UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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SEP 5 2002

Gregg R. Overbeck
Senior Vice President, Nuclear
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P.O. Box 52034
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SUBJECT: FEDERAL EMERGENCY MANAGEMENT AGENCY'S REPORT

Dear Mr. Overbeck,

Enclosed is a copy of the Federal Emergency Management Agency's (FEMA) drill evaluation report of the emergency preparedness medical drill conducted for the Emergency Planning Zone around the Palo Verde Nuclear Generating Station on March 29, 2002.

The report indicates that FEMA observed no deficiencies or areas requiring corrective action during the drill.

The purpose of this letter is to transmit to you the results of the FEMA evaluation of the 2002 annual medical drill. No response to the NRC is required.

If you have any further questions, please contact Ryan E. Lantz at (817) 860-8158 or Paul J. Elkmann at (817) 276-6539 of my staff.

Sincerely,

Michael P. Shannon
FOR GMG

Gail M. Good, Chief
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Final Medical Drill Report

PALO VERDE
NUCLEAR GENERATING STATION

Licensee: **Arizona Public Service Company**

Drill Date: **March 29, 2002**

Report Date: **August 5, 2002**

FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION IX
Building 105
Post Office Box 29998
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I. EXECUTIVE SUMMARY

The Federal Emergency Management Agency (FEMA), Region IX evaluated an Off-site Medical Drill on March 29, 2002, for the emergency planning zone (EPZ) around the Palo Verde Nuclear Generating Station (PVNGS). The purpose of the exercise and drill was to assess the level of State and local preparedness in responding to a radiological emergency. This exercise and drill was held in accordance with FEMA's policies and guidance concerning the exercising of State and local radiological emergency response plans (RERP) and procedures.

The most recent biennial exercise at this site was conducted on March 14, 2001. The most recent medical drill for the Good Samaritan Regional Medical Center was conducted on December 3, 1999. The qualifying emergency preparedness exercise was conducted on April 1, 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 an additionally 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 drill.

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

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II. INTRODUCTION

On December 7, 1979, the President directed FEMA to assume the lead responsibility for all off-site nuclear planning and response. FEMA's activities are conducted pursuant to 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.

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

- FEMA's responsibilities in radiological emergency planning for fixed nuclear facilities include the following:

- Taking the lead in off-site 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. Department of Commerce,
  - 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 FEMA Region IX Regional Assistance Committee (RAC) that is chaired by FEMA.

Formal submission of the RERPs for the Palo Verde Nuclear Generating Station to FEMA Region IX by the State of Arizona and the involved local jurisdictions occurred on May 31, 1988.

State and local Radiological Emergency Preparedness plans are required, in NUREG-0654/FEMA REP 1, Rev. 1 (November 1980), to designate primary and back-up medical facilities capable of providing appropriate care to injured/contaminated individuals originating from the off-site effects of an incident at a nuclear power plant. One or more of these facilities are usually exercised as part of the biennial State/Local REP exercise. Others may be exercised during the off-year period. At least one evaluated medical drill must be held each year at each nuclear facility, according to NUREG-0654 Planning Standard N.2.c.

FEMA Region IX evaluated an Off-site Medical Drill on March 29, 2002, 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 the PVNGS. The purpose of this report is to present the results and findings on the performance of the off-site response organizations (ORO) during a simulated radiological emergency.

The findings presented in this report are based on the evaluations of the Federal evaluator team, with final determinations made by the FEMA Region IX RAC Chairperson, and approved by the Regional Director.

The criteria utilized in the 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 Radiological Emergency Preparedness Exercise Evaluation Methodology, September, 2001; and

- FEMA Guidance Memoranda MS-1, "Medical Services," November 1986.

Section III 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, a listing of all participating jurisdictions and functional entities that were evaluated, and a tabular presentation of the time of actual occurrence of key exercise events and activities.

Section IV of this report, entitled "Exercise Evaluation and Results," presents detailed information on the demonstration of applicable exercise evaluation areas 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 the Tribal, State and local governments' schedule of corrective actions for each identified issue and (2) descriptions of unresolved ARCAs assessed during previous drills and the status of the OROs' efforts to resolve them.

III. OVERVIEW

Contained in this section are data and basic information relevant to the March 29, 2002, medical drill to test a portion of the off-site emergency response capabilities for the area surrounding the Palo Verde Nuclear Generating Station. This section of the report includes a description of the plume pathway EPZ, and a listing of all participating jurisdictions and functional entities that were evaluated.

A. Plume Emergency Planning Zone Description

The State of Arizona has designated an Emergency Planning Zone (EPZ) that extends out from a 10-mile circle around the plant. The EPZ includes the unincorporated areas of Maricopa County.

B. Exercise Participants

The following agencies, organizations, and units of government participated in the Palo Verde Nuclear Generating Station off-site medical drill on March 29, 2002.

RISK JURISDICTIONS

Maricopa County

PRIVATE/VOLUNTEER ORGANIZATIONS

Air Evac Services
Good Samaritan Regional Medical Center
Palo Verde Nuclear Generating Station

IV. EVALUATION AND RESULTS

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities which participated in the March 29, 2002, medical drill to test the off-site emergency response capabilities of Tribal Nations, State and local governments in the 10-mile EPZ surrounding the Palo Verde Nuclear Generating Station

Each jurisdiction and functional entity was evaluated on the basis of its demonstration of criteria delineated in exercise evaluation area criteria contained in the FEMA REP Program Manual. Detailed information on the exercise evaluation area criteria and the extent-of-play agreement used in this exercise are found in Appendix 3 of this report.

A. Summary Results of Exercise Evaluation - Table 1

The matrix presented in Table 1, on the following page, presents the status of all exercise evaluation area criteria from the FEMA REP Program Manual. that were scheduled for demonstration during this exercise by all participating jurisdictions and functional entities. Exercise evaluation area criteria are listed by number and the demonstration status of those evaluation area criteria 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 - ARCA(s) assessed or unresolved ARCA(s) from prior exercise(s)

N - Not Demonstrated (Reason explained in Subsection B)

TABLE 2. SUMMARY RESULTS OF EXERCISE EVALUATION

DATE
March 29, 2002

SITE
Palo Verde Nuclear Generating Station

	EMERGENCY OPNS MANAGEMENT					PROTECTIVE ACTION DECISION-MAKING					
	Mobilization	Facilities	Direction & Control	Communications Equipment	Equipment & Supplies to Support Operations	Emergency Worker Exposure Control	Rad Assmt PARs Based on Avail Information	Rad Assmt PADs for General Public	Prot Action Decisions for Special Population's	Rad Assmt & Decision Making for Ingest Exposure	Rad Assmt & Dec Making for Relo/Re-entry/& Return
	1a1	1b1	1c1	1d1	1e1	2a1	2b1	2b2	2c1	2d1	2e1
Air Evac Services					X	X					
Good Samaritan Medical Center					X	X					

	PROTECTIVE ACTION IMPLEMENTATION									FIELD MEASUREMENT & ANALYSIS					NOTIF & PUBLIC INFO			SUPPORT OPN/FACILITIES			
	Implementation of Emergency Wrkr Exposure Control	Implementation of KI Decision	Implementation of PADs for Special Population's	Implementation of PADs for Schools	Implementation of Traffic Access & Control	Impediments to Evac & Traf are Identified & Resolved	Implementation of Ingestion Pathway Decisions	Impl of IP Decisions Show Strat & Instr Material	Impl of Relocation/Re-entry/Return Decisions	Plume Phase Measurement & Analysis Equip	Plume Phase Field Measurement & Analysis Mgmt	Plume Phase Fld Measurements & Analysis Proced	Post Plume Phase Field Measurements & Sampling	Laboratory Operations	Activation of Prompt Alert & Notification	Activation Prompt Alert & Notif in Exception Areas	Emerg Info & Instructions for the Public & Media	Monitoring/Decon/Registration of Evacuees & EWs	Monitoring & Decon of Emerg Worker Equipment	Temporary Care of Evacuees	Trans & Treatment of Contam Injured Individuals
	3a1	3b1	3c1	3c2	3d1	3d2	3e1	3e2	3f1	4a1	4a2	4a3	4b1	4c1	5a1	5a3	5b1	6a1	6b1	6c1	6d1
Air Evac Services																					X
Good Samaritan Medical Center																					X

M - Met (No Deficiency or ARCA(s) Assessed and no Unresolved ARCAs from Prior Exercises
N - Not Demonstrated as Scheduled (Reason Explained in Section IV.B)
D - Deficiency

A - ARCA(s) Assessed or Unresolved ARCA(s) from Prior Exercises
Blank - Not Scheduled for Demonstration

B. Status of Jurisdictions Evaluated

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

- **Met** - Listing of the demonstrated exercise 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 was assessed during this exercise. Included is a description of each Deficiency and recommended corrective actions.

- **Area Requiring Corrective Actions** - Listing of the demonstrated exercise evaluation area criteria under which one or more ARCAs were assessed during the current exercise or ARCAs assessed during prior exercises remain unresolved. Included is a description of the ARCAs assessed during this exercise and the recommended corrective action to be demonstrated before or during the next biennial exercise.

- **Not Demonstrated** - Listing of the exercise evaluation area criteria which were not demonstrated as scheduled during this exercise and the reason they were not demonstrated.

- **Prior ARCAs - Resolved** - Descriptions of ARCAs assessed during previous exercises that were resolved in this exercise and the corrective actions demonstrated.

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

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

- A **Deficiency** is defined in the FEMA REP Program Manual as "...an observed or identified inadequacy of organizational performance in an exercise that could cause a finding that off-site 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 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 exercise issues (Deficiencies and ARCAs). This system is used to achieve consistency in numbering exercise issues among FEMA Regions and site-specific exercise reports within each Region. It is also used to expedite tracking of exercise issues on a nationwide basis.

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

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

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

! **Evaluation Area Criterion** - A letter and number corresponding to the criteria in the FEMA REP Program Manual.

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

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

SUMMARY

Air Evac Services

a. **MET:** Exercise Criteria: 1.e.1; 2.a.1; 6.d.1

b. **DEFICIENCY:** None

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

d. **NOT DEMONSTRATED:** None

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

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

Good Samaritan Regional Medical Center

a. **MET:** Exercise Criteria: 1.e.1; 2.a.1; 6.d.1

b. **DEFICIENCY:** None

d. **AREAS REQUIRING CORRECTIVE ACTION:** None

d. **NOT DEMONSTRATED:** None

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

g. **PRIOR ARCAs - UNRESOLVED:** None

Drill Detail

The initial call that an accident had occurred at the Palo Verde Nuclear Generating Station (PVNGS), and that one victim had been injured and was contaminated with radioactive material, was received at 0716 via the Phoenix Fire Department Radio Net. The call also contained information that an air ambulance from Air Evac Services, Incorporated, was en route to the PVNGS to transport the patient to the Good Samaritan Regional Medical Center (GSRMC). During this drill, land-line telephones and the Phoenix Fire Department Radio Net operated properly and message traffic was handled without delay.

Equipment, maps, displays, dosimetry, and other supplies were sufficient to support emergency operations. Sufficient supplies and equipment were available in the GSRMC to provide medical treatment and decontamination of radioactively contaminated ill or injured individuals. Sufficient dosimetry was available to measure total dose to staff members participating in this activity.

The GSRMC demonstrated the ability to continuously monitor and control radiation exposure to the staff. Each staff member participating in the medical treatment and decontamination of the radioactively contaminated individual was issued two direct reading dosimeters (DRDs) of ranges 0-200 mR and 0-1000 mR, a thermoluminescent dosimeter (TLD) and a right and left hand TLD extremity monitoring device. The DRDs were calibrated June 5, 2001.

The name of the user, social security number, and the serial numbers of the dosimetry devices were logged on the "Hospital/Medical Facility Dosimeter Log" for later assignment of total dose to the individual. The "Reading at Issue" and "Reading at Exit" for the DRDs were also logged on the same form. An operating DRD charger was available and used to zero the DRDs prior to issue.

Although the procedure does not address permissible exposures, and there are no "turn back" values for the medical staff or handling of dosimetry, the staff was aware of the whole body occupational dose limit of 5000 millirem deep dose equivalent. At the end of the mission, dosimetry is turned into the Dosimetry Coordinator and returned to the vendor for processing and evaluation.

Through interview with the PVNGS Fire Department Emergency Medical Technician (EMT) responsible for transporting the contaminated victim to the helipad, it was established that the Air Evac, Incorporated, helicopter team would receive dosimetry, if needed, from the plant's Radiological Protection Technician (RPT) who would normally be part of the team at the helipad for transfer of the radioactively contaminated victim. An RPT was not present because in the scenario and extent-of-play, this was part of an on-site activity that occurred on Day-1 of the drill. The PVNGS Fire Department EMT further advised that an emergency kit with dosimeters was in the ambulance and could only be unlocked by the RPT.

For this exercise, radiation from the victim was of very low level; therefore, dosimetry was not required for the Air Evac crew.

Through discussions at the post-exercise debrief, the RPT that participated in the drill at the GSRMC and met the Air Evac helicopter upon arrival advised that it would be his responsibility to collect the dosimetry from the Air Evac crew and take further actions as the situation

The capability to provide appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination, and medical services to contaminated injured individuals was successfully demonstrated by personnel of the PVNGS, Air-Evac Services, Incorporated, and GSRMC at that facility in Phoenix, Arizona and at the PVNGS site.

Patient Transfer Operations at PVNGS Site

Transportation of the contaminated injured PVGNS employee to the GSRMC was via helicopter by Air Evac Services, Incorporated. Air Evac was notified by PVNGS at 0714 of the need for an Air Evac helicopter to evacuate the victim to GSRMC.

At 0720, a PVNGS Fire Department ambulance arrived at the PVNGS helipad from the PVNGS Medical Facility with the victim. The contaminated victim was properly wrapped in a plastic sheet and secured on a backboard that rested on a gurney protected with a covering. Thus, the possibility of cross-contamination was minimized.

At 0736, the Air Evac helicopter advised the Fire Department Coordinator at the helipad that it was two minutes out from landing. At 0740 the helicopter landed.

The helicopter crew consisted of a pilot, a flight nurse, and a paramedic. The nurse and paramedic immediately went to the ambulance to assess the situation. They were briefed by the Fire Department EMT and provided with a body map showing contamination locations and levels and vital signs of the victim. Monitoring results and victim's medical condition were thoroughly discussed. The Fire Department EMT advised the nurse and paramedic to put on a second pair of gloves before transferring the victim.

Transfer to the helicopter was flawless. The victim was moved onto a stretcher with protective covering. This protective covering was then strapped around and over the victim. Thus, the victim was double-wrapped to further minimize contamination spread. At 0755, the Air Evac helicopter lifted off en route to the GSRMC.

In an interview with the nurse prior to departure, she stated that there were four kits with masks, gowns, and gloves aboard the helicopter that could be used as protective equipment for a variety of hazardous materials (HAZMAT) incidents, including radiological emergencies. She indicated that they had been informed they were en route to an incident involving radiological contamination, they had a HAZMAT Handbook aboard the helicopter, and they have a variety of resources they can contact while en route (e.g., Dispatch, GSRMC, Poison Center) if they are uncertain how to handle a situation. This interview also revealed that the Air Evac crew was aware that they and the helicopter would be monitored and decontaminated, if necessary, prior to departure from the GSRMC. Transfer operations of the contaminated victim at the PVNGS were excellent.

Both the PVNGS Fire Department personnel and the Air Evac personnel displayed a high degree of professionalism and thorough knowledge of how to prepare and transport a radioactively contaminated victim, and they worked well as a team to get the job done.

Patient Transfer Operations Between GSRMC Helipad and Treatment Area

Transportation of the contaminated injured patient was provided by air ambulance (helicopter) operated by Air Evac, Incorporated of Phoenix. The flight from the PVNGS took approximately twenty-two minutes, arriving at the GSRMC helipad at 0817. The hospital Nuclear Medicine Technician (NMT) monitored the hands of the paramedic and flight nurse and then checked for contamination on the patient by swiping the protective covering ("cocoon") in which the patient had been placed at the PVNGS to contain any radioactive contamination. The NMT used a Ludlum Model 3 portable survey meter (last calibrated October 31, 2001) with Ludlum Model 44-9 GM pancake probe covered with protective plastic covering for all monitoring operations, including checking of the swipe(s). Personnel on the helicopter did not wear dosimetry; however, dosimetry would have been provided by the PVNGS upon transfer of the patient to the air ambulance, had the PVNGS radiation safety staff deemed such protective measures necessary.

The patient was transferred from the helicopter to a hospital-supplied gurney at 0820 and transported by elevator to the trauma room in the GSRMC Emergency Department. The floor areas in the helipad, the elevator, and Emergency Department, over which the gurney had passed, were checked by use of a masslin mop swipe and then checked by use of the survey meter. All use of the survey meter was accomplished using the lowest scale and with the audible speaker system in the "on" position.

Following turn-over of the patient to the Trauma Team in the Emergency Department, the Air Evac personnel returned to the helicopter and were checked for contamination. The helicopter interior was surveyed for contamination by direct monitoring and also by use of masslin swipes that were checked by use of the survey meter. Following the contamination checks, the helicopter was released, and it departed the helipad at 0850. It was explained by the NMT that if decontamination of the helicopter had been necessary, it would have been accomplished on the helipad. Had the helicopter remained contaminated to unacceptable levels following decontamination efforts at the helipad, it would have been returned to PVNGS for proper handling. The NMT was aware of the decontamination action level of 100 counts/minute above background for personnel and for equipment.

ARCA 45-99-20-A-24, cited in the Off-Site Medical Drill report, dated December 3, 1999, noted that actions "for the transfer of the simulated injured and contaminated patient from the helipad to the REA, specified in Procedure No: EP2-004A, Subject: Emergency Preparedness: PVNGS Occupational Radiation Injury" were not followed. Corrective Action noted in that same report stated that the procedure has been revised (12/20/99) and that the ARCA "is corrected." The procedure has, indeed, been revised and the actions that were required by the old procedure have been eliminated from the current procedure. Therefore, ARCA 45-99-20-A-24 is considered corrected, as stated in the aforementioned Off-Site Medical Drill report of December 3, 1999.

Treatment of Patient at the GSRMC Emergency Department

Facilities at the GSRMC, a Level I Trauma Center, are sufficient to handle radioactively contaminated patients. Adequate space, furnishings, lighting, equipment, ventilation, restrooms and back-up power are available. The GSRMC personnel are trained to treat and decontaminate radioactively contaminated ill or injured individuals.

At the GSRMC, land-line telephones, cellular telephones, the Phoenix Fire Department Radio Net, and direct communication to the 911 communications center are available.

At 0716, the GSRMC Emergency Department received a call from the PVNGS stating that a radioactively contaminated and injured worker was being sent to GSRMC via Air-Evac with an estimated arrival in 20 minutes. The individual's injuries, vital signs, areas of contamination and contamination levels were provided in the initial notification. Notification and mobilization of Medical Center staff began immediately. At 0720, a RPT from PVNGS arrived at the GSRMC emergency (trauma) room.

At 0730, the Emergency Department Nurse notified the Trauma Attending Staff, the Emergency Center Attending Physician, and Nursing staff, the Safety Office, Security, the Radiation Safety Officer, Public Relations, Nuclear Medicine, and an emergency operator (extension 1-6666) to assemble in the Emergency Trauma Room to receive and treat a radioactively contaminated, injured patient. These notifications were completed at 0745. At approximately 0800 the trauma team had arrived and was fully in readiness to receive the patient.

Preparation of the Radiation Emergency Area (REA) began at 0725 and was completed at 0743. Hospital staff donned protective clothing and were issued dosimetry. A staff briefing was held to discuss patient injuries, vital signs, and contamination locations and levels. Participating medical staff were aware of the necessity to treat life-threatening medical conditions before decontamination and of the 100 counts/minute above background decontamination action level. At 0827 the patient arrived in the REA. The staff was aware that medical treatment superceded any decontamination efforts and the patient was stabilized to beginning decontamination.

Contamination monitoring in the REA was accomplished using two Eberline RM20 survey meters with GM pancake probes. The instruments were calibrated October 31, 2001. They were checked for response to radiation with a small radioactive source and the probes were covered to prevent contamination.

Monitoring and decontamination of the patient were carried out in a competent manner. Good contamination control was demonstrated including frequent monitoring and changing of gloves, frequent monitoring of the staff and patient, monitoring in the area adjacent to the treatment gurney and discussions between the medical staff and the Health Physics Technician concerning the decontamination of the patient. A C-spine x-ray was simulated, using good contamination control techniques.

Upon successful decontamination, the patient was transferred to a clean gurney and admitted to the hospital for definitive treatment. Staff then removed their protective clothing and were monitored out of the REA. A large chart was available that provided a step-by-step procedure for removing protective clothing. The RPT correctly described the cleanup of the REA and disposal of the radioactive waste.

At 0904, the drill was completed.

The staff demonstrated a thorough knowledge of the procedure for treatment and decontamination of a radioactively contaminated and injured individual. Their play was noteworthy and commendable, and all played the exercise as if it were a real event.

APPENDIX 1

ACRONYMS AND ABBREVIATIONS

The following is a list of the acronyms and abbreviations that were used in this report.

ARCA	Area Requiring Corrective Action
CD-V	Civil Defense - Victoreen
CFR	Code of Federal Regulations
CPM	Counts Per Minute
DRD	Direct Reading Dosimeter
EMT	Emergency Medical Technician
EPZ	Emergency Planning Zone
ETA	Estimated Time of Arrival
FEMA	Federal Emergency Management Agency
FR	Federal Register
GM	Guidance Memorandum
HAZMAT	hazardous materials
mR	milliroentgen
mR/h	milliroentgen per hour
NMT	Nuclear Medicine Technician
NRC	U.S. Nuclear Regulatory Commission
NUREG-0654	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*
ORO	Off-site Response Organization
PVNGS	Palo Verde Nuclear Generating Station

R	Roentgen
REA	Radioactive Emergency Area
REM	Roentgen Equivalent Man
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plan
R/h	Roentgen(s) per hour
RO	Radiological Officer
RPT	Radiological Protection Technician
TL	Team Leader
TLD	Thermoluminescent Dosimeter

APPENDIX 2

EVALUATORS AND TEAM LEADERS

The following is a list of the personnel who evaluated the Good Samaritan Regional Medical Center medical drill on March 29, 2002. The organization which each evaluator represents is indicated by the following abbreviations:

ICF - ICF Consulting

EVALUATION SITE	EVALUATOR	ORGANIZATION
Air Evac Services	Paul Carlson	ICF
Good Samaritan Regional Medical Center	Frank Bold	ICF
	Lyle Slagle	ICF

APPENDIX 3

EVALUATION AREA CRITERIA AND EXTENT-OF-PLAY AGREEMENT

This appendix lists the exercise evaluation area criteria that were scheduled for demonstration in the Off-site Palo Verde Nuclear Generating Station Medical Drill on March 29, 2002, and the extent-of-play agreement approved by FEMA Region IX.

The exercise evaluation area criteria, contained in the "Radiological Emergency Preparedness Exercise New Methodology" 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.

Because the evaluation area criteria are intended for use at all nuclear power plant sites, and because of variations among off-site plans and procedures, an extent-of-play agreement is prepared by the State and approved by FEMA to provide evaluators with guidance on expected actual demonstration of the Evaluation area criteria.

A. Evaluation Area Criteria

Listed below is the specific radiological emergency preparedness evaluation area criteria scheduled for demonstration during this drill.

EVALUATION AREA 1: EMERGENCY OPERATIONS MANAGEMENT

Sub-element 1.e - Equipment and Supplies to Support Operations

Criterion 1.e.1: Equipment, maps, displays, dosimetry, potassium iodide (KI), and other supplies are sufficient to support emergency operations. (NUREG-0654, H., J.10.a.b.e.f.j.k., 11, K.3.a.)

EVALUATION AREA 2: PROTECTIVE ACTION DECISION-MAKING

Sub-element 2.a - Emergency Worker Exposure Control

Criterion 2.a.1: OROs use a decision-making process, considering relevant factors and appropriate coordination, to insure that an exposure control system, including the use of KI, is in place for emergency workers including provisions to authorize radiation exposure in excess of administrative limits or protective action guides. (NUREG-0654, K.4.)

EVALUATION AREA 6: SUPPORT OPERATION/FACILITIES

Sub-element 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. (NUREG-0654, F.2, H.10., K.5.a.b., L.1., 4.)

B. Extent-of-Play Agreement

The extent-of-play agreement on the following pages was submitted by the Palo Verde Nuclear Generating Station, and was approved by FEMA Region IX, in preparation for the Off-site Palo Verde Nuclear Generating Station Medical Drill on March 29, 2002. The extent-of-play agreement includes any significant modification or change in the level of demonstration of each exercise evaluation area criterion listed in Subsection A of this appendix.

OBJECTIVES

In accordance with FEMA-REP-14, the following objectives will be demonstrated in this drill and evaluated by the Federal Emergency Management Agency (FEMA). Additionally, Areas Requiring Corrective Action (ARCAs) noted in the FEMA drill report for the December 3, 1999, evaluated exercise at the Samaritan Regional Medical Center will be re-evaluated for closure: (#45-97-20-A-24: Adherence to SRMC Occupational Radiation Injury procedure by hospital staff).

Objective 5: Emergency Worker Exposure Control

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

Demonstration of this objective focuses on:

- The ERO utilizes appropriate dosimetry for emergency worker radiation exposure control.
- Emergency workers periodically read, and at the end of each mission, record their dosimeter readings on the appropriate exposure record or chart. Procedures are followed to manage radiological exposure so that emergency workers do not incur excess doses.
- Appropriate decisions are made to send emergency workers into areas within the plume exposure pathway emergency planning zone where special missions require higher dose limits.
- All activities described in the demonstration criteria for this objective are carried out in accordance with the plan, unless deviations are provided for in the extent-of-play.

For this Evaluated Exercise, on-scene response activities related to this objective may be actually demonstrated, or they may be demonstrated via process interviews between players and on-scene evaluators.

Objective 20: Medical service - Transportation

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

Demonstration of this objective focuses on:

- Control of the spread of contamination from individuals who may be contaminated and injured.
- Setting of priorities between the need to address radioactive contamination and need for prompt transportation to a medical facility equipped to deal with such problems.
- Transportation of such individuals to medical facility equipped to deal with such problems.
- Communications with the medical facility by the vehicle crew while enroute to the medical facility.
- Monitoring and decisions on the need to decontaminate emergency vehicles after use.
- Completion of activities through adherence to the plan.

Objective 21: Medical Services - Facility

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

Demonstration of this objective focuses on:

- Control of the spread of contamination from individuals who may be both contaminated and injured.
- Setting of priorities between the need to address radioactive contamination and prompt treatment for urgent medical conditions.
- Decontamination of contaminated individuals.
- Completion of activities through adherence to the plan.

Extent of Play

The drill will consist of a medical contamination incident. Response by PVNGS Radiation Protection, Emergency Medical, and Medical Facility personnel will support the care and decontamination of the contaminated injured individual to the extent possible on site. AirEvac Services, Inc. will transport the contaminated injured individual from the PVNGS Medical Facility to Samaritan Regional Medical Center. The drill will terminate when the contaminated injured individual is cleared for admission to a hospital ward.

APPENDIX 4

SCENARIO

This appendix contains a summary of the simulated sequence of events -- Scenario -- that was used as the basis for invoking emergency response actions by OROs in the Off-site Palo Verde Nuclear Generating Station Medical Drill on March 29, 2002.

This exercise scenario was submitted by the Tribal Nation or State of Palo Verde Nuclear Generating Station, and approved by FEMA Region IX.

Medical Scenario	Anticipated Actions
General Situation: Day #1 A mechanic has been simulated to have been opening a valve on a filter in the Unit 1 Radwaste Building 100' compactor area when the operator slipped and fell against a contaminated piece of hardware protruding from the lower front of the filter, causing a severe laceration from the left hairline across the right eye.	**MEDICAL EMERGENCY SCENE:** (Unit 1 RW Bldg 100' Compactor Room inside a simulated contamination control area.) The Medical Controller at the scene (C-2) should initiate the drill by phoning in a report of the accident on a plant phone extension 4444. When EMTs and a security officer are dispatched to the scene, they will find the simulated contaminated injured individual and the medical emergency drill will commence.
Medical Emergency Initiation: Day #1 The Contaminated injured individual is wearing protective clothing (PCs) and a plastic outer suit. **Contaminated Injured Individual: Day #1** Conscious, lying on left side. Upper portion of the PCs is covered with blood.	