Byron Station

# After Action Report/ Improvement Plan

Drill Date - May 18, 2010

Radiological Emergency Preparedness (REP) Program

FEMA

*Published June 01, 2010*

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Byron Station

# After Action Report/Improvement Plan

*Published June 01, 2010*

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# EXECUTIVE SUMMARY

On May 18, 2010, the U.S. Department of Homeland Security's (DHS) Federal Emergency Management Agency (FEMA), Region V, evaluated a medical services drill (MS-1) in the 10-mile plume exposure pathway Emergency Planning Zone (EPZ) around the Byron 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, Byron Station, Lifeline Ambulance and OSF. Saint Anthony's Medical Center 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, decontamination, and medical services to 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, and
- 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 Byron Station to FEMA Region V by the State of Illinois and involved local jurisdictions occurred on March 28, 1982. Formal approval of these RERPs was granted by FEMA on September 12, 1984, under 44 CFR 350.

A Medical Services Drill (MS-1) was conducted on May 18, 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 Bryon Station. The purpose of this drill report is to present the drill results and findings on the performance of the offsite response organizations (ORO) 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 2 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**
Byron Station

**Type of Exercise**
Drill

**Exercise Date**
May 18, 2010

**Program**
Department of Homeland Security/FEMA Radiological Emergency Preparedness Program

**Scenario Type**
Radiological Emergency

## 1.2 Exercise Planning Team Leadership

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## 1.3 Participating Organizations

Agencies and organizations of the following jurisdictions participated in the Byron Station drill:

State Jurisdictions

Illinois Emergency Management Agency

OSF. St. Anthony's Medical Center

Lifeline Ambulance

# SECTION 2: EXERCISE DESIGN SUMMARY

## 2.1 Exercise Purpose and Design

On May 18, 2010, the DHS/FEMA Region V Office evaluated a medical services drill for the Byron 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.

## 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 "Scenario Details", 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 Medical Services 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 addtional 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 May 18, 2010, medical services drill (MS-1) conducted to test the offsite emergency response capabilities of State and local governments in the EPZ surrounding the Byron 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

| DATE: 2010-05-18<br>SITE: Byron Station, IL<br><br>M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated | | MS-1 H - St. Anthony's | MS-1 T Lifeline Amb. |
|---|---|---|---|
| Emergency Operations Management | | | |
| Mobilization | 1a1 | | |
| Facilities | 1b1 | | |
| Direction and Control | 1c1 | | |
| Communications Equipment | 1d1 | M | M |
| Equip & Supplies to support operations | 1e1 | 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 - OSF. St. Anthony's 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:**
The medical facility portion of this drill was conducted in the contaminated patient trauma room located adjacent to the ambulance bay at OSF St. Anthony's Medical Center in Rockford, Illinois. This room is designated the Radiological Emergency Area (REA) for radiological medical emergencies, and it is separated via corridor and entrance doors from the emergency rooms (ERs) and intensive care unit of the hospital.

The hospital has several forms of communications available, including Medical Emergency Radio Communications of Illinois (MERCI) radio, a Motorola StarCom telephone device operating on the State-wide 800 MHz radio system with numerous talk group capability, the Emergency Communications Registered Nurse (ECRN) telephone for receiving emergency calls involving the ER, multi-line telephones, cellular telephones for backup, numerous desktop computers with E-mail and internet capability 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.

Personal dosimetry for the nuclear medicine and radiological emergency medical staff consists of Landauer + Luxor Optically Stimulated Luminescence Dosimeters (OSLs) with change out dates of May 1, 2010, and Landauer Ring Thermoluminescence Dosimeters with change out dates of May 1, 2010. The radiation survey meter used by the Nuclear Medicine Coordinator (NMC) in

the REA was a Ludlum 14C using a Ludlum Model 44-9 pancake GM detector. The Ludlum 14C has four scales for use with the external detector: X0.1, X1, X10 and X100. The X1000 scale is applicable only for use with the internal detector and is good only for measuring in R/Hr. Otherwise, using the lower four scales the Ludlum 14C has a range of either 0 to 660,000 cpm or 0 to 200 mR/Hr. The survey meter was calibrated on April 30, 2010 and was due calibration on April 30, 2011. Also, the survey meter was operationally checked using a 1 uCi Cs-137 check source prior to being placed into service.

Additional equipment and supplies for use in the REA consisted of boxes containing plastic surgical gowns, surgical gloves, surgical head covers, surgical shoe covers, surgical masks, face shields, Tyvek suits if needed, a rolling tool kit for performing on-the-spot maintenance, tape, two yellow 50-gallon rolling drums with yellow plastic liners for collecting contaminated waste, barrier tape for marking off the REA, step-off pads from preventing the spread of contamination beyond the REA, standard operating procedures, and administrative supplies including recording forms. The REA was equipped with two wall-mounted water spraying stations, stainless steel cabinets and a sink, and a floor drain to a contaminated liquid holding tank. The gurney used for contaminated patients was constructed of white PVC tubing with a blue mesh cover to facilitate drainage. The decontamination gurney was equipped with four rollers to allow easy movement of the gurney. The REA was also equipped with a wall-mounted telephone and a wall-mounted medical center public address speaker.

At 0921 hours, the duty nurse was contacted by the ambulance carrying the injured contaminated patient on the ECRN cordless phone and informed of an estimated arrival in five minutes. The duty nurse recorded the patient's vitals as a blood pressure (B/P) of 130/100, pulse of 110 and respirations of 16. The call was completed at 0922 hours, the nurse promptly notified the medical center's Emergency Coordinator (EC) of the pending arrival of an injured contaminated patient. The REA staff was instructed to complete the set up of the REA.

Upon arrival back at the REA from the duty nurse's station, the REA was set up, and the REA staff was completing getting dressed out to receive the contaminated injured patient. The Buffer Zone Nurse's station was set up outside the REA doorway leading into the hallway, and a step-off pad was placed on the floor just outside the REA entrance and held down with yellow contamination border tape. The other members of the REA staff included a Registered Nurse (RN), an Orthopedic Technician (OT), and a Decontamination Technician (DT) from the Nuclear Medicine Department. Another RN served as the Buffer Zone Nurse for recording REA

activities and providing guidance. Shortly after the arrival of the contaminated injured patient, a physician was present outside of the REA to obtain additional information from the patient and to observe and direct the activities of the medical staff in the REA.

The two yellow 50-gallon plastic drums were placed in the REA and lined with yellow plastic bags inserted in them for containing contaminated waste. The Buffer Zone Nurse and three medical center staff in the REA were dressed out in plastic surgical gowns, two pairs of surgical gloves, surgical shoe covers, surgical caps, surgical masks and plastic face shields. The principal method for decontaminating the patient consisted of multi-layered surgical sponges and Baxter 0.9% sodium chloride irrigation solution. A sufficient amount of surgical sponges and irrigation solution were available in the REA, and radiation emergency response instructions were posted to an REA wall.

At approximately 0928 hours, the Lifeline Ambulance arrived outside the entrance to the REA, and the patient transfer was completed and the patient was in the REA at 0932 hours. The patient was cocooned in layers of blankets and the patient was transferred from the ambulance gurney to the REA gurney at the designated, marked contamination control line without either the ambulance crew or REA staff violating approved radiation safety protocols.

As the DT began monitoring the patient, the RN and OT were obtaining patient vitals and assessing the patient's condition. The preliminary vitals obtained were: levels of consciousness – alert and oriented X3, respiration – 12, pulse – 75, skin – normal, pupils – PERL, B/P – 130/85, and visual – slight swelling and bruising of left arm and hip. The patient informed the RN that left hip hurt a little, and that his left hand hurt a little more. The patient also informed the RN that he was allergic to Penicillin and Vicodin. Also, upon completing the checking of the patient's vitals and evaluating his injuries, the RN and OT promptly changed out their outer surgical gloves.

Upon completion of the first radiation monitoring the following areas had significant amounts of contamination, well above twice times a background of 60 cpm: right palm – 3,000 cpm, left palm – 1,200 cpm, left injured hand – 800 cpm. The only other area that showed any significant activity above background was the left lower arm with a contamination level of 100 cpm.

Both the RN and OT began decontaminating the affected areas on the patient using the multi-layered surgical sponges soaked with the irrigation solution. Upon completing the first round of

decontamination, the RN and OT promptly changed out their outer surgical gloves.

After completing the second radiation survey of the patient, the back of the left hand had a contamination level of 600 cpm, the left palm had a level of 1,000 cpm, the right palm had a level 1,700 cpm and the back of the right hand was at background.

During the course of this activity, the physician was communicating with the patient and overseeing the monitoring and decontamination activities.

After the second decontamination attempt, the previously contaminated areas of the patient were re-monitored and found to be at background levels. At this point the RN and OT performed a second evaluation of the patient and the following vitals were obtained: level of consciousness – alert and oriented X3, respiration – 8, pulse – 65, skin – normal, pupils – PERL, B/P – 120/75, and visual – slight swelling and bruising of left arm and hip.

Upon completion of the second patient evaluation, the patient was determined to be medically cleared to exit the REA. The patient was able to walk to the inside of the doorway with the step-off pad and was re-monitored prior to being permitted to advance to the step-off pad. The patient departed the REA at 0955 hours.

The RN demonstrated doffing the surgical ensemble with the assistance of the DT. The RN followed the prescribed doffing procedure and was released from the REA.

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 - Lifeline Ambulance

**Criterion 1.d.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 Byron Station 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 May 18, 2010 at St. Anthony's Medical Center at 5666 East State Street, Rockford, Illinois.

The out-of-sequence Medical Services Drill commenced at the St. Anthony's Medical Center in Rockford, Illinois at 0900 hours. Lifeline Ambulance Service provided the transportation for a contaminated injured patient (simulated) originating at the officer's assigned Traffic and Access Control Point. The officer was manning his post when he was struck by a vehicle that was driven by a distraught citizen who was evacuating from the Byron EPZ and was reporting to the Jefferson High School Reception Center.

The contamination levels and the extent of injury were provided by the controller to the ambulance crew. The ambulance crew obtained some background information from the patient, including any allergic reactions to medications and extent of pain, which was injected as slight swelling and bruising of left arm and hip, and called the hospital to inform them of the pending arrival of a contaminated patient and briefly discussed the extent of injuries. The crew then prepared the patient for transport to the hospital. The clothing was cut-off the patient taking into account the areas of contamination and therefore the direction of clothing removal. The removed items were bagged to control the spread of contamination.

The patient was cocooned in three layers of sheets and a blanket and lifted into the ambulance. Once in the ambulance, vital signs were taken, due to the mechanism of injury only a blood pressure was taken and the cuff remained inside of the cocoon to prevent further spread of

contamination. The ambulance crew had appropriately worn the proper personal protection equipment and conducted numerous glove changes to prevent cross contamination. The removed gloves were placed in a red biohazard bag which was sealed and properly disposed of after the patient was transferred to hospital personnel.

While enroute to the hospital, the ambulance crew called the hospital by cellular phone, (which was one of two communication methods to contact the hospital, the other form of communication demonstrated was a VHF radio which is tested at the beginning of every shift as per procedures), and informed the hospital of the condition of the patient and the estimated time of arrival. The patient stated that there was pain but it was not severe enough to warrant administration of medication. This was one of the indications of the strong team work and communications between the crew members and the Medical Radiation Technician (MRT).

Upon arrival at the hospital, the patient was transferred to a hospital gurney minimizing any potential spread of contamination. The patient was taken by the St. Anthony's Medical Center staff into a treatment room that was prepared prior to the patient's arrival. The MRT described and demonstrated the procedure for the handling of the patient's contaminated clothing and/or personal items.

The IEMA MRT conducted a function check of his Ludlum 2241 survey instrument S/N PR223014 and pancake probe S/N 18841 also included in his instrument case was a NA1 2x2 S/N PR223240 tube probe, a Alpha probe S/N PR21999 and a Bicron Instrument S/N A774Q all were functioning properly, the MRT used the Ludlum 2241 with a pancake probe, which was operationally checked with a 1 micro/curie check source and was found to be functioning within range. The MRT also obtained a background reading of 46 cpm and began to check ambulance personnel and equipment. After the offloading of the patient the Emergency Medical Technicians (EMT) were monitored by the MRT. One EMT was found to have no contamination, the other EMT was scanned by the MRT and was found to have a reading of over 1000 cpm. The MRT continued scan of EMT and still found readings of over 1000 cpm. The MRT checked instrumentation to ensure proper function. The higher readings could not be explained until the MRT discovered that the EMT had recently had a stress test and that a radioactive substance was used during the stress test, which explains the high readings. After the survey of all of the ambulance and equipment, there was no contamination found. The ambulance crew and the MRT were interviewed and properly explained the procedures for decontamination of equipment and personnel in the event that they were contaminated.

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, 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: 2010-05-18, SITE: Byron Station, IL

| LOCATION | EVALUATOR | AGENCY |
|---|---|---|
| Medical Services (MS-1) Hospital - OSF. St. Anthony's Medical Center | *Clinton Crackel | DHS/FEMA |
| Medical Services (MS-1) Transportation - Lifeline Ambulance | *James King | DHS/FEMA |
| * Team Leader | | |

# APPENDIX B: EXERCISE PLAN

# OFFSITE MEDICAL DRILL
# EXTENT of PLAY
# ST. ANTHONY'S HOSPITAL
# Rockford, Illinois

## May 18, 2010
## Start Time 9:00 a.m.

**EXTENT OF PLAY AGREEMENT**
**FOR THE**
**MEDICAL SERVICES EXERCISE**
**May 18, 2010**

Location: St. Anthony's Hospital
Transportation Provider: Lifeline
5666 East State St.
Rockford, IL 60432

Participants:
Victim (volunteer):
Lead Controller: (IEMA)
IEMA ER Monitor: Not Applicable IEMA Hospital Controller: Kathy Allen
IEMA Ambulance Monitor: Adnan Khayyat 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 Lifeline Ambulance will use 2-way radios to communicate with St. Anthony's 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.

St. Anthony's 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.

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.

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.

Lifeline Ambulance will demonstrate the capability to transport contaminated, injured individuals to St. Anthony's Hospital in Rockford. The ambulance crew will pick up a contaminated injured patient near the grounds of St. Anthony's Hospital (simulating pick-up of a patient from traffic control point). The ambulance crew will be met by St. Anthony's Nuclear Medicine staff that will perform initial radiation monitoring, and will provide information regarding contamination levels on the patient. Lifeline 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.

Lifeline Ambulance will call in the information regarding the patient to St. Anthony's Hospital in Rockford so they can prepare for receipt of a contaminated patient.

St. Anthony's 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.

For purposes of this exercise, an IEMA staff member will be dispatched to St. Anthony's Hospital with radiation detection and measurement equipment to survey the ambulance and EMS staff and to assist St. Anthony's if requested.

The drill will conclude with the hospital Nuclear Medicine Staff supervising the removal of protective clothing and surveying of the emergency room and hospital personnel. IEMA may also advise on the proper procedure for release or disposal of contaminated material if requested by the hospital.

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 C: SCENARIO SUMMARY

## OFFSITE MEDICAL DRILL
## Within the EPZ
## (Summary and Injects)
## ST. ANTHONY'S HOSPITAL
## ROCKFORD, IL

## May 18, 2010
## Start time: 9:00 a.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.) | Adnan Khayyat |
| IEMA Rad Monitor (Hosp.) | Not Applicable |
| IEMA Ambulance Controller | Joni Estabrook |
| IEMA Hospital Controller | Kathy Allen |
| Lead Controller | IEMA |

EXTENT OF PLAY FOR ST. ANTHONY'S 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**:
Byron 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 Byron EPZ and reporting to the Thomas Jefferson 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 MS1 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 ST. ANTHONY'S HOSPITAL MEDICAL DRILL

Byron 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 Rockford, 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 back up 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. Lifeline Ambulance personnel will demonstrate patient loading and transport. Lifeline 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 (X) Player ( ) Contingency

Drill/Exercise Type: St. Anthony's Hospital Medical Drill

Message for: Victim

**MESSAGE**

While directing and controlling traffic in the EPZ during the Byron 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 and 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: St. Anthony's 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**: | **First Decon** | **Second Decon** |
|---|---|---|
| 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 | | |

*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.



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.

| | *EMS Arrival on Scene* | *Enroute to Hospital* | *In REA* | *After Treatment* |
|---|---|---|---|---|
| **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

(X) Controller (X) Player () Contingency

Drill/Exercise Type: St. Anthony's 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 0920. 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

(X) Controller () Player ( ) Contingency

Drill/Exercise Type: St. Anthony's 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.

TIME: After patient arrival at hospital

**MESSAGE: Decontamination Activities**

MESSAGE FORM

(X) Controller () Player ( ) Contingency

Drill/Exercise Type: St. Anthony's 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.

| **Contamination Levels**: | **First Decon** | **Second Decon** |
|---|---|---|
| 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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