ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.:	50-275 50-323
License Nos.:	DPR-80 DPR-82
Report No.:	50-275/98-15 50-323/98-15
Licensee:	Pacific Gas and Electric Company
Facility:	Diablo Canyon Nuclear Power Plant, Units 1 and 2
Location:	7 ½ miles NW of Avila Beach Avila Beach, California
Dates:	November 3-6, 1998
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Attachment:	Supplemental Information

EXECUTIVE SUMMARY

Diablo Canyon Nuclear Power Plant, Units 1 and 2
NRC Inspection Report 50-275/98-15; 50-323/98-15

A routine, announced inspection of the licensee's performance and capabilities during the full-scale, biennial exercise of the emergency plan and implementing procedures was performed. The inspection team observed activities in the control room simulator, technical support center, operational support center, and emergency operations facility.

Plant Support

- Overall, performance was good. The control room, technical support center, operational support center, and emergency operations facility successfully implemented key emergency plan functions including emergency classifications, protective action recommendations, and dose assessment.

- The control room staff's performance was generally very good. The staff effectively implemented the emergency plan; recognition, declaration, and notification of the alert were all timely. Accountability was quickly determined and dose assessments of the gas decay tank release were accurate and timely. A strength was identified concerning implementation of mitigation strategies for plant equipment failures. Both internal and external communications were generally good; however, on several occasions communications lacked appropriate detail and/or were inaccurate. The frequency of control room briefings declined during the latter part of the exercise. Response to plant annunciators was inconsistent (Section P4.2).

- The technical support center staff's performance was good. Activation was slow to occur even though minimum staffing was quickly achieved. The untimely activation was identified as part of an exercise weakness identified in the emergency operations facility. Analysis of plant conditions and corrective actions were appropriate for the scenario conditions. Offsite agency notifications for the site area emergency were transmitted within regulatory requirements, and followup notifications were made frequently. Dose assessments were performed correctly. Protective action recommendations for the site area emergency were appropriate for the scenario conditions. There was generally good coordination and communications with the other emergency response facilities to discuss status, priorities, and potential issues. The change in wind direction during the release was not communicated to plant personnel and could have resulted in higher personnel exposures (Section P4.3).

- The operational support center staff's performance was good. The center was activated with appropriate personnel, and it was equipped properly to perform its function. Briefings were concise, informative, and regularly performed; however, participants sometimes did not attend because they were having telephone discussions with counterparts. High priority jobs were clearly identified. Information sharing was timely, and the repair team status board was well maintained. Radiological controls and team briefings were generally good; however, other safety information, such as, team

routing and heat stress considerations were not adequately addressed. One repair team member did not meet respiratory protection program requirements (Section P4.4).

- The emergency operations facility staff's performance was generally good. The facility was promptly staffed, but activation and transfer of direction and control duties was unnecessarily delayed. The untimely activation of both the technical support center and emergency operations facility was identified as an exercise weakness. The general emergency was quickly recognized and correctly classified, and protective action recommendations were correctly determined. Offsite agency notifications made by the emergency operations facility were timely. However, an exercise weakness was identified for failure to notify the offsite agencies of the site area emergency declaration within the required time limit (initiated by the technical support center but coordinated through the emergency operations facility staff). Since the licensee identified this exercise weakness, no response is required. Opportunities for improvement included: (1) communication and information flow were ineffective at times and contributed to the late notification; and (2) the event classification, description, and status were confusing, unclear, and incomplete on notification forms. Dose assessment and field team control activities were well managed, controlled, and implemented (Section P4.5).

- The originally submitted exercise scenario package was of poor quality because objectives were vague and not measurable, offsite radiological plume maps were missing, a scenario event was not properly coordinated with security personnel and had to be rewritten, and a list of simulated events was not developed or provided. The revised objectives were improved (Section P4.6).

- Post-exercise critiques were not fully effective because inplant repair team members did not participate in the OSC critique, and the CR and EOF critiques tended to focus more on positive performance and had limited participant involvement. In contrast, the management critique was very thorough and self-critical. Three weaknesses were identified along with numerous opportunities for improvement. The integrated critique process demonstrated an effective program for identifying areas in need of correction, but exercise participants tended to be passive members in the process (Section P4.7).

- Correction of two emergency action levels was untimely (Section P8).

IV. Plant Support

P4 Staff Knowledge and Performance in Emergency Preparedness

P4.1 Exercise Conduct and Scenario Description (82301 and 82302)

The licensee conducted a full-scale, biennial emergency preparedness exercise on November 4, 1998. The exercise was conducted to test major portions of the onsite (licensee) and offsite emergency response plans. The licensee activated its emergency response organization and all emergency response facilities. The Federal Emergency Management Agency evaluated the offsite response capabilities of the State of California and San Luis Obispo county. The Federal Emergency Management Agency will issue a separate report.

The exercise scenario was conducted using the plant control room (CR) simulator. The exercise began at 7:45 a.m. with Unit 1 at 100 percent power. Emergency response Team D was on-call for augmentation of the onshift staff. The following initial conditions were simulated for Unit 1: residual heat removal Pump 1-1 was unavailable because of an ongoing inspection of the associated pump motor breaker, and emergency diesel Generator 1-2 was also inoperable with troubleshooting in progress.

At 7:58 a.m., the CR was notified by the auxiliary building operator of a potential bomb located in residual heat removal pump Room 1-1. With concurrence from the watch commander, the shift supervisor directed the evacuation of the auxiliary building at 8:05 a.m.

At 8:06 a.m., the shift supervisor declared an alert because of the ongoing security event that threatened the operability of safety-related equipment and assumed the duties of interim site emergency coordinator. Implementation of the emergency plan at the alert level prompted the activation of both the onsite and offsite emergency response facilities.

At 8:13 a.m., a second bomb was simulated to detonate in the vicinity of gas decay Tank 1-1, initiating a release of the tank's contents to the plant vent. The crew took action to isolate the tank's fill lineup and to assess the dose consequences of the release. The results of the CR staff's dose assessments showed that offsite consequences from the release were minimal. At 8:41 a.m., the CR staff commenced a normal shutdown of Unit 1 based upon the ongoing security threat.

At 9:19 a.m., chemistry notified the CR that diesel fuel oil day tanks for all three emergency diesel generators were contaminated beyond acceptance limits. This rendered all three emergency diesel generators inoperable.

At 9:23 a.m., the technical support center (TSC) was activated and the site emergency coordinator functions were transferred to the TSC. The site emergency coordinator used position-authorized judgment to immediately upgrade the event to a site area emergency based upon the uncertainties of the security threat.

At 9:50 a.m., a 500kV grid disturbance caused a turbine trip and reactor trip. All 4160V vital busses transferred to startup power. At 9:59 a.m., startup power was also lost and emergency diesel Generators 1-1 and 1-3 started and loaded on to their respective busses. However, because of the fuel oil contamination, the diesels failed within several minutes initiating a loss of all AC power. Utilizing the emergency operating procedures, the CR crew maintained core cooling through use of the turbine driven auxiliary feedwater pump and the atmospheric steam dumps. Actions were also initiated to cross-connect power from Unit 2 and to establish backfeed from the 500kV grid through the main transformers.

At 10:15 a.m., the CR crew implemented the requirements of 10 CFR 50.54(x) and (y) to deviate from the plant's license and close the steam admission valve to the auxiliary feedwater pump turbine to prevent the steam generators from overfilling. Subsequently, local manual control was established for the individual steam generator level control valves and the turbine driven auxiliary feedwater pump was restarted.

At 11:22 a.m., the capability to backfeed from the 500kV grid was established and the 4160V vital busses were reenergized. Operators then implemented emergency contingency actions for AC power restoration with safety injection required (due to low reactor coolant system pressure). Actions were also initiated to restore vital plant loads.

At 12:05 p.m., a break in reactor coolant Loop 1-3 initiated a loss of coolant accident and a safety injection actuation signal. Although the centrifugal charging pumps and the safety injection pumps properly started, residual heat removal Pump 1-1 was still out of service and residual heat removal Pump 1-2 failed to start because its associated motor breaker failed to close. The lack of low pressure injection sources resulted in inadequate core cooling and subsequent fuel damage. The pressure spike in containment from the reactor coolant system blowdown also caused the containment purge valves to open, initiating a radiological release to the environment via the plant vent.

At 1:10 p.m., the CR crew was able to manually close the breaker for residual heat removal Pump 1-2. Residual heat removal Pump 1-1 was also returned to service at 1:30 p.m. At 1:33 p.m., containment spray was initiated to assist in iodine removal in containment and to reduce containment pressure to minimize the release rate. At 1:45 p.m., the CR crew transitioned the emergency core cooling system to cold leg recirculation and completed containment spraying using both containment spray pumps.

At 3:35 p.m., maintenance personnel were able to close a manual damper in series with the containment purge valves to terminate the radiological release. The exercise was terminated at 3:45 p.m.

P4.2 Control Room (CR)

a. Inspection Scope (82301-03.02)

The inspectors evaluated the CR shift staff as they performed tasks in response to the exercise scenario conditions. These tasks included event detection and classification;

analysis and mitigation of plant conditions; offsite agency notifications; adherence to emergency plan implementing procedures and emergency operating procedures; command and control; and communications. The inspectors reviewed applicable emergency plan sections and implementing procedures, operator logs, checklists, and notification forms.

b. Observations and Findings

The CR staff effectively analyzed and mitigated the effects of the simulated plant and equipment failures. The operators quickly recognized and classified the alert based upon the identification of a simulated bomb in residual heat removal pump Room 1-1. The CR staff was notified of the bomb at 7:58 a.m. and declared the alert at 8:06 a.m. Offsite agency notifications of the alert declaration were promptly made at 8:15 a.m.

The operating crew was proactive in its implementation of mitigation strategies for the simulated plant casualties. Upon notification of the bomb in residual heat removal pump Room 1-1, the shift foreman directed the closure of the residual heat removal Pump 1-1 suction valve from the refueling water storage tank (Valve 8700A). The action was designed to protect the integrity of the refueling water storage tank in the event the simulated bomb detonated. Also, recognizing that emergency diesel Generator 1-2 was inoperable, the operating crew reviewed the electrical loads supplied by 4160V vital Bus G to determine plant impact if offsite power was lost. When it was determined that all three emergency diesel generators were inoperable, the crew took early action to establish an electrical lineup for cross-connecting power from Unit 2. Finally, with the uncertainty of the location of additional bombs in the power block, the operating crew requested the operational support center (OSC) and security personnel to prioritize bomb searches based upon plant equipment needs during the unit shutdown. As an example, the crew requested a priority search of the auxiliary feedwater pump room because of the imminent need for those pumps.

The emergency evaluation coordinator's (shift technical advisor) performance in assessing the dose consequences of the release from the gas decay tank was excellent. Challenged by erroneous process radiation monitor data given by a controller, the emergency evaluation coordinator appropriately questioned the validity of the data and the error was quickly corrected (this data error is addressed in Section P4.6 below). The emergency evaluation coordinator completed three separate dose assessments. The results were consistent with the exercise scenario and promptly communicated to the interim site emergency coordinator.

The shift foreman's command and control of CR activities was generally good, including execution of the emergency operating procedures. However, on two occasions crew briefings were not conducted and/or did not provide sufficient detail for implementing procedural actions. First, no briefing was provided to the crew for implementing the Unit 1 plant shutdown. As a result, operators were not properly positioned for several evolutions, including opening the feedwater bypass valves, which occurred at a lower power level than that suggested by procedural guidance, and removing the condensate polishers from service. Second, discussions between the CR staff did not adequately address contingencies for transitioning to cold leg recirculation. As a result, the shift

foreman had to direct an operator to locally close the breaker for residual heat removal Pump 1-2 instead of having the operator prepositioned for that function. This delayed the completion of the transition.

The operating crew's response to plant annunciators was inconsistent. Alarms were not routinely announced and, in one instance, not properly questioned. As examples, no announcements were made when the axial flux deviation alarm was received during plant shutdown or when the safety injection actuation signal was received due to low reactor coolant system pressure following the plant trip. Also, during restoration of the 4160V vital busses, the operating crew did not question the fact that there was no alarm for loss of DC control power for Bus G even though reports were received that the DC knife switches on Bus G were open. Had the DC control power been available to components on Bus G, those components could have inadvertently started upon bus restoration.

Although the CR shift staff demonstrated effective implementation of the emergency plan, the use of emergency plan implementing procedures was inconsistent. Emergency plan implementing checklists for the alert declaration were not routinely reviewed by the interim site emergency coordinator, the CR assistant, or the emergency evaluation coordinator. As a result, the interim site emergency coordinator did not announce the alert declaration to the CR staff as required by the alert activation checklist. In addition, the interim site emergency coordinator did not sign off completion of the checklist when emergency coordinator functions were transferred to the TSC.

Communications within the CR and between the CR and other facilities were not always clear, complete, and accurate. In the following instances, the communication difficulties caused confusion regarding actions to be taken:

- After the discovery of the simulated bomb in residual heat removal pump Room 1-1, the interim site emergency coordinator directed the fire brigade to respond without providing the location where the brigade was needed. The fire brigade leader had to contact the interim site emergency coordinator to seek clarification.

- After the loss of coolant accident, the TSC directed the CR to initiate containment spray. However, the TSC did not indicate whether one or both pumps should be operated, and the shift supervisor did not seek clarification until questioned by the control operator.

- There was some confusion about whether the OSC had relocated. On two separate occasions, two different backup locations were identified for the OSC. The OSC never relocated.

- News Release 1 (for the alert declaration) was not adequately reviewed. The news release erroneously indicated that the bomb was located in the turbine building and that no injuries were reported.

- Some plant announcements originating from the CR were contradictory and presented poorly. For example, an announcement was made at 1:47 p.m. regarding the establishment of residual heat removal circulation. The individual who made the announcement made a misstatement and then attempted to correct it. However, in doing so, the individual confused some exercise participants. Inspectors noted that some individuals in the OSC were mistaken about the availability of residual heat removal Pump 1-1, after the announcement.

- During the latter part of the exercise, the frequency of CR staff briefings significantly declined. No briefings were held to update status of events between 11:25 a.m. and 12:32 p.m. No other crew briefings were held after 12:32 p.m.

c. Conclusions

The CR staff's performance was generally very good. The staff effectively implemented the emergency plan; recognition, declaration, and notification of the alert were all timely. Accountability was quickly determined and dose assessments of the gas decay tank release were accurate and timely. A strength was identified concerning implementation of mitigation strategies for plant equipment failures. Both internal and external communications were generally good; however, on several occasions communications lacked appropriate detail and/or were inaccurate. The frequency of CR briefings declined during the latter part of the exercise. Response to plant annunciators was inconsistent.

P4.3 Technical Support Center (TSC)

a. Inspection Scope (82301-03.03)

The inspectors observed and evaluated the TSC staff as they performed tasks necessary to respond to the exercise scenario conditions. These tasks included staffing and activation, facility management and control, accident assessment, classification, dose assessment, protective action decision making, notifications and communications, assistance and support to the CR, and dispatch and coordination of monitoring teams.. The inspectors reviewed applicable sections of the emergency plan, procedures, checklists, and logs.

b. Observations and Findings

The TSC met "minimum staffing requirements" approximately 14 minutes after the alert declaration, but the center was not activated until about 75 minutes after the alert declaration. Although the TSC was considered functional at the time minimum staffing requirements were met, it was not considered activated until the emergency coordinator responsibilities were assumed from the CR. As a result, TSC activation was considered untimely. The failure to activate the TSC in a timely manner was identified as part of the exercise weakness discussed in Section P4.5 below.

In accordance with procedures, a site assembly was ordered following the alert declaration. When the event escalated to a site area emergency, the accountability process was initiated; however, it took an exceptionally long time to complete (75 minutes). All of the designated assembly areas/facilities were accounted for within 30 minutes, except one (medical facility). In reviewing this matter, inspectors noted that, prior to the exercise, medical facility personnel were informed that they were not participating in the exercise. As a result, the facility did not provide information to security in a timely manner and caused the delay in establishing initial accountability. The inspectors did not consider the untimely accountability to be an exercise weakness, because the delay was due to exercise artificialities. However, the licensee identified this issue as a weakness during its critique.

Analysis of plant conditions and corrective actions were appropriate for the conditions presented. The TSC site emergency coordinator elected to declare a site area emergency based upon judgment that conditions warranted upgrading from an alert. There was sufficient discussion among the staff and with the interim site emergency coordinator to substantiate the decision to upgrade. Offsite agency notifications were performed within 15 minutes of the site area emergency declaration, and followup notifications were made approximately every 30 minutes.

The TSC staff monitored plant conditions to identify negative trends and potential problems. The inspectors observed good interactions between engineering and dose assessment personnel. The engineering staff often discussed plant conditions and potential release paths with the dose assessment staff. The resulting information was used to adjust goals or priorities.

The TSC staff correctly performed dose assessments and used the results to confirm protective action recommendations and coordinate offsite monitoring team response. Protective action recommendations for the site area emergency were appropriate for the conditions identified.

Good internal communications and facility briefings helped the TSC staff maintain focus on goals and priorities. While there was confusion associated with the security event early in the exercise, the TSC staff aggressively worked to develop strategies to deal with existing problems and to minimize affects of potential damage from the remaining bomb (or bombs). Later in the exercise, the TSC worked to stop the release by requesting the use of containment sprays to reduce containment pressure. The staff cautiously used the refueling water storage tank (to conserve level) by using the sprays for a short time, then assessing the impact.

Facility briefings were conducted in the TSC command room every 30 minutes to provide current plant conditions and task status, and to reassess goals and priorities. The assistant site emergency coordinator ensured that all of the command room staff attended the briefings, led the briefings, and solicited input/status from each person. Briefings typically lasted about 10 minutes. To ensure that the command room staff was prepared for the briefings, the briefing time was announced shortly before each briefing. The TSC secretary answered telephone calls and took messages to limit distractions

during the briefings. Following the briefings, the engineering advisor and the radiation advisor briefed their staffs on status, goals, and priorities.

The TSC staff demonstrated generally good coordination with the other emergency response facilities through routine communications to discuss status, priorities, and potential issues. Plant personnel were often informed of changing plant conditions; however, the change in wind direction during the release was not communicated to plant personnel in a timely manner. The information was communicated to the OSC approximately 1 hour after the wind change was observed. No announcement was made to inform personnel in the plant of the change in radiological conditions caused by the change in wind direction. The failure to communicate this information could have resulted in higher exposures than expected for personnel working in or crossing areas affected by the plume.

The TSC and OSC communicated frequently regarding the need to relocate the OSC. One discussion occurred when power was lost to the OSC and again later in the exercise when dose rates increased due to the release. The TSC staff considered the need to use potassium iodide but decided that it was not necessary for the given conditions. This decision was appropriate.

c. Conclusions

The TSC staff's performance was good. Activation was slow to occur even though minimum staffing was quickly achieved. The untimely activation was identified as part of an exercise weakness identified in the emergency operations facility. Analysis of plant conditions and corrective actions were appropriate for the scenario conditions. Offsite agency notifications for the site area emergency were transmitted within regulatory requirements, and followup notifications were made frequently. Dose assessments were performed correctly. Protective action recommendations for the site area emergency were appropriate for the scenario conditions. There was generally good coordination and communications with the other emergency response facilities to discuss status, priorities, and potential issues. The change in wind direction during the release was not communicated to plant personnel and could have resulted in higher personnel exposures.

P4.4 Operational Support Center (OSC)

a. Inspection Scope (82301-03.05)

The inspectors observed and evaluated the OSC staff as they performed tasks in response to the exercise scenario conditions. These tasks included response to CR and TSC requests and emergency response team dispatch. The inspectors reviewed applicable emergency plan sections, procedures, checklists, logs, and radiological surveys.

b. Observations and Findings

Prior to OSC activation, the inspectors observed an operator (exercise participant) during a routine equipment inspection tour. As part of the exercise scenario, a simulated explosive device had been placed in residual heat removal pump Room 1-1. Scenario developers assumed that the operator would identify the device and take actions that would initiate the exercise. However, even though the simulated explosive device was not concealed, the operator did not observe it. In order to prevent falling behind the scenario time line, a controller intervened and informed the operator of the presence of the device. The operator immediately informed the operations shift supervisor, made a quick check of the area to warn other exercise participants in the area, and left to brief security personnel.

When the inspectors arrived at the OSC, the center was activated with appropriate personnel. The participants' names and emergency response function descriptions were recorded on a sign-in board within the center. Telephones, radios, and other equipment necessary for the OSC to function were in place. Area radiation surveys were first performed approximately 10 minutes after dose rates began to rise, and habitability surveys in the center were performed regularly, thereafter. OSC personnel were routinely informed of the radiation dose rates and reminded to check individual pocket ion chamber doses.

The OSC was under the supervision of the emergency maintenance coordinator. The emergency maintenance coordinator demonstrated good command and control by effectively communicating plant status and job priorities. Job priorities were not numerically ranked, as in the TSC; however, the emergency maintenance coordinator always clearly identified the highest priority assignment. OSC briefings were concise and informative. The emergency maintenance coordinator conducted the briefings regularly and solicited information from all OSC members. However, during some of the briefings, some of the OSC leads continued telephone conversations with counterparts and did not participate in the briefings. Otherwise, information sharing within the OSC was timely. The only status board maintained in the OSC identified maintenance teams and team location and status. The team status board was well maintained.

Typically, good emergency team briefings were conducted prior to team dispatch from the OSC. Maintenance and radiation protection OSC leads provided the teams with the appropriate information so that the teams could properly assess equipment conditions and perform assigned tasks expeditiously, while maintaining radiation doses low. However, only radiological safety information was addressed in some briefings. For example, the pre-job briefing for the repair team sent to close Manual Damper 35 (Team 33) did not alert the workers to the possible effects of heat stress, even though the team members were required to wear cloth anti-contamination clothing, plastic anti-contamination clothing, and self-contained breathing apparatuses. No maximum stay time was established based on heat stress considerations for actual or simulated conditions. Additionally, although identified as a consideration during preliminary discussions, the safest route of travel was not provided to Team 33. OSC personnel did not follow through on early suggestions to review plant maps to identify the best route of travel for the team. The controller for the team intervened for safety reasons and

redirected the team so that team members would not have to climb ladders or travel through narrow passage ways while wearing self-contained breathing apparatuses.

The inspectors noted that some aspects of the licensee's respiratory protection program were not met by one individual participating on an emergency maintenance team. When respiratory protection requirements were discussed during the pre-job briefing for Team 33, a mechanic mentioned the need to wear corrective lens inserts. The team was instructed to proceed to the locker room, together, retrieve the mechanic's corrective lens inserts, and then wait at the radiological access control access point for permission to enter the radiological controlled area. However, the inspectors noted that the mechanic did not wear corrective lens inserts while wearing a self-contained breathing apparatus, despite the pre-job briefing instructions.

Additionally, the mechanic assigned to Team 33 failed to perform a negative pressure functional test to ensure a good seal after donning the respirator face piece. The other two team members performed the test appropriately.

c. Conclusions

The operational support center staff's performance was good. The center was activated with appropriate personnel, and it was equipped properly to perform its function. Briefings were concise, informative, and regularly performed; however, participants sometimes did not attend because they were having telephone discussions with counterparts. High priority jobs were clearly identified. Information sharing was timely, and the repair team status board was well maintained. Radiological controls and team briefings were generally good; however, other safety information, such as, team routing and heat stress considerations were not adequately addressed. One repair team member did not meet respiratory protection program requirements.

P4.5 Emergency Operations Facility (EOF)

a. Inspection Scope (82301-03.04)

The inspectors observed the EOF staff as they performed tasks in response to the exercise. These tasks included facility activation, recognition and classification of emergency events, notification of state and local response agencies, development and issuance of protective action recommendations, dose projections, field team control, and direct interactions with offsite agency response personnel. The inspectors reviewed applicable emergency plan sections and procedures, forms, dose projections, logs, and press releases.

b. Observations and Findings

Although the EOF was quickly staffed after the 8:06 a.m. alert declaration, facility activation and transfer of emergency direction and control responsibilities was untimely. At 8:40 a.m., (36 minutes after the alert declaration), the first person arrived at the EOF (the EOF is about 11 miles northeast of the Diablo Canyon Power Plant). The recovery manager arrived at 8:55 a.m., and minimum staffing was present at 8:58 a.m.; however,

the EOF was not declared activated until 9:57 a.m. (almost 2 hours after the alert declaration), when the recovery manager assumed overall emergency direction and control responsibilities.

As discussed in Section P4.3 above, the TSC was promptly staffed but was not activated until 75 minutes after the alert declaration, even though the exercise was conducted during normal work hours. There appeared to be no urgency to activate and assume direction and control responsibilities from the CR to the TSC and then from TSC to the EOF. The purpose of these facilities is to free the CR and TSC of emergency plan functions so that the technical staff can focus on plant mitigation efforts.

In evaluating this matter, the inspectors identified the following pertinent information:

- Section 6.1.1.1 of the Diablo Canyon Power Plant Emergency Plan stated that emergency response facilities "will be staffed when required within approximately 60 minutes after initiating classification . . . . "

- NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, Evaluation Criteria H.1 and 2 specify that a TSC and EOF be established in accordance with NUREG-0696.

- NUREG-0696, "Functional Criteria for Emergency Response Facilities," Revision 1 specifies that: (1) the TSC ". . . achieve full functional operation within 30 minutes;" and (2) the EOF "achieve full functional operation within 1 hour."

- NUREG-0737, Supplement 1, "Clarification of Three Mile Island Action Plan Requirements," which superceded NUREG-0696, requires that the TSC be "Staffed by sufficient . . . and be fully operational within approximately 1 hour after activation." The EOF is required to be: "Staffed using Table 2 (previously approved by the Commission) as a goal. Reasonable exceptions to goals for the number of additional staff personnel and response times for their arrival should be justified and will be considered by NRC staff."

During discussions about this matter, the licensee indicated that it interpreted its emergency plan to mean that the facilities had to be "staffed" within 60 minutes, not "activated." The licensee acknowledged that the emergency plan did not contain facility activation times and that neither term was defined in the plan.

Since the emergency plan did not contain actual activation times, the inspectors had to rely on the above references as the bases for the evaluation (60 minutes). Accordingly, the inspectors identified the untimely activation of the TSC and EOF as an exercise weakness (50-275; 323/98015-01).

Prior to EOF activation, the TSC declared a site area emergency at 9:23 a.m. Since the county emergency operations center was activated and the advisor to the county position was filled (a licensee position at the EOF), the notification was coordinated

through the EOF. Notification of the site area emergency declaration was not provided to the offsite agencies in a timely manner (within the 15-minute requirement). County authorities were not notified until 9:46 a.m. (23 minutes after the site area emergency declaration). TSC personnel called the offsite liaison at the EOF; however, the message was not transmitted to the advisor to the county. The failure to notify the offsite agencies of the site area emergency declaration in a timely manner was identified as an exercise weakness (50-275; 323/98015-02).

The licensee identified the untimely notification as an exercise weakness during the management critique and discussed preliminary recommendations (corrective actions). The preliminary recommendations included revising the checklists for the liaison advisor (and assistants), agency liaison, and advisor to the county. The planned corrective actions appeared reasonable.

At about 12:09 p.m., the EOF recognized that a loss of coolant accident and radiological release were in progress. With input from the TSC, the EOF quickly classified the general emergency condition based on a loss of coolant accident with containment radiation levels greater than 100% gap release (General Emergency #2). The recovery manager declared the general emergency at 12:14 p.m. The corresponding offsite agency notification was timely, and protective action recommendations were correctly determined and quickly communicated.

Although all the general emergency notification and subsequent followup notifications made by the EOF were timely, information provided on event notification forms was unclear, confusing, and incomplete. Inspectors observed the following examples:

- The bases for the emergency declarations was not described in the written summary section for all three events (including the alert and site area emergency declarations made by the CR and TSC, respectively). In the case of the general emergency (prepared by the EOF), the description simply referred to GE#2, rather than the actual conditions (loss of coolant accident and containment radiation levels greater than100% gap release). Inspectors determined that the information contained on the form had little value to those who received the forms (offsite agencies and NRC). Containment radiation levels were not mentioned until 1:31p.m. (over an hour after the conditions existed).

- Closure/termination of the security event was never documented on the forms. The forms continued to reference bomb threats until the end of the exercise.

- Form 10 was confusing in that it stated that the event was a site area emergency (big bold letters at the top) but the written summary stated that a general emergency was declared (small print at the bottom of the form). A general emergency condition actually existed at the time.

- Acronyms were used extensively on the notifications forms. The meaning of the terms would not likely be known by those who received the forms. The inspectors determined that the use of acronyms reduced the value of the information provided and that the information was unclear and confusing.

- The written summaries appeared incomplete for Notification Forms 13 and higher. Summaries ended with: (1) "unfiltered release via plant vent from," (2) "Charging an", and (3) "Charging a."

Communications and information flow within the EOF were ineffective at times. Inspectors identified the following examples:

- Personnel in the command room, including the recovery manager and advisor to the county, were not informed of the site area emergency declaration in a timely manner. This situation may have contributed to or prevented the delay in the site area emergency notification. The site area emergency was declared at 9:23 a.m. The Unified Dose Assessment Center (UDAC) was informed at 9:33 a.m., and the public information staff was preparing a press release at 9:29 a.m. to address the site area emergency declaration. The recovery manager was not informed until about 9:41 a.m. (18 minutes after the declaration).

- The status of the security event was not clearly communicated to EOF and UDAC personnel. At 10:10 a.m., UDAC was informed that there was a third bomb. This was not consistent with information provided to the recovery manager from the site emergency coordinator.

- Although three-part communications were occasionally used, sometimes even the three-part communications were ineffective. For example, at 2:37 p.m., a decision was made in UDAC to have one field team collect a surface water sample at the reservoir and to have another team collect soil and vegetation samples. The radiological monitoring director repeated-back water and soil samples to the radiological manager. The radiological manager incorrectly confirmed the repeat-back instruction. As a result, the field team at the reservoir was directed to take a water sample (as opposed to a surface water sample), and the other team was directed to take only a soil sample (not soil and vegetation samples).

- The effectiveness of briefings was challenged by telephone calls and conversations that occurred in the command room during briefings (the conversations were distracting). Also, it was not always clear when briefings were over. At times, the briefings appeared to continue after an announcement was made that the briefing was over.

Dose assessment and field team control activities were effectively performed. Numerous dose calculations were computed using the emergency assessment and response system to evaluate the offsite impact of the radiological release. Plant conditions affecting dose assessments, such as, filtration and core spray status changes, were quickly determined and factored into the calculations. The radiological manager provided detailed briefings and was able to keep the recovery manager informed of offsite radiological conditions and still provide direction and control to the utility UDAC staff. There was very good coordination with the offsite UDAC representatives. The decision to recommend potassium iodide to field team members was properly determined and quickly communicated to offsite field team members.

In contrast; efforts to validate/confirm the emergency assessment and response system thyroid dose projections and protective action recommendations with field team samples were unnecessarily delayed. The radiological release started at about 12:07p.m.; however, the centerline field team was not directed to take an air sample until 1:45 p.m. The results were not available until 2:06 p.m.

Facility and functional area staffing were consistent with the emergency plan; however, inspectors observed that the radiological monitoring director appeared to be excessively burdened with responsibilities during the exercise. The individual was challenged to complete the following assigned tasks: communicating with field teams, taking new directions from the radiological manager, logging field team radiological readings and sample results, performing hand calculations, maintaining a hand-written log, and maintaining the electronic log.

c. Conclusions

The emergency operations facility staff's performance was generally good. The facility was promptly staffed, but activation and transfer of direction and control duties was unnecessarily delayed. The untimely activation of both the technical support center and emergency operations facility was identified as an exercise weakness. The general emergency was quickly recognized and correctly classified, and protective action recommendations were correctly determined. Offsite agency notifications made by the emergency operations facility were timely. However, an exercise weakness was identified for failure to notify the offsite agencies of the site area emergency declaration within the required time limit (initiated by the technical support center but coordinated through the emergency operations facility staff). Communication and information flow were ineffective at times and contributed to the late notification: (1) the recovery manager and advisor to the county were not immediately informed of the site area emergency declaration, (2) the status of the security event was not clearly communicated and disseminated, and (3) three-part communications were not always effectively used to ensure that directions were understood. The event classification, description, and status were confusing, unclear, and incomplete on notification forms. Dose assessment and field team control activities were well managed, controlled, and implemented. However, there was a delay in obtaining field team air samples to validate dose projections and protective action recommendations results, and the radiological monitoring director was overburdened with responsibilities.

P4.6 Scenario and Exercise Control

a. Inspection Scope (82301 and 82302)

The inspectors evaluated the exercise to assess the challenge and realism of the scenario and exercise control.

b. Observations and Findings

The licensee submitted the exercise objectives and scenario for NRC review on July 24, 1998. Although the exercise objectives and scenario were considered appropriate to meet emergency plan requirements (reference NRC letter dated September 22, 1998), the quality of the scenario package was lacking in the following areas:

- The exercise objectives were vague and not measurable. Following the initial submittal, the exercise objectives were rewritten. The revised objectives were improved.
- No plume maps/offsite radiological data were provided.
- The original security event was not well coordinated with licensee security personnel and had to be rewritten. Problems with the security event were identified by the NRC scenario reviewer.
- The scenario package did not contain a clear list of simulated actions as specified by NUREG-0654, Evaluation Criterion N.3.c, and Section 8.1.3.3 of the emergency plan.

In addition to the exercise planning and preparation issues discussed above, the following aspects of exercise control detracted from the realism and training value of the exercise:

- The process radiation monitor data for the gas decay tank release provided to the shift technical advisor by a controller was in the wrong units and the units were not specified. The shift technical advisor appropriately questioned the validity of the data; however, completion of the initial dose calculation was unnecessarily delayed.
- Weak controller coordination hampered operation of the steam admission valve for the turbine driven auxiliary feedwater pump. As a result, valve operation was unrealistic and affected the operator's ability to reinitiate feeding of the steam generators.
- Weak controller coordination resulted in delays in closing the DC control power knife switches for the emergency core cooling system pump motor breakers and the racking in of the containment fan cooler breakers. This situation adversely affected system response following the loss of coolant accident.
- On two separate occasions, the simulator operators provided erroneous indication of the status of DC control power to 4160V vital Bus G.

- There was some confusion concerning the identification of exercise participants. The following problems were observed: (1) the operator identifying the explosive device had to ask security personnel who the exercise participants were, (2) while securing areas within the radiological controlled area, security personnel had to ask plant workers if they were exercise participants, and (3) access control personnel had to ask if workers were exercise participants.

- During a 1:19 p.m. EOF briefing, it was reported that the EOF had simulated sending the assistant radiological manager to the joint media center. The individual remained in the facility, and there was no apparent attempt to call in an alternate radiological manager to fulfill the request. This over-simulated action was initiated by a participant but was not corrected by controllers.

c. Conclusions

The originally submitted exercise scenario package was of poor quality because objectives were vague and not measurable, offsite radiological plume maps were missing, a scenario event was not properly coordinated with security personnel and had to be rewritten, and a list of simulated events was not developed or provided. The revised objectives were improved. Some aspects of exercise conduct and control detracted from the realism and training value of the exercise.

P4.7 Licensee Self Critique

a. Inspection Scope (82301-03.13)

The inspectors observed and evaluated the licensee's post-exercise facility critiques and the formal management critique on November 6, 1998, to determine whether the process would identify and characterize weak or deficient areas in need of corrective action.

b. Observations and Findings

Post-exercise critiques in the CR, TSC, OSC, and EOF were generally self-critical and thorough, with input from participants, controllers, and evaluators. Inspectors observed the following exceptions:

- In the CR, there was limited input from the exercise participants. Critique input was almost exclusively provided by the operations director and the lead controller. Comments made were predominantly positive.

- In the TSC, the critique appeared to be rushed so that it could be completed by 5 p.m. As a result, input may have been limited.

- Inplant repair team members did not participate in the OSC critique.

- The EOF command room critique tended to focus more on positive performance rather than problem areas needing improvement. Controllers provided more input than exercise participants.

During the management critique, the emergency preparedness supervisor presented the results of the licensee's evaluation process. The presentation, accompanied by a written report, covered the following topics: exercise summary, performance competencies, objectives evaluation, scenario time line, and recommendations.

The licensee identified three weaknesses in exercise performance: (1) the objective to perform offsite agency notifications within applicable time limits was not met, (2) the objective to perform assembly and accountability per applicable emergency plan implementing procedures was not met, and (3) the performance competency to dispatch offsite field monitoring teams from the CR/TSC per emergency plan implementing procedures was not met. Preliminary recommendations to correct the weaknesses were discussed, including revisions to certain position checklists and the need to emphasize procedural adherence during drills and training.

In addition to the exercise weaknesses, the licensee identified areas of positive performance and areas where there were opportunities for improvement. The strongest performance was observed in the UDAC. The inspectors concluded that the licensee had performed a thorough and self-critical evaluation of its performance but noted the value of increased participant involvement. There was good overlap between the issues identified by the licensee evaluators and NRC inspectors.

c. Conclusions

The integrated critique process demonstrated an effective program for identifying areas in need of correction, but exercise participants tended to be passive members in the process. Post-exercise critiques, however, were not fully effective because inplant repair team members did not participate in the OSC critique, and the CR and EOF critiques tended to focus more on positive performance and had limited participant involvement. In contrast, the management critique was very thorough and self-critical. Three weaknesses were identified along with numerous opportunities for improvement.

P8 Miscellaneous Emergency Preparedness Issues (92904)

(Closed) Inspection Followup Item 50-275; 323/97022-02: Verify correction of two emergency action levels. During the last operational status inspection, the inspector identified two emergency action levels in Procedure EP G-1, "Emergency Classification and Emergency Plan Activation," Revision 25, that were not consistent with NRC approved emergency action level schemes (Site Area Emergency #6 and General Emergency #4). The two emergency action levels were corrected in Revision 28 to EP G-1, dated September 29, 1998. The licensee issued Revisions 26 and 27 in the interim but did not correct the two emergency action levels in either of the revisions. Given the severity of the emergency action levels, correction of the two emergency action levels was considered untimely.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on November 6, 1998. The licensee acknowledged the facts presented. No proprietary information was identified.

The Federal Emergency Management Agency conducted a public meeting in San Luis Obispo, California, on November 6, 1998. Federal Emergency Management Agency representatives presented preliminary results of evaluated offsite performance.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. Adams, Supervisor, Nuclear Quality Services
R. Bliss, Emergency Preparedness Coordinator
R. Cheney, Quality Engineer, Nuclear Quality Services
S. Fridley, Manager, Outage Services
R. Gray, Director, Radiation Protection
A. Halverson, Emergency Preparedness Coordinator
D. Johnson, Health Physicist
S. Ketelsen, Supervisor, Regulatory Services
M. Lemke, Supervisor, Emergency Preparedness
D. Marsh, Emergency Preparedness Coordinator
J. Molden, Manager, Operations Services
R. Morris, Emergency Preparedness Coordinator
D. Oatley, Vice President and Plant Manager
M. Snyder, Emergency Preparedness Coordinator
E. Waage, Senior Engineer, Emergency Preparedness

NRC

D. Acker, Resident Inspector
D. Proulx, Senior Resident Inspector

LIST OF INSPECTION PROCEDURES USED

IP 82301	Evaluation of Exercises at Power Reactors
IP 82302	Review of Exercise Objectives and Scenarios for Power Reactors
IP 92904	Followup - Plant Support

LIST OF ITEMS OPENED AND CLOSED

Opened

50-275; 323/98015-01	IFI	Failure to activate the TSC and EOF in a timely manner (Section P4.5)
50-275; 323/98015-02	IFI	Failure to make a timely offsite agency notification (Section P4.5)

Closed

50-275; 323/97022-02	IFI	Verify correction of two emergency action levels (Section P8)

LIST OF DOCUMENTS REVIEWED

Emergency Plan Implementing Procedures

EP EF-2	Activation and Operation of the Operational Support Center	Revision 19
EP EF-3	Activation and Operation of the Emergency Operations Facility	Revision 12
EP G-1	Emergency Classification and Emergency Plan Activation	Revision 28
EP G-2	Activation and Operation of the Interim Site Emergency Organization (Control Room)	Revision 20
EP G-3	Notification of Off-site Agencies and Emergency Response Organization Personnel	Revision 29A
EP G-4	Personnel Assembly, Accountability and Site Access Control During Emergencies	Revision 16C
EP G-5	Evacuation of Nonessential Personnel	Revision 6B
EP MT-27	Technical Support Center Emergency Equipment Inventory	Revision 0
EP R-2	Release of Airborne Radioactive Materials Initial Assessment	Revision 19C
EP RB-1	Personnel Dosimetry	Revision 5B
EP RB-3	Stable Iodine Thyroid Blocking	Revision 3
EP RB-5	Personnel Contaminations	Revision 4A
EP RB-10	Protective Action Recommendations	Revision 6
EP RP-4	Access to and Establishment of Controlled Areas Under Emergency Conditions	Revision 4A

Other Documents

Diablo Canyon Nuclear Power Plant Emergency Plan, Revision 3, Changes 16 and 17

RP1.ID3, Respiratory Protection Program, Revision 3

GRRA-500i, Student Handout for Respiratory Protection, November 1997

Emergency Response Organization Bi Annual (sic) Graded Exercise Management Summary November 4, 1998