Federal Emergency Management Agency

Region V
536 South Clark Street, 6th Floor
Chicago, IL 60605-1521

April 25, 2000

Mr. James E. Dyer
Regional Administrator
Nuclear Regulatory Commission Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

Dear Mr. Dyer:

Enclosed is a copy of the report for the Annual Medical Drill conducted in Monroe and Wayne Counties for the Fermi 2 Nuclear Power Plant on March 8, 2000. Participants included the American Medical Response Ambulance Service, the Oakwood Seaway Hospital, Monroe County, and Michigan Department of Environmental Quality.

There were no new issues identified. Also, there were no previous Areas Requiring Corrective Action. Copies of the report have been forward to the Nuclear Regulatory Commission's (NRC) National Office, the State of Illinois and the Federal Emergency Management Agency's National Office.

If there should be any questions, please call me or have a member of your staff contact Bruce Pfaff at (312) 408-5321.

Sincerely,

Dale W. Shipley
Regional Director

Federal Emergency Management Agency

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Regional Director

Medical Drill Report

Fermi 2 Nuclear Power Plant

Licensee:	**Consumers Energy Company**
Exercise Date:	**March 8, 2000**
Report Date:	**April 24, 2000**

FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION V
536 South Clark Street, 6th Floor
Chicago, IL 60605

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I. EXECUTIVE SUMMARY

On March 8, 2000, the Federal Emergency Management Agency (FEMA), Region V, conducted a medical drill in the plume exposure pathway emergency planning zone (EPZ) around the Fermi 2 Nuclear Power Plant. The purpose of the medical drill was to assess the ability of offsite agencies to respond to a medical emergency involving a potentially radiologically contaminated member of the public. The medical drill was held in accordance with FEMA's policies and guidance concerning the exercise of State and local radiological emergency response plans.

FEMA wishes to acknowledge the efforts of the Fermi 2 team that served as controllers and injured persons, the American Medical Response Ambulance Service Company, and the Oakwood Hospital Seaway Center staff who participated in this medical drill.

The scenario for this medical drill was developed by personnel from the Fermi 2 Nuclear Power Plant and coordinated with the Michigan State Police, Emergency Management Division. The following objectives, which are part of the 33 standardized objectives contained in FEMA's Exercise Manual (FEMA-REP-14), were evaluated during this medical drill.

> **Objective 5: Emergency Worker Exposure Control.** Demonstrate the capability to continuously monitor and control radiation exposure to emergency workers.
>
> **Objective 14: Implementation of Protective Actions – Use of KI for** Emergency Worker, Institutionalized Individuals, and the General Public. Demonstrate the capability and resources to implement potassium iodide (KI) protective actions for emergency workers, institutionalized individuals, and, if the State plan specifies, the general public.
>
> **Objective 20: Medical Services - Transportation.** Demonstrate the adequacy of vehicles, equipment, procedures, and personnel for transporting contaminated, injured, or exposed individuals.
>
> **Objective 21: Medical Services - Facilities.** Demonstrate the adequacy of the equipment, procedures, supplies, and personnel of medical facilities responsible for the treatment of contaminated, injured, or exposed individuals.

The State and local organizations, except where noted in this report, demonstrated knowledge of their organizational emergency response plans and procedures and adequately implemented them. There were no Deficiencies or Areas Requiring Corrective Action (ARCA) identified as a result of this medical drill.

II. DRILL OVERVIEW

The Medical Drill was conducted at the Fermi 2 Nuclear Power Plant, Nuclear Operations Center (NOC) on March 8, 2000. The NOC, for this drill, simulated the Monroe County Emergency Operations Center (EOC). Present at the NOC were the controller and patient, the assistant EOC Director who also served as the Radiation Protection Officer (RADPRO), two members of American Medical Response (AMR) Ambulance Service, two representatives from the Michigan State Police Emergency Management Division (MSP/EMD) and the FEMA evaluator. Participating at the Oakwood Hospital Seaway Center were two members of the Michigan Department of Environmental Quality (DEQ) serving as a monitoring and decontamination team. The DEQ team simulated being deployed from the State Field Team Center. The drill was initiated by a simulated call from the Monroe County EOC, by the MSP/EMD controller in the NOC, to the Oakwood Hospital Seaway Center. This call informed the Hospital of the transport from inside the plume of a contaminated/injured police officer. Prior to the call the following actions had been simulated at the NOC: an accident at the Fermi 2 Nuclear Power Plant had caused an uncontrolled release to the environment, with a deposition of contamination to the off-site community. The patient was moulaged and prepared for transport to a location (simulated) inside the plume. The patient simulated a police officer that had been dispatched inside the plume to assist in an evacuation of a reported and unidentified individual. While in the plume the officer slipped and broke his leg, and gashed his forehead. Both wounds were contaminated when he fell. The officer called the EOC (simulated) and requested medical attention. Through interview with the assistant EOC Director it is determined that an ambulance and crew requires dispatch with dosimetry and KI. The assistant EOC Director in the NOC explained the process for the AMR crew to obtain their dosimetry and KI. The AMR crew is provided the Health Department briefing, and required forms, which were filled in per standard operating procedure, along with the dosimetry kits. The assistant EOC Director explained the process where-by the EOC would have the ambulance dispatched. The AMR ambulance crew then simulated entering the plume to treat the officer and transport him to the Hospital.

III. DRILL EVALUATION AND RESULTS

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities which participated in the Fermi 2 medical drill to test the ability of offsite agencies to respond to a medical emergency involving a potentially radiologically contaminated member of the public in the area surrounding the Fermi 2 Nuclear Power Plant.

This subsection provides information on the evaluation of each participating jurisdiction and functional entity, in a jurisdiction based, issues only format. Presented below is a definition of the terms used in this subsection relative to objective demonstration status.

- **Met** - Listing of the demonstrated exercise objectives under which no Deficiencies or ARCAs were assessed during this Drill and under which no ARCAs assessed during prior drills remain unresolved.

- **Deficiency** - Listing of the demonstrated objectives under which one or more Deficiencies were assessed during this drill. Included is a description of each Deficiency and recommended corrective actions.

- **Area Requiring Corrective Actions (ARCA)** - Listing of the demonstrated exercise objectives under which one or more ARCAs were assessed during the current drill or ARCAs assessed during prior drills remain unresolved. Included is a description of the ARCAs assessed during this drill and the recommended corrective action to be demonstrated before or during the next biennial exercise.

- **Not Demonstrated** - Listing of the drill objectives which were not demonstrated as scheduled during this drill and the reason they were not demonstrated.

- **Prior ARCAs - Resolved** - Descriptions of ARCAs assessed during previous drills, which were resolved in this drill, and the corrective actions demonstrated.

- **Prior ARCAs - Unresolved** - Descriptions of ARCAs assessed during prior drills, which were not resolved in this drill. Included is the reason the ARCAs remains unresolved and recommended corrective actions to be demonstrated before or during the next biennial exercise.

The following are definitions of the two types of exercise issues, which are discussed in this report.

- A **Deficiency** is defined in FEMA-REP-14 as "...an observed or identified inadequacy of organizational performance in an exercise that could cause a finding that offsite emergency preparedness is not adequate to provide reasonable assurance that appropriate protective measures can be taken in the event of a radiological emergency to protect the health and safety of the public living in the vicinity of a nuclear power plant."

- An **ARCA** is defined in FEMA-REP-14 as "...an observed or identified inadequacy of organizational performance in an exercise that is not considered, by itself, to adversely impact public health and safety."

FEMA has developed a standardized system for numbering exercise issues (Deficiencies and ARCAs). This system is used to achieve consistency in numbering exercise issues among FEMA Regions and site-specific exercise reports within each Region. It is also used to expedite tracking of exercise issues on a nationwide basis.

The identifying number for Deficiencies and ARCAs includes the following elements, with each element separated by a hyphen (-).

- **Plant Site Identifier** - A two-digit number corresponding to the Utility Billable Plant Site Codes.

- **Exercise Year** - The last two digits of the year the exercise was conducted.

- **Objective Number** - A two-digit number corresponding to the objective numbers in FEMA-REP-14.

- **Issue Classification Identifier** - (D = Deficiency, A = ARCA). Only Deficiencies and ARCAs are included in exercise reports.

- **Exercise Issue Identification Number** - A separate two (or three) digit indexing number assigned to each issue identified in the drill.

1. MONROE COUNTY

1.1 Monroe County Emergency Operations Center

a. **Met:** Objectives 5 and 14

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs - RESOLVED:** NONE

f. **PRIOR ARCAs - UNRESOLVED:** NONE

1.2 American Medical Response Ambulance Service - Monroe

a. **MET:** Objectives 5, 14 and 20

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs - RESOLVED:** NONE

f. **PRIOR ARCAs - UNRESOLVED:** NONE

1.3 Oakwood Hospital Seaway Center – Woodhaven

a. **MET:** Objectives 5 and 21

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs - RESOLVED:** NONE

f. **PRIOR ARCAs - UNRESOLVED:** NONE

2. State of Michigan

2.1 Department of Environmental Quality

a. **MET:** Objectives 5, 14 and 20

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs - RESOLVED:** NONE

f. **PRIOR ARCAs - UNRESOLVED:** NONE

APPENDIX 1 DRILL NARRATIVES

OBJECTIVE 5: EMERGENCY WORKER EXPOSURE CONTROL

Demonstrate the capability to continuously monitor and control radiation exposure to emergency workers.

Objective Status: Met

Monroe County

This drill used a simulated plant release into the plume emergency planning zone. The scenario provided the following simulated actions: Emergency Operations Center (EOC) to be operational and fully staffed, a report received in the EOC of a person in the plume area, an officer is dispatched to confirm that an evacuee remains in the evacuated area. While in the plume, the officer slips and falls, causing a compound fracture to the right upper leg and a large gash above the right eye. The officer radios police dispatch for assistance, the call is relayed to the EOC, the EOC directs, through the Health Department, the dispatch of an ambulance, with instructions on how to obtain and use of dosimetry kits.

American Medical Response Service

The ambulance team had thermoluminescent dosimeters (TLDs) and direct reading dosimeter's (DRDs) issued by the county health department at the Monroe County EOC. The actual issuance of the dosimetry and the briefings along with the preparation of all required forms was accomplished at the Fermi 2 Nuclear Operations Center. The American Medical Response Ambulance service paramedics wore work clothing and standard blood borne barriers. Through interview, it was determined that the paramedics were knowledgeable about turn-back values; radiation exposure control and that they understood how to use their dosimeters. They knew how to read the DRDs and what to do if they started to see a rise in their exposure rate.

Oakwood Hospital Seaway Center

At the Oakwood Hospital Seaway Center a Charge/Buffer nurse recorded dosimeter serial numbers and initial readings on a Dosimetry Report Form. The medical team was dressed in anti-contamination clothing. Individual report forms were maintained throughout the drill. Hospital personnel who were in the Radiation Exclusion Area (RERA) wore one ring TLD and one DRD pen dosimeter. The DRDs were CD V-138s with a range of 0-200 mR. The buffer zone nurse recorded the serial number of each TLD and DRD issued to the medical team by name and social security number. Dosimeter inspection dates were current and within the time frames specified. Electrical leak test

and calibration date documents for each plant site are reviewed at the biannual pre-exercise meeting and during the review of the Annual Letter of Certification by agreement with the state. Instructions on how to use the DRDs and to take periodic readings were available.

The instruments used for radiological monitoring were within calibration and proper pre-operation checks had been performed.

Michigan Department of Environmental Quality

The Michigan Department of Environmental Quality (DEQ) provided the radiation monitors and decontamination support for this drill. One member of the department preformed radiological monitoring of the ambulance, the radiation exclusion area and decontamination support for the ambulance. The other member monitored the injured officer, the emergency room supplies and equipment and provided decontamination of the officer, staff and emergency room area. Each member had Landauer personnel dosimetry (TLD), a CD V 138 (range 0-200 mR) and CD V 742 (range 0-200 R). One team member utilized a Bicron 2000 survey instrument, last calibrated 6/28/99, with an SHP360 pancake probe last calibrated 7/22/99. The other member used an Eberline E-600, last calibrated 7/21/99. A pancake Geiger-Muller (PGM) probe, last calibrated 6/28/99 was also available.

All activities described in the demonstration criteria for this objective were carried out in accordance with the plan, procedures, and the extent-of-play agreement.

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All activities described in the demonstration criteria for this objective were carried out in accordance with the plan, procedures, and the extent-of-play agreement.

Objective 14: Implementation of Protective Actions

Demonstrate the capability and resources to implement potassium iodide (KI) protective actions for emergency workers, institutionalized individuals, and, if the State plan specifies, the general public.

Objective Status: Met

Monroe County EOC

The Monroe County Emergency Operating Center (EOC) demonstrated this objective. Prior to deploying, all emergency workers received dosimetry kits containing a vial of potassium iodide (KI) tablets and an instruction sheet with directions for the use and side effects of KI. The expiration date of the KI tablets issued is January 2001. The emergency workers also received a briefing on the potential use of KI, and its side effects from the County Radiation Protection Officer (RADPO).

American Medical Response Ambulance Service

An American Medical Response Ambulance Service crew demonstrated this objective. Prior to deploying, both emergency workers received a dosimetry kit containing a vial of potassium iodide (KI) tablets and an instruction sheet with directions for the use and side effects of KI. The expiration date of the KI tablets issued is January 2001. The emergency workers also received a briefing on the potential use of KI, and its side effects from the County Radiation Protection Officer (RADPO).

State of Michigan, Department of Environmental Quality

Two members of the staff of the Michigan Department of Environmental Quality (DEQ) demonstrated this objective. Prior to deploying from the Field Team Center (simulated), both DEQ staff members received dosimetry kits containing a vial of potassium iodide (KI) tablets and an instruction sheet with directions for the use and side effects of KI. The expiration date of the KI tablets issued is January 2001. The DEQ staff workers also received a briefing (simulated) on the potential use of KI at the Field Team Center.

All activities described in the demonstration criteria for this objective were carried out in accordance with the plan, procedures, and the extent-of-play agreement.

OBJECTIVE 20: MEDICAL SERVICES –TRANSPORTATION

Demonstrate the adequacy of vehicles, equipment, procedures, and personnel for transporting contaminated, injured, or exposed individuals.

Objective Status: Met

American Medical Response Ambulance Service

On March 8, 2000 the American Medical Response (AMR) Ambulance Service demonstrated the adequacy of vehicles, equipment, procedures and personnel for transporting contaminated, injured, or exposed individuals. The Fermi 2 Nuclear Power Plant is located in Monroe County, Michigan. The demonstration was initiated at 0928 hours by a telephone call to the Oakwood Hospital Seaway Center Emergency room. A controller playing the role of the 911 center simulated the call to the hospital.

At 0940 hours, AMR Emergency Medical Technicians (EMTs) responded to the staged scene. The first EMT arrived at the location of the incident at 0942 hours. The EMTs dosimetry kits had been issued earlier at the NOC, simulating the county dosimetry issue point. The patient had sustained contamination of both his leg and head wounds. Due to the seriousness of the injuries, decontamination efforts were not attempted. The patient received emergency medical attention from the EMTs and was then prepared for transport. Because of the presence of radioactive contamination in the plume EPZ, the decision was made to transport the patient to Oakwood Hospital Seaway Center – Wayne County MI. At 0949 hours the patient was loaded on a gurney and placed in the AMR ambulance, for transport.

While enroute to Oakwood Hospital Seaway Center, the AMR ambulance crew contacted the hospital by way of radio, keeping the hospital center staff apprised of the patient's condition and the estimated time of arrival.

The ambulance arrived at the hospital at 1010 hours. The AMR paramedic, providing the patient's medical care, gave the hospital staff updated patient vitals and patient status.

The ambulance and the paramedics were monitored and found clean after the patient was removed. The ambulance was released to service.

Michigan Department of Environmental Quality

The Monroe County Emergency Worker Decontamination Facility for injured persons was located at the Oakwood Hospital Seaway Center. A message to activate the facility was received at 0930 hours, and the facility was operational by 1000 hours. Personnel from the State of Michigan, Department of Environmental Quality, staffed the monitoring and decontamination teams.

The Hospital had sufficient space and lighting to support monitoring and decontamination. The facility was equipped with a shower and utility sink for personal decontamination. The facility also had locker rooms, offices and toilets. The personnel monitoring and decontamination area was well marked and separated from clean areas. Two monitors and a recorder were assigned to this area; one monitor performed initial monitoring actions and the second performed patient pre-trans and post-decontamination monitoring in the emergency room. The monitoring team was equipped with two Bicron Surveyor, Model 2000 radiation survey meters. One meter was equipped with a GM-type pancake probe and the other meter was equipped with a standard GM probe with removable Beta shield. Both instruments were last calibrated on 6/28/99 and the instrument carrying case had a five-micro curie Cesium-137 check source, which was used for performing the pre-operational checks.

The vehicle monitoring and decontamination areas were conspicuously posted and were barricaded to restrict the traffic flow. The vehicle monitoring team consisted of one monitor; the monitor performed the initial vehicle monitoring functions of area subjected to contamination (door handles, exterior surfaces, interior surfaces subject to touch) and post-decontamination monitoring. Had the vehicle required extensive decontamination it would have been dispatched to a county vehicle decontamination station.

All activities described in the demonstration criteria for this objective were carried out in accordance with the plan, procedures, and the extent-of-play agreement.

OBJECTIVE 21: MEDICAL SERVICES – FACILITIES

Demonstrate the adequacy of the equipment, procedures, supplies, and personnel of medical facilities responsible for treatment of contaminated, injured, or exposed individuals.

Objective Status: Met

Oakwood Hospital Seaway Center

At 0928 hours, the emergency room staff at Oakwood Hospital Seaway Center was notified by AMR personnel of an accident involving one patient with injuries to his leg and head. The hospital directed the ambulance to the Radiation Exclusion Area where they would receive the patient.

At approximately 0930 hours, emergency room personnel assigned to handle a radiologically contaminated/injured patient began dressing-out in standard surgical outfits. A buffer zone area was set-up and controlled by the buffer nurse. TLDs were documented and dosimetry was appropriately calibrated and zeroed. Non-essential equipment was removed or covered. Waste and fluid collection containers for radioactive waste materials were placed in the room. Radiation warning signs and labels were displayed. Although a procedure was available it was not utilized, resulting in an over sight when a contaminated waste receptacle was not lined with a plastic bag. This was resolved through interview, when it was determined that additional receptacles were available with plastic liners.

Upon arrival simulated readings given to the hospital staff indicated that radiological monitoring of the patient's leg wound reported a 1,000 cpm reading. His face injury was reported to read 1,000 to 1,500 cpm. At 1010 hours a clean transfer of the patient was accomplished.

Once the medical team had the patient in the emergency room, the patient was given immediate medical treatment. Medical attention was given to lacerations to the right side of the face. Numerous intravenous applications were simulated in the patient. The medical team conducted initial decontamination using saline. Contamination counts of 1,000 cpm were reported on the patient's clothing and 1,000 on his face wound. The second cleaning with saline resulted in a lower cpm reading of 100 cpm. After a third cleaning, monitoring of the patient showed background readings.

The hospital buffer nurse performed several checks of the emergency room medical staff during the drill to assure no contamination was being spread. The buffer nurse also directed the staff to change gloves frequently.

One RN performed disrobing procedures according to the guidance manual (SOP). She went through the procedures and the remaining staff disrobed normally. The drill terminated at 1130 hours.

All activities described in the demonstration criteria for this objective were carried out in accordance with the plan, procedures, and the extent-of-play agreement.