



Dresden Nuclear Power Station

After Action Report/ Improvement Plan

Drill Date - August 10, 2010

Radiological Emergency Preparedness (REP) Program



FEMA

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EXECUTIVE SUMMARY

On August 10, 2010, the U.S. Department of Homeland Security's (DHS) Federal Emergency Management Agency (FEMA), Region V, evaluated a Medical Services Drill in the 10-mile plume exposure pathway Emergency Planning Zone (EPZ) around the Dresden Nuclear Power Station. The purpose of the Medical Services 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 Services 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 Illinois Emergency Management Agency, Dresden Nuclear Power Station, Bolingbrook Fire Department, and Adventist Bolingbrook Hospital who participated in the Medical Services Drill.

The following criteria, which are 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, were evaluated during the Medical Services Drill.

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.

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

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

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

The County and local organizations demonstrated knowledge of and adequately implemented organizational emergency response plans and procedures.

There were no Deficiencies identified as a result of this drill. There were no Areas Requiring Corrective Action (ARCAs) identified during this drill. There were no previous Deficiencies or ARCAs to be corrected during this drill.

INTRODUCTION - EXERCISE BASIS

On December 7, 1979, the President directed FEMA to assume the lead responsibility for all offsite nuclear planning and response. DHS/FEMA activities are conducted pursuant to Title 44 Code of Federal Regulations (CFR) Parts 350, 351 and 352. These regulations are a key element in the Radiological Emergency Preparedness (REP) Program that was established following the Three Mile Island Nuclear Station accident in March 1979.

The FEMA Title 44 CFR 350 establishes the policies and procedures for DHS/FEMA initial and continued approval of State and local governments' radiological emergency planning and preparedness for commercial nuclear power plants. This approval is contingent, in part, on State and local governments' participation in joint exercises with licensees.

DHS/FEMA responsibilities in radiological emergency planning for fixed nuclear facilities include the following:

- Taking the lead in offsite emergency planning and in the review and evaluation of RERPs and procedures developed by State and local governments;
- Determining whether such plans and procedures can be implemented on the basis of observation and evaluation of exercises of the plans and procedures conducted by State and local governments;
- Responding to requests by the U.S. Nuclear Regulatory Commission (NRC) pursuant to the Memorandum of Understanding between the NRC and FEMA dated June 17, 1993 (Federal Register, Vol. 58, No. 176, September 14, 1993); and

• Coordinating the activities of Federal agencies with responsibilities in the radiological emergency planning process:

- U.S. Nuclear Regulatory Commission,
- U.S. Environmental Protection Agency,
- U.S. Department of Energy,
- U.S. Department of Health and Human Services,
- U.S. Department of Transportation,
- U.S. Department of Agriculture,
- U.S. Department of the Interior,
- U.S. Food and Drug Administration

Representatives of these agencies serve on the DHS/FEMA Regional Assistance Committee (RAC), which is chaired by DHS/FEMA.

Formal submission of the RERPs for the Dresden Nuclear Power Station to FEMA Region V Office by the State of Illinois and involved local jurisdictions occurred March 31, 1981. Formal approval of the RERP for the State of Illinois was granted by FEMA on October 14, 1982, under 44 CFR 350.

A Medical Services Drill (MS-1) was conducted on August 10, 2010, by DHS/FEMA to assess the capabilities of State and local emergency preparedness organizations in implementing their RERPs and procedures to protect the public health and safety during a radiological emergency involving the Dresden Nuclear Power Station. The purpose of this report is to present the drill results and findings on the performance of the Offsite Response Organizations (OROs) during a simulated radiological emergency.

The findings presented in this report are based on the evaluations of the Federal Evaluation Team, with final determinations made by the DHS/FEMA Region V RAC Chairman, and approved by DHS/FEMA Headquarters.

The criteria utilized in the DHS/FEMA evaluation process are contained in:

- NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear

Power Plants," November 1980;

- FEMA-REP-14, "Radiological Emergency Preparedness Exercise Manual," September 1991; and
- FEMA "Radiological Emergency Preparedness: Exercise Evaluation Methodology," as published in the Federal Register Notice/Vol. 67, No. 80, dated April 25, 2002.

Section 1 of this report, entitled "Exercise Overview," presents basic information and data relevant to the exercise. This section of the report contains a description of the plume pathway EPZ, and a listing of all participating jurisdictions and functional entities that were evaluated.

Section 3 of this report, entitled "Analysis of Capabilities," presents detailed information on the demonstration of applicable drill criteria at each jurisdiction or functional entity evaluated in a jurisdiction-based, issues-only format. This section also contains: (1) descriptions of all Deficiencies and ARCAs assessed during this exercise, recommended corrective actions, and (2) descriptions of resolved ARCAs assessed during previous drills and the status of the OROs efforts to resolve them.

SECTION 1: EXERCISE OVERVIEW

1.1 Exercise Details

Exercise Name

Dresden Nuclear Power Station

Type of Exercise

Drill

Exercise Date

August 10, 2010

Program

Department of Homeland Security/FEMA Radiological Emergency Preparedness Program

Scenario Type

Radiological Emergency

1.2 Exercise Planning Team Leadership

William King

Exercise Radiological Assistance Committee Chairperson

DHS/FEMA

Radiological Assistance Committee, Chairperson

536 South Clark Street

Chicago, Illinois, 60605

312-408-5575

William.King@dhs.gov

Dwaine Warren

Exercise Director

DHS/FEMA

Supervisory REP Team Leader

536 South Clark Street

Chicago, Illinois, 60605
312-408-5342
Dwayne.Warren@dhs.gov

Deborah Fulk
Site Specialist
DHS/FEMA
Technological Hazards Program Specialist
536 South Clark Street
Chicago, Illinois, 60605
312-408-5547
Deborah.Fulk@dhs.gov

Joni Estabrook
State Controller
Illinois Emergency Management Agency
Nuclear Safety Sr. Emergency Response Coordinator
1035 Outer Park Drive
Springfield, Illinois, 62704
217-524-0888
Joni.Estabrook@illinois.gov

Kathy Allen
State Controller
Illinois Emergency Management Agency
Manager, HazMat Section
1035 Outer Drive
Springfield, Illinois, 62704
217-524-0888
Kathy.Allen@illinois.gov

1.3 Participating Organizations

Agencies and organizations of the following jurisdictions participated in the Dresden Nuclear Power Station drill:

State Jurisdictions

Illinois Emergency Management Agency

Adventist Bolingbrook Hospital

Bolingbrook Fire Department

SECTION 2: EXERCISE DESIGN SUMMARY

2.1 Exercise Purpose and Design

On August 10, 2010, the DHS/FEMA Region V Office evaluated a Medical Services (MS-1) Drill for the Dresden Nuclear Power Station. The purpose of the MS-1 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 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.

2.2 Exercise Objectives, Capabilities and Activities

Exercise objectives and identified Capabilities/REP Criteria selected to be demonstrated are discussed in Appendix B "Exercise Plan".

2.3 Scenario Summary

Appendix C "Injects and Summary", contains a summary of the Exercise Scenario, a simulated sequence of events that was used as a basis for invoking emergency response actions by Offsite Response Organizations (OROs) in the MS-1 Drill.

During the exercise, controllers from the State of Illinois provided "inject messages" containing scenario events and/or relevant data to those persons or locations who would normally receive notification of such events. These inject messages were the method used for invoking additional specific response actions by OROs.

SECTION 3: ANALYSIS OF CAPABILITIES

3.1 Drill Evaluation and Results

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities that participated in the August 10, 2010, Medical Services (MS-1) Drill conducted to test the offsite emergency response capabilities of State and local governments in the EPZ surrounding the Dresden Nuclear Power Station.

Each jurisdiction and functional entity was evaluated based on its demonstration of exercise criteria delineated in Federal Register Notice: Vol. 67, No. 80, dated April 25, 2002. Detailed information on the exercise criteria and the extent-of-play agreements used in this exercise are found in Appendix B "Exercise Plan" of this report.

3.2 Summary Results of Drill Evaluation

The matrix presented in Table 3.1, on the following page(s) presents the status of all exercise criteria from Federal Register Notice Vol 67, No. 80, dated April 25, 2002, which were scheduled for demonstration during this drill by all participating jurisdictions and functional entities. Exercise criteria are listed by number and the demonstration status of those criteria is indicated by the use of the following letters.

- M – Met (No Deficiency or ARCAs)
- D – Deficiency assessed
- A – ARCA(s) assessed or unresolved ARCA(s) from prior exercise(s)
- N – Not Demonstrated
- Blank - Not scheduled for demonstration

Table 3.1.- Summary of Drill Evaluation

		MS-1 H - Adventist Bolingbrook Med Cntr	MS-1 T - Bolingbrook FD
DATE: 2010-08-10 SITE: Dresden Nuclear Power Station, IL M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated			
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 Assess/Decision making concerning Relocation, Reentry, and Return	2e1		
Protective Action Implementation			
Implementation of emergency worker exposure control	3a1	M	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 evacuees and emergency workers, and registration of evacuees	6a1		

Mon / decon of emergency worker equipment	6b1		
Temporary care of evacuees	6c1		
Transportation and treatment of contaminated injured individuals	6d1	M	M

3.3 Criteria Evaluation Summaries

3.3.1 Illinois Jurisdictions

3.3.1.1 Medical Services (MS-1) Hospital - Adventist Bolingbrook Medical Center

Criterion 1.d.1:

Successfully demonstrated - this criterion narrative is contained in the Criterion 6.d.1 section.

Criterion 1.e.1:

Successfully demonstrated - this criterion narrative is contained in the Criterion 6.d.1 section.

Criterion 3.a.1:

Successfully demonstrated - this criterion narrative is contained in the Criterion 6.d.1 section.

Criterion 6.d.1:

During the medical facility portion of the drill, Adventist Bolingbrook Hospital successfully demonstrated the capability to provide appropriate space, adequate resources, and trained personnel for monitoring, decontaminating, and provide medical services to contaminated injured individuals. The demonstration was conducted on August 10, 2010, in the Radiological Emergency Area (REA) of the hospital, which is located at 500 Remington Boulevard, Bolingbrook, Illinois. The REA for this drill consisted of a dedicated Contaminated Patient Room, a cordoned-off section of the Ambulance Bay immediately outside the Contaminated Patient Room and Emergency Room (ER) wing of the hospital, and the Buffer Zone located at the doorway leading from the Contaminated Patient Room to the ER area. The Contaminated Patient Room had a dedicated access door to the Ambulance Bay area separate from the main entrance to the ER. This arrangement ensured that radiologically contaminated patients would be segregated from the general hospital population until decontaminated.

The hospital has several modes of communications available, including a CarePoint Radio Workstation (Model PT1700M), which served as the primary system, and two levels of backup systems: a Medical Emergency Radio Communications of Illinois (MERCIC) radio and a Motorola StarCom radio operating on the State-wide 800 MHz band. The Care Point system had two dedicated lines, one for cellular communications, the other for landline communications, and provided the designated Emergency Communications Registered Nurse (ECRN) telephone used

to receive in-route notifications concerning the transport of radiologically contaminated and injured patients to the hospital. The MERCI system had two channels, one for hospital communications, and the other for the State all-call band. The StarCom system has numerous talk group and data transmission capabilities that could be used in the event that cellular and landline communications were down. At 1400 hours, the ECRN used the CarePoint system telephone to receive transport notification during this MS-1 Drill. Numerous desktop computers with internet and e-mail capabilities, including medical reporting via the Illinois Department of Public Health internet site, and a red telephone dedicated to making outside calls in the event of a loss of emergency backup power, were available in the ER's ECRN Communications area. The ambulance crew provided an estimated time of arrival to the ECRN that compressed the real time that a real world event would involve. The compression was an artificiality created to expedite the drill.

In accordance with the extent-of-play agreement, only the Radiation Safety Officer (RSO) was required to have dosimetry; the other REA staff are not required have any dosimetry. Dosimetry used by the hospital's RSO/nuclear medicine Technologist consisted of a Landauer Luxel Optically Stimulated Luminescent Dosimeter (OSLD) with change out date of August 31, 2010, and Ludlum Model 14C handheld survey instrument, with change out date of August 14, 2010, and equipped with a Ludlum Model 44-9 pancake GM detector. The Ludlum Model 14C has five scales, four of which (X0.1, X1, X10 and X100) are for use with the external detector and measure primarily gamma emission counts per minute (cpm). The fifth (X1000) scale is applicable only for measuring exposure rate in R/hr. Using X0.1, X1, X10 and X100 scales, the Ludlum 14C instrument has a range of 0-660,000 cpm (equivalent to 0-200 mR/hr). The survey instrument was calibrated on August 14, 2009 and is due for re-calibration on August 14, 2010. The dosimetry and associated logs are maintained by the hospital's Nuclear Medicine Department (NMD). The OSLDs worn by the department's staff are changed out monthly and sent to Landauer for reading. The results are reported back to the NMD, which maintains permanent individualized cumulative radiation exposure logs.

The Hospital's Radiation Safety Officer (RSO) operationally checked his survey instrument at the beginning of the MS-1 Drill using a 1 μ Ci Cs-137 check source mounted on the side of the instrument prior to placing the instrument in service. According to the RSO, this source has a 30-year half-life, was placed in service in May 2007, and had an activity of approximately 5 mR/hr on the X10 scale, with the probe held against the source. The source was mounted on the right side of the instrument canister body. The activity was within the range of 4-6 mR/hr

acceptable for the check. The hospital does not currently have a backup instrument but has approved the purchase of an additional instrument. In the event that the current instrument failed, the RSO would request an identical instrument from one of the Adventist sister hospitals in the area. According to the RSO, the loaned instruments could be obtained in 20-40 minutes. The RSO also stated that other instruments could be obtained from nearby Edward's Hospital and from IEMA.

At 1400 hours, the hospital was contacted by a Bolingbrook Fire Department EMS unit via the CarePoint ERCN telephone to notify the hospital that they were in route with an injured contaminated patient. The ambulance crew provided information concerning the patient's condition, including vital signs, injuries, possible contamination status, and Estimated Time of Arrival (ETA) (five minutes). The duty nurse recorded information concerning the patient's blood pressure (BP) of 130/100, pulse of 110 and respirations of 16. The call was completed at 1401 hours, and the ERC Nurse promptly announce a Code Orange over the hospital's Public Address (PA) system. This announcement signaled the ER and other hospital staff to prepare for receiving contaminated casualties. The ER Manager immediately instructed the REA staff to set up of the REA.

The REA staff consisted of the a Buffer Zone Nurse, REA Checklist Nurse who served as the REA Recorder, three Nurses who handled and decontaminated the patient, transferred samples and relayed patient evaluation information to the Buffer Zone nurse and assisted in patient handling and movement, and the RSO, who monitored the REA Staff, patient and items used in and leaving the REA. A physician was present in the ER and was on-call to direct medical treatment of the patient, if needed.

The REA setup consisted of removing a regular waste receptacle and replacing the type of waste bag, two metal cabinets containing REA supplies, which had wheels for easy movement, positioning the cabinets in the ER hallway immediately outside the Contaminated Patient Room, laying down a Buffer Zone Step-off Pad, posting a Radiation Emergency Response (RER) Incident Checklist on the ER hallway wall immediately outside the Contaminated Patient Room above the Buffer Zone Step-off Pad, rolling-in two waste carts fitted with heavy-duty red plastic hazardous waste bags, donning Personal Protective Equipment (PPE), and establishing, security, barriers and a transfer zone in the Ambulance Bay immediately outside the Contaminated Patient Room.

Equipment and supplies for use in the REA were stored in the two metal cabinets, including boxes of disposable Personal Protective Equipment (PPE), which included: yellow tie-behind gowns, surgical gloves, surgical head covers, surgical shoe covers, surgical masks with face shields, and tape. The Contaminated Patient Room was also equipped with two rolling plastic waste containers fitted with red plastic liners for collecting contaminated waste, PPE, patient clothing, barrier tape for marking off the REA, Step-off Pads for preventing the spread of contamination beyond the REA, and any other materials that may become contaminated during handling and treatment of patients. The REA staff had access to the hospital's Standard Operating Procedures (SOPs) and administrative supplies including recording forms. The SOPs addressed biohazards and hazardous materials contamination but does not specifically the handling of patients who are contaminated with radiological materials.

The Contaminated Patient Room had a fixed floor-mounted shower station that could be used to remove substantial contamination. The room also had a fixed floor drain that would be covered with duct tape to prevent shower discharge from entering the hospital's public sewer system. The hospital does not have a holding tank for contaminated liquid wastes, and the hospital currently has no means of containing the shower discharge but is currently reviewing containment options, including the use of a portable pool and other barrier options. Bedding and towels would be used as a stop-gap measure to soak-up waste water and prevent the spread of contamination outside the room. All waste generated by the hospital would be stored in an isolated section of the hospital until natural decay reduced contamination levels to the background level of 30 cpm. The hospital does not have a standing contract for radiological waste disposal and would work with IEMA and the Utility to secure such services, if needed.

A laminated Radiation Emergency Response (RER) Incident Checklist was posted on the ER hallway wall immediately outside the Contaminated Patient Room in the Buffer Zone above the Step-off Pad. The checklist provided blocks of events, actions and check-offs, including Notification, REA Preparation, Patient Arrival, Patient Care & Assessment, Sample Collection, Patient Decontamination, Patient Exit, and REA Return to Service. In addition, the checklist contained conspicuous blocks with telephone numbers for IEMA and the 24-hours Emergency Service for the U.S. Department of Energy's REAC/TS located at Oak Ridge National Laboratory, in Tennessee. An erasable marker was used to record incident information on the checklist. The later number provided access to technical assistance regarding patient decontamination. The REA Checklist Nurse was responsible for completing the checklist and used an erasable marker to record information provided by the ERCN and REA staff.

The Buffer Zone Step-off Pad consisted of a large padded surgical drape that was taped to the floor on the ER side of the Contaminated Patient Room Exit Door.

At approximately 1401 hours, the Bolingbrook Fire Department Ambulance arrived outside the entrance to the REA. The patient was transferred from the ambulance gurney to the hospital's Stryker gurney at about 1415 hours for decontamination and treatment. The patient was fully cocooned in a sheet on arrival that was transferred with the patient from the ambulance gurney to the hospital's Stryker gurney, which was also covered with one sheet prior to the transfer. The ambulance crew briefed the REA staff regarding the patient's condition and relinquished care, custody and control to the REA staff at about 1415 hours.

The Ambulance Bay entrance to the Contaminated Patient Room served as the demarcation for the transfer and compliance with the hospital's radiation safety protocols. The ambulance crew quickly provided verbally-delivered information to the REA Staff concerning the patient's medical and contamination status, with hard copy information to follow. The patient was conscious, alert and oriented, and able to communicate verbally with the REA staff. She reported pain in her left arm and left hip. The patient's vital signs were immediately recorded on the hospital's admitting form, as follows: BP 130/100; pulse 110 per minute; respirations 16 per minute; skin color normal; pupils reactive. The patient was queried about allergies to medications and reported that she was allergic to penicillin and vicodin. This information was consistent with the information provided by the ambulance crew. Other information, such as name, age, and medications used, was also collected.

The injuries suffered by the patient in this MS-1 Drill were determined by the REA staff to be non-critical, and, consequently, the ER physician was not called to the REA. The staff determined that decontamination took precedence over observed injuries. The REA staff recognized that more serious injuries could reverse the priorities.

While the REA staff evaluated the patient's medical condition, the RSO then carefully surveyed the patient to determine whether there were any areas of contamination. He systematically performed the survey on the patient's front side starting with the head and neck and working from there to the shoulder, upper chest and left and right arms, and then from there to the lower chest, abdomen, groin/hips, left leg, right leg, and finally to the left foot and right foot.

The Buffer Zone Nurse/Checklist Recorder, three Decontamination Nurses, and the RSO were dressed-out in the following PPE: a yellow, tie-behind, paper surgical gown, two pairs of surgical gloves, surgical shoe covers, surgical caps, and combination surgical masks with plastic face shields. A buddy-system team approach to dispensing PPE, tying the gowns and providing assistance and was used to speed the donning process.

The Buffer Zone Nurse/Recorder was not equipped with body diagram forms to help track the decontamination process and location(s) and type(s) of injuries. The IEMA Controller was equipped with body diagram forms that were used to inject contamination levels during the drill. While such forms are currently not part of the hospital's radiation emergency plan and are not required, their use is a good practice that could help expedite the decontamination and treatment process, minimize recording errors, and provide a permanent record to include in each patient's chart. The wall-mounted checklist is designed to be reusable and, therefore, does not provide a permanent record. The Evaluator requested and was granted permission to photographically record the checklist information. IEMA staff did likewise.

One simulated nasal swab was also collected in accordance with the extent-of-play agreement by swabbing the outer left nostril. The swab was placed in a clear plastic tube that was sealed and then surveyed by the RSO and determined to be at background. The tube was then carefully transferred by one of the REA nurses into a clean, properly labeled zip-lock plastic bag held by the Buffer Zone Nurse. At no time did the Buffer Zone nurse make direct contact with the nasal swab tube or the REA nurse; thus avoiding cross-contamination. The Buffer Zone nurse would then have sent the sample to the Nuclear Medicine Department for analysis to confirm the RSO's results. The REA nurses who collected and handled the sample and sample tube changed-out their outer gloves immediately after the transfer to the Buffer Zone nurse.

The removal of the patient's outer clothing was simulated, except for the shoes, which were actually removed and separately surveyed. The RSO was at first a little hasty in how quickly he moved the monitoring probe (sometimes exceeding the recommended 1-inch per second) and the distance from the patient's body (sometimes exceeded the recommended ½-inch from the surface being monitored). The IEMA Controller advised the RSO regarding technique, and from that point forward speed and distance were exemplary. Upon completion of the patient's evaluation, the REA staff quickly determined that the patient's injuries were non-critical and that decontamination should take precedence. The REA staff in the Contaminated Patient Room also promptly changed-out their outer surgical gloves and donned a fresh set.

The initial radiation monitoring revealed the following levels of contamination: Left Hand – 1200 cpm; Left Wrist – 800 cpm; Left Palm – 1200 cpm; Left Stomach/Hip area – 2000 cpm; and Right Hand – 3000 cpm. All other body areas did not exceed the background radiation threshold. After the simulated removal of outer clothing and actual removal of shoes, the stomach/hip area and feet were determined to not exceed the background radiation threshold. Clothing and shoes were bagged as contaminated waste.

The RSO advised the nursing staff to start decontamination with the highest areas of contamination and progressively work towards the lowest areas of contamination. In accordance with the RSO's guidance, the following body areas were selected for demonstrating decontamination technique: Right Hand (3000 cpm); Left Palm (1200 cpm); and Left Wrist (800 cpm). The Stomach/Hip area was not selected because the simulated removal of outer clothing eliminated this area as a source of contamination.

The method used for decontaminating the patient consisted of placing a padded surgical drape under the contaminated area and using a 4-inch by 4-inch gauze pad to which a small amount of saline solution was applied from a plastic bottle to gently swab the contaminated area. Care was taken not to rub the skin too aggressively, thus minimizing the potential for driving contamination deeper into the skin where it might become more difficult to remove or enter the circulatory system.

The gauze pads were used only once at each contaminated location and then disposed in the designated waste receptacle. After each decontamination attempt, the RSO re-monitored the body area to determine whether residual contamination remained. The hospital's average background reading of 30 cpm, which had previously been established by the Nuclear Medicine staff, was used as the threshold for adequate decontamination. Once an area was determined to be sufficiently decontaminated, the surgical drape was also disposed as waste in the appropriate receptacle. A sufficient amount of surgical drapes, pads and saline solution were available in the REA to handle foreseeable amounts of contamination, and additional supplies were readily available in the ER, if needed. The Radiation Emergency Response (RER) posted in the Buffer Zone was used to track the decontamination process.

Initially, the REA staff performed a change-out of outer gloves after each decontamination attempt in an effort to demonstrate their concern for potential cross-contamination. Midway

through the patient's decontamination, the IEMA Controller recommended to the REA staff that the RSO survey their outer gloves (palm-sides and backs) to determine whether they had become contaminated. This recommendation was made to minimize waste materials and expedite the decontamination process. From that point forward, the REA staff generally had their hands surveyed before deciding whether to change-out their gloves. The staff was very conscious of the need to control cross-contamination throughout the drill and very conscientious about glove change-outs.

In accordance with the extent-of-play agreement, only one decontamination attempt was needed to reduce survey instrument readings to the background decontamination threshold. The Evaluator queried the REA staff regarding what they would do if the initial attempt failed the 30 cpm threshold test. They replied that they would make additional attempts, but if they were unsuccessful at reducing contamination to this level, they would call IEMA for guidance (if an IEMA Liaison was not already on scene) and/or contact REAC/TS at Oak Ridge National Laboratory at the telephone numbers shown on the RER Incident Checklist.

Upon completion of the medical and radiological evaluation, the patient was determined to be cleared to exit the REA and be transferred to the ER for further evaluation. The patient was able to walk up to the Step-off Pad and was re-monitored prior to being permitted to advance on to the pad and exit the REA. The patient exited the REA at 1437 hours.

One of the Contaminated Patient Room nurses demonstrated the doffing of PPE. He was assisted by another nurse. He followed the prescribed doffing procedure and was released from the REA. The procedure involved the following sequence: outer gloves; mask/face-shield; gown (carefully to minimize "fluffing" of particulate contamination); and cap. At this point, the nurse was carefully monitored from head to ankles (front and back). The nurse then removed his shoe covers and then his inner gloves. He then attempted to exit the REA but was stopped by the Buffer Zone nurse and the RSO before stepping on to the Step-off Pad so that his shoes and hands could be monitored. He was then released from the REA and allowed to enter the ER. The other RA nurses and observing hospital staff watched the doffing process for lessons-learned, doffed their PPE and returned to their normal assignments.

The Evaluator then interviewed the REA staff regarding the steps that would be taken to clear the REA and Ambulance crew and vehicle and return facilities, vehicles and people to normal service and duties. They discussed how the REA would be surveyed, steps that would be taken to

reduce contamination levels to the 30 cpm threshold, steps that might be taken if they were unable to sufficiently decontaminate the REA (such as, contacting the IEMA and the Utility for assistance and sealing contaminated areas until they were sufficiently decontaminated), and the handling of radioactively contaminated waste.

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

In summary, the status of DHS/FEMA criteria for this location is as follows:

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

3.3.1.2 Medical Services (MS-1) Transportation - Bolingbrook Fire Department

Criterion 1.d.1:

Successfully demonstrated - this criterion narrative is contained in the Criterion 6.d.1 section.

Criterion 1.e.1:

Successfully demonstrated – this criterion narrative is contained in the Criterion 6.d.1 section.

Criterion 3.a.1:

Successfully demonstrated - this criterion narrative is contained in the Criterion 6.d.1 section.

Criterion 6.d.1:

As part of the Dresden Nuclear Power Station (DNPS) Radiological Emergency Preparedness Exercise, the State of Illinois demonstrated that the facility/ORO has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring decontamination, and medical services to contaminated injured individuals. The demonstration was conducted during an out-of-sequence activity on August 10, 2010 at Adventist Bolingbrook Hospital, 500 Remington Road, Bolingbrook, Illinois.

The out-of-sequence Medical Services Drill commenced at the Adventist Bolingbrook Hospital at 1330 hours. Bolingbrook Fire Department Paramedic Unit M-5 provided the transportation for a contaminated injured patient, a Sheriff's Department deputy, originating (simulated) at the Deputy's assigned Traffic and Access Control Post on an evacuation route. The Deputy was manning her post when she was struck by a vehicle driven by a distraught citizen who was evacuating from the DNPS EPZ and was reporting to the Carl Sandburg High School Reception Center.

The ambulance crew consisted of two Emergency Medical Technicians/ Paramedics (EMT/P) with one EMT/P caring for the patient and the other one serving as the driver and communicator. The primary means of communicating consisted of cellular telephones, with a console mounted Motorola Model TR 1500 two-way radio with multi-channel capability and hand-held Motorola Model HT 1250 multi-channel radios serving as backup communications. A minimum of 16 talk groups were available for use on the two-way radios that operated on the Medical Emergency Radio Communications of Illinois (MERCII) network. The cellular telephones and console mounted two-way radio were used during this drill with no communications failures noted.

Personal protective equipment (PPE) used by the EMT/Ps consisted of several pre-stocked BioSafety Infection Control Kits in sealed plastic bags. Each kit contained one pair of extra-large shoe covers, one white impervious extra-large gown, one pair of protective surgical eyewear, one dust/mist respirator (similar to a surgical mask), one hair cover, one towelette, one red resealable biohazard plastic bag, one red 30-gallon plastic biohazard bag, and one pair of large SafetyPlus latex gloves. Additional latex gloves were available in the ambulance.

Per the extent-of-play agreement, the ambulance crew was not issued dosimetry. However, the IEMA Medical Radiation Technicians (MRTs) were issued Landauer Luxel+ Optically Stimulated Luminescence Dosimeters (OSLs) for recording occupational radiation exposures. The OSLs were issued on August 5, 2010 with a change-out date of September 4, 2010. The MRT response kits also had dosimetry packets consisting of InLight Systems Luminescence Dosimeters (LDs) for recording occupational radiation exposures. The LDs were effective from July 2010 to June 2012. Both the LDs and OSLs use OSL technology. Each dosimetry kit also contained one Dosimetry Corporation of America (DCA) Model 622 Direct-Reading Dosimeter (DRD) with a range of 0 – 20 R, last tested September 10, 2009.

The IEMA MRT radiation monitoring instrument kit consisted on one Ludlum Model 2241-3

radiation survey meter with a range of 0 – 999,999 cpm, calibration date of June 18, 2010, one Bicon Micro rem internal ion chamber radiation survey meter with a range of 0 – 200,000 microrem, calibration date of September 18, 2009, one Ludlum Model 44-9 pancake GM detector, one Ludlum Model 43-65 scintillation detector and one Ludlum Model 44-10 sodium iodide (NaI) detector. The kit also contained one Spectrum Technologies 10 mCi Cs-137 check source with an in-service date of January 2009. The IEMA radiation survey meters are calibrated on an annual basis.

Prior to deployment, the MRT performed a circuit function test and radiation source check on the Ludlum Model 2241-3 survey meter using the Ludlum Model 44-9 pancake GM detector. This was the principal instrument used for performing radiation monitoring outside of the REA in the ambulance area. The MRT also obtained a background reading of 50 cpm.

At 1330 hours, the drill was declared started. The Bolingbrook Fire Department was notified (simulated) of an injured, potentially contaminated Sheriff's Deputy awaiting medical services. At 1337 hours, the ambulance arrived at the TACP (simulated) where the injured contaminated patient was located. Due to the ambient outside temperature, and with the consent of the evaluator, the EMT/P tending to the patient demonstrated donning a biohazard PPE ensemble consisting of the impervious gown, two pairs of latex gloves, eyewear, respirator, hair cover and shoe covers. The driver donned two pairs of latex gloves.

The ambulance crew was briefed the patient contact dose rates were less than 2 mR/hr, and that contamination levels were less than 5,000 cpm, thereby exempting the ambulance crew from using DRDs and LDs. Upon arrival at the TACP, the EMT/P tending to the patient performed an initial assessment of the patient. The patient stated she had pain in her left hip and left arm but could still move her hand and walk. However, moving her hand and walking aggravated the pain. A sling was then placed around the patient's left elbow and forearm to keep the arm stabilized.

Then the EMT/P checked for vitals, with the following vitals being obtained: level of consciousness – alert and oriented X3, respirations – 14 non labored, pulse – 110, skin – normal, pupils – PERL, blood pressure (BP) – 140/100, and visual – slight swelling and bruising of left arm and hip.

While the patient's initial vitals were being taken, the driver prepared the gurney by laying two

blankets over the pad in order to be able to cocoon the patient. Once the gurney was prepared, the patient was escorted to the gurney and instructed to lie down. The patient was cocooned and strapped down. The EMT/P tending to the patient placed his stethoscope and BP cuff inside of the blanket cocoon next to the patient in order to minimize the potential for spreading contamination. The patient and gurney were then placed in the ambulance.

Once enroute to the hospital, the patient's vital were taken again, with the following vitals obtained: level of consciousness – alert and oriented X3, respirations – 14, pulse – 110, skin – normal, pupils – PERL, BP – 130/100, and visual – slight swelling and bruising of left arm and hip. The patient was asked if she was allergic to Penicillin and Vicodin, and the patient replied that she was not. The patient was asked if she had a medical history, and the patient replied that she did not. The patient was asked based on a scale of one to 10 how much pain the patient was in she stated about seven. The patient was asked if she wanted morphine but the patient refused stating she could take the pain.

During this time, the EMT/P caring for the patient performed two outer glove change outs, placing the discarded gloves in a red biohazard waste bag. The driver performed an outer glove change out after the patient was placed in the ambulance, placing the discarded gloves in the red biohazard bag.

While the second set of vitals was being obtained, the drive contacted the hospital via the console mounted two-way radio to inform the hospital that the ambulance was enroute with an estimated time of arrival of 10 minutes.

At 1356 hours, the EMT/P tending to the patient contacted the hospital via cellular telephone to relay the latest vitals and to inform the hospital arrival was in about four minutes. The EMT/P also informed the hospital that he patient had been offered morphine for the pain but refused.

The ambulance arrived at the hospital at 1358 hours, and was directed to the designated contaminated patient transfer area. The area was marked of by orange plastic traffic cones with yellow caution barrier tape affixed to the cones in order to separate the receiving area outside of the hospital's Radiation Exposure Area (REA) from ambulances carrying non-contaminated patients.

The patient transfer into the REA was successful without adding to the potential of releasing

contamination outside of the REA. The patient was placed head first toward the REA entrance with the ends of ambulance gurney and hospital gurney facing each other. The patient, while still fully cocooned, was transferred onto the hospital gurney inside the REA without the ambulance gurney crossing over the REA barrier tape placed across the floor at the doorway.

During this time the IEMA MRT had set up an exit station next to the main ambulance entrance in order to monitor the ambulance crew for radioactive contamination. The driver was monitored, and 200 cpm was found on the left latex glove, 100 cpm on the right latex glove and 200 cpm on the bottom of the right shoe. The driver was instructed on the proper removal of the outer gloves into the awaiting contaminated waste receptacle. Then the driver was instructed to turn around and remove each boot without touching the outside of the boot. Once the first boot was removed and placed in the contaminated waste receptacle, the driver was instructed to raise his foot so the bottom could be monitored prior to stepping backward onto the mat just outside of the step off area. Then the same procedure was followed for removal of the left boot. The driver was also properly instructed on the method to use to remove the second pair of gloves for disposal in the contaminated waste receptacle before being permit to exit the area. The IEMA MRT explained the same procedure would be followed for the other EMT/P.

Once the EMT/Ps were released, the IEMA MRT performed a survey of the rear step of the ambulance, rear door handles, patient transport area floor, walls and any cabinets that could have touched by the EMT/P attending to the patient. It was noted the EMT/P attending to the patient even deposited his cellular telephone in the red biohazard bag in the ambulance in the event the phone was contaminated. The ambulance and crew were then released, and drill was terminated at 1448 hours.

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

In summary, the status of DHS/FEMA criteria for this location is as follows:

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

- f. PRIOR ISSUES - RESOLVED: None
- g. PRIOR ISSUES - UNRESOLVED: None

SECTION 4: CONCLUSION

There were no Deficiencies, ARCAs, or Plan Issues identified for the State of Illinois.

APPENDIX A: DRILL EVALUATORS AND TEAM LEADERS

DATE: 2010-08-10, SITE: Dresden Nuclear Power Station, IL

LOCATION	EVALUATOR	AGENCY
Medical Services (MS-1) Hospital - Adventist Bolingbrook Medical Center	Carl Bebrich	DHS/FEMA
Medical Services (MS-1) Transportation - Bolingbrook Fire Department	Clinton Crackel	DHS/FEMA
* Team Leader		

APPENDIX B: ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
DNPS	Dresden Nuclear Power Station
ECRN	Emergency Communications Registered Nurse
EPZ	Emergency Planning Zone
ER	Emergency Room
FEMA	Federal Emergency Management Agency
NMD	Nuclear Medicine Department
NRC	Nuclear Regulatory Commission
OSLD	Optically Stimulated Luminescent Dosimeter
PA	Public Address
PPE	Personal Protective Equipment
RAC	Regional Assistance Committee
REA	Radiation Exposure Area
REP	Radiological Emergency Preparedness
RER	Radiation Emergency Response
RSO	Radiation Safety Officer

APPENDIX C: EXERCISE PLAN

**OFFSITE MEDICAL DRILL
EXTENT of PLAY
ADVENTIST BOLINGBROOK HOSPITAL
Bolingbrook, Illinois**

**August 10, 2010
Start Time 1:00 p.m.**

**EXTENT OF PLAY AGREEMENT
FOR THE
MEDICAL SERVICES EXERCISE
August 10, 2010**

Location: Adventist Bolingbrook Hospital
Transportation Provider: Bolingbrook Fire and Rescue
500 Remington Blvd.
Bolingbrook, IL 60440

Participants:

Victim (volunteer)

Lead Controller: (IEMA)

IEMA ER Monitor: Tarver Haven

IEMA Ambulance Monitor: N/A

IEMA Hospital Controller: Kathy Allen

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 Bolingbrook Fire and Rescue will use 2-way radios to communicate with Adventist Bolingbrook Hospital. 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.

Adventist Bolingbrook Hospital 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.

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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.

Bolingbrook Fire and Rescue will demonstrate the capability to transport contaminated, injured individuals to Adventist Bolingbrook Hospital in Bolingbrook. The ambulance crew will pick up a contaminated injured patient near the grounds of Adventist Bolingbrook Hospital (simulating pick-up of a patient from Traffic Access and Control Point). Bolingbrook Fire and Rescue will utilize universal precautions and good housekeeping practices to minimize the spread of contamination, and will focus on treating the patient's medical condition.

Bolingbrook Fire and Rescue will call in the information regarding the patient to Adventist Bolingbrook Hospital in Bolingbrook so they can prepare for receipt of a contaminated patient. IEMA personnel may be dispatched to assist at the hospital's request.

Adventist Bolingbrook Hospital 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. Hospital personnel will demonstrate their knowledge of who to call beyond IEMA for assistance in Radiological Accidents, e.g., REAC/TS.

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 the release of disposal of contaminated material.

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.

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

APPENDIX D: INJECTS AND SUMMARY

OFFSITE MEDICAL DRILL

Within the EPZ

(Summary and Injects)

ADVENTIST BOLINGBROOK HOSPITAL

BOLINGBROOK, IL

August 10, 2010

Start time: 1:00 p.m.

OBJECTIVES:

1. Demonstrate the ability of EMS personnel to transport a contaminated accident patient.
2. Demonstrate the ability of hospital personnel to treat a contaminated accident patient.
3. Demonstrate the ability of personnel to exercise proper radiological controls.
4. Demonstrate the proper techniques of personnel decontamination.
5. Demonstrate good communication between medical personnel and IEMA staff.
6. Demonstrate proper use of radiation detectors.

IEMA PLAYERS AND CONTROLLERS

Injured Victim	TBD
IEMA Rad Monitor (Amb.)	Tarver Haven
IEMA Rad Monitor (Hosp.)	Not Applicable
IEMA Ambulance Controller	Joni Estabrook
IEMA Hospital Controller	Kathy Allen
Lead Controller	IEMA

EXTENT OF PLAY FOR ADVENTIST BOLINGBROOK HOSPITAL MEDICAL DRILL

Introduction:

An offsite medical drill will be conducted to demonstrate the State of Illinois' concept of operations for handling contaminated injured individuals. The drill is structured to address MS-1 Hospital and Transportation criteria.

NOTE: Evaluators should be aware that this drill will originate within the EPZ and IEMA staff will not be present during the transportation portion. Transportation staff will be responsible for preventing contamination spread to the extent possible. Hospital personnel are encouraged to assume responsibility for monitoring, decontamination, and contamination control activities within their facility to the extent they are able to do so, they are advised to take direction from Illinois Emergency Management Agency (IEMA) personnel regarding these issues. Hospital staff may call IEMA for direction and advice. The purpose of providing IEMA support is to ensure appropriate radiation protection protocols are observed.

Extent of Play:

Dresden Nuclear Power Station has declared a general emergency. 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 County Deputy who was assigned to a traffic control point traffic in an evacuation route. The deputy was at his assigned work location when he was struck by a vehicle. The vehicle was being driven by a distraught citizen who was evacuating from the Dresden EPZ and reporting to the Carl Sandburg High School Reception Center. [Radiation monitoring and if necessary, decontamination of evacuees is provided for at these facilities by staff from IEMA under the Illinois Plan for Radiological Accidents (IPRA).]

NOTE: Evaluators should be aware that the dosimetry worn by the county deputy is issued in accordance with IPRA procedures and will not be an evaluated portion of this drill. Dosimetry evaluation will occur independent from the MS-1 evaluation. In addition, traffic control and access will not be demonstrated during this exercise and this example was given to support exercise intent.

1. An ambulance and EMS staff will be used to demonstrate loading, transporting and unloading the victim. EMS personnel will pick up the patient at a staged location close to the hospital. IEMA staff and the patient will be pre-staged for the ambulance arrival.
2. The ambulance crew will communicate with the receiving hospital regarding the medical status and contamination levels associated with the patient.
3. Upon patient's arrival a representative from the hospital will provide radiological exposure control and monitoring of EMS and Hospital personnel until IEMA medical radiation technician arrives.
4. Once the IEMA medical radiation technician arrives, he/she will assist with ingress and egress of radiological control areas and recommend limited access into the radiological control area. Monitoring will be performed prior to personnel leaving the potentially contaminated patient treatment area. Protective clothing used by

hospital personnel will be similar to that used for a chemical or biological agent in accordance with hospital protocol.

5. Decontamination is determinant on ambulance protocols and injury that the patient presents.
6. The IEMA medical radiation technician will assist with ingress and egress of radiological control areas and supervise the access into the radiological control area. Monitoring will be performed prior to personnel leaving the potentially contaminated patient treatment area. Protective clothing used by hospital personnel will be identical to that used for a chemical or biological agent in accordance with hospital protocol.
7. Upon arriving at the hospital, the supervision of contamination control and medical radiation technician and activities remain the responsibility of IEMA. Hospital nuclear medicine personnel that are trained and properly equipped to address monitoring functions will assist to the extent necessary with monitoring and contamination control activities.
8. The medical facility will demonstrate or describe their procedures for the medical treatment and necessary decontamination of a contaminated injured individual. Multiple methods of decontamination, including dry, damp or wet, may be utilized for the removal of contamination. IEMA/Nuclear medicine personnel will survey the hospital and medical personnel to maintain contamination control. These methods will include taking swipes of floors and surfaces so that the hospital and ambulance can be cleared for normal operations.
9. Emergency medical personnel will be able to maintain their exposure below the limits specified in 10 CFR Part 20 because for the exercise, the dose rate from the patient is below 2 mR/hr.
10. After the Hospital is notified, Hospital personnel will prepare the area to receive the patient in accordance with their procedures and provide security as necessary. IEMA as a general practice would, if necessary, post radiation signs in accordance with the requirements as set forth in 10 CFR Part 20. Hospital security will control the area in accordance with the same policies and procedures used to provide isolation in the treatment of a chemical or biological agent.
11. Regardless of specific written hospital procedures for addressing radiation contamination, the supervision and advice provided by IEMA personnel should be the governing guidance for determining whether the patient's contamination situation is appropriately addressed.

The drill shall terminate when the controller verifies that the criteria under Evaluation Area 6, Sub-element 6.d and Evaluation Area 3, Sub-element 3.a.1, have been satisfied.

NARRATIVE SUMMARY FOR ADVENTIST BOLINGBROOK HOSPITAL MEDICAL DRILL

Dresden Nuclear Power Station has declared a general emergency. 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 reception center located in Bolingbrook, 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).

A county deputy is controlling traffic at a traffic control point when he is struck by a vehicle driven by an evacuee. The deputy is not severely injured, but is in quite a bit of pain and needs to seek treatment. He calls for backup to replace him and his commanding officer calls an ambulance to the officer's location so he/she may be transported to a local hospital for medical assistance.

The deputy maintains his post while waiting for backup and the ambulance to arrive. Decontamination is determinant on ambulance protocols and injury the patient presents as well as ambulance protocol. Bolingbrook Fire and Rescue Ambulance personnel will demonstrate patient loading and transport. Bolingbrook Fire and Rescue Ambulance personnel will communicate with the receiving hospital.

Patient contact dose rates are less than 2 mR/hr. Contamination levels will be less than 5,000 cpm, which means EMS personnel are exempt from direct read dosimeters and LDs in accordance with IEMA procedures for personnel monitoring.

At the hospital, medical personnel will utilize universal precautions and good housekeeping practices to ensure contamination from the patient is controlled and not spread. Simple decontamination efforts will be demonstrated after the patient has been medically stabilized. Hospital personnel will demonstrate their knowledge of who to call beyond IEMA for assistance in Radiological Accidents, e.g., REAC/TS.

For purposes of the 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.

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

TIME: Pre t = 0

Victim Instructions

MESSAGE FORM

Controller

Player

Contingency

Drill/Exercise Type: Adventist Bolingbrook Hospital Medical Drill

Message for: Victim

MESSAGE

While directing and controlling traffic in the EPZ during the Dresden evacuation you are struck by a motorist attempting to evacuate. You are not severely injured; however you can no longer perform your duty and call for replacement because you are in need of medical attention.

Your commanding officer informs you to maintain to your post if you are able to do so and he will call an ambulance for assistance.

You tell ambulance staff that your hip and hand was grazed by vehicle mirror and you are in pain but can still move your hand and walk. However, walking and moving your hand aggravates the pain.

You are in pain – 7 out of 10, but are having difficulty moving your hand and your hip is sore.

You are allergic to Penicillin and vicodin

If asked you have no previous medical history.

FOR CONTROLLERS USE ONLY

The information would be available to the hospital as they received preliminary notification information from outbound ambulance calls.

TIME: Time 0
MESSAGE: Initial Conditions

MESSAGE FORM

(X) Controller (X) Player () Contingency

Drill/Exercise Type: Adventist Bolingbrook Hospital Medical Drill

Message for: IEMA and Hospital Personnel

MESSAGE

Initial Conditions:

At the reception center, the IEMA Staff performed a radiological survey of the deputy and discovered contamination. The preliminary survey identified general contamination on right palm, left palm, left injured hand, right pant knee, the left pant knee, both pant cuffs and bottom and toes of shoes. The deputy began to feel pain and stiffness in the hand and hip where he was struck by the vehicle.

Contamination Levels:

Right palm 3000 cpm
Right pant knee 1500 cpm
Left palm 2000 cpm
Left pant knee 1500 cpm
Left injured hand 800 cpm
Pant cuffs 2000 cpm
Shoe bottoms/toes 3000 cpm
Left Hip 800 cpm

First Decon

*
*
*
*

Second Decon

*Pant/shoes should be removed and bagged.

**Contamination would likely be spread from hand to injured arm either on patient's skin or clothing.

Current Medical Conditions:

There is bruising and slight swelling of the left arm and hip area.

Medical Stats (for Controller inject)

On next page.

Note: See last page for contamination locations and levels.

FOR CONTROLLERS USE ONLY

The information would be available to the hospital as they received preliminary notification information from outbound ambulance calls.

TO: First Responders/EMS

FROM: EMS Controller

NOTE: Do not provide the data to players unless the means to obtain it are demonstrated.

THIS IS A DRILL
DO NOT initiate actions affecting safe operations

Message:

Patient pain is 7 of 10 and seems to be worsening.

	<i>EMS Arrival on Scene</i>	<i>Enroute to Hospital</i>	<i>In REA</i>	<i>After Treatment</i>
Level of consciousness:	Alert & Oriented X3	Alert & Oriented X3	Alert & Oriented X3	Alert & Oriented X3
Respirations:	14 non labored	14	12	8
Pulse:	110	110	75	65
Skin:	Normal	Normal	Normal	Normal
Pupils:	PERL	PERL	PERL	PERL
Blood Pressure:	140/100	130/100	130/85	120/75
Visual:	Slight swelling and bruising of left arm and hip	Slight swelling and bruising of left arm and hip.	Slight swelling and bruising of left arm and hip.	Slight swelling and bruising of left arm and hip

Note:

ECG Monitor – Sinus tachycardia corresponding to pulse.

Pulse Oximeter 97% on room air.

- Patient allergic to Penicillin and Vicodin

Expected Action:

Follow local protocols or standing orders.

THIS IS A DRILL
DO NOT initiate actions affecting safe operations

TIME: 0 + 5 min.

MESSAGE: _____

MESSAGE FORM

Controller

Player

Contingency

Drill/Exercise Type: Adventist Bolingbrook Hospital Drill

Message for: Hospital Personnel

MESSAGE

When the hospital is notified that a potentially contaminated patient will be arriving, the hospital should make preparations to receive patient in accordance with hospital procedures.

FOR CONTROLLERS USE ONLY

Issue the message only if ambulance departure from reception center was to occur after 1320. Realistically it would take 20 minutes after the initial call for the ambulance to respond and depart with the patient.

TIME: After patient arrival at hospital

MESSAGE: Decontamination Activities

MESSAGE FORM

Controller

Player

Contingency

Drill/Exercise Type: Adventist Bolingbrook Hospital Drill

Message for: IEMA RAD Controllers

MESSAGE

If proper radiological controls are in place no contamination is found in the ambulance. All areas of the hospital and path from ambulance to treatment room will be surveyed and read as background.

The controller may adjust contamination levels based on actions of the players.

The patient has contamination on right palm, left palm, forehead at hairline, right knee, left knee and on both pant cuffs and bottom and toes of shoes.

IT DOES NOT MATTER IF THE CLOTHING IS REMOVED BY THE AMBULANCE OR HOSPITAL PERSONNEL. Clothing should be bagged and labeled.

FOR CONTROLLERS USE ONLY

TIME: After patient arrival at hospital

MESSAGE: Decontamination Activities

MESSAGE FORM

Controller

Player

Contingency

Drill/Exercise Type: Adventist Bolingbrook Hospital Drill

Message for: IEMA RAD Controller

From: _____

MESSAGE

Decontamination efforts are as follows:

Once clothing is carefully removed, all outer contamination is removed. Bagged clothing reads 1300 cpm.

The first attempt will not remove all contamination from the right and left palm. After decon the hands will show readings but not twice background. The injured arm will also require multiple decon attempts, reading 800 cpm after the first attempt and slightly above background on the second decon attempt. The contamination levels and locations may be adjusted accordingly.

The bruise and pain in the arm and hip should be treated by hospital personnel.

<u>Contamination Levels:</u>	<u>First Decon</u>	<u>Second Decon</u>
Right palm 3000 cpm	1700 cpm	20 cpm
Right pant knee 1500 cpm	*	
Left palm 1200 cpm	1000 cpm	40 cpm
Left pant knee 1500 cpm	*	
Left injured hand 800 cpm	600 cpm	20 cpm
Pant cuffs 2000 cpm	*	
Shoe bottoms/toes 3000 cpm	*	
Left Hip Pants 800 cpm	*	

*Pants and shoes should be removed and bagged.

**Contamination would likely be spread from hand to injured arm either on patient's skin or clothing.

Note: Controllers may adjust levels based on player actions.

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