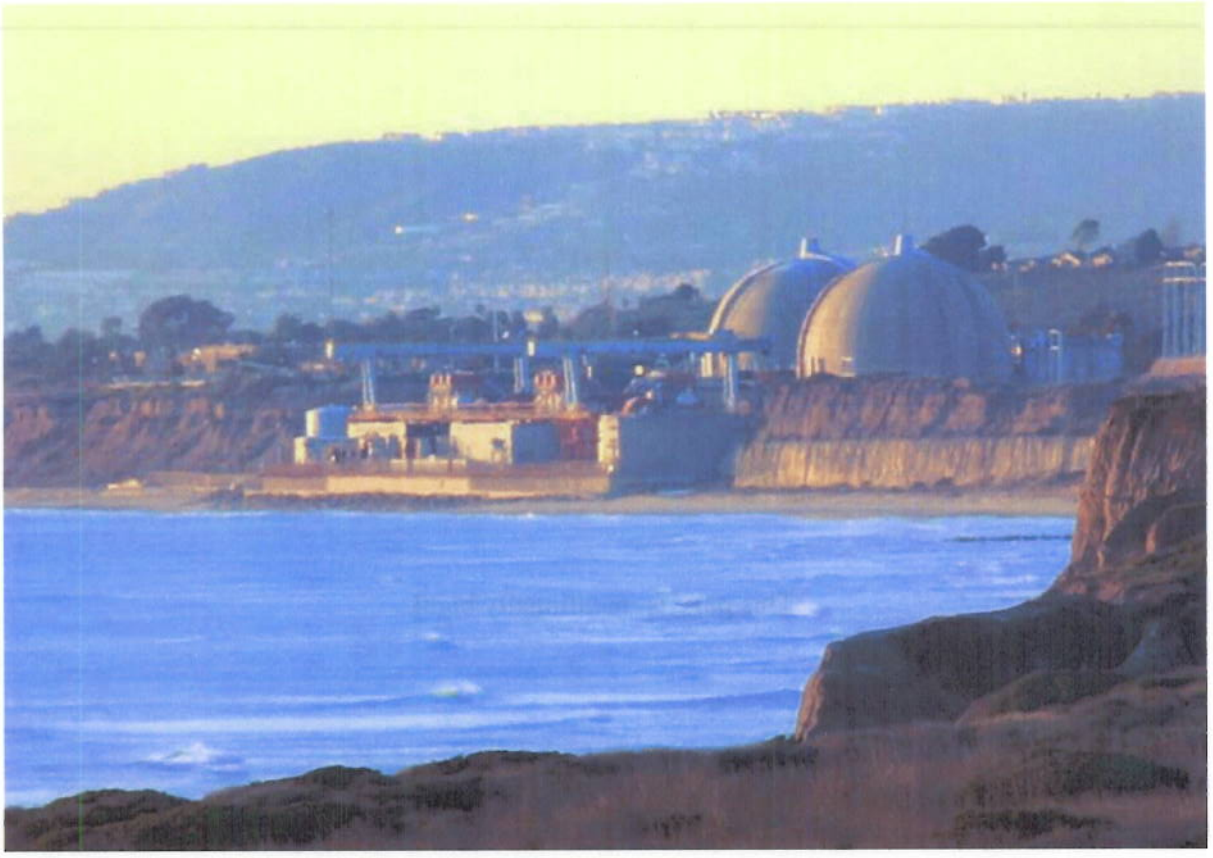

San Onofre Nuclear Generating Station

After Action Report/Improvement Plan

Drill Date – March 23, 2010

Radiological Emergency Preparedness (REP) Program

FEMA

Published June 21, 2010

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San Onofre Nuclear Generating Station

After Action Report/Improvement Plan

Published June 21, 2010

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EXECUTIVE SUMMARY

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) National Preparedness Division - Technological Hazards Branch in Region IX evaluated an offsite emergency worker and evacuee monitoring and decontamination drill at the Orange County Fairgrounds in Costa Mesa on March 23, 2010 in the Plume Exposure Pathway Emergency Planning Zone (EPZ) around the San Onofre Nuclear Generating Station (SONGS). The purpose of the drill was to assess the level of state and local preparedness in response to a radiological emergency. This drill was held in accordance with FEMA's policies and guidance concerning the exercise of state and local Radiological Emergency Response Plans (RERP) and procedures.

The most recent biennial exercise at SONGS was conducted on September 23, 2009. The most recent emergency worker and evacuee monitoring and decontamination drill at the Orange County Fairgrounds was conducted on November 17, 2004. The qualifying emergency preparedness exercise was conducted on May 13, 1981.

FEMA wishes to acknowledge the efforts of the many individuals who participated in this exercise.

Protecting the public health and safety is the full-time job of some of the exercise participants and additional assigned responsibility for others. Still others have willingly sought this responsibility by volunteering to provide vital emergency services to their communities. Cooperation and teamwork of all the participants were evident during this exercise.

This report contains the final evaluation of the drill. The organizations except where noted in this report, demonstrated knowledge of their emergency response plans and procedures and adequately implemented them. No deficiencies were identified during this drill. One Area Requiring Corrective Actions (ARCA) was identified and corrected during this drill. No ARCA remains uncorrected from previous drills.

SECTION 1: EXERCISE OVERVIEW

1.1 Exercise Details

Exercise Name

San Onofre Nuclear Generating Station Emergency Worker and Evacuee Monitoring and Decontamination Drill

Type of Exercise

Drill

Exercise Date

March 23, 2010

Program

Department of Homeland Security/FEMA Radiological Emergency Preparedness Program

Scenario Type

Radiological Emergency

1.2 Exercise Planning Team Leadership

Katrina Faulkner

County of Orange Emergency Management Bureau

Exercise Director

Rick Garcia

Emergency Services Coordinator

Southern California Edison

Richard Echavarria

Senior Site Specialist

Radiological Emergency Preparedness Program

FEMA Region IX

1.3 Participating Organizations

The following agencies and organizations participated in the San Onofre Nuclear Generating Station drill:

Risk Jurisdictions
- County of Orange
- Orange County Health Care Agency
- Orange County Sheriff's Department
- Orange County Fire Authority

Support Jurisdictions
- City of Costa Mesa
- Costa Mesa Fire Department
- Metro Net Affiliated Fire Agencies
- Orange County Fair & Event Center

Private Organizations
- Southern California Edison
- American Red Cross
- Orange County California Citizen Corps Council

SECTION 2: EXERCISE DESIGN SUMMARY

2.1 Exercise Purpose and Design

FEMA Region IX evaluated the exercise on March 23, 2010 to assess the capabilities of local emergency preparedness organizations in implementing their RERPs and procedures to protect the public health and safety during a radiological emergency involving SONGS. The purpose of this report is to present the results and findings on the performance of the Offsite Response Organizations (OROs) during a simulated radiological emergency.

2.2 Exercise Objectives, Capabilities and Activities

The exercise evaluation area criteria, contained in the FEMA Federal Register Notice, "Radiological Emergency Preparedness Exercise Evaluation Methodology," dated August 25, 2002 represent a functional translation of the planning standards and evaluation criteria of NUREG-0654/FEMA-REP-1, Rev.1, "Criteria for the Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980.

The objectives of this exercise are as follows:

Criterion 1.e.1: Equipment and Supplies to Support Operations – Demonstrate that equipment, maps, displays, dosimetry, potassium iodide (KI), and other supplies are sufficient to support emergency operations. (NUREG-0654, H.7, 10; J.10.a, b, e; J.11; K.3.a)

Criterion 3.a.1: Implementation of Emergency Worker Exposure Control – OROs issue appropriate dosimetry and procedures, and manage radiological exposure to emergency workers in accordance with the plans and procedures. Demonstrate that emergency workers periodically and at the end of each mission read their dosimeters and record the readings on the appropriate exposure record or chart. (NUREG-0654, K.3.a, b)

Criterion 3.b.1: Implementation of KI decision – Demonstrate the capability and resources to implement KI protective actions for emergency workers and institutionalized individuals. Appropriate record keeping of the administration of KI for emergency workers and institutionalized individuals is maintained. (NUREG-0654, J.10.e)

Criterion 6.a.1: Monitoring and decontamination of evacuees and emergency workers, and registration of evacuees – The reception center/emergency worker facility has appropriate space, adequate resources, and trained personnel to provide monitoring, decontamination, and registration of evacuees and/or emergency workers. (NUREG-0654, J.10.h; J.12; K.5.a)

Criterion 6.b.1: Monitoring and decontamination of emergency worker equipment – The facility/ORO has adequate procedures and resources for the accomplishment of monitoring and decontamination of emergency worker equipment including vehicles. (NUREG-0654, K.5.b)

Criterion 6.c.1: Temporary care of evacuees – Managers of congregate care facilities demonstrate that the centers have resources to provide services and accommodations consistent with American Red Cross planning guidelines. Managers demonstrate the procedures to assure that evacuees have been monitored for contamination and have been decontaminated as appropriate prior to entering congregate care facilities. (NUREG-0654, J.10.h, 12)

2.3 Scenario Summary

This section contains a summary of the simulated sequence of events used as the basis for invoking emergency response actions by OROs requiring the activation and establishment of the Orange County Reception and Decontamination Center for the SONGS emergency worker and evacuee monitoring and decontamination drill on March 23, 2010, submitted to FEMA by the state of California and SONGS.

At 0700 hours, the Unit 2 Control Room at SONGS identified a 5000-gallon per minute leak from the Reactor Coolant System resulting in SONGS declaring a Site Area Emergency Event Code B3-1. This prompted Orange County to mobilize the Reception and Decontamination Center at Orange County Fairgrounds at 0730 hours. At 0735 hours, the Shift Supervisor declared a General Emergency, Event Code B4-1, due to a radioactive noble gas and iodine release from the Unit 2 Containment. At 0755 hours offsite jurisdictions made a Protective Action Decision to evacuate Emergency Planning Zones 1, 4 and 5 and instructed the general public within that area to ingest Potassium Iodide.

The Reception Center Staff assembled at 0800 hours for a briefing followed by facility setup. The first evacuees from Emergency Planning Zones 4 and 5 are expected to arrive at the facility at approximately 0915 hours. Evacuees from Emergency Planning Zone 1 are expected to evacuate to San Diego County.

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 March 23, 2010 emergency worker and evacuee monitoring and decontamination drill to test the offsite emergency response capabilities of state and local governments in the EPZ surrounding SONGS. Each jurisdiction and functional entity was evaluated on the basis of its demonstration of criteria delineated in the exercise evaluation areas as outlined in the August 2002, Interim REP Program Manual. Detailed information on the extent-of-play agreement used in this exercise is found in Appendix C of this report.

3.2 Summary Results of Drill Evaluation

The matrix illustrated in Table 3.1, presents the status of all exercise evaluation area criteria that were scheduled for demonstration during this exercise by all participating jurisdictions and functional entities. Exercise criteria are listed by number and the demonstration status is indicated by the use of the following letters:

M - Met (No Deficiency or ARCAs assessed and no unresolved ARCAs from prior exercises)

D - Deficiency assessed

A – ARCAs assessed or unresolved ARCAs from prior exercises

N - Not Demonstrated (Reason explained in Appendix C, extent-of-play agreement)

Presented below are definitions of the terms used in this section relative to criteria demonstration status.

- Met – Listing of the demonstrated exercise evaluation area criteria under which no Deficiencies or ARCAs were assessed during this exercise and under which no ARCAs assessed during prior exercises remain unresolved.
- Deficiency – Listing of the demonstrated exercise evaluation area criteria under which one or more Deficiencies were assessed during this exercise. Included is a description of each Deficiency and recommended corrective actions.

- Area Requiring Corrective Action – Listing of the demonstrated exercise evaluation area criteria under which one or more ARCAs were assessed during the current exercise. Included is a description of the ARCAs assessed during this exercise and the recommended corrective actions to be demonstrated before or during the next emergency worker and evacuee monitoring and decontamination drill.
- Not Demonstrated – Listing of the exercise evaluation area criteria that were scheduled to be demonstrated during this exercise, but were not demonstrated and the reason they were not demonstrated.

The following are classifications of the types of issues that are discussed in this report:

A Deficiency is defined in the FEMA August 2002, Interim REP Program Manual as "...an observed or identified inadequacy of organizational performance in an exercise that could cause a finding that offsite emergency preparedness is not adequate to provide reasonable assurance that appropriate protective measures can be taken in the event of a radiological emergency to protect the health and safety of the public living in the vicinity of a nuclear power plant."

An ARCA is defined in the FEMA August 2002, Interim REP Program Manual as "...an observed or identified inadequacy of organizational performance in an exercise that is not considered, by itself, to adversely impact public health and safety."

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

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

- Plant Site Identifier – A two-digit number corresponding to the Utility Billable Plant Site Codes.
- Exercise Year – The last two digits of the year the exercise was conducted.
- Evaluation Area Criterion – A letter and number corresponding to the criteria in the FEMA REP Exercise Evaluation Methodology.
- Issue Classification Identifier – (D = Deficiency, A = ARCA)
- Exercise Issue Identification Number – A separate two digit indexing number assigned to each issue identified in the exercise.

Table 3.1 – Summary of Drill Evaluation

DATE: 2010-03-23 SITE: San Onofre Nuclear Generating Station, CA A: ARCA, D: Deficiency, M: Met, N: Not Demonstrated		Orange County Fairgrounds
Emergency Operations Management		
Mobilization	1a1	
Facilities	1b1	
Direction and Control	1c1	
Communications Equipment	1d1	
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 Assessment and Decision making concerning Relocation, Reentry, and Return	2e1	
Protective Action Implementation		
Implementation of emergency worker exposure control	3a1	M
Implementation of KI decision	3b1	M
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 / decontamination of evacuees and emergency workers, and registration of evacuees	6a1	A
Mon / decontamination of emergency worker equipment	6b1	M
Temporary care of evacuees	6c1	M
Transportation and treatment of contaminated injured individuals	6d1	

3.3 Criteria Evaluation Summaries

3.3.1 Risk Jurisdictions

3.3.1.1 Orange County Fairgrounds

a. MET: 1.e.1, 3.a.1, 3.b.1, 6.b.1, 6.c.1
b. AREAS REQUIRING CORRECTIVE ACTION: 6.a.1

ISSUE NO.: 51-10-6a1-A-1

CRITERION: Monitoring and decontamination of evacuees and emergency workers, and registration of evacuees – The reception center/emergency worker facility has appropriate space, adequate resources, and trained personnel to provide monitoring, decontamination, and registration of evacuees and/or emergency workers. (NUREG-0654, J.10.h; J.12; K.5.a)

CONDITION: Participant improperly surveyed a masolin mop that was used to check the paper walkway after a contaminated individual passed through. The frisking speed was greater than the 1 to 2 inches per second and the distance from the monitored item was greater than 0.5 to 1 inch. This speed and distance are specified in the County of Orange Nuclear Power Plant Emergency Plan for the SONGS Radiation Monitoring and Decontamination Center Procedures, Annex Part Two.

POSSIBLE CAUSE: Participant was not practiced in using hand held frisking instruments. When asked the speed and distance for frisking he responded properly.

REFERENCE: NUREG-0654, J.12; County of Orange, Nuclear Power Plant Emergency Plan for the SONGS Radiation Monitoring and Decontamination Center Procedures, Annex Part Two, "General hand held frisking guidelines".

EFFECT: Contamination on walkway could have gone undetected and subsequent evacuees could have become contaminated after passing through the portal monitor.

CORRECTIVE ACTION DEMONSTRATED: The Controller stopped play and retrained the participant in proper scan speed and distance. The participant re-demonstrated frisking the masolin mop using proper technique.

c. DEFICIENCY: None
d. NOT DEMONSTRATED: None

SECTION 4: CONCLUSION

An emergency worker and evacuee monitoring and decontamination drill was conducted at the Orange County Fairgrounds in Costa Mesa, CA on March 23, 2010 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 SONGS. The purpose of this exercise report is to present the exercise results and findings on the performance of the 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 FEMA Region IX Regional Assistance Committee Chairperson and approved by the Regional Administrator.

No deficiencies were identified during this exercise for the state of California or Orange County. One ARCA was identified and re-demonstrated during this exercise.

Based on the evaluation of the March 23, 2010 emergency worker and evacuee monitoring and decontamination drill, the offsite radiological emergency response plans for the state of California and the affected local jurisdictions site-specific to SONGS can be implemented, and are adequate to provide reasonable assurance that appropriate measures can be taken offsite to protect the health and safety of the public in the event of a radiological emergency at SONGS.

APPENDIX A: ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
ARCA	Area Requiring Corrective Action
EPZ	Emergency Planning Zone
FEMA	Federal Emergency Management Agency
KI	Potassium Iodide
ORO	Offsite Response Organization
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plans
SONGS	San Onofre Nuclear Generating Station

APPENDIX B: DRILL EVALUATORS

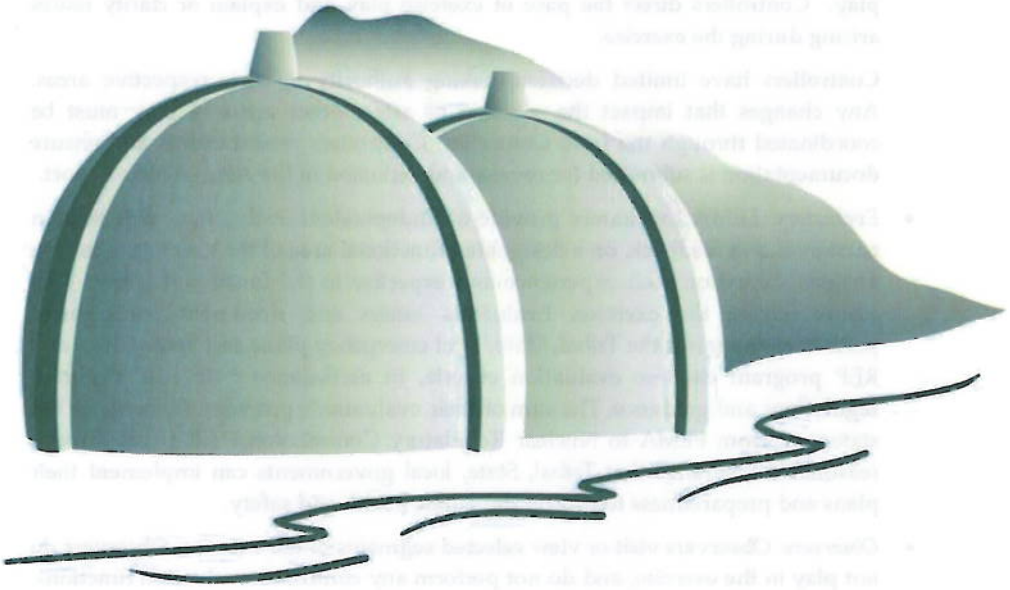
DATE:2010-03-23, SITE: San Onofre Nuclear Generating Station, CA

LOCATION	EVALUATOR	AGENCY
Orange County Fairgrounds	Paul Anderson	FEMA RIX
	Alan Bevan	ICF
	Deborah Blunt	ICF
	Thomas Essig	ICF
	Elena Joyner	FEMA RIX
	*Joseph Keller	ICF
	Roy Smith	ICF
	Dave Stuenkel	ICF
	Dennis Wilford	ICF
	John Wills	ICF
	John Zeidler	ICF
*Team Leader Site Specialist, Katherine Nishihara – FEMA RIX Senior Site Specialist, Richard Echavarria – FEMA RIX		

APPENDIX C: EXTENT-OF-PLAY

The summary presented in this appendix is a compilation of exercise scenario materials submitted by the state of California and the SONGS. This appendix contains the extent-of-play agreement prepared by the state of California and approved by FEMA Region IX to provide evaluators with guidance on expected actual demonstration of the evaluation area criteria.

Orange County Fairgrounds Reception Center Exercise March 23, 2010



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Orange County Fairgrounds Reception Center Exercise March 23, 2010

EXERCISE SUMMARY

Initial Conditions

At 0700 hours, the Unit 2 Control Room at SONGS identifies a 5000-gallon per minute leak from the Reactor Coolant System resulting in SONGS declaring a Site Area Emergency Event Code B3-1. This prompts Orange County to mobilize the Reception and Decontamination Center at the Orange County Fairgrounds at 0730 hours. At 0735 hours, the Shift Supervisor declares a General Emergency, Event Code B4-1, due to a radioactive noble gas and iodine release from the Unit 2 Containment. At 0755 hours offsite jurisdictions make a Protective Action Decision to evacuate the Emergency Planning Zones 1, 4 and 5 and instruct the general public within that area to ingest Potassium Iodide.

The Reception Center Staff assembles at 0800 hours for a briefing followed by facility setup. The first evacuees from Emergency Planning Zone 4 and 5 will arrive at the facility at approximately 0915 hrs. Evacuees from Emergency Planning Zone 1 are expected to evacuate to San Diego County.

Exercise Termination

The exercise will be terminated when all evaluation criterions has been properly evaluated by FEMA Evaluators. This should occur at about 1100. Upon termination, debriefings will be conducted with the players and their respective Exercise Controllers and FEMA Evaluators.

Orange County Fairgrounds Reception Center Exercise March 23, 2010

SEQUENCE OF EVENTS

Time	Exercise Controller	Event Description	Required Response
0800	**Lead Controller and Exercise Director**	Pre Exercise Briefing	1. Review the "Guidelines for Exercise Conduct" with all exercise participants. 2. Review the following with all exercise participants. *At 0700 hours, The SONGS Unit 2 Control Room identified a 5000-gallon per minute leak from the Reactor Coolant System resulting in a Site Area Emergency, Event Code B3-1. At 0730 hours, Orange County authorized the mobilization of the Orange County Fairgrounds Reception and Decontamination Center. At 0735 hours, the Shift Supervisor at SONGS declared a General Emergency, Event Code B4-1, due to a radioactive noble gas and iodine release from the Unit 2 Containment. At 0755 hours, Offsite jurisdictions made a Protective Action Decision to evacuate the Emergency Planning Zones 1, 4 and 5 and instructed the general public within the area to ingest Potassium Iodide. Based on the best available estimates, the first evacuees from Emergency Planning Zone 4 and 5 are expected to arrive at fairgrounds at approximately 0915 hrs. Evacuees from Emergency Planning Zone 1are expected to evacuate to San Diego County.*
~0915	**Health Care Group Supervisor**	Exercise Initiaton	1. When the facility setup is complete, allow the evacuees to begin processing into the Reception and Decontamination Center.
~0920	**Initial Monitoring Controller and Evacuee Controller**	Individuals Alarm the Portal Monitors	1. When 10 to 20 evacuees have passed through the portal monitors, randomly select out two females and two males out of the evacuees. When these individuals go though the portal monitors, inform the players that they have alarmed the portal monitor every time twice. The expected action will be to send these individuals to the appropriate decontamination facility.
~0925	**Decon Controllers**	Decon Process	1. Two female evacuees and two male evacuees will enter the appropriate facility. After the individuals have simulated the showering process, one male and one female will exit without alarming the portal monitors. The other male and female evacuees after simulating showering will alarm the portal monitors twice. When they are surveyed with the hand held radiation instrument, the staff will find 1000 cpm on the back of both their hands. After the second shower, the evacuees will successfully exit the portal monitor. **NOTE: there will be no deviation from this step without the Lead Controllers' approval.**

Orange County Fairgrounds Reception Center Exercise March 23, 2010

~0930	**Initial Monitoring Controller and Evacuee Controller**	Portal Monitor Timing Evaluation	1. Stop normal play and randomly select 6 evacuees and line them up behind each portal monitor. 2. Have a stopwatch ready and inform the players that these evacuees will be timed on how quickly these individuals can process through the portal monitors. Timing begins when first individual enters the portal monitor. Timing ends when the last individual exits the portal monitor. 3. Based on 20% of the PAZ 4 and 5 population (44,374) six evacuees must pass through each portal monitor within the total seconds allowed (assumes standing or walk through mode): **Portals Used** / **Seconds Per Individual** / **Total Seconds** 6 / 15 / 90 5 / 14 / 84 4 / 11 / 66 3 / 8 / 48 2 / 5 / 30
~1015	**Vehicle Monitoring Controller and Initial Monitoring Controller**	Emergency Worker Monitoring	1. At the completion of the evacuee monitoring process, two emergency workers will be monitored. These workers arrived at the reception center from a traffic control point and radiological monitoring team in the Emergency Planning Zone. The emergency vehicle their equipment will be surveyed and found clean. The emergency workers will be directed to the portal monitors at initial monitoring
~1020	**Initial Monitoring Controller**	Emergency Worker Monitoring	1. When the emergency workers arrive and go through the portal monitors, emergency workers will not alarm the portal monitor and will be allowed to proceed. **NOTE: there will be no deviation from this step without the Lead Controllers' approval.**
~1100	**Lead Controller**	Terminate Exercise	1. When all objectives have been evaluated and concurrence has been received from all FEMA Evaluators, then announce to all controllers, participants and volunteers that the exercise has been terminated. 2. Gather all Exercise Controllers, FEMA Evaluators, participants and volunteers together and perform a facility debrief.

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