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CPPR-69 Safeguards Group ____

Licensee: Pacific Gas and Electric Company

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Facility Name: Diablo Canyon Units 1 and 2

Inspection at: (1) Pacific Gas and Electric Company, San Francisco, California

(2) Diablo Canyon Site, San Luis Obispo County, California

Inspection conducted: December 7-17, 1981

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Appraisal Summary:

Appraisal on December 7-17, 1981 (Report Nos. 50-275/81-33, 50-323/81-19)

Areas Inspected: Special announced appraisal of the emergency preparedness program, including administration of emergency pmeparedness, emergency organization, training and retraining, facilities and equipment, emergency plan implementing procedures, coordination with offsite groups, and drills and exercises. The inspection involved approximately 330 inspector hours onsite by six (6) NRC inspectors.

Results: Five significant deficiencies were identified. Three of the significant deficiencies were in the area of facilities and equipment (see Sections 4.1.4 and 4.2.5). One significant deficiency was in the area of emergency plan implementing procedures (see Section 5.6). The fifth significant deficiency was in the area of coordination with offsite groups (see Section 6.4). A letter confirming the licensee's proposed corrective actions for these deficiencies was issued by NRC Region V on January 7, 1981.

No deficiencies were identified with respect to the other four (4) areas of the appraisal.

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DETAILS

1. Administration of Emergency Preparedness

According to the Diablo Canyon Power Plant (DCPP) Emergency Plan, the Vice President, Nuclear Power Generation, has overall authority and responsibility for emergency preparedness related to the DCPP. The administrative duties for managing the emergency preparedness program have been delegated to the Supervisor of Personnel and Environmental Safety and the Technical Assistant to the (DCPP) Plant Manager for the Corporate and Site Emergency Plans respectively. The Technical Assistant to the Plant Manager is also responsible for offsite and local emergency planning coordination with local government agencies.

The duties assigned to the Supervisor of Personnel and Environmental Safety (SPES) are accomplished by subordinate staff. A staff Senior Nuclear Power Generation Engineer has the responsibility for Corporate emergency planning, including plan maintenance and related training. The Supervisor of Emergency Planning and Radwaste Management, who reports to the SPES, is responsible for the coordination effort related to the interface between the Corporate and Site Emergency Plans (EP) and maintenance of agreements with offsite organizations. Included in the coordination responsibility are the EPs, the Implementing Procedures (EPIPs), and necessary training. For positions of Senior Engineer and above (supervisory personnel) position plans (organizational duties and responsibilities) and position descriptions assure that qualified personnel are responsible for the corporate emergency planning program and related training. Position descriptions provide the same assurance for individuals below the position of Senior Engineer. Personnel involved in emergency planning at the corporate level appeared to be qualified to perform their assignments.

The Staff Senior Power Production Engineer, who reports to the Technical Assistant to the Plant Manager, has been assigned the responsibility for the Site EP, including related training. Recently, this individual has been assisted by a Stone and Webster employee provided under a contract. The Staff Senior Power Production Engineer also supervises personnel who work in the areas of reliability data and licensing assistance. Position descriptions have been used to assure that persons involved in the site emergency planning program are qualified. According to management, they support personnel involved with emergency planning with respect to attendance at seminars and classes so as to maintain or improve the capability to perform their assignments. Personnel involved in emergency planning at the site appeared to be qualified to perform their assignments.

According to Corporate and Site management, there is financial support for the emergency planning program. At the corporate level, this is assured by virtue of the fact that emergency planning has an organizational status which must be funded in order to function. At the plant, funding has not been a problem. Management did state that because emergency planning has been specifically assigned, funding will be provided to assure performance.

A formal program exists to assure appropriate review, approval, and distribution of the Corporate and Site EPs, EPIPs, and ammendments thereto. The Corporate EP is reviewed and concurred in by the Vice President, Nuclear Power Generation, and approved by the Chairman of the President's Nuclear Advisory Committee, the Company President, and the Chairman of the Board. The EPIPs for the Corporate EP are reviewed by Manager of Nuclear Plant Operations and approved by the Vice President, Nuclear Power Generation, and the Chairman of the President's Nuclear Advisory Committee. The Site EP is reviewed and approved by the Plant Staff Review Committee plus an approval by the Plant Manager. The Site EPIPs receive the same review and approval as the Site EP. Amendments or changes to the EPs or EPIPs receive the same review and approval as the original documents. There are provisions for an annual review of the EPs to assure they remain current.

The licensee's EP requires an independent audit of the various aspects of the emergency preparedness program (Section 8.2.1 of the Site EP) on an annual frequency. According to the licensee, this requirement will be met by audits performed by the Quality Assurance Department plus a yearly audit conducted by the Institute of Nuclear Power Operations (INPO). Copies of these audit reports will be provided to upper management, including the President.

Based on the above findings, this portion of the licensee's program appears to be acceptable.

2.0 Emergency Organization

2.1 Onsite Emergency Organization

Emergency Procedure G-2 describes the responsibilities and the actions required by plant personnel for establishing the Onsite Organization and indicates the preferred candidates for each position. Upon declaration of an emergency, the Shift Foreman assumes the position of Site Emergency Coordinator and maintains that position until properly relieved or close out of the emergency condition. For immediate response, the crew on watch comprise the emergency organization. Figure 1 of Emergency Procedure G-2 shows the Onshift Emergency Organization and assignments. Table 1 of the procedure describes specific responsibilities of the members of the Onsite Emergency Organization, including those responsibilities of the Site Emergency Coordinator (EC) that may not be delegated.

Walk-through interviews were held with each of the eight Shift Foremen. The interviews confirmed the Shift Foremen operate in accordance with written procedures. The procedures and responsibilities verified during these walk-throughs included emergency classification using EALs, notification to offsite authorities and recommendations for protective measures.

2.2 Augmentation of Onsite Emergency Organization

Each shift crew includes a shift clerk whose duties include liaison coordination and call-out of additional personnel in an emergency. Emergency Procedure G-2 includes an Emergency Organization call list that covers all of the job functions in Table B-1 of NUREG-0654. The call-out list includes alternates for each position, pager call number, and home phone. The licensee had requested all plant personnel to time their travel from home to work. The inspectors examined the results of this travel survey and judged that the travel times noted responded satisfactorily to the goals of the time response tables of B-1, NUREG-0654.

The NRC critique of the August 1981 exercise included the comment that it took approximately 2½ hours for the (corporate) Manager of Nuclear Operations to travel to the location of the EOF at the San Luis Obispo (SLO) County Sheriff's facility, to assume the position of the Offsite Recovery Manager, and to manage the utility's EOF. The licensee has modified the initial manning of the EOF so that it will be manned well within an hour by senior plant personnel including a Senior Health Physicist for dose assessment, a Senior Engineer for Public Information Manager, a second Senior Engineer for Technical Support, and another Senior Engineer as Manager of the EOF. These plant personnel will be relieved of primary responsibility upon the arrival of corporate personnel from headquarters in San Francisco. Initially, PG&E recommendations to the County EOC will result from consultation between the Manager of the EOF and the Manager of the TSC. The inspectors judge that this restructuring of the organization adequately responds to the concern expressed in the exercise critique.

2.3 Conclusions: Emergency Organization

Based on the above findings, this portion of the licensee's program appears to be acceptable. However, the EP should be modified to describe the initial manning of the EOF.

3.0 Emergency Plan Training and Retraining

3.1 Program

Sections 8.1.1 and 8.1.2 (Training of Plant Staff Personnel and Training of Offsite Personnel, respectively) of the EP describe the training program associated with the DCPP. The training of corporate personnel is covered in Section 8.1.2. According to the introductory paragraphs of Section 8.1 of the EP, the Vice President Nuclear Power Generation is the person with "overall authority and responsibility for emergency preparedness ...training for Company emergency response personnel for DCPP."

3.1.1 Site Training

The licensee's site training and retraining program is described in Nuclear Plant Administrative Procedure No. B-2 (General Requirements for Training of Onsite Personnel) and Administrative Procedure No. AP B-50 (Emergency Planning Training). The responsibility for the implementation of this training program has been assigned to the Staff Senior Power Production Engineer (SSPPE) by the Technical Assistant to the Plant Manager (TAPM). The Training Coordinator, who also reports to the TAPM, is responsible for providing the basic emergency preparedness training that is given to all persons permitted unescorted access to the protected area.

The scope and content of the training and retraining appear to be consistent with planning standard program "O," Part II of NUREG-0654, Rev. 1. A total of 13 courses have been established to provide the training for the various emergency response personnel. These courses have been identified and summarized in Appendix 1 to Administrative Procedure No. AP B-50. Each summary describes the objectives of the course, the intended audience, the course materials, the completion criteria, the requalification criteria (if applicable), and the course duration. Procedure No. AP B-50 also establishes the training requirements (courses) for the various emergency response positions.

The SSPPE has assembled a binder that contains materials pertinent to the onsite emergency planning training. The binder is organized according to the emergency planning training courses. The materials contained under a given course number included one or more of the following: course description, lecture notes, information notes, handouts, manuals, instructions, and test or quiz questions.

The examination of this material and discussions with the SSPPE disclosed that in some cases, a course lesson plan consisted of the applicable EPIPs plus the course summary in Administrative Procedure No. AP B-50. Some of the courses did not require a written examination to complete and pass the course. There were some instances where the course completion criteria described in the course summary stated that no minimum score on the quiz was required. According to the SSPPE, the course instructors made an evaluation of each attendee's performance and additional instruction was provided as necessary to assure that all attained an acceptable level of competence in the subject. The SSPPE acknowledged that improvements in course materials (e.g. lesson plans, performance evaluation, and handouts) were needed.

The first aid training program used at the Diablo Canyon site is the one developed by the Corporate Safety, Health and Claims Department for general employee instruction. This program was considered to be satisfactory by past standards, but it does not meet the current requirements of the Red Cross Standard First Aid Multimedia course. The first aid training given at the site includes two to three hours of cardiopulmonary resuscitation (CPR) instruction. The minimum instruction period to receive a (Red Cross or American Heart Association) CPR certificate is eight to nine hours.

The training of personnel assigned to the fire brigade functions appeared to be quite thorough and is presently nearing completion. The training, which is conducted both onsite and offsite, includes practical fire fighting tactics and strategy as well as use of the equipment. Quarterly fire drills are considered to be part of the training effort. The California Department of Forestry, which provides fire protection for the area, has been the primary source of instructors for the fire training program. PG&E is in the process of making arrangements with the California Department of Forestry to send fire brigade members to the Forestry's Ione Fire Academy for two to three days of fire fighting training.

The emergency preparedness training provided to the various onsite contractor personnel, including those working for PG&E's Department of Engineering Research and the California State Fish and Game, is of limited scope. The scope of this training covers the emergency warning devices and the evacuation actions to be followed. One individual in each organization has been assigned the responsibility for assuring that all employees in the organization have received the training. It should be noted that contractor personnel who are permitted unescorted access to the protected area must complete basic training described in Administrative Procedure No. AP B-2, which includes the emergency plan and related procedures.

The qualifications of the individuals involved in providing the emergency preparedness training courses were reviewed. The basic types of courses have been given by the SSPPE or the Stone and Webster employee who is there under a contract. This latter individual has 13 years of experience at a nuclear power plant where he was assigned duties up to the position of Watch Engineer (equivalent to Shift Supervisor). For a period of time, he was also responsible for the administration of reactor operator training. He has been assigned to PG&E since 1979. The Supervisor of Chemistry and Radiation Protection (SCRP) and Chemistry and Radiation Protection Engineers (CRPEs) have given those training courses in Administrative Procedure No. AP B-50 where they have the expertise. The other specialized courses have been given by persons onsite or from the corporate office with expertise in the subject matter. According to the licensee, they have hired an individual for the training group who has experience in coordinating emergency planning with offsite organizations and emergency preparedness training and was an engineering laboratory technician (ELT) in the nuclear part of the U.S. Navy.

As noted above, each course summary includes a statement concerning the retraining requirement, including the time frame during which it must be given. Changes to the EP and EPIP will be covered during retraining.

3.1.2 Corporate Training

The corporate training program was divided into four (4) sections. The first section consisted of a classroom style presentation covering an overview of the Site EP and Corporate EP along with individual responsibilities during an emergency. The second presentation consisted of small groups walking through their responses using scenario type information. This walk-through session culminated in a walk-through involving all groups. The third part of the training consisted of simulations of events and was also conducted in small groups. The final section of the training consisted of participation in exercises with the final one being a full scale field exercise. The training program was documented in a lesson plan and participants were required to take and pass a written examination. A total of 22-25 hours was used to cover the corporate training program.

The Senior Nuclear Power Generation Engineer who has the overall responsibility for the Corporate Emergency Response Plan also was in charge of the corporate training program. He was assisted by a member of his staff as well as other personnel from the Personnel and Environmental Safety organization. These personnel all have extensive experience in the nuclear power plant field and are qualified to provide this type of training.

3.2 Program Implementation

A review of the documentation related to emergency preparedness training and examination of typical questions used to evaluate course participants were performed during the appraisal. The verification of training records at the corporate office revealed no adverse findings.

The licensee uses a computer to keep track of the training status. Attendance records, a copy of which is sent to the Training Coordinator, provide the input for the computer program. Monthly printouts have been provided to the SSPPE so that he is kept informed about the training completed and additional training or retraining required. According to the SSPPE, the computer does not yet reflect the true status of the emergency preparedness training because all training received has not been recorded or credit has not been given where one course covers the subject matter of one or more other courses. The most recent printout showed that about 77 percent of the required training had been completed; however, this is probably a low value. The SSPPE said that a few stragglers and new hires are the only ones still needing the training.

In addition to the classroom training, a number of drills and exercises had been conducted during 1981. These provided an opportunity for practical application of the classroom training. Each drill and exercise was evaluated so that appropriate corrective actions could be taken to improve the emergency response or provide additional instruction to the participants.

The position of Shift Clerk had been recently established. Personnel in these positions had received some training. Interviews disclosed that the emergency planning training was primarily oriented toward their initial responsibility for notifying PG&E personnel. According to the licensee, the shift clerk serves as a backup for the offsite communicator.

The shift clerks have not received any training that would include nuclear systems and associated terminology. The offsite communicator needs to be able to provide the transmitted information in a clear, understandable manner so that the offsite agencies receive the information accurately.

The licensee has provided the offsite fire support organization (California Department of Forestry) with radiological training. This training took about 40 hours. Periodic retraining will be scheduled. The licensee will provide an escort(s) for the Department of Forestry personnel when they respond onsite to a fire emergency.

The State of California Office of Emergency Services had the overall responsibility for the training to be given to the local and State governmental agencies. The licensee supported this training effort. The licensee's Supervisor of Chemistry and Radiation Protection was responsible for providing some training to the French Hospital personnel. The licensee arranged for the doctors at French Hospital, who would be involved in contaminated or overexposed patient care, to receive specialized training in the handling of radiation accidents at the Oak Ridge Associated Universities in Oak Ridge, Tennessee.

3.3 Conclusions: Emergency Plan Training and Retraining

Based on the above findings, this portion of the licensee's program does not appear to have any significant deficiencies. However, the following items should be considered for improving the program:

(a) Review the onsite student performance requirements and course documentation to assure that the site emergency preparedness training courses meet the intended objectives.

(b) Examine the first aid training and compare it to the Red Cross Multi-Media requirements. Also, review the CPR training in terms of the requirements for being CRP certified.

(c) Consider the need for additional training of the STAs in the area of dose assessment calculations (see Section 5.5 of this report for discussion of walk-through findings).

(d) Consider additional or improved training of the shift clerks to assure their capability to perform offsite notifications if they are required to perform this function.

4.0 Emergency Facilities and Equipment

4.1 Emergency Facilities

4.1.1 Assessment Facilities

4.1.1.1 Control Room (CR)

The inspectors observed that there is available in the CR an updated version of both the Site EP and the EPIPs. The CR also has a terminal of the METETT system which reads out meteorological information from either of the two meteorological towers. A switch on the instrument transfers the input from one tower to the second and at the same time transfers the input to the METETT in the Technical Support Center from the second to the first tower. The CR contains readouts of radiation monitoring instrumentation including the containment high range radiation monitor. The CR has been equipped with a terminal for the Emergency Assessment and Response System (EARS) and readouts for seismic monitoring system. The EARS was demonstrated during the appraisal and the August 1981 exercise and shown to be operational.

4.1.1.2 Technical Support Center (TSC)

The inspectors visited the TSC and also reviewed EPIPs EF-1 (Activation of the Technical Support Center), EF-6 (Activation of the Emergency Assessment and Response System), and EF-7 (Activation of the Nuclear Data Communications). This review and its use during the August 1981 exercise demonstrated that the TSC's location, staffing and training, size, structure, habitability, communications equipment, seismic capability, instrumentation, data systems, radiological monitors, power supplies, data display systems, and records management are in substantial compliance with NUREG-0696. Plant personnel stated that both the EARS and the Emergency Response Facilities Data System (ERFDS) are high quality systems designed to achieve an operational availability goal of at least 0.9 during all plant operating conditions.

4.1.1.3 Operations Support Center (OSC)

The OSC (Security Building) was found to be as described in Section 7.1.5 of the EP. Its activation and the related emergency organization and responsibilities are covered by EPIP Nos. EF-2, G-1, and G-2. According to the EPIPs, the OSC is to be actuated at the "alert" or higher class of event.

The appraisal disclosed that the actual operations of the OSC differed somewhat from the description contained in NUREG-0696. Presently, the OSC is to be staffed subsequent to the accountability process at the assembly area located in the building just east of the Security Building. During nonregular work hours (backshifts and weekends), the OSC serves as a control point for personnel requested to come to the site by the EC. The Shift Security Supervisor (SSS) is the shift staff member assigned to the OSC Supervisor position until relieved by someone appointed by the EC. The SSS may request that a maintenance foreman be assigned to this position. Based upon discussions with some of the SSSs during the appraisal, it appears that they consider the assignment to the OSC Supervisor position to be a secondary duty and are not sure what the OSC Supervisor's role is to be. According to NUREG-0696 (Section 3.1), the OSC should be supervised by an operations management person designated in the emergency plan and provide an assembly location for operations support personnel.

The licensee noted that the two fire brigades, which are in addition to the Shift Fire Brigade, are composed of personnel from the maintenance and technical departments. They normally assemble at the cold machine shop. These individuals, particularly the maintenance personnel, would also be available to participate as team members dispatched from the OSC.

The OSC does not have special provisions for minimizing exposure of personnel in the OSC to radiation or airborne radioactivity. This facility has a dedicated telephone line to the CR and TSC as well as the normal plant telephone system. According to the EP, the EC is responsible for taking appropriate action if the OSC becomes uninhabitable.

4.1.1.4 Emergency Operations Facility (EOF)

The inspectors visited the Interim Emergency Operations Facility, which is co-located with the SLO County EOC at the Sheriff's facility, on Route 1 northwest of the city of San Luis Obispo. The interim EOF consists of two trailers and five offices within the Sheriff's facility. One trailer is dedicated to the management coordination and analysis of the PG&E response. The other trailer is designated the Unified Dose Assessment Center (UDAC). A permanent radiological monitor, part of the offsite real time monitoring system, is installed adjacent to the EOF trailer. The communications systems available were observed to include two radio systems and 11 telephone lines. The EOF is equipped with an EARS terminal for dose assessment and a terminal of the Emergency Response Facilities Data System for monitoring reactor plant parameters. The EOF has a backup electrical generator. Plastic overlays and isopleths were available in the EOF for dose projection if EARS is inoperable. The following items were found to be in the EOF emergency kit:

Stationary and supplies
SLO County map
Emergency procedures
Emergency Environmental Monitoring Field Data Sheets
Computation paper
Hand calculator
Dose rate meters
Dosimeters
Air sampling equipment for particulates and iodine
Protective clothing
Decontamination material
Signs and barriers
Sampling Equipment - plastic bags, bottles, towel
First Aid equipment
Battery-powered lantern
Stopwatch
Roll of dimes
Flashlight with batteries
Hand tools

4.1.1.5 Post-Accident Coolant Sampling and Analysis

The DCPP Unit has both an interim and a final post-accident coolant sampling system. The interim post-accident coolant sampling system is a part of the Interim Post LOCA Sampling System (IPLSS) and is described in the DCPP Chemical Analysis Procedures (CAP) G-1 and G-2. The control panel to operate this system and obtain samples is located on the 115' level of the Auxiliary Building. The panel is located on a concrete shielding wall for the Unit 1 Steam Generator Blowdown Demineralizers. Retrieval of the samples from this location involves entry into areas with rather high direct radiation, airborne radioactivity, and surface contamination under severe accident conditions. The access route to this location is described in the procedures.

There are no fixed monitoring stations located in the sampling station area, and portable monitoring instruments, to survey for direct radiation, are used by the two-person sampling team. The team does pass two fixed monitoring stations in the Auxiliary Building, which they observe on their way to the IPLSS panel, but monitoring will be performed using portable instruments. In the event that radiation levels above the established administrative limits are encountered, there are several alternate routes through the Auxiliary Building that can be used to reach the IPLSS control and sampling panel. The team is equipped with full protective clothing, self contained breathing apparatus, high range portable gamma instruments, and both TLD and direct reading dosimeters. Also, they are equipped with hand and finger extremity dosimeters.

The team must maintain communications with the Control Room in order to perform their sampling mission. This is done by the use of an intraplant phone located approximately 50' from the IPLSS panel. The team also is equipped with a portable radio transceiver unit.

The IPLSS panel can be used to obtain direct inline coolant samples from the following four locations:

1. Reactor Coolant Hot Leg Loop #1
2. Reactor Coolant Hot Leg Loop #2
3. RHR Pump #1-1
4. RHR Pump #1-2

The samples are obtained by opening and closing a number of valves and sampling lines. Purging with nitrogen or demineralized water is required prior to taking the sample to assure sample integrity. The sample from one of the above locations is collected in a lead shielded flask that has been connected to the sampling line. The excess sample is sent back to containment. These samples can be obtained with a dilution of either 20 to 1 or 1,000 to 1. In order to obtain a sample from the primary coolant, it is necessary for the CR to open and close the containment isolation valves on the sampling lines since these valves cannot be controlled from the IPLSS control panel.

A number of valve controls, used in obtaining inline samples, are located in the normal inline sampling room which is on the 100' elevation of the Auxiliary Buidling almost directly under the IPLSS panel. Thus, one of the team members must go down to the normal sample room to operate these valves. In addition, there are several valves located in the Sentry Sampling Room (the final inline sampling and chemical analysis facility when it is completed) that must be operated. Another team must be sent to this location to operate these valves. The operation of the valves by the second team is directed by the team at the IPLSS panel using the intraplant telephones that are at both locations.

During the walk-through of these procedures, it was noted that the fact a team must go to the Sentry Room to operate valves was not covered. Agreement was made to modify the procedures appropriately. The team also found their access to the Auxiliary Building blocked because their key did not fit a locked gate due to an unannounced lock change by Security. This same situation was encountered when the team tried to enter the normal sampling room on the 100' elevation.

After collecting the sample(s) and purging the sample lines into the collection flask, the sample is carried to the plant Chemistry and Radiological Measuring Laboratories (located on the 85' elevation of the Auxiliary Building) for chemical testing and analysis. This procedure is designed to limit the whole body dose to 3 rems or less and a dose to the extremities of 18.75 rems or less. The walk-through indicates that the sampling can be performed in less than one hour and the analysis of the samples, except for chlorine, takes less than two hours. The team members appeared to be thoroughly familiar with the IPLSS panel and one team member read the value sequencing procedure while the other member repeated his actions verbally as he carried them out.

Chemical Analyses for pH, specific conductivity, boron, hydrogen content, and chloride content of the coolant samples are carried out in the Chemistry Laboratory using chromatographic and normal chemical procedures. During operation of the RHR under certain post LOCA conditions, the Chemical Laboratory is expected to be uninhabitable due to high radiation levels. In this situation, the laboratory facilities in the Sentry Room will be used to perform the chemical analysis.

The IPLSS panel was not operated during the walk-through since the system has not been turned over to the licensee by the contractor. The IPLSS currently has some minor defects, but is expected to be turned over to DCPP personnel by February 1, 1982.

The "final" post-accident coolant sampling system is the Sentry System developed by the NUS Corporation and designed and built by the Sentry Equipment Corporation. This system is located on the 85' elevation of the Containment Penetration Building. The system is still being installed and is not expected to be operable until April 1982. The procedures for this system are in the form of a draft procedure for the Sentry High-Radiation Sampling System. The sample team routing is directly through the Turbine Building to the Reactor Penetration Building. The team is to be composed of two rad-chem technicians and a health physics technician who will be equipped the same as the IPLSS team. The Sentry Room is equipped with a fixed gamma area monitor and an intraplant telephone.

The Sentry System can obtain inline samples from the following locations in the RCS:

1. Reactor Coolant Hot Leg Loop #1
2. Reactor Coolant Hot Leg Loop #4
3. Volume Control Tank
4. RHR Pump Discharge
5. Pressurizer Steam Sample
6. Pressurizer Liquid Sample

In addition, the following samples can be obtained from Radwaste:

1. Containment Sump
2. Equipment Drain Receiver
3. Floor Drain Receiver

The Sentry System uses a series of valves, sampling lines, and sample tanks (as well as nitrogen and demineralized water) to collect and dilute the samples and purge the sample lines. Samples can be obtained undiluted or with a dilution factor of 1,000 to 1. In addition, the Sentry System has the ability to perform inline analyses for pH, specific conductivity, dissolved oxygen, boron, and hydrogen. All of the valves to control the sampling and perform the inline analyses are located in the Sentry Room except the system containment isolation valves. In addition, there are shielded (6.5" of lead) casks to handle undiluted samples or transport samples to the laboratory or offsite for further analysis or dilution. The liquid sampling panel is shielded with 7" of lead shot. An NUS shielding study of the system indicates that the whole body dose from taking an undiluted sample will be less than 80 mrem and the maximum dose rate in an area of significant size i 326 mrem/hr.

Because installation of this system has not been completed, the procedures for its operation have not been finalized and no technicians have been trained to operate the system, no walk-through was performed. The draft training procedure was reviewed and appeared to be adequate. The Sentry System appears to be an efficient means for coolant sampling and analysis and should significantly decrease the radiation dose to the team.

The plant radiological measurement laboratory where the liquid samples will be analyzed has three spectrometer systems with intrinsic detectors, a Parkard Tricarb and two gas proportional counters. The spectrometers are equipped with stripping and other spectrum enhancing software. If the RHR system is operated during a LOCA, this facility cannot be used because of high radiation levels. A backup radiological measurement laboratory, located in the TSC, contains both an identical spectrometer system and a gas proportional counter.

4.1.1.6 <u>Post Accident Containment Air Sampling and Analysis</u>

The coolant sampling systems (IPLSS and Sentry) described in 4.1.1.5 also include a capability for sampling the containment atmosphere following an accident. CAP G-1 and G-2 address the analysis of containment air samples as well as the reactor coolant samples.

The IPLSS operating procedure requires that the containment atmosphere sample be collected after the sample lines have been purged with nitrogen to ensure sample integrity. The sample is drawn through a particulate and silver zeolite filter and then collected in a flask to obtain the noble gases. The excess sample passes back into the containment.

The filters are removed from the sampling line and a 2 cc sample of noble gas is removed from the flask using a shielded 5 cc syringe. The containment atmosphere sample can be diluted to either 6667 to 1 or 50 to 1. The radiation levels from the flask are estimated at 7R/hr for the 50 to 1 dilution and 50 mR/hr for the 6667 to 1 dilution.

The filter cartridge and the syringe are placed in plastic bags and carried to the Chemistry Laboratory for chemical analysis and further dilution if necessary. The radiological measurements are made in the adjacent measurement laboratory. In the event that the Chemistry Lab and the measurement laboratory are not functioning, the chemical analysis facilities in the Sentry Room and the counting facility in the TSC will be utilized.

The walk-through for the collection of a containment atmosphere sample was also simulated because of the present status of the IPLSS. The personnel appeared to be trained and familiar with the system. The same key problems encountered with the coolant sampling were encountered here. Estimated sampling time was one hour and time for analysis was less than two hours.

The Sentry control panels for containment atmosphere sampling are provided with 5" of lead shot shielding and are located adjacent to those for collecting the reactor coolant samples. There are four shielded (5" of lead shot) sampling flasks, placed on dollies, that can be used for collecting up to four samples of containment gas simultaneously. The first flask is for particulates and radioiodines and the other three are for noble gases. The system provides a capability for diluting the samples by 1,000 or 15,000 to 1. The Sentry System includes a capability for stripping gas samples from liquid coolant samples. The estimated whole body dose from taking a gas sample is less than 100 mrems.

The Sentry System provides the same inline chemical analysis of gas samples as it does for liquid coolant samples. Chemical analysis in the Chemistry Laboratory and the counting of the samples will be the same as described for the coolant samples in 4.1.1.5.

The containment atmosphere part of the Sentry System is in the same state of implementation as the coolant portion and was evaluated in the same manner. The gas sampling part of the Sentry system also appears to be well designed and highly efficient. The time to obtain and analyze the samples, except for chlorine, is less than two hours.

The continuous hydrogen measuring system being installed in accordance with NUREG-0737, Item II.F.1, Attachment 6, was also evaluated. This system has two identical continuous sampling locations at the 96' level in the Reactor Containment Building. The control and calibration panel for this system is located on the 100' elevation of the Auxiliary Building. A sampling control panel for this system is also located in the Sentry Room. Both of these panels have a duel range meter and can measure levels of 0 to 20% H_2 in the containment atmosphere. There are two panels in the control room which display these measurements continuously over a range of 1 to 10%.

This hydrogen system appears adequate to meet the requirements of NUREG-0737. However, the placement of the sample intakes at the 96 foot level is questioned. This level is approximately 4 feet above flood level for containment and most of the operating equipment is located above this level. The applicant's staff was unable to provide a rationale for this location. It is believed that this location is a poor one because water in containment may rise above the flood level under some accident conditions. It is recommended that a thorough analysis of a number of loss of coolant accident scenarios be evaluated and the location the sample intakes be optimized on the basis of this analysis.

4.1.1.7 Post-Accident Effluent Sampling and Analysis

Radio-iodine, noble gas, and particulates in the gaseous effluents and liquid effluents are sampled and monitored via in-place facilities and equipment. Section 11.4 of the FSAR describes this capability. The effluent monitors read out in the control room. Most of the effluents are also sampled and analyzed prior to their release from the accumulation tanks.

Walk-throughs were conducted with the Chemical and Radiation Protection Technicians (CRPTs) on shift to ascertain the suitability of the facilities, equipment, procedures, and training for collection and analysis of effluent samples. The walk-through began at the access control point with the selection of protective apparel, radiation monitoring instruments, and sampling equipment. Enroute to the sampling station, and the subsequent return with the samples to the laboratory facility (just inside the access point), three security control points are interposed. One of the control points requires pressing buttons that are numbered to provide individual access codes. Apparently, no provision exists to deactivate these access control points on a timely basis to facilitate emergency sample collection and analysis (see Section 5.4 of this report). Although no personnel entrapment could occur, the sampling mission could be significantly delayed if the computerized card system should fail, if an access card broke, or if the individuals were to forget their access codes.

The walk-throughs demonstrated that the CRPTs would properly collect and analyze the effluent samples. The CRPTs were capable of making radioiodine estimates with dose rate instruments, if sample dose rates were too high to count in the 4000 plus channel analyzer, and/or removal of a portion of the sample (particulates or iodine) for counting. The lead-shielded counting pig (for the multi-channel analyzer) is equipped with a four-place geometry jig to facilitiate a wider range of activity level counting. The positions of the sample in the jig are coded for the computerized counting system.

Since it could be possible for dose rates at the sample collection site to prohibit sampling, a special high range sample collection system is currently being installed to assure the capability of sample collection. The new vent sampling facility incorporates a portable sample collection cask and shielded isokinetic sampling lines to the sampling station: The new system would only be employed should loss of coolant cause fuel melt and some failure of containment to occur simultaneously.

Since the Diablo Canyon plant is designed to contain all liquid effluents during emergencies, the routine procedures, facilities, and equipment are all that is required. The liquid effluents, like the gaseous effluents, are collected in waste holdup tanks during normal operations. Samples of the liquid effluents are analyzed for radionuclide content prior to disposition.

4.1.1.8 Offsite Laboratory Support

The offsite laboratory support for emergencies consists of a mobile laboratory owned by PG&E and a counting laboratory in the Physics Department of California Polytechnic University (Cal-Poly). Both of these facilities are equipped to evaluate environmental samples or low-level samples which must be diluted by PG&E.

The mobile laboratory, manned by PG&E personnel, is equipped with an intrinsic gamma spectrometer (same type unit as located in the Chemistry Laboratory and the TSC), and a 3" NaI spectrometer as well as hardware and software for spectrum stripping and analysis. An EARS terminal is available to both perform the analysis and transmit results to any other terminal in the EARS system. All of this instrumentation is dedicated for emergencies and is routinely maintained and calibrated.

The counting laboratory at Cal-Poly is an environmental counting facility that has the same intrinsic gamma spectrometer as located in the mobile laboratory, Chemistry Laboratory, and the TSC. This system also has the same hardware and software analysis system, but it is not used as an EARS terminal. This instrumentation was provided as part of a PG&E contract. This system is used continuously and is maintained and calibrated by Cal-Poly. PG&E will man this facility in the event of an emergency.

PG&E is currently negotiating a contract with Rockwell International to use their hot laboratory at Santa Susana to provide an offsite backup facility for chemical and radiological measuring and analysis. This facility is within three hours driving time of DCPP. A call-in service will be provided by Rockwell to perform the following measurement and analysis of diluted or undiluted samples obtained from the reactor coolant and containment atmosphere:

1. Coolant analysis for

   a. Boron

   b. Chlorides

   c. Radiological analysis of total alpha, total beta, and total gamma

   d. Gamma spectrum analysis

2. Containment Atmosphere for gamma spectrum analysis

These systems address the requirements of NUREG-0654, II.H.6.c.

4.1.2 Protective Facilities

4.1.2.1 Assembly/Reassembly Areas

Six assembly areas have been pre-established by the licensee; (1) the cold machine shop, (2) the control room, (3) access control, (4) the TSC, (5) the temporary training facility, and (6) contractor and site visitor location. Currently, the temporary training facility is being structurally modified, and the licensee plans to revise the procedure for accountability at this location and train the personnel who would report to this location accordingly. The provisions in these facilities uniformly include adequate lighting, protective clothing, and a method for communications. The TSC and CR provide adequate shielding, ventilation, and multiple means for communications.

Should any of the three facilities (1, 3 and/or 5 above) become uninhabitable, arrangements have been made to caravan all personnel to be evacuated to offsite reassembly areas that would be selected based upon meteorological conditions. Also, provisions have been made for checking all personnel for contamination and performing necessary decontamination. EPIP G5 and G4 describes the procedures for evacuating nonessential site personnel and the accountability and assembly of personnel respectively.

4.1.2.2 Medical Treatment Facilities

The licensee's First Aid Room was found to be as described in 7.5.2.2.a of the Site EP. At the time of the appraisal, both doors in the room were open and it was being used as a hallway. When the access control point is actuated, the doors will be closed and secured in a manner that will maintain a barrier between the controlled and uncontrolled areas of the Auxiliary Building as described in the above referenced section of the EP.

The equipment to be stored in the First Aid Room was located in a nearby storage closet at the time of the appraisal. The equipment included a few blowup splints, a PG&E first aid kit, breathing oxygen (two bottles), pillows, and blankets. The licensee had a gerney; however, it was not in good condition due to lack of care. First aid kits and wooden splints had been placed at several locations in the plant. The equipment intended to be kept in the first aid room does not appear to be commensurate with the remoteness of the site, the number of persons that will be working there, and the types of hazards.

The First Aid Room will not be staffed. As noted in 3.1.1 above, employees have received only basic first aid training. The licensee does not intend to include qualified EMT personnel in the site staffing.

4.1.2.3 Decontamination Facilities

The primary personnel decontamination facility is located at the access control point. The facility includes a shower, sink, and supply cabinets. The shower and sink drain to waste hold up tanks. Adequate supplies, instrumentation, and procedures were available. The onsite medical facility is located through the access control point and just around the corner from the decontamination facility. The decontamination supplies, soap and detergent, are available as described by the procedures. Protective clothing, along with other emergency radiological equipment such as respiratory protection devices and dosimeters are within a few feet of the decon facility.

The licensee has also considered the possibility that decontamination activities may occur at onsite assembly and offsite evacuation assembly areas. EPIP-RB-5, Personnel Decontamination, provides guidance on establishing temporary locations for performing necessary decontamination of personnel. Some of the guidance is applicable to decontaminating cars and trucks at such locations.

4.1.3 Other Facilities

4.1.3.1 News Center

PG&E has established an Emergency Response Media Center at the auditorium of Cuesta College. The inspectors visited the Media Center which is a large hall with a stage and a public address system. In a building across the street are numerous telephone outlets for use by the reporters. The Cuesta College Media Center was used during the August 1981 exercise and was judged to be adequate by observers.

4.1.3.2 Expanded Support Facilities

Designated work facilities have been or are being constructed for corporate, contractor, and non-licensee augmentation personnel. These facilities include the OSC, TSC, and the interim EOF. The licensee has determined the layout for the permanent EOF which will be located where the interim EOF is presently situated.

The existing training facilities and the planned administration/training facility would be used for recovery operations which would require more space for support personnel. Communications are available in all existing facilities and will be available in all planned facilities.

4.1.4 Conclusions: Emergency Facilities

Based on the above findings, the following deficiency must be corrected to achieve an acceptable program:

Neither the IPLSS nor the Sentry System was operational, including approved procedures and necessary personnel training. This capability to sample reactor coolant and containment atmosphere following an accident is required prior to exceeding five percent of full power operations.

In addition to the above finding, the following items should be considered for improvement of the program:

(a) The description of the OSC in the EP should be reviewed and compared to the requirements in NUREG-0696. Any changes made as the result of this review should be incorporated into the EP.

(b) The onsite Medical Treatment Facility and the supplies kept there should be reexamined to assure they are adequate for the first aid capability required at the site.

4.2 Emergency Equipment

4.2.1 Assessment

4.2.1.1 Emergency Kits and Emergency Survey Instrumentation

There are five emergency kits. Each of these kits was inspected for inventory adequacy, functional equipment, procedures, and assurance that they had been checked in accordance with specified schedules. The kits are fully inventoried annually and after each use (e.g. drills). Survey and dose rate meters are recalibrated/ exchanged quarterly along with the exchange of the dosimeter charger, bullhorn, calculator, and flashlight batteries. The emergency kits are located in: (1) a locked storage room in the Morro Bay Power Plant, (2) locked room in the Nuclear Information Center, (3) EOF trailer at the Sheriff's office, and (4) two in the Weapons Storage Room of the Plant Security Building.

Each of these kits are fully equipped with sufficient instruments and supplies to conduct on or offsite sampling and decontamination within the field. In addition, silver-zeolite cartridges and a kit containing IEDA (impregnated ethylene diamine) charcoal and particulate sampling units, that would be used in conjunction with battery operated air samplers, are available at the access control point and mobile laboratory.

As a team picks up the kits, hand-held communication radios would also be obtained for field communications with the CR, TSC, or EOF. The mobile laboratory (see Section 4.1.1.8) would be used for field measurements of at least 1 E-07 uCi/cc of radioiodine and 1 E-09 uCi/cc of particulate activity. The beta-gamma survey and dose rate instrumentation is capable of distinguishing between beta and gamma for plume monitoring, and contamination surveys for personnel and objects. The written instrument calibration procedures for routine operations are also used for the emergency kit instruments.

In addition to the emergency kits, full supplies of emergency instruments and protective apparel are found at the access control point and would be available for emergency use. In addition, the reactor CR, TSC, OSC, EOF, and the mobile laboratory have varying amounts of dedicated emergency supplies and equipment.

4.2.1.2 Area and Process Radiation Monitors

The area and process monitors (A & PMs) described in the Site EP and EPIPs, that would be used for emergency detection, classification and assessment, were in place, operable, and calibrated in accordance with written procedures. Readouts for these devices were located in the CR. The monitors were located and/or shielded so that they would perform their intended use. These monitors have been described in Section 11.4 of the FSAR.

All monitor readouts are accessible to the operating staff of either unit. A series of curves have been developed for use by the operations and health physics staffs so that the monitoring readouts can be quickly converted into uCi release rates for use in the computerized or hand calculated emergency dose assessment program (see section 5.5). Alarm levels have been set to alert the operations staff of off-standard conditions, and an automatic data processor types up the identification of the alarming monitor for the operator.

One monitor shares a common panel readout location between the two reactor units. That readout is located in the Unit 1 A&PM panel and is specially identified in that panel as a "Unit 2" readout. Critical monitors are serviced by vital power. The A & PMs are given periodic functional tests and calibrated on specified schedules. The tests and calibrations are conducted jointly by the maintenance and health physics staff. The Technical Specifications identify the actions required to be taken if specified monitors fail.

It should be noted that the existing, calibrated, and functional A & PMs will not provide monitoring for the full range of postulated radiological emergency events. Consequently, the licensee is installing new sampling and monitoring equipment to supplement the existing system, in order to cover the full spectrum of postulated emergency events. These have been described in Sections 4.1.1.5, 4.1.1.6, and 4.1.1.7 of this report.

The inspectors observed all A & PMs in the Diablo Canyon Unit 1 and the TSC. During this observation, it was noted that the high range containment monitors were already installed. The placement of the monitors, however, did not appear to meet the NUREG-0737 criterion regarding a "view" of a large fraction of the containment atmosphere. In fact, the placement of the two high range monitors was such that the significant and varying amounts of shielding, afforded by equipment that may be stacked on grating over one monitor and the proximity of the second monitor to a steam generator and containment cooling unit, would invalidate the procedural interpretation of the containment source term(s). The licensee also plans to place a monitor on the main steam line to monitor that potential airborne environmental release source.

4.2.1.3 Non-Radiation Process Monitors

Two non-radiation process monitors are used at the DCPP: chlorine gas and seismic monitors. Chlorine gas escaping from the tanks may be detected by observation of the chlorinator equipment, odor detected by plant personnel, or the chlorine monitors. Two annunciators may sound following a chlorine gas release; one associated with the monitors located at the intake auxiliary system and/or one associated with the CR ventilation intake duct. Should a high chlorine concentration (2 ppm) occur at the ventilation intake duct for the CR, the CR ventilation system would automatically go to a recirculation mode.

A Kinemetrics triaxial accelerometer, on the containment base slab of each reactor unit, is the primary seismic monitor at Diablo Canyon. These units transmit seismic measurement signals to an Earthquake Force Monitor readout device in the CR.

The monitor readouts contain three indicators (one for each axis; horizontal, vertical, and transverse) which read out in percent of g. The indicator pointer stays at its maximum reading until it is reset so that maximum acceleration can be determined. The units are activated at 0.01g which would also initiate the annunciator.

The first Seismic EAL, as indicated above, is 0.01 g which would trigger the unusual event actions specified in the EPIPs. The second EAL is > 0.2g (and up to 0.6 g) which would be an alert classification. The third EAL is > 0.6g, which would be a site area emergency classification. However, the reactor would automatically scram should the seismic trip reach or exceed ~ 0.4g.

4.2.1.4 Meteorological Instrumentation

The bases for the review of the Diablo Canyon meteorological measurements program included Regulatory Guides 1.23 and 1.97, and the criteria set forth in NUREGS-0654, -0696, and -0737.

The meteorological measurements program has been briefly described in section 7.3 of the EP. The integration of meteorological data into the dose calculational methodologies was outlined in a number of implementing procedures: R-2, EF-6, RB-9, -10, and -11. The inspectors' reviewed elements of the licensee's meteorological measurements preventative maintenance program as outlined in procedures STP I-44A, -44B, and -44C (including STPI-44 C-1, -2, -3) and MP 8.7 and MP 8.8. The Corporate EP upon activation calls for meteorological support to aid the dose assessment process.

The inspectors determined that the meteorological capabilities address the requirements of NUREG-0737, Task Action Item II.A.2, and the criteria set forth in NUREG-0654, Appendix 2 with the adoption of the interim compensating actions to milestone 3. The meteorological measurements systems (primary and backup) provide the necessary data to represent the environment into which airborne effluents may be released and transported in the immediate plant vicinity.

All measurements systems appeared to be in operation. The preventative maintenance program consists of a multi-tiered, graded set of checks, surveillance, and calibration activities all of which provide reasonable assurance that appropriate data will be available for use. In the event both the primary and backup systems are coincidentally out of service, provisions have been made for the installation of a temporary weather station and access to National Weather Service station information for Santa Maria and Monterey.

CR personnel are advised by the load dispatcher in the event severe weather conditions could impact the site area. Provisions have been made for transmission of meteorological information among the various emergency response facilities: CR, TSC, and EOF. Direct telephone access to individuals responsible for performing dose calculations can be accomplished by the NRC using the NRC Health Physics Network.

The methods utilized to consider transport and diffusion through the plume exposure EPZ do not incorporate terrain affected air flow regimes. For the interiors, the potential uncertainty associated with plume trajectory can be compensated by uniform (direction independent) designation of protective measures recommendations. Inasmuch as the Corporate EP provides that a senior professional meteorologist be available to support the radiological analysis and protection actions, adequate interpretation of the transport and diffusion assessment is reasonably assured for the interim period.

The long term improvements required include: (1) a mechanism to provide digital electronic data transfer of meteorological and dose projection information; (2) a "Class A" transport and diffusion module of a dose calculational methodology which considers the terrain affected flow in the vicinity of the plant to the plume exposure EPZ; and (3) the installation of supplemental measurements systems necessary to support the methodology above. None of these long-term improvements are required at this time.

4.2.2 Protective Equipment

4.2.2.1 Respiratory Protection

The licensee has established a respiratory protection program. The basic company wide program, which does not address radioactive materials, was established by the Safety, Health and Claims Department.

The Chemistry and Radiation Protection Supervisor has been given the responsibility for establishing and implementing the program at the DCPP. The Diablo Canyon program has been developed on the basis of the requirements for radioactive materials. A Chemistry and Radiation Protection Engineer has been assigned to oversee the program.

The respiratory protection program is governed by a number of procedures. The Safety, Health and Claims Department has established a manual on the subject that is used company wide. The basic requirements for the use of respiratory protection equipment at DCPP are contained in Radiation Control Standard RCS-2 and Radiation Control Procedure RCP-2, both titled Internal Exposure Control. Other procedures address the equipment to be used, how it is to be used, and its maintenance. Due to some deficiencies in cross referencing, the procedures that pertained to the respiratory protection program appeared to lack coordination.

The licensee has established a training program for persons that may be required to use respiratory protective equipment. The basic formal training is provided by the training instructors. The practical instruction and mask fitting and testing are performed by Chemical and Radiation Protection personnel. The medical evaluation is directed by the Safety, Health, and Claims Department and performed under a contract issued by the Department. Records of the training, mask testing, and medical qualification are incorporated into the computer which then provides a listing of persons qualified to use respiratory protective equipment. The CRPE assigned to oversee the program expressed a feeling of inadequate information to properly perform his assignment in the area of respiratory protection, particularly with respect to medical results and the identification of persons needing training or retraining.

The licensee appears to have an adequate supply of respiratory protection equipment. The licensee presently cleans this equipment in a sink located at the entrance to the decontamination area. The use of the decontamination area for its intended purpose may interfere with the respiratory equipment cleaning process. The cleaning is performed by hand and the equipment is air dried. Licensee personnel have been trained by the manufacturer to maintain the equipment.

4.2.2.2 Protective Clothing

The protective equipment and clothing is satisfactory for Unit 1's operation. There are adequate supplies of protective clothing; coveralls, boots, hoods, gloves, tape, and face masks maintained onsite. Such equipment is maintained at the control point and in the readily accessible warehouse of the turbine building. The minimum-maximum level control system of protective clothing supplies ensures that there is always some in reserve for emergency use.

4.2.3 Emergency Communications Equipment

The emergency communications system is extensive and ensures the capability of communicating with offsite agencies and personnel in times of severe circumstances and emergency conditions. Emergency communication systems are composed of redundant telephone systems (private and public), UHF and VHF radio frequencies, dedicated circuits to the NRC offices, and pager systems. The phone systems and radios have redundant power supplies. The telephone systems adequately cover all offsite agencies; locals, state, NRC, as well as the corporate office and plant managers. There is a cabability to make contact with these personnel and agencies 24 hours a day. The emergency communications system has been described in Section 7.2.1 of the Site EP.

The radio systems are designed for use at the plant and the surrounding areas as well as for communicating with offsite agencies, e.g., sheriff, fire, and monitoring teams. There are some dead spots in the areas but personnel are aware that they exist and therefore take steps to ensure communications are completed; i.e., keep calling the person or location intermittently until contact is made.

The licensee has marine and aeronautical frequencies which allow communications with the Coast Guard and aircraft. The aeronautical frequency allows contact to be made with corporate officials enroute to the area.

There is some concern related to the documenting of tests performed on the phone system and radios. No one individual is designated to ensure that all emergency communication circuits are tested as required.

Alarms for evacuation and fire are set up with different sounds and meanings. Alarms and lights for evacuation are distributed throughout the plant and at remote onsite locations in order to ensure full coverage. The fire alarm is activated by dialing identified numbers located at each phone. The code used indicates a general area where the fire is. However, it does not indicate the elevation on which the fire is located. Therefore, if the reporting party hangs up before giving appropriate information to others, a delay in response efforts and corrective actions may occur.

The plant phone system has a special seven phone conference feature that is set aside for emergency use. This feature is normally actuated following the sounding of an emergency signal or fire alarm. The emergency signal would be used for first aid response. An emergency telephone number that would be answered by the CR has not been established. Emergency numbers usually eliminate the "unavailable because of use" problem that is associated with a normal business number.

4.2.4 Other Equipment

4.2.4.1 Damage Control

The licensee has made arrangements to have appropriate personnel available onsite and in the corporate office, during emergencies, for procurement of special equipment and materials. Heavy equipment, if needed, can be obtained from various construction companies in the local area or throughout the State. Requests for such equipment may be made by the site or corporate office.

In addition to the necessary items for the hot and cold machine shops, the licensee maintains some additional items in the warehouse. The following three bases are used to include an item in the warehouse inventory: it is a safety-related item, it is a high use rate item or there is a long lead time for receiving the item. The licensee also has an onsite capability to manufacture items.

4.2.4.2 Reserve Emergency Supplies and Equipment

The onsite warehouse maintains a backup supply of protective clothing. Reserve supplies of respirators, extra oxygen bottles, dosimeters, zeolite and charcoal cartridges, and filter paper for particulates are available at the access control point. High range dose rate meters and other survey meters are also maintained in a locked room at the access control room. The amount of supplies currently available is adequate. Following startup, and once equilibrium of operations is achieved, reserve supply minimums may require some adjustment.

4.2.4.3 Transportation

At present, there are no vehicles dedicated for emergency use. There is one four-wheel drive vehicle assigned to the operations group that can be used for transporting a radiation monitoring team if necessary. Other vehicles are availale for use by radiation monitoring teams during regular and non-regular hours. During non-regular hours, the keys are available through the shift foreman.

The licensee has three four wheel drive vehicles on order. Once these arrive, they will be assigned to the Chemistry and Radiation Protection Department for routine and emergency use.

4.2.5 Conclusions: Emergency Equipment

Based on the above findings, the following two deficiencies must be corrected to achieve an acceptable program:

(a) The two high range monitors, located inside the Unit 1 containment on the 140 foot level, were not positioned so as to view a large fraction of the containment volume.

(b) The radiation monitors intended to view the main steam line upstream of the main steam safety valve and dump valve discharge lines had not been received onsite and thus were not installed.

In addition to the above findings, the following items should be considered for improvement of the program:

(a) Reexamine the facilities used for maintenance of the respiratory protection equipment to assure adequate decontamination, cleanliness, and storage of the equipment during routine operations and emergency conditions.

(b) Review the applicable respiratory protection procedures to assure that there is adequate cross referencing to all of these procedures.

5.0 Emergency Plan Implementing Procedures (EPIP)

5.1 General Content and Format

The two volumes of EPIPs which consist of 41 emergency operating procedures for coping with plant malfunctions, and 38 procedures for implementing the EP were reviewed. The procedures were judged to be written clearly and logically and to give specific instructions to the person using the procedure. Walk-throughs demonstrated that station personnel had been trained to operate strictly by procedure.

Sometimes there is a problem with operators making the transition from emergency operating procedures that are designed to prevent plant conditions from worsening to EPIPs that are designed to initiate protective measures for the public. The Diablo Canyon emergency operating procedures have a feature that helps this transition in that each procedure includes an Appendix Z, Emergency Procedure Notification Instructions. In a few sentences, this appendix gives the operator specific instructions for classifying the event and for notifying offsite authorities.

Emergency Operating Procedure OP-1, Loss of Coolant Accident, includes graphs of dose rates inside and outside containment for (1) coolant activity, (2) 100% gap release, (3) 1% fuel melt, (4) 10% fuel melt. These graphs appear to be a useful tool for operators to make a quick assessment of core conditions in an accident, and to classify the event.

5.2 EPIP Review

The review of the EPIPs disclosed that they were all in an acceptable form. Some minor modifications could be made in a few of the procedures to improve directions or clarify the intent; however, none of these possible modifications were considered necessary to assure accomplishing the objective(s) of the given procedure. The licensee has not formalized the use of aircraft to locate a radioactive plume released from the site. Because this is a coastal site with hills and valleys nearby and the dose assessment methodology does not yet consider terrain affected flow, provisions should be made for locating the released radioactive plume. The roadway system within the Plume Exposure Zone (10 miles radius) is very limited.

5.3 Evacuation and Accountability

Personnel accountability, assembly, and evacuation of non-essential site personnel are covered by EPIPs G-4 and G-5.

The accountability program appears to accomplish its objective. Actual drills of evacuation and accountability showed that onsite personnel could be accounted for within 30 minutes. Accountability forms are included in EPIP G-4, but the one for use by the designated assembly area supervisor has not been specifically identified in the procedure details (instructions). The EC has been assigned the responsibility for designating "appropriate personnel to perform a plant search." The evacuation procedures provide for moving non-essential personnel to assembly areas and then off site if necessary. All personnel in the protected area (presently Unit 1), who assemble in the area outside the Security Building, must exit via the Security Building. The procedure does specifically address the action(s) to be taken if the Security Building is downwind during a radioactive release. The licensee has not placed evacuation signs within the plant to assist personnel in leaving during an evacuation situation. According to EPIP G-4, security personnel at perimeter or other fixed posts, those on routine patrol and in the Alarm Stations are to continue their assignments unless they receive specific instructions from the Security Shift Supervisor or other supervisors with authority.

5.4 Security During Emergencies

The security plan and the security procedures relating to emergency situations were reviewed to determine whether they complemented the procedures used during operational emergencies. One security procedure has been established for use during "operational" (not related to security events) emergencies. This security procedure does not, however, address the hazards (e.g. airborne radionuclides, high dose rates, chlorine releases and fire) and precautions essential for the safety of the security staff while performing their duties. The licensee plans to provide radiological/emergency training to the security staff so that when the fuel is loaded and the reactor becomes operational, they will be qualified for unescorted access into radiation areas.

As discussed in Sections 4.1.1.5 and 4.1.1.7 above, walk-throughs involving the CRPTs identified some situations where the inplant security system could cause delays in the timely completion of certain EPIPs. In addition, the security system has the potential for causing additional exposures to emergency personnel.

Because of these potential adverse impacts, additional effort was expended to assess the possible impact of the security system on emergency response. The current security system restricts access into various locations within the protected area. A number of these controlled locations are associated with the "two man rule." This rule requires two persons, both of whom must be knowledgeable and cleared for access to the specific location, to enter a preassigned access code into the card reader station prior to gaining access to the area. In the event of an emergency involving high airborne activity or radiation levels, emergency repair or shutdown of equipment, fire or personnel rescue, the card reader system in the areas employing the "two man rule" may unduly impede access of personnel and thus may jeopardize critical equipment or the safety of the personnel.

The existing computer software for the security card system can deactivate the security doors on a one door at-a-time basis until some or all doors are open. To initiate security door deactivation, the operations shift foreman calls the security shift foreman and requests that specifically identified doors be deactivated. There was, within the operations and security staffs, no uniform knowledge that this door deactivation capability existed. According to the security staff, a new computer software program is in the approval process. This new program would allow complete deactivation of all doors in a single action. Should the computer program fail (and it has), access controlled doors immediately lock, and stay locked until the system returns to normal and the deactivation process is repeated.

In addition to computer control of access, keys can be used to open all of the access controlled doors. Keys are maintained in the control room behind a locked "glass" door that is breakable. Operations supervision is responsible for controlling these keys. Using a key to open a door is an inconvenience for persons who are carrying an injured individual on a stretcher. Some delay in egress might be experienced even if an additional person whose responsibility was to open the door(s) was present.

Some doors within the facility are locked for reasons other than security; e.g. high radiation areas. The key problems experienced by the CRPTs during the walk-through described in Section 4.1.1.5 was associated with access to an area that was locked because it will be a high radiation area when the reactor is operational. This area was currently being used to store a Pu-Be neutron source. Subsequent to the walk-through, it was determined that the previous evening security personnel had changed the lock, but had not yet exchanged the keys for the lock.

The appraisal also disclosed that gates in the metal grating used to separate Unit 1 from Unit 2 had been welded shut.

This is a security barrier separating the two units. The lack of access through this barrier would result in lengthening the response time of a fire crew reacting to a fire that spreads from one side of the barrier to the other.

5.5 Assessment Actions

The implementation of the dose assessment system is covered in the EPIPs RB-11, "Emergency Offsite Dose Calculations," R-2 Release of Airborne Radioactive Materials," RB-9 "Calculation of Release Rates and Integrated Release, EF-6 "Activation of Emergency Assessment and Response System," and Appendix J of the Site EP. The primary dose assessment system is called Emergency Assessment and Response System (EARS). EARS is a computer based system which can use real time plant data (to determine source terms) and site meteorology to develop offsite dose projections for both centerline and plume edge doses as well as to plot the plume location on two different scaled area maps using a CRT. There are active input terminals in the CR, TSC, EOF, the mobile laboratory, the California Office of Emergency Services, and the PG&E Corporate Incident Response Center. The control computers are located in the TSC, EOF, and the Corporate Incident Response Center. The EARS also has a data base covering 14 different accidents which provides anticipated source terms based on either the design basis or anticipated accident conditions. The meteorological program uses a straight line, segmented, ground level release, Gaussian plume model to calculate dispersion. This model permits changes in wind direction, wind speed, and stability class for discrete intervals to redirect the plume as appropriate, but there is no consideration of terrain effects, flow regimes and other refinements in the diffusion model (see Section 4.2.1.4).

In the event the input from the central computer is lost, the active terminal can be used to carry out the same atmospheric dispersion model but the source term data from the CR and meteorological data from the site tower must be manually put into the terminal. This backup system is called the EARMAN mode. Other than the manual input of data, the EARMAN mode provides the same program for dose projections as the EARS.

If the active terminals become inoperable, there is a manual procedure described in Appendix J and EPIP RB-9. The manual system with a series of overlays can provide dose projections without the use of the computerized system. This system while providing an over simplistic dose projection, is adequate for the initial dose assessment. When the TSC and EOF are manned with professional personnel who understand the limits of the dose assessment computer programs, such simplistic assumptions can be modified to provide more realistic projections.

A walk-through with a Shift Technical Advisor (STA) and with an engineer responsible for dose projections at the EOF in an emergency, showed that the system provides an adequate projection within 15 minutes as required using either EARS or the EARMAN mode. However, it appears that the manual procedure for use by the STA needs to be clarified and further training of STAs is necessary. During the walk-through, the STA became confused comparing results obtained manually with results using the EARMAN system and had difficulty in carrying out dose assessment calculations.

5.6 Conclusions: Emergency Plan Implementing Procedures

Based on the above findings, the following deficiency must be corrected to achieve an acceptable program:

> The security system in the Auxiliary Building and nearby areas may interfere with a timely response to an emergency situation.

In addition to the above finding, the following item should be considered for improvement of the program:

> Review the current program for tracking a plume of released radioactivity and determine whether it should be expanded to incorporate an aircraft for locating and tracking the plume. If necessary, develop documentation for the aircraft activities.

6.0 Coordination with Offsite Groups

6.1 Offsite Agencies

The inspector's review of records of the August 1981 exercise showed that adequate coordination existed between the licensee and offsite agencies with one exception. That exception was the delay between the declaration of a General Emergency by the licensee and the activation of the Early Warning Siren System (EWS) by the SLO County. Records show that the licensee declared a General Emergency at 10:48 a.m., the President of the United States and the Governor of California were informed at 11:10 a.m., but the Early Warning System to alert the general public was not activated (in simulation) until 12:05 p.m.

The inspectors reviewed the SLO County Emergency Plan, included with Revision 3 of the PG&E Site EP (dated August 1981), and also a draft SLO County EP dated October 1981. The SLO County EP includes statements on the advisability of prompt alerting of the general public, but the implementing procedures state that the Direction and Control Group will confirm readiness on the part of all Response Group members prior to issuance of an area wide alert. The Emergency Services Director will also insure that all public safety switchboards are apprised of instructions prior to sounding the EWS sirens. The decision to notify the public will be based on the UDAC (Unified Dose Assessment Center) assessment and approved by the Direction and Control Group. The inspectors interviewed Watch Commanders at the SLO County Sheriff's Department, who stated that they did not have authority to activate the EWS without approval by the Sheriff or the Emergency Services Director or their alternates.

At the exit interview, attention was directed to IV.D of Appendix E, 10 CFR Part 50, which states that, "The licensee shall demonstrate that the State/local officials have the capability to make a public notification decision promptly on being informed by the licensee of an emergency condition." FEMA and SLO County representatives were also informed of this requirement. Subsequent to the appraisal, possible changes to the SLO County plan were suggested that would authorize the Sheriff's Watch Commander, without need for further consultation or authorization from governmental or advisory bodies, to activate the EWS system and initiate EBS warnings upon the notificatation of a General Emergency by the PG&E Site Emergency Coordinator. The delay in decision making by offsite authorities appears to effectively cancel out the goal of prompt alerting of the public, via the EWS, by the operator's recognition of observable and measureable emergency action level conditions before there is a release of radiation.

6.2 General Public

Section 8.1.2.3 of the Site EP describes the licensee's program for educating the public on basic radiation health and actions they should take during an emergency. A booklet has been developed for distribution to persons in the State of California defined EPZ, businesses in this area, and to all persons in SLO. This booklet, which will include information on the DCPP and radiation and health effects as well as warning procedures and protective actions, is presently in draft form. Information concerning the SLO County Emergency Plan still needs to be added. SLO County must approve this booklet prior to its distribution. The target date for distribution of the booklet is March 22, 1982. This distribution will include a card that can be filled out and mailed informing local government of any special needs during an emergency. The licensee noted that a Spanish version of the booklet will be available at a later date. The public will be informed of the booket distribution via radio, TV, press releases and bill inserts to PG&E customers in the area. Copies of the booklet will also be available at the PG&E offices in the area.

The licensee has used and is developing other means to inform the public. The October 1981 phone book covering SLO County includes a page that provides information on nuclear emergency response and actions to be taken. The licensee is also involved in discussions with the Hotel/Motel Association regarding postings to be placed in such facilities regarding nuclear emergency response. The licensee will also use a periodic newsletter to PG&E customers in the SLO County to provide related information. The first such newsletter was issued in July 1981 and the second one is expected in January 1982. The licensee is working with the SLO County to develop an acceptable posting for the Montana del Oro Park. Discussions are also being held with school officials in the area.

For about two years, the licensee has had a Task Force of about seven (7) persons working in the area. This group was established to provide information to the public in areas that may be affected by the DCPP. This Task Force has coordinated their efforts with the Corporate Public Information organization. The licensee noted that they intend to provide such information to special groups (e.g. public officials, educational institutions, religious organizations) in the future.

6.3 News Media

For several years, the licensee has been working with the media to provide an appropriate flow of information. Recently, the licensee has provided three presentations (backgrounders) for the media to provide them with information related to the DCPP. A backgrounder will be provided to the media in Southern California in the near future. This latter presentation will be coordinated with the effort being made by the Southern California Edison Company in connection with their nuclear facilities at San Onofre. The licensee expects to provide an annual refresher training for the media, possibly in connection with the annual emergency plan exercise. The media has been given conducted tours of the DCPP.

The licensee has prepared kits for distribution to the media. A variety of material is included in the kit. A copy of the Edison Electric Institute booklet on "Nuclear Power" is provided. Also, there is printed material on where to get information during an emergency at DCPP. Information specifically related to the DCPP has been included. The licensee stated that they keep 100-200 of these kits assembled and have supplies for assembling additional kits.

The licensee has considered the problems of rumors and inaccurate media information during an emergency. The primary responsibility for coping with rumors belongs to SLO County. However, PG&E has provided for personnel to answer telephone calls they receive during an emergency. PG&E public information personnel assigned to the Emergency Response Media Center will monitor the media during an emergency to identify inaccurate information. Action will be taken to provide correct information to the media associated with the inaccuracies.

The licensee has taken action to assure a coordinated effort by the involved organizations in the area of public information. PG&E's Public Information personnel have provided training for the Public Information Officers from the other organizations. Emergency Plan exercises conducted by the licensee have provided opportunities for the Public Information Officers of the various organizations to improve the coordination of public information during an emergency.

6.4 Conclusions: Coordination with Offsite Groups

Based on the above findings, the following deficiency must be corrected to achieve an acceptable program:

> Based on discussions and a review of the proposed SLO County Emergency Plan, it appears that the county may not be able to satisfy their requirements and actuate the public alert notification system within 15 minutes after receiving a recommendation for such action from PG&E.

7.0 Drills and Exercises

7.1 Purpose

Section 8.1.3 of the EP describes the requirements and frequency that pertain to the identified drills and exercises. The listed drills and exercises meet the essential requirements of Planning Standards N2.a-e and 3 of NUREG-0654, Rev. 1. A number of drills and exercises have been conducted during the last six (6) months. Most of these have been in connection with the training effort preparatory to the full scale exercise observed by NRC and FEMA. The documentation of these drills and exercises was found to be comprehensive and current.

Scenarios are used for both drills and exercises. They are developed by onsite personnel and consultants. Corporate personnel are responsible for the exercise scenarios and controllers/observers. Copies of the scenarious are kept for the record and use in developing future scenarious. From the examination of the records, it appeared that the licensee has a satisfactory program which includes scenario development, identification of participants, keeping of records, written critiques, and suggestions for improvements. There is also a system for assuring corrective actions are completed.

7.2 Walk-Through Observations

The appraisal effort included evaluating the response of selected individuals to emergency situations postulated by various NRC team members. The responses were primarily evaluated by comparing them to the EP, EPIPs, and applicable plant procedures. CR, dose assessment, post accident sampling, offsite and inplant monitoring, and Fire Brigade personnel were included in this evaluation effort. The results of these walk-throughs have been incorporated into the previous paragraphs of this report.

7.3 Conclusions: Drills and Exercises

Based on the above findings, this portion of the licensee's program appears to be acceptable.

8.0 Exit Interview

On December 17, 1981, an exit interview was held with the licensee for the purpose of discussing the preliminary findings of the appraisal. Those licensee personnel who attended the meeting have been identified in Attachment A to this report. The following NRC and Appraisal Team members were present: F. G. Pagano, Chief, Emergency Preparedness Licensing Branch; F. A. Wenslawski, Chief, Region V Reactor Radiation Protection Section; R. F. Fish, Region V Emergency Preparedness Analyst and Team Leader; J. R. Sears, Emergency Planner; E. F. Williams, Reactor Safety Engineer; K. Scown, Region V Emergency Preparedness Coordinator and Team Member; and C. D. Corbit, Battelle Pacific Northwest Laboratories Staff Scientist and Team Member. The findings were discussed in terms of the seven (7) major areas of the appraisal. The following five items were identified as significant deficiencies: (1) neither of the two post accident reactor coolant/containment atmosphere sampling and analysis systems were operational, (2) the two high range monitors located inside the Unit 1 containment were not positioned so as to view a large fraction of the containment volume, (3) the SLO County Emergency Plan did not appear to provide a capability to actuate the public alert notification system within 15 minutes after receiving a recommendation for such action from PG&E, (4) the security system in the Auxiliary Building and nearby areas may interfere with a timely response to an emergency situation, and (5) the radiation monitors intended to view the main steam line upstream of the main steam safety valve and dump valve discharge lines had not been installed. In addition, six items were specifically identified as matters that should be considered for improving the emergency preparedness program. During this meeting, licensee personnel asked questions and made some statements in an effort to clarify the findings.

With respect to the five significant deficiencies, the licensee requests time for them to discuss these items and suggested they contact Region V by telephone on December 21, 1981 with proposed corrective actions. On December 21 and 22, 1981, Messrs. J. D. Shiffer, Manager of Nuclear Plant Operations, and J. L. Potter, Senior Nuclear Generation Engineer in charge of Emergency Planning and Radwaste Management, discussed by telephone their suggested corrective actions and the proposed implementation schedule with R. F. Fish, Appraisal Team Leader. Following these discussions, the Region V Administrator sent a January 7, 1982 letter to Pacific Gas and Electric Company acknowledging the proposed corrective actions and the expected completion times.

Appendix A

Individuals Contacted

I. Licensee Personnel

Diablo Canyon

*R. Thornberry, Plant Manager
*W. Kaefer, Technical Assistant to the Plant Manager
L. Lundsford, Security Supervisor
*J. Boots, Supervisor, Chemistry and Radiation Protection
R. Kosmala, Supervisor, I&C Engineering
J. Shearer, Administrative Supervisor
A. Bruce, Security Shift Supervisor
W. Drake, Security Shift Supervisor
M. Goodale, Security Shift Supervisor
*R. Todaro, Security Training Supervisor
O. Cole, Shift Foreman
L. Collins, Shift Foreman
T. Kensinger, Shift Foreman
J. Raab, Jr., Shift Foreman
W. Keyworth, Senior Power Production Engineer
*V. R. Foster, Senior Power Production Engineer
*W. O'Hara, Senior Chemistry and Radiation Protection Engineer
M. Peterson, Senior Chemistry and Radiation Protection Engineer
H. Fong, Chemistry and Radiation Protection Engineer
*A. Taylor, Chemistry and Radiation Protection Engineer
D. Unger, Chemistry and Radiation Protection Engineer
K. Wallace, Power Production Engineer
P. Syalinski, Health Physicist
*R. Bliss, Senior Training Engineer
A. Dame, Training Specialist
*R. Kohout, Training Specialist
M. Stevens, Instrument Maintenance Foreman
*D. Clifton, Chemistry and Radiation Protection Foreman
*R. Snyder, Chemistry and Radiation Protection Foreman
A. Cordova, Shift Technical Advisor
P. Baxter, Chemistry and Radiation Protection Technician
M. Creath, Chemistry and Radiation Protection Technician
J. Droney, Chemistry and Radiation Protection Technician
M. Kunde, Chemistry and Radiation Protection Technician
G. Lyon, Chemistry and Radiation Protection Technician
R. Martin, Chemistry and Radiation Protection Technician
L. Moretti, Chemistry and Radiation Protection Technician
L. Vulchev, Chemistry and Radiation Protection Technician
J. Cramer, Shift Clerk
H. Davis, Shift Clerk
N. Hays, Shift Clerk
R. Linski, Shift Clerk

A. Orlando, Shift Clerk
C. Meyers, Document Analyst
M. Norem, Resident Startup Engineer
W. Coley, Startup Engineer
T. Aclan, Field Engineer
G. Gould, Construction Inspector
D. Hibner, Equipment Mechanic, Department of Engineering Research
R. Richardson, Test Supervisor
T. Wilson, Biologist, Department of Engineering Research
J. Kelley, Associate Biologist, Department of Engineering Research

Corporate Office

J. Schuyler, Vice President, Nuclear Power Generation
*J. Shiffer, Manager, Nuclear Plant Operations
J. Hock, Manager, Nuclear Projects
D. Baxter, Manager, Public Information
C. Peterson, Senior Editor of the News Bureau
*S. Skidmore, Supervising Nuclear Generation Engineer, Personnel and Environmental Safety
J. Townsend, Supervising Nuclear Generation Engineer, Nuclear Safety and Engineering
*J. Potter, Senior Nuclear Generation Engineer, Emergency Planning and Radwaste Management
W. Fujimoto, Senior Nuclear Generation Engineer, Operations Engineering
*R. McDevitt, Senior Nuclear Generation Engineer, Corporate Emergency Response Plan
R. Thuillier, Senior Meteorologist
R. Swanson, Senior Meteorologist
W. Alton, Technical Assistant, Meteorological Services Section
G. English, Nuclear Generation Engineer
C. Shih, Nuclear Generation Engineer
S. Foster, Nuclear Generation Engineer
A. Nevolo, Staff Engineer, Communications Department

*Denotes those present at Exit Interview on December 17, 1982.

II. Other Personnel

S. Sharpe, Captain, California Department of Forestry
R. Just, Training Officer, California Department of Forestry
L. Freeman, Firefighter, California Department of Forestry
D. Gotshall, Senior Biologist, California State Fish and Game
D. Farnsworth, Safety and Security Coordinator, Foley Construction Company
D. Ramsey, Safety and Security Coordinator, Pullman Piping Company
R. Massengill, Supervisor of Field Activities, TERRA Corporation
D. Peterson, Security Officer, Pinkerton

III. Personnel Present at December 17, 1982 Exit Interview Only

D. Serpa, Senior Nuclear Generation Engineer, Radiation Projects and Support Services
R. Hower, Senior Power Production Engineer
T. Mack, Health Physicist
J. Gisclon, Power Plant Engineer
D. Backens, Supervisor of Maintenance
K. Doss, Senior I&C Supervisor
W. Crockett, Senior Power Production Engineer

Appendix B

Emergency Plan Implementing Procedures

Procedure No.	Title
R-1	Personnel Injury (Radiological Related) and/or Overexposure
R-2	Release of Airborne Radioactive Material
R-3	Release of Radioactive Liquids
R-4	High External Radiation (In-Plant)
R-5	Radioactive Liquid Spill
R-6	Radiological Fire
R-7	Transportation Accidents
M-1	Employee Injury (Nonradiological)
M-2	Injury to Nonemployee (Third Party)
M-3	Chlorine Release
M-4	Earthquake
M-5	Tsunami Warning
M-6	Nonradiological Fire
M-7	Oil Spill Iso and Cleanup Procedure
G-1	Accident Classification and Emergency Plan Activation
G-2	Establishment of the On-Site Emergency Organization
G-3	Notification of Off-Site Emergency Organizations
G-4	Personnel Assembly and Accountability
G-5	Evacuation of Nonessential Site Personnel
OR-2	Release of Information to the Public
EF-1	Activation of the Technical Support Center

EF-2	Activation of the Operational Support Center
EF-3	Activation of the Emergency Operations Facility
EF-4	Activation of the Mobile Laboratory
E.	Emergency Equipment, Instruments and Supplies
EF-6	Activation of the Emergency Assessment and Response System
EF-7	Activation of the Nuclear Data Communications System
RB-2	Emergency Exposure Guides
RB-3	Stable Iodine Thyroid Blocking
RB-4	Access to and Establishment of Controlled Areas Under Emergency Conditions
RB-5	Personnel Decontamination
RB-6	Area and Equipment Decontamination
RB-7	Emergency On-Site Radiological Environmental Monitoring
RB-8	Emergency Off-Site Radiological Environmental Monitoring
RB-9	Calculation of Release Rates and Integrated Release
RB-10	Protective Action Guides
RB-11	Emergency Off-Site Dose Calculations
RB-12	Mid and High Range Plant Vent Radiation Monitors
RB-13	Improved In-Plant Air Sampling for Radioiodines

The following documents and procedures were also examined:

*CAP G-1	Access to IPLSS Area, Post Accident Sample Preparation, Handling and Analysis
CAP G-2	Interim Post LOCA Sampling System
CAP H-2	Gamma Spectrum Acquisition with Hewlett Packard 9845B and ND66

CAP H-7	Calibration Standards Data Entry Program
**STP I-18A1	Containment Air Particulate and Radiogas Monitor Functional Test
STP I-18A2	Containment Air Radioactive Gas Monitor Calibration (RM-12)
STP I-18B2	Plant Vent Radioactive Gas Monitor Calibration
STP I-18C2	Waste System Discharge Liquid Monitor Calibration
STP I-18D2	Gas Decay Tank Discharge Gas Monitor Calibration
STP I-18E2	Component Cooling Water Pump Discharge Header Effluent Liquid Monitor Calibration
STP I-18F2	Steam Generator Blowdown Tank Liquid and Vent Gas Monitors Calibration
STP I-18G2	Miscellaneous Area Monitor Calibration
STP I-18H2	Miscellaneous Air Particulate Monitor Calibration
STP I-18I2	Spent Fuel Pool and New Fuel Storage Area Monitors Calibration
STP I-18J2	Steam Generator Blowdown Sample Liquid Monitor Calibration
STP I-18L2	Condensor Air Ejector Discharge Radioactive Gas Monitor Calibration
STP I-18M2	Control Room Ventilation Intake Radiation Monitor Calibration
STP I-18T2	Containment Air Particulate Monitor Calibration
STP I-18V2	Plant Vent Air Particulate Monitor Calibration
EP OP-1	Loss of Coolant Accident

Operations Manual for KIII Containment Hydrogen Monitor, Comsip Incorporated

Sentry High Radiation Sampling System Operating and Maintenance Manual, NUS Corporation

Interim Post LOCA Sampling System Valve Designs

Evaluation of the Dose Rate and Shielding Requirements for the HRSS Equipment, NUS Corporation

*CAP is Chemistry Analysis Procedure
**STP is Surveillance Test Procedure