U.S. Department of Homeland Security
Region V
536 South Clark Street, Floor 6
Chicago, IL 60605

FEMA

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NRC HQ Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

To Whom It May Concern:

Enclosed is one copy of the Dresden Nuclear Power Station Medical Services (MS-1) Drill Report. The drill was conducted in Pontiac, Illinois, on July 14, 2009. Participants included members from the Illinois Emergency Management Agency, Duffy Ambulance Service, and the Order of Saint Francis – Saint James, John W. Albrecht Medical Center.

No Deficiencies and no Areas Requiring Corrective Action were identified during this drill. If you have any questions, please contact me at (312) 408-5575 or William E. King at (312) 408-5575.

Sincerely,

Janet M. Odeshoo
Acting Regional Administrator

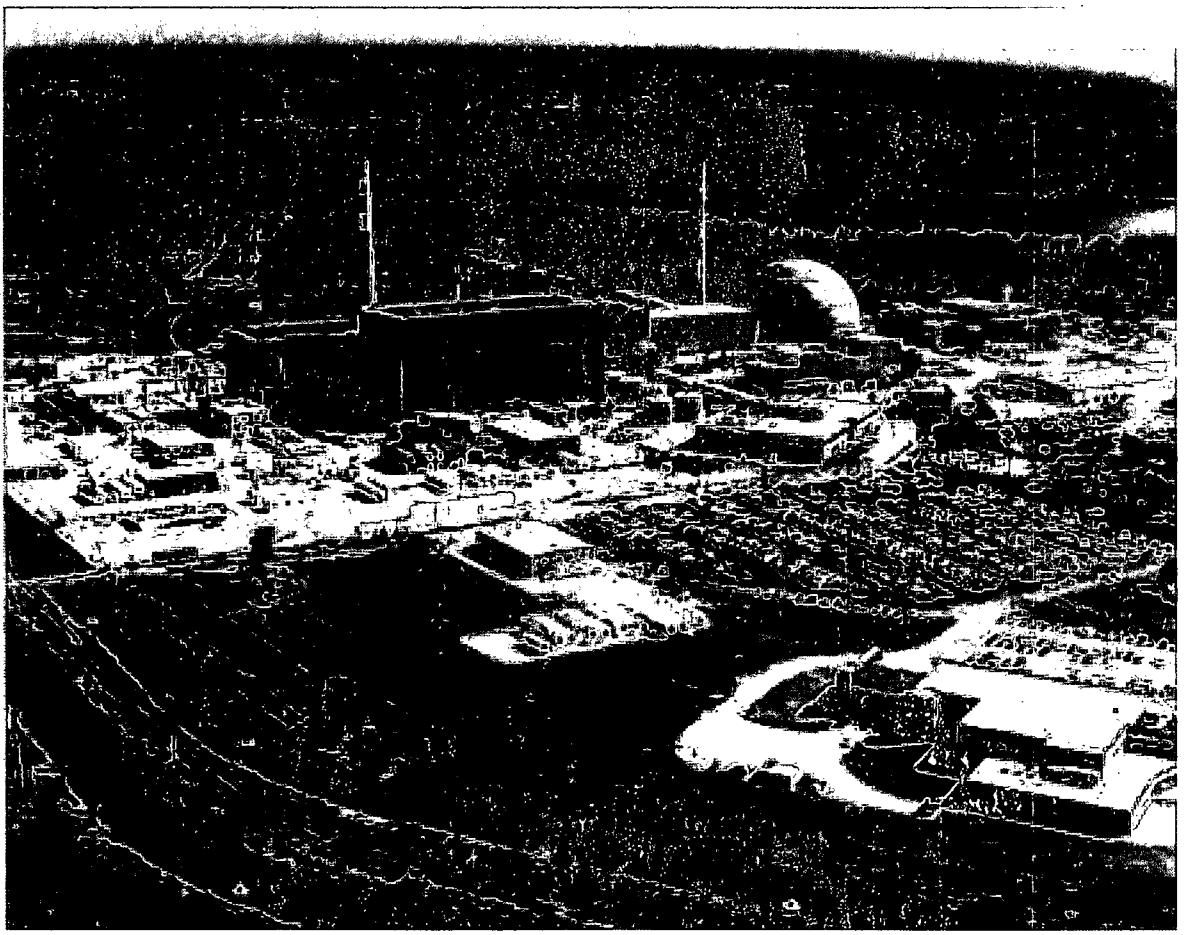
Enclosure

A045
NRR

Dresden Nuclear Power Station

Drill Report - 2009-07-14
Final Report - Radiological Emergency Preparedness (REP) Program
2009-08-28

FEMA



FEMA

Drill Report

Dresden Nuclear Power Station

Drill Date: 2009-07-14

Report Date: 2009-08-28

U.S. DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency

REP Program

536 S. Clark St. 6th floor

Chicago, IL 60605

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1. Executive Summary

On July 14, 2009, the U.S. Department of Homeland Security's (DHS) Federal Emergency Management Agency (FEMA), Region V, evaluated a Medical Services (MS-1) drill in the 10-mile plume exposure pathway Emergency Planning Zone (EPZ) around the Dresden Nuclear Power Station (DNPS). The purpose of the MS-1 drill was to assess the ability of off-site agencies to respond to a medical emergency involving a potentially radiologically contaminated member of the public. The MS-1 drill was held in accordance with DHS/FEMA's policies and guidance concerning the exercise of State and local radiological emergency response plans.

DHS/FEMA wishes to acknowledge the efforts of the personnel from the State of Illinois Emergency Management Agency (IEMA), Duffy Ambulance Service, and the Order of Saint Francis - Saint James, John W. Albrecht Medical Center who participated in the MS-1 drill.

The scenario for the MS-1 drill was developed by personnel from the State of Illinois. The drill scenario stated that a General Emergency was declared at the Dresden Nuclear Power Station. The emergency alert sirens have sounded, the public has been directed to evacuate affected areas and to report to Reception Centers set up in the local area. The scenario is based on a local resident who had just returned from traveling and is unloading her luggage from her vehicle. The resident has not heard the evacuation order over the local radio station or the order to report to the Reception Center. While unpacking she hears that a radioactive release has occurred from the Dresden Nuclear Station and that members of the public living in her area are to report to the Reception Center located in Pontiac, Illinois. Radiation monitoring and, if necessary, decontamination, of evacuees is provided for at these facilities by staff from IEMA under the Illinois Plant for Radiological Accidents (IPRA). The resident grabs a few necessities and leaves her home, however when leaving she slips and falls down her front porch stairs sustaining an internal injury to her right arm.

While driving to the Reception Center the resident's arm begins to hurt and is difficult to move. Upon arrival at the Reception Center the pain becomes more intense and the resident's arm has become very stiff. As IEMA staff processes her through the radiation monitors they discover that she is contaminated and cannot straighten her arm. As the resident is being surveyed she has intense pain in the right arm in which she caught herself. She explained the fall incident and her discomfort to the IEMA staff and they immediately called Duffy Ambulance to transport the resident to Order of Saint Francis - Saint James, John W. Albrecht Medical Center. An ambulance was dispatched to the Reception Center. The IEMA staff advised the Duffy Ambulance Service to transport the person as a contaminated injured patient.

The Reception Center was simulated for this drill and was actually located at a garage area on the OSF St James Medical Center property. The Duffy Ambulance Service's vehicle was pre-positioned near the simulated Reception Center.

The resident was kept comfortable while the ambulance was in route. Decontamination at the Reception Center was waived due to the individual's injury. There was simulated bruising and slight swelling of the right arm. There were no visible lacerations or bone dislocation. The resident was simulated as being allergic to Septra and Tramadol and having a history of anxiety and asthma.

Due to the condition of the patient, decontamination was not attempted and was pending the patient's safe arrival at the medical center.

The preliminary monitoring survey performed by the IEMA personnel identified general contamination on right and left palm, forehead, right pant knee, left pant knee, both pant cuffs and bottom and toes of shoes.

The Duffy ambulance service arrived at the Reception Center with two EMTs (ambulance driver and assistant) that assessed the individual's injury. The IEMA Medical Radiological Technician (MRT) at the Reception Center advised the EMTs of the patient contamination levels and complaint of injury to the right arm. The EMTs communicated the situation and patient status, to include vital signs, to the medical center. The IEMA MRT joined the EMTs in the ambulance and rode to the medical center with the patient.

While the individual was in transit, the staff at OSF St James Medical Center having been notified of the pending arrival of a radiological contaminated patient declared a Code Orange. This action commenced preparations for receiving and the treatment of a contaminated patient. The necessary staff responded to the Emergency Department (ED). The Emergency Department's vehicle entrance area was cordoned off using yellow tape and traffic cones. The ED Decontamination room was prepared and the responding staff donned Personal Protective Equipment, as necessary. A second IEMA MRT was pre-positioned at the ED to assist the medical staff in the monitoring and decontamination of the patient.

Upon arrival at the OSF St James Medical Center a successful transfer of the individual from the Ambulance gurney to a patient transfer bed was conducted by the EMTs and hospital staff. The EMTs and the ambulance were properly surveyed by the IEMA MRT from the Reception Center. The ambulance and EMTs were then released to return to normal service.

The patient was then moved into the Decontamination Room. The hospital staff attended to the patient giving priority to the injury, while maintaining awareness of the radiological contamination. Together the IEMA MRT and hospital staff successfully treated the patient's injury and conducted decontamination procedures. Afterwards effectively decontaminating the patient and removing her from the Decontamination Room. The patient was moved to a treatment room within the ED for further observation by the attending physician. The IEMA MRT properly surveyed the attending hospital staff and processed them out of the Decontamination Room. The IEMA MRT also addressed the proper survey, disposal and handling of contaminated materials and the

decontamination and clean-up of the Decontamination Room.

During the MS-1 drill, Criterion 6.d.1 - Transportation and Treatment of Contaminated Injured Individuals, which is part of the six Exercise Evaluation Areas described in Federal Register notice [67 FR 20580-20602], April 2002, which amends the FEMA-REP 14, Radiological Emergency Preparedness Exercise Manual, was evaluated. The State and local organizations demonstrated knowledge of their organizational emergency response plans and procedures and adequately implemented them. No issues were identified as a result of this drill.

Table 1 - Summary of Drill Evaluation

DATE: 2009-07-14 SITE: Dresden Nuclear Power Station, IL A: ARCA, D: Deficiency, M: Met, N: Not Demonstrated		MS-1 T - Duffy Ambulance	MS-1 H - St James Hosp
Emergency Operations Management			
Mobilization	1a1		
Facilities	1b1		
Direction and Control	1c1		
Communications Equipment	1d1	M	M
Equip & Supplies to support operations	1e1	M	M
Protective Action Decision Making			
Emergency Worker Exposure Control	2a1		
Radiological Assessment and PARs	2b1		
Decisions for the Plume Phase -PADs	2b2		
PADs for protection of special populations	2c1		
Rad Assessment and Decision making for the Ingestion Exposure Pathway	2d1		
Rad Assessment and Decision making concerning Relocation, Reentry, and Return	2e1		
Protective Action Implementation			
Implementation of emergency worker exposure control	3a1		M
Implementation of KI decision	3b1		
Implementation of protective actions for special populations - EOCs	3c1		
Implementation of protective actions for Schools	3c2		
Implementation of traffic and access control	3d1		
Impediments to evacuation are identified and resolved	3d2		
Implementation of ingestion pathway decisions - availability/use of info	3e1		
Materials for Ingestion Pathway PADs are available	3e2		
Implementation of relocation, re-entry, and return decisions	3f1		
Field Measurement and Analysis			
Adequate Equipment for Plume Phase Field Measurements	4a1		
Field Teams obtain sufficient information	4a2		
Field Teams Manage Sample Collection Appropriately	4a3		
Post plume phase field measurements and sampling	4b1		
Laboratory operations	4c1		
Emergency Notification and Public Info			
Activation of the prompt alert and notification system	5a1		
Activation of the prompt alert and notification system - Fast Breaker	5a2		
Activation of the prompt alert and notification system - Exception areas	5a3		
Emergency information and instructions for the public and the media	5b1		
Support Operations/Facilities			
Mon / decon of emergency worker equipment	6b1		
Temporary care of evacuees	6c1		
Transportation and treatment of contaminated injured individuals	6d1	M	M

2. Drill Evaluation and Results

2.1. Medical Services (MS-1) Transportation – Duffy Ambulance Service

On Tuesday, July 14, 2009, a Medical Services (MS-1) Drill was conducted at the OSF St James Medical Center, 2500 West Reynolds Street, Pontiac, Illinois. In accordance with the extent of play agreement, the ambulance and crew from the Duffy Ambulance Service and an Illinois Emergency Management Agency (IEMA) Radiological Monitor (RM), assigned to provide services at the simulated Reception Center and in the ambulance, participated in the MS-1 Transportation drill.

Transportation of a contaminated injured patient to OSF St. James Medical Center was demonstrated as an out of sequence activity at 0900 hours on July 14, 2009 by Duffy Ambulance Service. The exercise began at 0925 hours, when an exercise controller made a call to Duffy Ambulance Service requesting an ambulance to report to the public Reception Center and advising them that an individual had injured her right arm in a fall.

The Medical Radiological Technician (MRT) for the Illinois Emergency Management Agency (IEAM), Division of Nuclear Safety (DNS) wore dosimetry consisting of one DCA Model 622 DRD with a range of 0 – 20 R for the radiological incident and a Landauer In-Light Systems Luminescence Dosimeter (LD) as a means of recording permanent radiation exposures. The MRT was wearing a one-piece Tyvek suit, rubber gloves, booties and a surgical mask.

At 0930 hours the Medical Radiological Technician (MRT) for the Illinois Emergency Management Agency (IEMA), Division of Nuclear Safety (DNS) began surveying the injured individual. Surveying was completed at 0938 hours. The following simulated radioactive contamination levels were found: 3,000 counts per minute (cpm) on left palm, 1,500 cpm on left knee, 3,000 cpm on left shoe, 2,000 cpm on left pant cuff, 1,500 cpm on right knee, 3,000 cpm on right shoe bottom and right pants cuff, 1,200 cpm on left forearm, 3,000 cpm on right palm and 1,600 cpm at the front of the hair line on the head. Booties were then placed on the feet of the victim to prevent spreading contamination.

The ambulance and two Emergency Medical Technicians (EMTs) paramedics arrived on scene at 0940 hours. One of the EMTs was also the driver. The EMTs got out of the ambulance wearing yellow Poly Coat™ DuPont suits with hoods, yellow shoe covers, surgical masks, safety glasses and two pairs of surgical gloves. The patient was alert and responsive when the ambulance arrived but complained of a sore right arm.

The EMTs first tended to the patient by applying a neck collar and a cloth-type sling under the right arm to keep it immobilized. The MRT then monitored the EMTs' hands for contamination, and the outer surgical gloves were changed out. The MRT the briefed the EMTs of the levels and locations of radioactive contamination found. The EMTs then obtained a backboard and placed three blankets on it to use for cocooning of the patient.

The patient was then placed on the backboard, cocooned and strapped down, and then lifted onto an ambulance gurney. The EMTs then had their hands monitored for radioactive contamination and replaced their outer surgical gloves.

The gurney was then loaded into the ambulance with one EMT attending to the patient while the other EMT drove. The MRT also escorted the patient and ambulance crew in the ambulance.

After the patient was loaded into the ambulance, the EMT with the patient monitored for vitals. The following vitals were noted: level of consciousness – alert and oriented, respirations – 40, pulse – 145, skin – normal, pupils – PERL, blood pressure (BP) – 140/100, and visual – slight swelling and bruising of right arm. At 1008 hours, the EMT escorting the patient contacted the hospital to via MERCI to inform the hospital all further communications with the hospital would be via the Med Line not MERCI so the MERCI channels could be used for actual emergencies. At 1012 hours, the EMT escorting the patient notified the hospital via the Med Line that the ambulance was en route and informed the hospital of the patient's initial vitals.

The patient's vital were monitored again while en route to the hospital. The following simulated vitals were noted: level of consciousness – alert and oriented, respirations – 38, pulse – 135, skin – normal, pupils – PERL, BP – 130/100 and visual – slight swelling and bruising of the arm. The EMT escorting the patient then notified the hospital of the vitals via the Med Line.

The ambulance arrived at the hospital at 1018 hours. The area outside of the Emergency Room (ER) entrance designated for the arriving ambulance was marked off with plastic traffic cones and yellow caution tape. After the ambulance arrived, it was met by hospital staff and the patient was transferred from the gurney to a patient transfer bed to be taken into the REA.

After the patient transfer was completed, the MRT surveyed the EMT driver for contamination and protective clothing doffing procedures were demonstrated. The MRT then surveyed the EMT escorting the patient, and the EMT was allowed to doff her protective clothing. Then the MRT monitored the ambulance for contamination. The following areas were monitored: gurney wheels, patient pad, cabinets used by the EMT, patient area bench pad, floor, cab floorboard, steering wheel, driver's seat, inside door handles, radios, running boards and rear bumper and step.

The MRT explained the area around the ambulance would also be monitored for any contamination, and that if contamination was found on the ambulance, it would be sent to the designated vehicle monitoring and decontamination station.

The ambulance was released at 1049 hours.

The Duffy Ambulance Service ambulance dispatched for this drill was equipped with two

multi-channel, two-way radios for communicating through the Medical Emergency Radio Communications of Illinois (MERCI) System. The system operates on an 800 MHz frequency, and one radio was located inside the patient compartment and the other radio was located in the cab of the ambulance. This is the normal primary form of communications used by Duffy Ambulance Service. The radio in the patient compartment was monitored on a regular basis during transport of the patient. The radio was utilized to notify the dispatcher of the ambulance participating in a drill.

The driver, an EMT, and assisting EMT, were each equipped with cellular telephones and 9-1-1 pagers. The EMT in the patient compartment utilized a cellular telephone to establish and maintain contact with the hospital during the drill in order to keep the MERCI channels open for actual emergency communications and not risk having dispatchers and other radio users believe an actual radiological emergency was taking place.

No failures of the communications systems were noted during the drill.

The radiological emergency response survey meter kit maintained by the Illinois Emergency Management Agency (IEMA) Division of Nuclear Safety (DNS) contained one Bicron Micro-Rem Ion Chamber survey meter with an internal, tissue-equivalent, organic scintillator, with four scales giving a range of dose measurement of gamma or X-radiation of 0 to 200,000 microrems (µrem) or 0.2 rem with no R/hr conversion required. The Bicron Micro-Rem meter was last calibrated on August 19, 2008.

The second survey meter was a Ludlum Model 2241-3 with three different detectors available: a Ludlum Model 44-9, GM pancake-type halogen quenched for detecting alpha, beta and gamma radiation; a Ludlum Model 44-10, low-level, wide energy gamma sodium iodide scintillator; and a Ludlum Model 43-65 alpha detector. The Model 2241-3 has four display options: 0.0 µR/hr to 9,999 R/hr; 0.000 µSieverts (Sv)/hr to 9,999 Sv/hr; 0 to 999k cpm; or 0 to 100k cps. This survey meter was last calibrated on August 20, 2008.

Both survey meters were operationally tested before the drill, and both survey meters are due for annual calibration in August 2009.

The radiological emergency response bag for carrying other than radiation survey instruments, as displayed by the IEMA Medical Radiological Technician (MRT), was sufficiently stocked with Tyvek suits, surgical masks, booties, cotton inserts, surgical gloves, tape, safety glasses, replacement batteries, dosimetry kits and one CD V-750 Model 6, pistol-grip direct-reading dosimeter (DRD) charger. The dosimetry kit demonstrated contained on DCA Model 622 DRD with a range of 0 – 20R, and was last tested on May 4, 2009, one Landauer In-Light Systems Luminescence Dosimeter (LD) with a change out date of June 2010, 14 130mg iOSAT KI tablets in a blister pack with a listed expiration date of June 2007, one Emergency Worker KI Potency Card dated May 2007 explaining the KI would remain sufficiently potent, one Thyro-Block KI Instruction Sheet, and one blue Radiation Exposure Record/KI Ingestion Card with dosimetry use

instruction on the back.

During a discussion with the IEMA MRT it was identified that a letter was on file extending the date of the shelf life of the KI but that he didn't have one with him. A copy of the letter was later provided by the IEMA office.

All activities described in the demonstration criterion were carried out in accordance with the plan, procedures and the extent of play agreement.

Medical Services (MS-1) Transportation - Duffy Ambulance Service

a. MET: 1.d.1, 1.e.1, 6.d.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. NOT DEMONSTRATED: None
e. PRIOR ISSUES - RESOLVED: None
f. PRIOR ISSUES - UNRESOLVED: None

2.2. Medical Services (MS-1) Hospital – OSF Saint James Hospital

The State of Illinois' Medical Services (MS-1) Hospital Drill was performed out of sequence on July 14, 2009, commencing at 0900 hours, at the Order of Saint Francis - Saint James, John W. Albrecht Medical Center, 2500 West Reynolds Street, Pontiac, Illinois, where the appropriate space, adequate resources and trained personnel to provide transport, monitoring, decontamination, and medical services to contaminated injured individuals was demonstrated. At 1000 hours, an announcement was made over a public address system in the Medical Center for a Code Orange. This code signified that a patient contaminated with radiological materials was in route to the Emergency Department (ED) at the Medical Center.

Since this was an exercise, the Medical Center was notified of the situation by artificial means; a Controller inject. The IEMA Controller related to the Medical Center staff via an inject that it had been notified of an event at the Braidwood Station by the Illinois Emergency Management Agency (IEMA) or hospital representative stationed at the local Emergency Operation Center.

The nurse's station within the ED contained sufficient radio and telephonic equipment to allow for the center to communicate with responding ambulance services. The radio system utilized Medical emergency Radio Communications of Illinois (MERCI) 800 MHz channel. During the drill the ambulance and the medical center utilized the MERCI for initial contact. They then switched to their cell phone for the remainder of the drill to allow for the efficient use of the MERCI channel for real world activities. Within the medical center, the public address system was also utilized to inform or provide messages to staff and occupants of the medical center. The telephone system could also be used to communicate internally with the medical center staff and externally to other outside agencies.

The Medical Center personnel followed their procedures and established a secure Decontamination (Decon) Room for receipt of a contaminated injured patient. A public address system announcement was made for a Code Orange and that it was an ED drill. Medical Center personnel either notified or responding for drill activities included personnel from Security, Radiology, the Radiation Safety Officer, Hospital Administrator, Emergency Medical Services (EMS) Emergency Response Coordinator, and ED (Charge Nurse, Services Coordinator, physician, buffer zone monitor, and ancillary personnel.) The hospital radiological Decon Team was not available; attending to real world patients. Other Medical Center persons observed the drill. Through interview with the IEMA representative, it is noted that all persons assisting, along with other Medical Center and ambulance personnel had received Emergency Medical Services for Radiation Accidents training presented by IEMA on the week prior to the drill.

Medical Center personnel readied the Decon Room for patient arrival. The driveway to the Decon Room and the Decon Room itself provided an area that could be controlled with minimal need for security personnel and traffic barriers. During the exercise, yellow Caution tape was strung across the driveway as a visual barrier to control/limit vehicle

traffic. During the drill, when the ambulance arrived to off load the contaminated patient, yellow Caution tape also was strung in back of the ambulance to cordon off the vehicle from the rear until it was surveyed before release. The ambulance off loading area was protected from the weather by a fixed overhead canopy.

Two entrances into the Medical Center from the driveway were available. The main entrance into the Medical Center was through double electronically controlled doors. Inside the doors to the right was a short corridor with roll carts containing equipment. The Decon Room was located at the end of the corridor. The Decon Room had its own door leading to the driveway. The electronic doorway was not used for this drill.

Also inside the double electronically controlled doors, moving straight ahead, was another set of electronically controlled doors that opened up into the main ED. During the drill, entrance into the main part of the hospital was controlled to preventing non-essential or not approved persons from entering potentially contaminated areas. The secure corridor leading to the Decon Room was used as a buffer zone.

At 1000 hours, an IEMA Radiological Monitor (RM) dispatched (simulated) by his supervisor at the Pontiac Reception Center arrived at the Medical Center to provide survey and technical support to Medical Center personnel. The RM surveyed the Decon Room used for patient treatment and established a radiological baseline. He arrived with a metal carrying case containing survey meters, personnel dosimetry, and other support supplies such as disposable gloves. Copies of the Decontamination Center Monitoring/Action Log Form [IEMA 267 (8/05)] were available. A copy of this form was used during the drill by the ambulance IEMA RM to record patient survey information. A copy filled out with patient information was turned over to the Medical Center IEMA RM during patient transfer.

Personal dosimetry included the following: a Dosimeter Corporation of America Model 622 Direct-Reading Dosimeter with a range of 0-20 R, leak tested on April 15, 2009; a permanent reading Landauer Luminescent Dosimeter with an effective date of July 08–June 10; a Radiation Exposure Record card with space to record user information; an instruction sheet describing use and precautions for ingesting potassium iodide (KI); and a pencil grip CD V-750 Model 6 charger. Also included in the case were 14 doses of KI provided by iOSAT in 130 mg tablets individually sealed with an expiration date of June 2007. A printed card inside the kit advised the user that the KI was tested and the drug was found to be viable so the expiration date was extended. The evaluators were informed that a copy of the extension letter, which identifies the extension date as June 2008, is kept in the command vehicle located at the Reception Center from which the IEMA RM would be dispatched. A copy of the letter was obtained at the conclusion of the drill.

The IEMA RM was familiar with how to complete the Radiation Exposure Record card with name, social security number, and current date; knew how to wear the permanent Landauer Luminescent Dosimeter, check the DRD every 15-30 minutes and record readings on the record cards. He was aware of the administrative reporting limit (3 R)

and turn-back value (10 R). By monitoring his own DRDs and using radiation survey equipment, the IEMA RM at the Medical Center was aware of local conditions and could advise Medical Center personnel of changes in readings, if any. Only a very low level of exposure was expected at this facility. In addition, a permanent dosimeter supplied by the Medical Center's Nuclear Medicine Department was taped on a wall in the Decon Room and used for area exposure. It was reported that the dosimeter is exchanged following the Medical Center's Decontamination Guidelines. After this assignment, the IEMA RM could be reassigned to another location. Equipment would be checked out at the end of the mission.

According to the extent-of-play agreement negotiated with the Department of Homeland Security Federal Emergency Management Office, Region V, personal dosimetry was not issued to Medical Center staff by IEMA.

A Bicron Micro-R meter, last calibrated on May 12, 2009 and due for calibration on May 12, 2010; and a Ludlum 2241-3 digital scalar/rate meter with pancake probes last calibrated on May 12, 2009, with the next calibration due on May 12, 2010, were available. The IEMA RM conducted a system check of the Bicron survey equipment. In reality, this process would have occurred at the Pontiac Reception Center. The survey meter was checked to ensure that it contained fresh batteries. The survey meter was turned on and allowed to warm up. Instruments passed an operational battery test and a source response check prior to use by the IEMA RM. Sources were imbedded in the sides of the carrying cases used to transport the equipment. Operability check exposure rate and count rate were recorded on labels affixed on a side of the instrument (Bicron Micro-R meter was 1.1-1.8mR/hr and the Ludlum 2241-3 was 21.6-36.0 kcpm). Additional probes that were highly sensitive were available to measure small areas for contamination.

Using a Bicron Micro-R meter, a background check was done in the Decon Room shortly after the IEMA RM arrived at the hospital. A reading of 60 counts per minute was noted. This level was established as background to be used for future patient and emergency worker care. Decontamination levels established by the State of Illinois are two times background. In addition to taking background readings, the IEMA RM also spoke with the Decon Room nurses. He provided guidance on how he would perform surveys on the patient, why they would need to frequently change their gloves, decontaminations methods that could be used, that he was there to monitor radiation levels for their safety also, and that they were the persons responsible for the medical treatment of the patient, which took priority over his survey responsibilities.

All supplies needed to set up the Decon Room and perform decontamination activities were stored on carts in the Decon Room and adjacent corridor. During set up, the carts were wheeled into the foyer and opened. Yellow Caution tape and signs were obtained from one of the carts and used to visually establish control lines. Receptacles were available, placed in strategic locations, and marked for contaminated waste items. Decontamination kits with cleaning supplies, wipes, and protective clothing were placed on a supply cart in the receiving area. When set up was complete, personnel began

donning protective clothing.

In preparation to treat a contaminated patient, Medical Center ED personnel assisted each other as they each donned Personnel Protective Equipment (PPE) to include a gown, two pairs of gloves, mask, booties, and hair cover that were available on a cart. Additional PPE supplies were available from the Medical Supply Center. Other available equipment included the necessary supplies for patient decontamination: soap, moist wipes, sterile water, brushes, wraps in various sizes, and plastic bags to hold contaminated items. Individual packets with protective clothing were available for emergency response personnel.

As the Decon Room was readied for patient arrival, a Hill Rom (Hillenbrand Industry) gurney was moved into the Decon Room and covered with a sheet. A step off pad (chuck) was taped to the floor in the buffer zone just outside the doorway of the Decon Room and another was tape on the floor just outside of the door leading to the driveway.

During the drill, the buffer zone monitor stood on the outside of the Decon Room interior doorway to control movement of persons and supplies into and out of the room. I strip of yellow Caution tape was secured across the doorway to assist in identifying the buffer zone from the hot zone. The monitor recorded medical and radiation survey information gathered during patient treatment. He also maintained a list of Medical Center personnel who came in contact with the patient. All information was recorded on Medical Center forms (Radiological Accident Monitoring and Decontamination Form and Emergency Physician Record).

A communications center was located inside the main Medical Center ED. The center contained various 2-way radio units and telephones. The radios provide coordinated communication links between the Medical Center staff and personnel staffing area fire and ambulance field based units. Personnel from the ED used one of the 2-way radios to listen to and speak with an Emergency Medical Technician (EMTs) from the Duffy Ambulance Service who participated in this drill.

Slightly after 1110 hours, the Medical Center ED staff received a call from the Duffy Ambulance Emergency Medical Services team, over a 2-way radio, that they were in route to the Medical Center with a contaminated patient. The following patient information was given: exposed to radiation on the left hand, left shoulder, right foot, and right cheek; injury to the right arm; alert and oriented; shortness of breath with asthma and anxiety; respirations 23; pulse 110; blood pressure 125/70; allergic to Tylenol, Motrin, and Codeine; and estimated time of arrival three-four minutes. After receiving the call and logging this information, the Medical Center ED nurse briefed the Decon Room medical team on the medical and radiological conditions of the incoming patient.

At 1216 hours, the ambulance arrived at the Medical Center. The ambulance pulled up to the electronic double doors and the patient was unloaded from the ambulance.

Patient transfer occurred inside the established vehicle corridor then moved into the Decon Room. The patient was mummy wrapped in a sheet to prevent the spread of contamination. A clean Medical Center gurney, draped in double sheets, was placed next to the ambulance gurney and the patient was transferred. Care was taken by Medical Center and ambulance personnel during patient transfer so as not to spread contamination. Once transferred, a quick assessment of the patient's medical condition was conducted to determine if the injuries were life threatening. The patient's injuries were not considered life threatening.

Concurrent with the medical assessment, the ambulance IEMA RM, assisting with the patient at the simulated Reception Center and in the ambulance, provided verbal and written format [form: IEMA 267 (8/05)] information to the IEMA RM at the Medical Center. The patient's survey information indicated that contamination occurred as follows: left forehead at hairline 1600 cpm, left palm 3000 cpm, left pant knee 1500 cpm, left pant cuff 2000 cpm, left shoe 3000 cpm, right shoe 3000 cpm, right pant cuff 2000 cpm, right pant leg at knee 1500 cpm, right palm 3000 cpm and right forearm 1200 cpm. The patient's shoes had booties placed over them to control the spread of contamination. The Medical Center staff received a briefing from the EMTs. The briefing covered the information relayed on the incoming call, and reiterated that the patient was contaminated.

The patient was rolled into the Decon Room with the medical team accompanying the patient. The buffer zone monitor staffed a station just outside of the Decon Room in the clean entryway. After the patient was moved into the Decon Room, the corridor was monitored to ensure that the area was clean for receiving additional patients, if needed, or clean for persons exiting the Decon Room.

Upon entering the Decon Room, a through physical assessment of the patient's injuries and medical condition were conducted. Priority was given to ensuring that the patient was medically stable and the injury was treated prior to treatment for the exposure to radiation. The patient was unwrapped from the mummy wrappings. Care was given to rolling the outside of the sheet to the inside to contain any contamination that was present.

Medical treatment was administered. The medical team removed the neck brace and head pads used to stabilize the patient. These were surveyed by the IEMA RM and considered clean. The examination for neck and head for injuries resulted in no injuries found. The medical team cut off the sling used to stabilize the injured arm. A survey registered it as contaminated. It was secured in a hazardous material bag within the Decon Room. The injury site was viewed and the patient questioned for the location and level of pain. There was no visible break or dislocation of the limb. There was no visible lacerations or bleeding. The area was simulated as being swollen and bruised. The patient complained of stiffness and moderate pain. The IEMA RM surveyed the hands of the attending medical staff after the examination of the injured arm and contaminated gloves were removed and bagged. New, clean gloves were donned.

After the medical assessment was conducted, the IEMA RM conducted a survey of the patient. The following radiation readings were encountered and recorded: Forehead at hairline 1600 cpm; right palm 3000 cpm; right injured forearm 1200 cpm; right pant knee 1500 cpm; left palm 1200 cpm; left pant knee 1500 cpm; left pant cuff 2000 cpm. The shoes were covered with booties. The shoes were removed and bagged. The feet were surveyed and were clear of contamination. The clothing was cut and removed using proper techniques to control the spread of contamination. The removed clothing was placed in a contamination control bag. The IEMA RM surveyed the bag for contamination; bag read 1300 cpm. This bag was taken to the buffer zone monitor and properly double bagged. Again the IEMA RM surveyed the exterior of the second bag and found it to be clear of contamination. The bag was labeled by the buffer zone monitor and processed for proper disposal. Medical staff was monitored by the IEMA RM contaminated gloves were removed and clean gloves donned.

Throughout the Medical Center portion of the drill, monitoring of the patient was conducted in a low radiation background area. The patient was examined using a Ludlum Model 2241-3 survey instrument equipped with a pancake probe, speaker and set-able alarm. The monitoring techniques used were slow and methodical, with proper positioning of the probe for personnel monitoring. As monitoring occurred, contamination readings found on the patient were verbally given to the buffer zone monitor, who recorded the information on the Medical Center's Radiological Accident Monitoring and Decontamination Form.

The IEMA RM effectively decontaminated all areas. Using duct tape, the palms were decontaminated, resurveyed and found to be clean on the first attempt. The forehead was decontaminated first using tape and then with sterile water washes using surgical sponges; first attempt read 800 cpm; second attempt 40 cpm. The injured arm was decontaminated using first using tape and then a sterile water wash, using several surgical sponges; first attempt read 1000 cpm, second attempt 45 cpm. Each used sponge was placed in a label hazardous waste bag after use and the area re-surveyed to determine the contamination level. The third wash attempts resulted in successful decontamination.

All supplies used during treatment were properly disposed of in a container marked with a hazardous waste sign. As a precautionary measure, the injury site was re-surveyed to ensure that it had not become contaminated. Periodically during the decontamination process, individual nurses would request that the IEMA RM survey their gloved hands to ensure that they were not spreading contamination, reinforcing their knowledge and awareness of radiological contamination control.

The IEMA RM performed a complete survey of the patient and the gurney (wheels/bottom/sides) to ensure that it was clean. The patient was cocooned with clean sheets and was wheeled into the corridor for a final medical assessment by the ER physician. This process was carried out slowly and methodically as the medical staff and the IEMA RM wanted to ensure that no contamination haphazardly was overlooked.

For demonstration purposes, the IEMA RM performed a survey of one Decon Room nurse as she exited the Decon Room. The nurse started out by removing the outer gloves on both hands, rolling the outside of the glove to the inside during removal and then putting the gloves into a hazmat waste container. The hands were surveyed and found clean. The face mask and hair covering were removed. The nurse removed her gown; rolling the outside to the inside, and put the gown in the hazmat container.

The IEMA RM performed a slow and methodical full body survey with the probe held about one-half to one inch away from the survey area. This was the same technique used for all survey attempts conducted during the drill. The survey started at the top of the head and moved down the right and backside of the torso. The inside of the right thigh and calf were surveyed. The IEMA RM proceeded to the inside of the left thigh and calf and then up the left and backside of the torso. The nurse then faced the IEMA RM and the same process was used to survey the front of the torso. The nurse then faced to exit the Decon Room. The IEMA RM surveyed the upper portion of the doorway to determine a clean area for the nurse to have a handhold while the booties and shoes were surveyed. The IEMA RM instructed the nurse to remove the left bootie. After this occurred, the nurse's left foot was surveyed. It was found clean and the nurse stepped out of the Decon Room onto a clean step off pad. This process was repeated with the other foot. Finally, the nurse was told to take off the final pair of gloves.

The IEMA RM stated that he would follow the same procedures to clear and release the rest of the medical team from the Decon Room. All hazardous wastes would be double bagged, labeled, sealed and properly processed for disposal. Afterwards, he would survey the Decon Room for contamination, paying attention to the door jam and used equipment (gurney, backboard, scissors, stethoscope, etc). A sweep of the floor, following a grid pattern would be used to clear the Decon Room. If contamination was found at any spot, a surface wipe would be done at the location and the area would be resurveyed. If an area could not be decontaminated, the Decon Room would be closed off until more thorough decontamination efforts could be performed. The IEMA RM would provide advice on waste disposal that would be provided to him from State or IEMA officials.

The medical center's Radiological Supervisor was interviewed to determine what action would be taken if there was a need to obtain technical assistance with the handling of radioactive contamination and contaminated patient care. The Supervisor advised that if IEMA and State Radiological Emergency Assistance Center (REAC) could not provide the information that the Radiological Emergency Assistance Center/Training Site (REAC/TS) located in Oak Ridge, Tennessee, would be contacted. The contact information was identified as being available on the REAC/TS Radiation Patient Treatment poster located on the wall outside of the Decon Room.

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

Medical Services (MS-1) Hospital – Saint James Hospital

a. MET: 1.d.1, 1.e.1, 3.a.1, 6.d.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. NOT DEMONSTRATED: None
e. PRIOR ISSUES - RESOLVED: None
f. PRIOR ISSUES - UNRESOLVED: None

APPENDIX 1

DRILL EVALUATORS AND TEAM LEADERS

DATE: 2009-07-14, SITE: Dresden Nuclear Power Station, IL

LOCATION	EVALUATOR	AGENCY
Medical Services (MS-1) Transportation - Duffy Ambulance Service	Clinton Crackel	DHS/FEMA
Medical Services (MS-1) Hospital - Saint James Hospital	*William Sulinckas	DHS/FEMA

* Team Leader

APPENDIX 2

DRILL EVALUATION AREAS AND EXTENT OF PLAY AGREEMENT

OFFSITE MEDICAL DRILL

OSF ST. JAMES MEDICAL CENTER

PONTIAC, ILLINOIS

JULY 14, 2009
Start time: 9:00 a.m.

EXTENT OF PLAY AGREEMENT
FOR THE
MEDICAL SERVICES EXERCISE
July 14, 2009

Location: OSF St. James Medical Center **Transportation Provider**: Duffy Ambulance
2500 West Reynolds
Pontiac, IL 61764

Participants:
Victim (volunteer)
Lead Controller: (IEMA)
IEMA ER Monitor: Ed Stagen
IEMA Hospital Controller Kathy Allen
IEMA Ambulance Monitor: Kelly Grahn
IEMA Ambulance Controller: Joni Estabrook

Criteria that can be re-demonstrated immediately for credit, at the discretion of the evaluator, include the following: For Transportation: 1.d.1, 3.a.1 and 6.d.1; for the Hospital, 1.d.1, 1.e.1, 3.a.1 and 6.d.1. Criteria may be re-demonstrated, as agreed by the Lead Controller and FEMA Evaluators.

EVALUATION AREA 1 - EMERGENCY OPERATIONS MANAGEMENT

Criterion 1.d.1: At least two communication systems are available, at least one operates properly, and communication links are established and maintained with appropriate locations. Communications capabilities are managed in support of emergency operations.

The Duffy Ambulance will use 2-way radios to communicate with OSF St. James. Other communication systems that can be used include commercial telephone or cell phones.

Criterion 1.e.1: Equipment, maps, displays, dosimetry, potassium iodide (KI) and other supplies are sufficient to support emergency operations.

OSF St. James will adequately demonstrate the ability to support operations, with adequate resources. The availability of dosimetry and KI for hospital personnel will **not** be demonstrated during this exercise, however IEMA staff will be issued dosimetry and KI as field team members.

EVALUATION AREA 3 - PROTECTIVE ACTION IMPLEMENTATION

Criterion 3.a.1: The OROs issue appropriate dosimetry and procedures, and manage radiological exposure to emergency workers in accordance with the plan and procedures. Emergency workers periodically and at the end of each mission read their dosimeters and record the readings on the appropriate exposure record or chart.

The use of dosimetry and KI will not be demonstrated by hospital staff. IEMA staff will demonstrate appropriate use of dosimetry and KI.

For purposes of this exercise, if there is no medical need to bring equipment into and out of the treatment room, nasal swabs will be taken (swabs to be taken outside the nose to simulate taking swabs inside the nose) and passed out of the room to demonstrate movement of equipment and supplies into and out of the controlled area.

EVALUATION AREA 6.d – TRANSPORTATION AND TREATMENT OF CONTAMINATED INJURED INDIVIDUALS

Criterion 6.d.1: The facility/ORO has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination, and medical services to contaminated injured individuals.

Duffy Ambulance will demonstrate the capability to transport contaminated, injured individuals to OSF St. James in Pontiac, Illinois. The ambulance crew will pick up a contaminated injured patient near the grounds of OSF St. James (simulating pick-up of a patient from Pontiac High School Reception Center). The ambulance crew will be met by IEMA staff that will perform initial radiation monitoring, and will provide information regarding contamination levels on the patient. Duffy Ambulance will utilize universal precautions and good housekeeping practices to minimize the spread of contamination, and will focus on treating the patient's medical condition.

Duffy Ambulance will call in the information regarding the patient to OSF St. James in Pontiac so they can prepare for receipt of a contaminated patient. IEMA personnel will accompany the patient to the hospital along with the ambulance, bringing instrumentation to provide radiation readings and guidance to the hospital.

OSF St. James will implement their plan for receipt, isolation and treatment of an injured contaminated patient. Medical personnel will utilize universal precautions and good housekeeping practices to minimize the spread of contamination, and will focus on treating the patient's medical condition. Simple decontamination efforts will be demonstrated after the patient has been medically stabilized. The hospital will demonstrate procedures for limiting exposure to hospital staff, decontaminating a patient, and restricting access to the area where the patient is being treated and monitored. IEMA personnel will discuss the need to take additional samples for further radiological analysis. Hospital personnel will demonstrate their knowledge of who to call beyond IEMA for assistance in Radiological Accidents, e.g., REAC/TS.

For purposes of this exercise, another IEMA staff member will be dispatched to OSF St. James with radiation detection and measurement equipment in advance of the ambulance arriving. The purpose of having two separate individuals for this exercise is to facilitate monitoring the ambulance and ambulance personnel so they are not kept out of service for an extended period of time.

The drill will conclude with the hospital representative and IEMA personnel supervising the removal of protective clothing and surveying of the emergency room and hospital personnel.

IEMA will also advise on the proper procedure for release or disposal of contaminated material.

Following the conclusion of the drill, a short critique will be held.