOGICAL EFFLUENTS**

There were no unplanned radiological gaseous effluent releases during the reporting period. All measurable releases were associated with the decommissioning project. The maximum dose to an offsite member of the public from these releases was 1.0 E-6 mrem Total Effective Dose Equivalent (TEDE) derived from a total of 2.1 mCi of tritium. The gaseous effluent releases were below the Technical Specification air dose limit of 10 mrad of gamma radiation and 20 mrad of beta radiation per year. The individual dose calculated due to gaseous effluent releases was below the Technical Specification dose limit of 5 mrem Total Effective Dose Equivalent.

### **5.0 50.59 EVALUATIONS, DESIGN CHANGES AND LER's**

#### **5.1 10 CFR 50.59**

The Fermi 1 team conducted one 10 CFR 50.59 evaluation during this period. Screenings determined that 50.59 evaluations were not required for other activities.

10-008-SE 50.59 Evaluation addresses abandoning the Fuel and Repair Building (FARB) radioactive drain lines and hot sump.



Note that the drain lines and hot sump will not be abandoned at this time due to the return of the facility to the monitored passive SAFSTOR status. Detroit Edison will address the drain lines and hot sump during the planning for return to active decommissioning.

**Summary:**

This 50.59 evaluation supports design change 09-025-DC, Fermi 1 Safety Analysis Report change 09-023-SAR and work request EF1-09-024 for abandoning the radioactive drain lines and hot sump in the FARB as part of decommissioning.

The 50.59 evaluation addressed that the FARB systems containing radioactive water during plant operation have been abandoned and drained. The waste tanks and majority of the fuel pool liners had been removed at the time the evaluation was written. The steam cleaning chamber equipment removal was in progress. Therefore, the main reason a radioactive water drain system was designed and installed for the FARB no longer applies. The evaluation addressed that the work request would have a hold point to ensure that the temporary evaporation of contaminated water in the FARB was completed prior to plugging the drains and removing the sump. Remaining water sources in the FARB would be due to rain, snow or groundwater in leakage.

The 50.59 evaluation concluded that there would not be more than a minimal increase in the frequency or consequences of an accident or malfunction after this change would be implemented. The change would not create a possibility of an accident of a different type or malfunction of a system, structure or component important to safety with a different result. Since no fuel is stored at Fermi 1, there are no fission product barriers with design limits. Based on the evaluation, NRC prior review was not required.

**5.2 Design Changes**

During this reporting period, Design Change 08-045-DC was completed with the removals of the Liquid Waste and Gaseous Waste systems, abandoned hot sump equipment, and control panel in the FARB. No other Design Changes were implemented during this reporting period.

**5.3 Licensee Event Reports**

There were no Licensee Event Reports during this reporting period.

**6.0 AUDIT SUBCOMMITTEE**

The Audit Subcommittee inspected the physical facility and reviewed the Technical Specification surveillance records during the reporting period. No significant problems were identified.

All audit reports are maintained on file.