

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-528/91-08, 50-529/91-08, and 50-530/91-08

License Nos. NPF-41, NPF-51 and NPF-65

Licensee: Arizona Public Service Company  
P. O. Box 21666  
Phoenix, Arizona 85836

Facility Name: Palo Verde Nuclear Generating Station  
Units 1, 2, and 3

Inspection at: Palo Verde Site, Wintersburg, Arizona

Inspection dates: April 22-26, 1991

Inspector: Phillip M Qualls 6/14/91  
Phillip Qualls, Reactor Inspector Date Signed

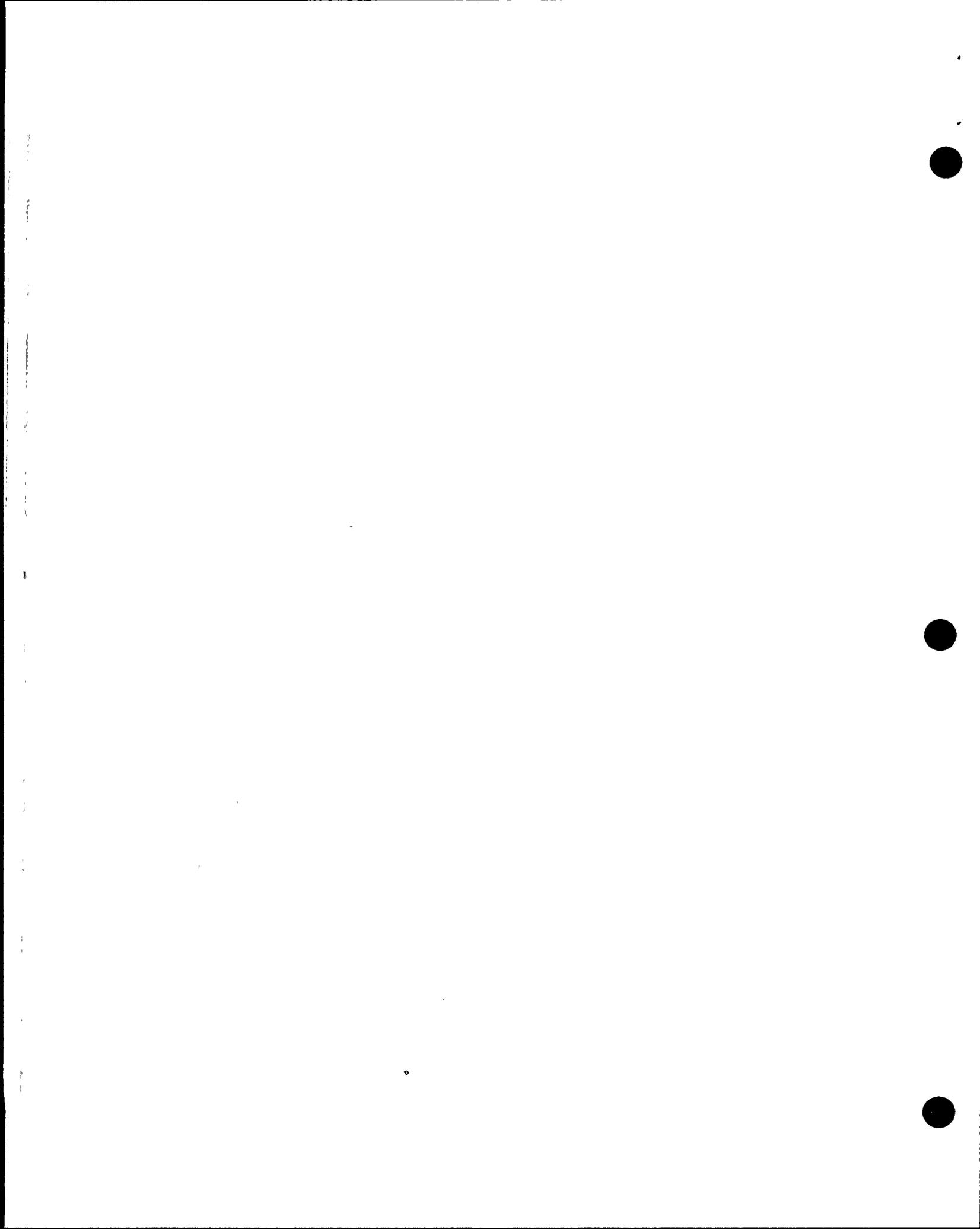
Team Members: Dennis Schaefer, Physical Security Specialist  
John MacKinnon, NRC/AEOD  
William Mattingly, NRC/AEOD  
Jim Jamison, Battelle/PNL  
Daniel McCarthy, Battelle/PNL

Approved by: James H. Reese 6/14/91  
James H. Reese, Chief Date Signed  
Emergency Preparedness and Non-Power  
Reactor Branch

Summary:

Areas Inspected: Routine announced inspection of the emergency preparedness exercise and followup on open items. Inspection procedures 82301, 82302, and 92701 were covered.

Results: No violations of NRC requirements, and one exercise weakness was identified. This weakness concerned the failure of the control room operators to promptly identify plant sabotage and classify the event as an Alert (see Paragraph 7).



## DETAILS

### 1. Persons Contacted:

G. Overbeck, Director, Site Technical Support  
P. Caudill, Director, Site Services  
G. Reed, SE Technologies  
W. Wolfe, Sr. EP Coordinator  
R. Rouse, Compliance Supervisor  
H. Bieling, Emergency Planning and Fire Protection  
N. Willsey, Emergency Planning Supervisor  
M. Pioggia, Emergency Planning Coordinator  
T. Barsuk, Lead Site Emergency Planner

In addition, many other members of licensee staff were contacted during the course of the exercise.

### 2. Action on Previous Inspection Findings (92701)

(Closed), Open Item 91-07-03, comparison of licensee and NRC dose projection models. During the annual exercise, the NRC deployed a partial site team to participate in the exercise as players. The results of the site team dose projections using the RASCAL program were comparable to the licensee dose projection results using their MESORAM program. This item is closed.

### 3. Emergency Preparedness Exercise Planning (82301)

The Emergency Preparedness and Fire Protection staff has the overall responsibility for developing and conducting the emergency preparedness exercise. The licensee issued a contract to SE Technologies, which assisted in scenario development. Persons involved in the scenario development were not participants in the exercise.

The scenario package was controlled such that players were not permitted access to the package prior to the exercise. Access was provided to authorized agencies, such as the NRC and the Federal Emergency Management Agency (FEMA), who reviewed the exercise objectives and scenario, and other personnel with a need for prior knowledge of the scenario. The exercise was intended to meet the requirements of Section IV.F.3 Appendix E to 10 CFR Part 50.

A partial NRC Region V Base Team participated in the licensee exercise.

### 4. Exercise Scenario (82302)

The exercise scenario started with an event classified as an Unusual Event (UE) and ultimately escalated to a general emergency (GE) classification. The initiating condition for the UE was a security event combined with a contaminated injured person. The Security event started when the person escorting a vendor representative was overpowered, injured, and left in a contaminated area. The vendor rep

then took his escort's ACAD and departed the scene. An Alert was declared when known sabotage was performed on plant vital equipment. Misoperation of a reactor coolant pump (RCP) breaker resulted in failure of a containment penetration, RCP impeller damage, and RCP seal leakage greater than 44 gpm. The RCS impeller damage and RCP seal had leakage greater than 44 gpm. The RCS leakage resulted in a Site Area Emergency (SAE) being declared. Fragments from the RCP impeller resulted in RCS flow blockage in the core and localized fuel melting. The RCS seal degraded and leakage and radiation level increased and a GE was declared.

5. Federal Evaluators

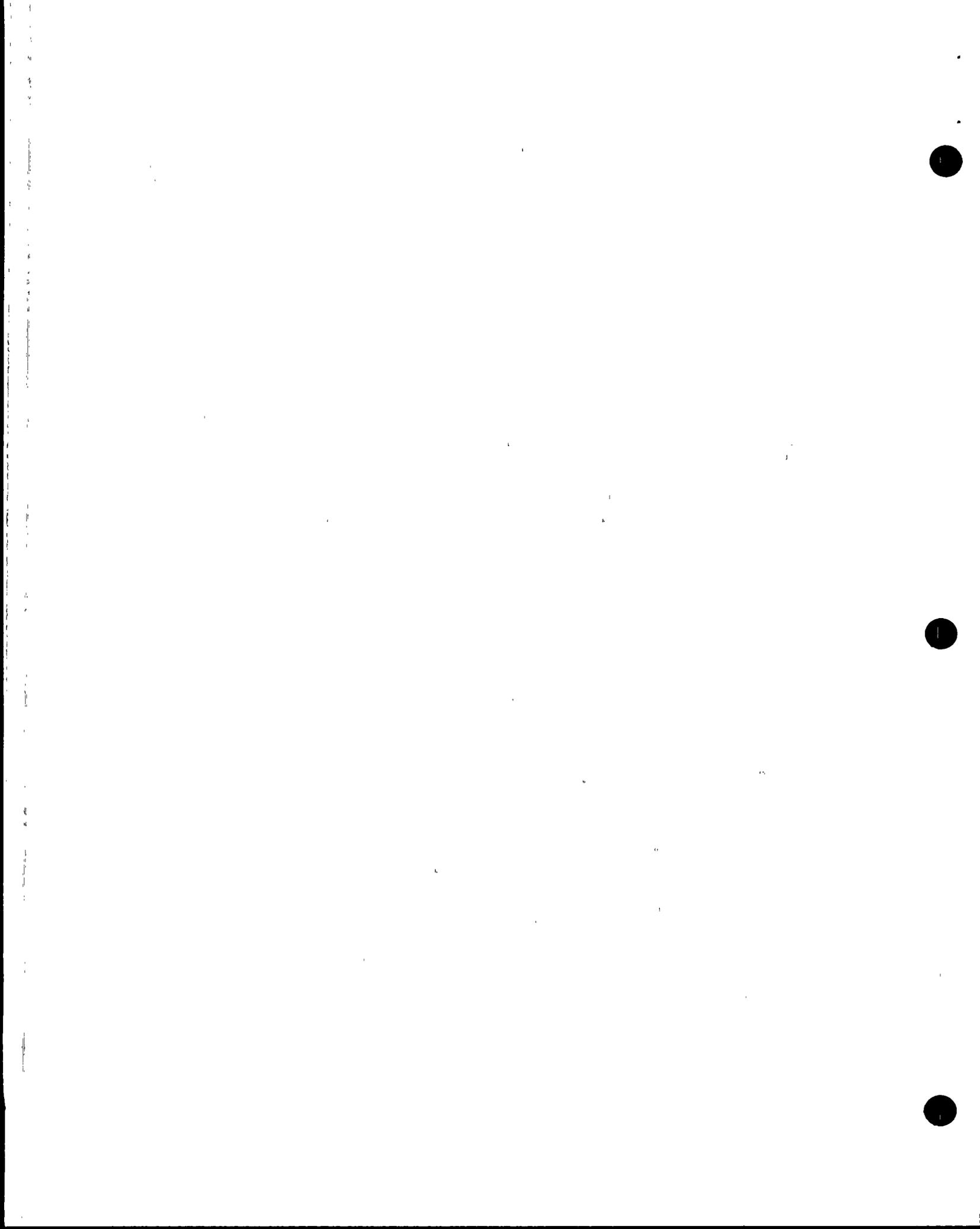
Six NRC inspectors evaluated the licensee's response to the scenario. Inspectors were stationed in the Control Room (simulator), the Central Alarm Station (CAS), Technical Support Center (TSC), Operations Support Center (OSC), and in the Emergency Operations Facility (EOF). The NRC Inspectors in the OSC also accompanied onsite repair and monitoring teams to evaluate their performance in responding to the scenario.

FEMA Region IX evaluators observed those portions of the exercise that involved state and local agencies, including the interface occurring in the EOF. The results of the FEMA evaluation will be described in a separate report issued by FEMA.

6. Central Alarm Station

The NRC observer evaluated the response of the security force to the security threat imposed by the exercise. The following observations were made:

- a. The security force expeditiously provided access to emergency response personnel and vehicles.
- b. The security force responded quickly and properly to establish and maintain access control for emergency facilities.
- c. The Operation Support Buildings (OSBs) are not equipped with a plant public address system. As a result, a security officer must be dispatched to these buildings each time a public address announcement was made to inform the occupants of the message. The security officer utilizes a bull-horn to effect the Plant announcement on each floor of the OSB. The timing of exercise plant announcements often coincided with periods of time in which the Security Department was heavily tasked with response missions. The inspectors were told during the inspection that this activity is controlled by a security department order and not a formal plant procedure. Since there is no formal mechanism in place to notify security to make the announcement, Security dispatches an officer once the formal plant announcement is made. This may cause an undue delay in providing information to plant personnel located in the OSB. Also, there is no formal message available for the officer to transmit thus parts of the original plant announcement may be lost. At the exit meeting, licensee personnel



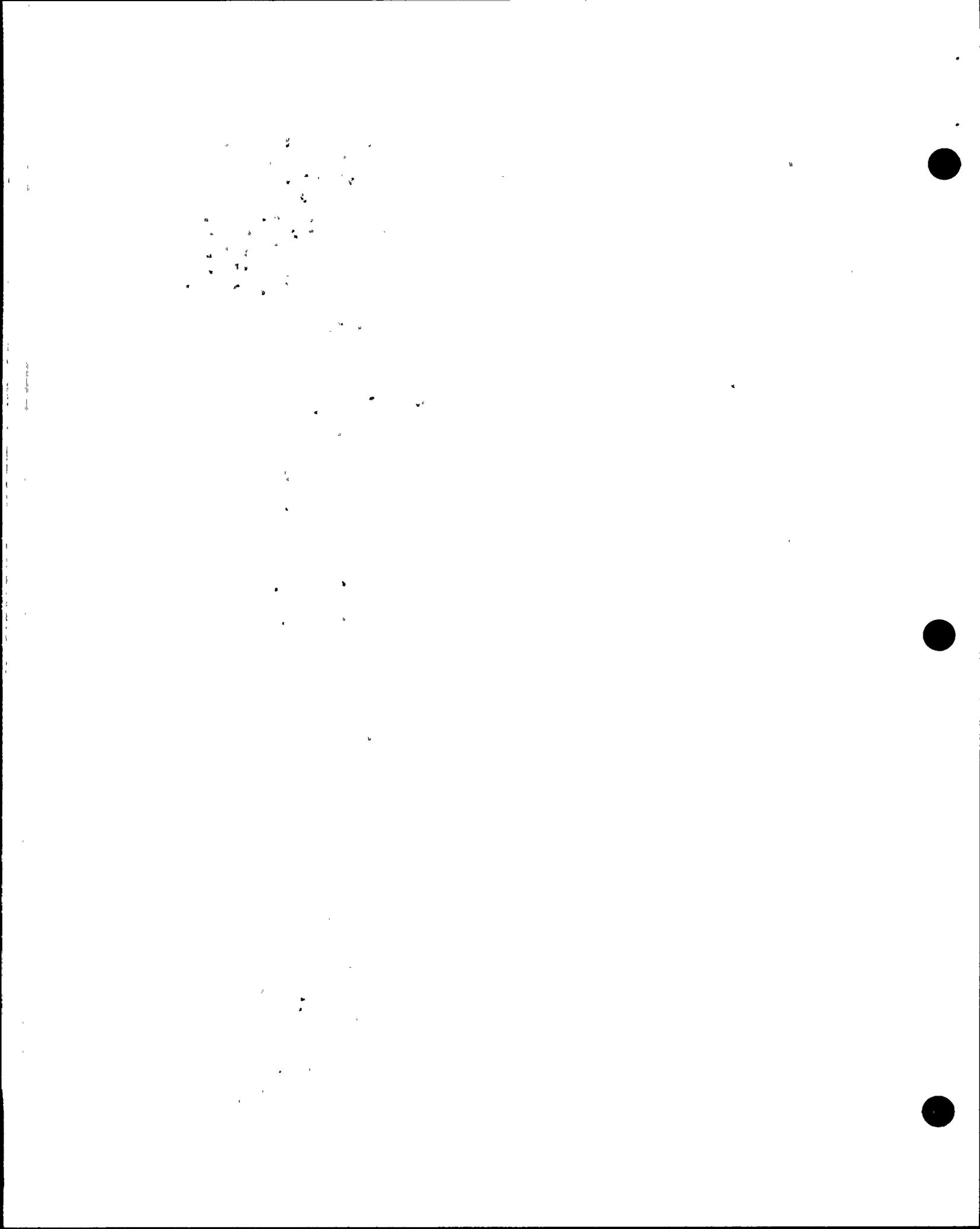
stated that a PA system for the OSBs was scheduled to be completed before December 1991. Licensee direction to the bullhorn announcers and completion of the PA system will be reviewed at a later inspection. This item is open (50-528/91-08-01).

- d. The Security Department maintains two (required) channels for radio communications. However, during this exercise (as during normal operations), the Security Department was administratively restricted from utilizing their alternate radio channel. The security radio traffic on the primary channel during the exercise was heavy. Occasionally, radio messages were cut out due to radio transmissions from other security officers. The licensee indicated that past use of the Security Department's alternate radio channel has previously disrupted Unit-2 Containment Hydrogen Monitor tests. As a result, the Security Department has been instructed that each use of their alternate radio channel must first be approved by the three plant control rooms. This administrative restriction has caused the central and secondary security alarm stations to continually discount the availability of their alternate radio channel. This item is open and will be addressed in a later inspection (50-528/91-08-02). All other activities observed in the CAS appeared satisfactory.

#### 7. Control Room/Simulator

The NRC observer evaluated the Control Room (CR) crew's ability to detect and classify emergency events, formulate protective actions, make notifications to state, local, and federal agencies, analyze plant conditions, and take corrective actions to mitigate the accident. The following observations were made:

- a. The Satellite Technical Support Counter (STSC) located in the control room experienced communication difficulties in receiving and understanding messages and reports coming into the STSC. These difficulties are listed below and appeared to be the result of drill simulation in using the STSC as the control room for the exercise:
- It took 6 minutes from the time of the initial injured person report until the STSC understood the report. It was repeated 4 times.
  - On at least 3 occasions, the actual Control Room Reactor Operator told the STSC that someone was trying to contact the STSC on the radio.
  - The radio volume was turned down (all the way) because it was too distracting to players in the STSC. All PA announcements were not heard in the STSC.
  - Many of the STSC phones rang repeatedly (sometimes for minutes) before they were answered.
- b. The initial report received by the STSC was that RCP 2B had



tripped vice RCP 2A, the actual faulted RCP.

- c. Control room operators failed to expeditiously pursue the cause of the trip of reactor trip breakers "A" and "C". Since this is an improbable simultaneous event, and occurring concurrent with a security event, the operators should have quickly investigated the occurrence as possible sabotage. It took 37 minutes, from the breaker trips, before the operators would confirm sabotage and escalate the event to an alert. This occurred only after prompting by the controllers. The SS/EC, when the trip breaker tripped, was overheard by the inspector to say that this was an alert. After discussions with the operations assistant, he did not declare the alert. The failure to identify and classify the event in a timely manner is an Exercise Weakness (50-528/91-08-03).
- d. The inspector observed that the operators did not respond to the potential sabotage in a manner consistent with a real event. The inspectors observed only one person dispatched from the control room, and then only after waiting for a security guard for accompaniment. No use of a formal procedure with designated search areas and check lists of things to look for (for example, valves out of position, cut cables, etc.) was observed. Although after the exercise, the licensee controller told the inspector that an announcement was made for all available auxiliary operators to walk down the plant, no mention was made of getting inspection assistance elsewhere onsite such as other non-duty Unit 1 operators, available qualified Unit 2 and 3 personnel, QA, or system engineers. The lack of performing these actions prevented the SS/EC from verifying that an act of sabotage had occurred and caused delay in classifying the event to a higher level as required.
- e. State notification of the Site Area Emergency took 19 minutes vice the 15 minutes specified in EPIP-04, Alert, Site Area on General Emergency Implementing Actions. When questioned after the exercise, the Assistant Shift Supervisor replied that he thought that the 15 minute time requirement applied only to the initial notification and not follow-up notifications. This training issue will be followed up at a subsequent inspection (50-528/91-08-04) open.

The other activities observed in the CR appeared satisfactory.

#### 8. Technical Support Center

The NRC observer evaluated the TSC staff's ability to activate in a timely manner, assess, and classify the accident, perform dose assessment, confer on protective action recommendations, analyze plant conditions, and provide innovative solutions to support the Control Room. The following observations were made:

- a. The TSC was activated expeditiously and command and control were effectively demonstrated. Briefings and turnover of



responsibilities were thorough.

- b. The TSC staff analyzed plant events and did a good job of suggesting innovative solutions to repair/bypass disabled plant equipment to mitigate the physical plant damage; however, there appeared to be no effort to mitigate the radioactive release in progress and hence offsite consequences.
- c. Reactor core uncover time projections did not appear to be performed during the exercise. The lack of TSC core uncover projections was also observed in the 1990 exercise. It is possible that the lack of core recovery projections could delay making adequate Protective Action Recommendations (PARS) in a timely manner. The inspector will review this at a later inspection (50-528/91-08-05) Open.
- d. The licensee appeared to rely on PASS sample results to make a core damage assessment, vice taking a gas sample for isotopic analysis, or using some other indication to make quick, but less accurate assessments which could be used early in the event.
- e. When opening the TSC airlock outer door, the inner doors would also swing open due to the positive air pressure being maintained inside of the TSC. This may cause a breach of the TSC habitability envelope. This item will be reviewed at later inspection (50-528/91-08-06) Open.
- f. TSC communicators did not always use the notice "This is a drill" when making communications.

The other activities observed in the TSC appeared satisfactory.

#### 9. Operations Support Center

The NRC observer evaluated the OSC staff's ability to activate in a timely manner, brief, and track repair teams, maintain communication logs, and support the CR and TSC with appropriate skills and craftsmen.

- a. The OSC was staffed and activated in a timely manner. Local OSC command and control were effectively demonstrated.
- b. The process of team briefings, dispatch, tracking, and debriefing was smoothly and efficiently handled.
- c. OSC logs, including the communication logs, were well maintained throughout the course of the exercise.
- d. Diagnosis by HP, electrical, and mechanical teams was excellent.
- e. Medical response was timely and professional.
- f. Timely and comprehensive direction from the TSC was not always provided to field teams for investigation of problems and repair of significant plant equipment. Emphasis appeared to be on



troubleshooting and conducting electrical components vice investigating possible mechanical malfunctions. Two examples are noted below:

- The failure of the "A" containment spray pump at 0919 was not reported to the OSC until 1012. At 1110, the lead electrician recommended a mechanical investigation prior to resetting the breaker overcurrent trip. At 1350, a mechanical team was deployed.
  - At 1245, the LPSI pump failed, and a mechanical team was not deployed to investigate the problem at any time during the exercise.
- g. Evacuation and reactivation of the OSC took 55 minutes.
- h. During transfer of the OSC from Unit 1 to Unit 2, the OSC phone talkers were left in a 500 mrem/hr field without consideration of moving telephone communicators to a lower dose rate area.
- i. It took 8 minutes for the HP and security team to respond to the contaminated injured person whose ACAD was stolen.

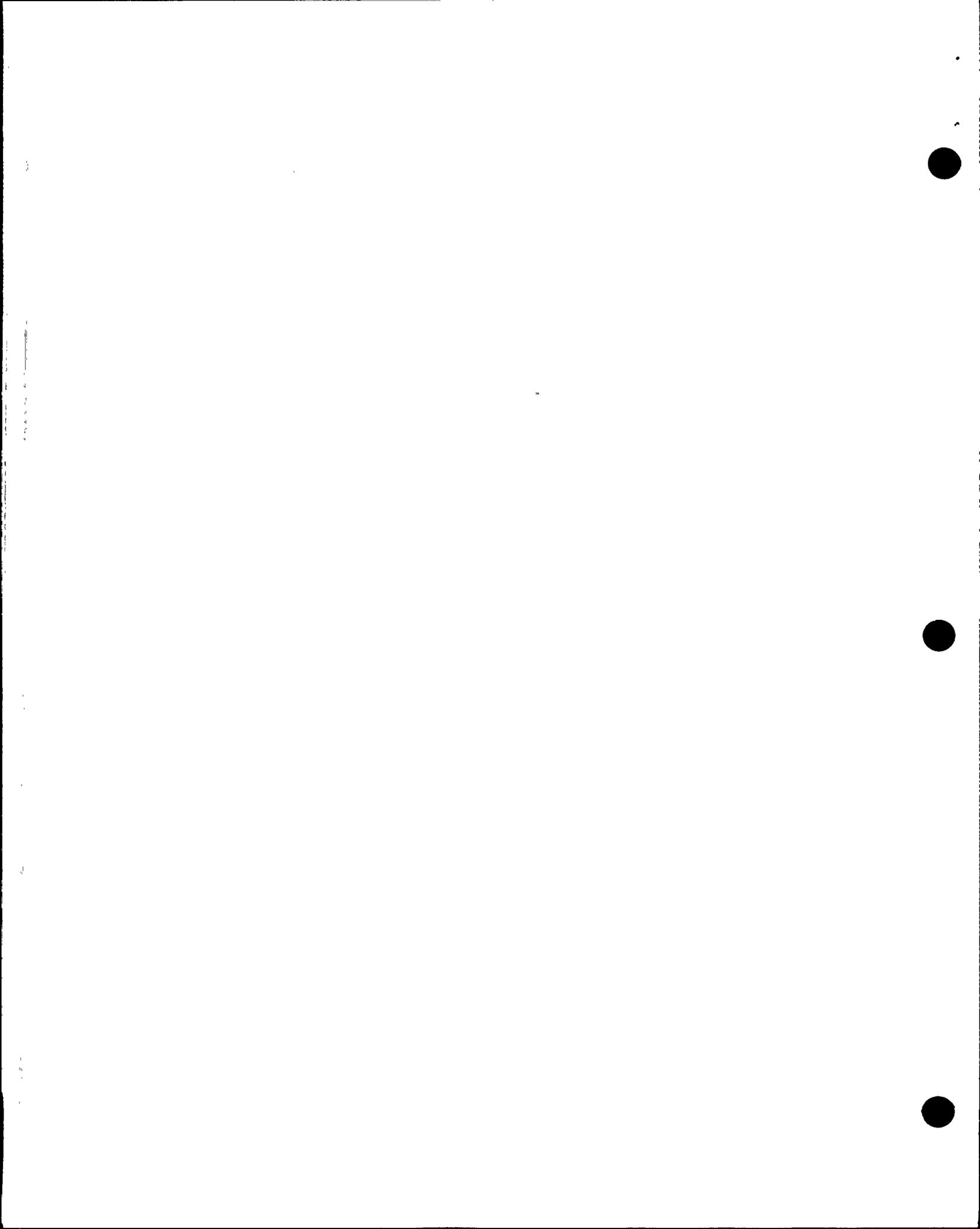
Although licensee exercise objectives for the OSC were met, the capability of the OSC to support efforts to repair mechanical failures and to transfer efficiently and safely to an alternate facility were not adequately demonstrated to the NRC inspectors. This item will be followed up in a later inspection (50-528/91-08-07).

The other activities observed in the OSC appeared satisfactory.

#### 10. Emergency Operations Facility

The NRC observer evaluated the EOF staff's ability to activate the facility in a timely manner with appropriate skills and disciplines, provide offsite dose assessment, perform appropriate and timely notifications, make protective action recommendations, interface with the corporate emergency organization, and establish the recovery organization. The following observations were made in the EOF:

- a. The EOF was fully staffed and activated within 24 minutes of the alert declaration.
- b. Command control in the EOF was effectively demonstrated, and the facility was well organized and equipped to perform its functions.
- c. Offsite notification was carefully monitored and performed as required. The EOF staff was kept informed of plant conditions via the use of frequent Public Address announcements and status boards.
- d. The recovery organization, established in the EOF during the exercise, appeared well organized and capable of performing their responsibilities.



- e. The Radiological Assessment Coordinator (RAC) and staff performed dose projection and field monitoring.
- f. Communication and coordination was good between Emergency Operations Director (EOD) and offsite authorities.
- g. The EOD did a good job in trying to anticipate possible failures, which could worsen the event or decrease time to core uncover.
- h. Although field teams were deployed to the correct locations and directed appropriately to define plume boundaries and centerline, only three air samples were taken and reported during the course of the 5 hour deployment. The teams were not directed to deliver the samples back to the plant for isotopic analysis nor was any monitoring of the plume "footprint" directed.
- i. The EOF players appeared to do a good job interfacing with the NRC Base Team.
- j. When EOF telephone problems occurred early in the event, the EOF staff did a good job making prompt repairs to restore the telephones.

The other activities observed in the EOF appeared satisfactory.

#### 11. Critique

Immediately following the exercise, licensee critiques were held in each of the emergency response facilities (ERFs). The controllers and players evaluated and identified areas for improvement. A formal critique by the licensee involving site and management personnel was conducted on April 25, 1991. The purpose of the formal critique was to summarize the findings of the earlier critique sessions and to present them to plant and corporate management. The following represent some of the findings discussed during this meeting:

- a. The OSC team dispatch took too long in some cases.
- b. The pager announcements were not clearly audible throughout Unit 1.
- c. Inplant EMTs cannot communicate by radio with the site medical facility.
- d. The Unit RP assumed a report that the plume was going north meant "plant north." The wind was from 180. Given a different scenario, this might have led to evacuating the OSC through the plume.
- e. Security players did not report to the TSC at the Notification of Unusual Event (NOUE). They reported within 5 minutes of the Alert declaration. EPIP-11, Technical Support Center/Satellite TSC Activation, calls for security to report at a NOUE.

- f. The State REAT radio volume interferes with other communication links.
- g. Shelf life of the EOF stored food is indeterminate.
- h. Due to communications problems, the air evacuation helicopter landed at the wrong helipad.

12. Exit Interview

An exit interview to discuss the preliminary NRC findings was held on April 26, 1991. Licensee personnel present at this meeting are identified in the Attachment to this report. The licensee was informed that no violations were identified during the inspection. The inspector discussed with licensee management the conclusion based on items listed in paragraphs 6.d, 7.c, 7.d, 8.6, 8.c, 8.f, 8.g, 8.h, and 8.i of this report that the exercise players did not appear to be responding to the exercise as they would respond to a plant event.

Exit Meeting Attendees

M. DeMichele, President, Corporate Executive Officer  
W. Conway, Executive Vice-President, Nuclear  
J. Levine, Vice-President, Nuclear Production  
E. Simpson, Vice-President, Nuclear Engineering and Construction  
R. Stevens, Director, Nuclear Licensing  
B. Ballard Sr., Director, Quality Assurance  
E. Dotson, Director, Site Nuclear Engineering  
G. Overbeck, Director, Site Technical Support  
P. Caudill, Director, Site Services  
M. Benac, El Paso Electric  
D. Marks, Manager, Nuclear Safety  
H. Bieling, Manager, Emergency Planning and Fire Protection  
R. Fullmer, Manager, Quality Audits and Monitoring  
R. Rouse, Compliance Supervisor  
N. Willsey, Emergency Planning Supervisor  
W. Wolfe, Emergency Planning Senior Coordinator  
T. Barsuk, Lead Site Emergency Planning  
D. Kanitz, Compliance Engineer  
G. Reed, SE Technologies  
J. Draper, SCE Site Representative  
R. Henry, Salt River Project Site Representative

