U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-361/84-08, 50-362/84-07 (IE-V-616)

Docket No. 50-361, 50-362 License No. NPF-10, NPF-15 Safeguards Group ___

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Facility Name: San Onofre Nuclear Generating Station, Units 2 and 3

Inspection conducted: March 26 through 30, 1984

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Summary:

Inspection on March 26 through 30, 1984 (Report Nos. 50-361/84-08 and 50-362/84-07)

Areas Inspected: An announced appraisal of the Emergency Response Facilities (ERFs) was conducted using draft Revision 4 of IE Inspection Procedure 82212 to determine if the licensee has successfully implemented the requirements in Supplement 1, to NUREG-0737 and the regulations. The appraisal covered the

Technical Support Center (TSC), Control Room response, Operational Support Center (OSC), Fmergency Operations Facility (EOF), backup EOF and the Emergency Data Acquisition System as well as the instrumentation, supplies and equipment for these facilities. The apprisal involved approximately 330 inspector hours onsite by five (5) NRC inspectors and four (4) contractor team members.

Results: No deficiencies or violations of NRC requirements were identified. The independent verification of the dose projections using the Health Physics Computer System has been identified as an open item.

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DETAILED ERF EVALUATION

1.0 Technical Support Center (TSC)

1.1 Physical Facilities

1.1.1 Design, Location and Structure

The San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 (Units 2/3) TSC is located in the Units 2/3 Control Area of the Auxiliary Building in an area adjacent to (above and behind) the Control Room (CR). The location is within a 30 second walk of the CR and within a 2 minute walk to the Radiochemistry Lab Counting Room, Access Control point and the Operational Support Center (OSC). The TSC is a complex of five (5) rooms containing approximately 1350 square feet (ft^2) of floor space. The TSC has concrete walls and floor except for the east wall of Room 238 which has a bullet-resisting window overlooking the CR. As part of the Units 2/3 Auxiliary Building, the TSC has been built to NRC Seismic Class 1 structural requirements which meet or exceed those of the California Uniform Building Code. Therefore, it has been designed to withstand the plant's Design Basis Earthquake, winds up to 100 miles per hour and a maximum flood level of 30.8 feet. The heating ventilation and air conditioning (HVAC) system for the TSC, which controls the temperature and humidity, is part of the CR Complex system. The CR HVAC system also provides an emergency (recirculating) mode of operation which incorporates high efficiency particulate activity (HEPA) and charcoal filters. The TSC has been provided with the same shielding protection as the CR which limits doses under "loss of coolant accidents" (LOCA) to 5 rem whole body from all contributing modes of exposure during a 30-day period. The appraisal disclosed that the TSC was as described in Section 7 of the Emergency Plan and the enclosure to the March 31, 1982 letter from Ken Baskin, Southern California Edison Company (SCE), to the NRC (Frank Miraglia, Chief, Licensing Branch No. 3). It is suggested that Room 248A of the TSC, used by personnel who provide engineering support, needs additional working surface for examining drawings, schematics and other documents. Such space could be provided by a folding table attached to the wall.

1.1.2 Layout

A detailed design review, including a human factors input, of the TSC layout has apparently not been performed. It is recommended that such a review be done, taking into account not only traffic flow but also information flow. In the present TSC confirguration the engineering group is separated from the gallery area that provides visual access to the control room and contains the "Critical Functions Monitoring System" (CFMS) keyboard and displays. The health physics group, which has been assigned to the gallery area, seems to have no need to view control room activities or to access the CFMS. In addition, the health physics group's current location seems to isolate them somewhat from the communicators and the engineering group. This would seem to make the flow of information within the TSC less than optimal.

1.1.3 Equipment and Supplies

The TSC has been supplied with an excellant technical library. Documents in this library include microfiche and hard copy piping and instrument drawings (P&ID's), electrical and instrument schematics (one lines, control wiring diagrams, etc.), all plant operating and administrative procedures, architect/engineer and vendor drawings and an updated copy of the Final Safety Analysis Report. Additional reference material and base line data is available at the onsite Corporate Document Management (CDM) Center and copies of such material can be readily transmitted to the TSC. The TSC library also includes copies of the Emergency Plan, Emergency Plan Implementing Procedures (EPIP's) and the Emergency Operating Procedures (EOP's).

Various radiological supplies and equipment are maintained in the TSC. The equipment, which is operated by a health physics technician assigned to cover the TSC during an emergency, provides a capability to monitor TSC dose rates, radionuclide concentrations in air and levels of personnel and surface contamination. The appraisal disclosed that the monitoring equipment was within the calibration period and tests showed the portable monitor's batteries were in good condition. Supplies of direct reading dosimeters, covering the ranges of 0-200 mR and 0-5 R, were available. The emergency cabinet also held an adequate supply of protective clothing and related materials as well as copies of procedures related to the stored items. A copy of the inventory of items stored in the emergency cabinet was posted on the inside of the door. The licensee has a procedure for checking the inventory quarterly and upon the conclusion of each drill/exercise or actual emergency.

The TSC was also well stocked with other necessary supplies. The use of computers and hard copy equipment has reduced the need for forms, status boards and administrative supplies. Sufficient hard copy supplies, battery powered calculators and other items were stored in the TSC to allow continued functioning in the unlikely event of computer system failures or loss of power. The examination of these supplies disclosed that no graph paper was provided. It is recommended that several different scales of graph paper be included in these supplies.

1.1.4 Communicat'o .s Systems

The lic ·see has provided multiple systems and redundancies for transmitting and receiving information between the various SCE emergency response facilities and offsite agencies' locations during the course of an emergency. These systems have been described in the Emergency Plan (Section 7.5 and Table 7.1) and in Sections II.F., III.C and IV.F plus Appendix 5 of the enclosure to the March 31, 1982 letter from Ken Baskin, SCE, to the NRC (Frank Miraglia). The communications systems were inspected during the period December 5-9, 1983 and the inspection findings have been documented in paragraph 5 of Inspection Report No. 50-361/83-39. The communications capabilities were also examined during the February 29, 1984 emergency preapredness exercise and documented in Inspection Report No. 50-361/84-07. In addition to confirming the communications capabilities, this appraisal included an examination of EPIP's SO123-VIII-0.201 and SO123-VIII-0.301 (Surveillance Requirements Emergency Response Facilities and Equipment and Onsite/Offsite Communications Checks respectively) and their implementation. The multiple systems and redundant capabilities provide SCE with an excellant ability to communicate onsite and offsite during an emergency.

The appraisal also included discussions concerning the notification of licensee personnel for the purpose of augmenting the onshift emergency organization. The licensee stated that two backshift (notification) drills were held in 1982 and one was held in 1983. Because the 1983 drill was held immediately following a real occurrence, the response to this drill exceeded the one hour performance objective. On the basis of the 1983 drill results the licensee made some changes to the notification procedures. The drill to be performed in 1984 should test these changes and reverify the augmentation times.

1.1.5 Power Supplies

The TSC lighting and wall plugs are supplied by normal offsite power. There are eight sources of offsite power that can be fed through the three incoming lines to the site. In the event of a loss of offsite power, these lights and wall plugs can be restored to operation by manually manipulating key switches that will provide a connection to a vital bus. Only two of the TSC lights are DC powered. It is recommended that one or two battery powered, relay activated, spotlight type lighting units be installed in the TSC to provide additional lighting in case of a loss of offsite power.

The CFMS, the Health Physics Computer System (HPCS) and their peripheral equipment, located in Room 238 of the TSC, are powered by separate circuits. These separate circuits are powered from non-1E uninterruptable power source (ups) circuits that are supplied through inverters from batteries with a minimum lifetime of 90 minutes. The two Model HP 1000 computer central processing units, which are part of the HPCS, have the same power supply as the remainder of the HPCS.

1.1.6 Conclusion

Based on the above findings, this portion of the licensee's program meets the requirements of Supplement 1 to NUREG-0737.

1.2 Information Management

1.2.1 Variables and Parameters

The licensee has installed two computer systems to provide the operators and TSC personnel with an emergency data acquisition system to determine the safety status of the plant and potential for actual exposures to the public during emergencies. These two computer systems, the CFMS and the HPCS, make use of 400 data inputs from plant variables and parameters. These inputs include all of the variables found in Regulatory Guide 1.97, Revision 2, except for the containment sump temperature. In addition, there is a seismically qualified system called Qualified Safety Parameter Display System (QSPDS) in the control room that serves as an additional source of information to the CFMS. The CFMS has a non-seismic interface with the QSPDS, and combined they accept a total of 600 data inputs. These systems provide an Emergency Data Acquisition capability that meets and exceeds the requirements contained in Sections 6 and 8 of Supplement 1 to NUREG-0737.

1.2.2 Critical Functions Monitoring System (CFMS)

The CFMS provides a concise, integrated and understandable presentation of information to assist the user in assessing the overall safety status of the plant. This computer system has been described in the enclosure to the March 31, 1982 letter from Ken Baskin, SCE, to the NRC (Frank Miraglia, Chief, Licensing Branch No. 3). The system consists of a Perkin Elmer 3230 central processing unit (CPU) with color graphic cathode ray tube (CRT) displays in the CR, TSC and EOF. There are separate systems for Unit 2 and Unit 3. There is a 400 channel input/output capabilility that shares data inputs with the QSPDS. The types of input to the CFMS include analog (range), digital (two state) and data link (digital word) format. The CFMS is isolated from safety related instrumentation by a fiber optic data link that prevents degradation of the safety systems. The 400 inputs, which are scanned once every second, are used during normal and emergency conditions. The CPU has a 750 kilobyte (kbyte) memory with an expansion to one(1) megabyte (Mbyte) planned for the future. The CFMS has 80 Mbytes of disk storage plus a 10 Mbyte disk for systems and programs. There is a capability for transfering the information on the disk(s) to tape. The storage capacity is capable of collecting data from the 400 inputs at the rate of once per second for 16 hours plus once per minute for two weeks. The software provides for recalling the stored data or displaying trends of the stored data. The CFMS is supplied with an uninterruptible, regulated source of power and a 90 minute battery backup.

At present the Unit 3 CFMS has a greater capability than the Unit 2 CFMS, although the Unit 2 capability provides an acceptable level of information. The licensee intends to upgrade the Unit 2 CFMS to that of the Unit 3 CFMS during the next Unit 2 outage. Future modifications are likely to occur to bring the QSPDS and CFMS into harmony with the soon to be completed symptomatic emergency operations procedures. It is recommended that a rigorous configuration management program be applied to any of these modifications to ensure the displays available in the CR, TSC and EOF are consistant with each other.

Transmissions between the CPU and the CRT displays are via dedicated phone lines at 9600 baud. Input acquisition failures due to chassis or software malfunction result in a bad data alarm on the CRT display for that particular input. The system also identifies those composed points and variables that are outside pre-established acceptable ranges. The analog inputs are all filtered to eliminate noise problems. Combustion Engineering, who provided the CFMS, has supplied SCE with an analysis (Document No. 1370-ICE-1619) that states the CFMS has an availability factor of 0.997.

Based on the appraisal of the CFMS, it is recommended that the following features of the system be improved:

a. The flashing feature is distracting and interferes with readability.

b. There is no provision for a page up/down function, only page forward/back.

c. Blank pages in the middle of the current alarm list and bad data list could mislead the operator into thinking that there are fewer alarms or bad data points than there actually are.

d. Inconsistent indexing and page numbering between Unit 2 and 3 displays may cause unnecessary confusion and delay in display access, e.g. page 102 for Unit 2 is the "Current Alarm List," while page 102 for Unit 3 is the "CFMS Monitor."

e. Alarms in the "Current Alarm List" do not seem to be presented in any logical format (chronological scroll, etc.). They seem to jump up at various places on the screen, making the last-in alarm hard to find and making recurring alarms even more distracting than they would normally be.

f. Data validation is limited to range checking, as a result the system may lack credibility under some emergency conditions.

In response to NUREG-0737 Task Action Plan Item I.D.1, Detailed Control Room Design Review, and Item I.D.2, Safety Parameter Display System, the licensee will review the CFMS displays. It is recommended that all improvements and changes made to the CFMS as a result of I.D.1 and I.D.2 be incorporated system-wide to assure that the Units 2 and 3 CR, TSC, and EOF are provided with identical data bases and display formats. This will minimize the possibility of confusion and delay arising from the use of different signal sources and/or inconsistent formats among facilities.

1.2.3 Health Physics Computer System (HPCS)

The HPCS supports the emergency radiological assessment and protective action recommendation functions assigned to the TSC. This computer system has been described in the enclosure to the February 2, 1981 letter from Ken Baskin, SCE to the NRC (Frank Miraglia, Chief, Licensing Branch No. 3). The system consists of two Hewlett-Packard Model 1000 CPU's that are multi-task multi-user processors and four(4) Hewlett-Packard Model HP-9845 microcomputers that serve as intelligent terminals for the HPCS. One of the HP-9845's is located in the TSC and the others are in the EOF. The two Model 1000 CPU's function in redundant capacities to preclude the loss of function should one of the units be out of service for maintenance or malfunction. Each of the CPU's has a 1.5 Mbyte memory. Each HP-9845 has 289 kbytes of memory and 2 Mbytes of disk storage. In addition the HPCS has two (2) redundant 120 Mbyte disk units for storing data. These disks provide a storage input capability of once a minute input for two hours.

The Model 1000 CPU's receive analytical and live time data from several sources. Data from the various plant radiation monitors, offsite pressurized ion chamber (PIC) monitors and radioanalysis results from the post-accident sampling system (PASS) are fed to the CPU's on a live time basis. The CPU's also receive meteorological data on a live time basis. Analytical data from laboratory analysis of samples can be manually entered. The plant area radiation monitors and process radiation monitors are connected to a vital power source. The onsite meteorological equipment is supplied with backup battery power to assure availability of the data. The CPU's are subject to the same demands during emergency conditions as during normal operations. Since the Model 1000's do not receive any inputs from safety system instrumentation, isolation is not a consideration.

The CPU's receive inputs on a frequency that provides for timely calculations. The meteorological data and readings from the nine (9) PIC monitors are inputed once each minute. Once every three (3) minutes inputs from the 80 radiation monitors are received. The PASS multichannel analyzer, an inline instrument, can store approximately 500 80-character records, all which represent an input to the HPCS. Transmission between the CPU's and the terminals is via dedicated phone lines at 9600 baud. Input to the CPU's are checked for out-of-range or failed sensors and software checks are made to determine if the input values are reasonable.

System reliability was determined to be adequate on the basis of discussions with the users and the system manager and the system redundancy with respect to the CPU and disk drives.

1.2.4 Manual Information Systems

The licensee uses some manual methods to display information in the TSC. A status board on the wall in Room 248A provides the Engineering Support staff with a visible summary of reactor operating data and other pertinent information. An adjacent board is used to record important events in chronological order. A status board for displaying pertinent radiation data and other important information has been posted on the wall in the area of Room 238 occuppied by the Health Physics Leader and his staff. Pull down maps of the area around SONGS have also been installed for the purpose of recording environmental monitoring data and the location of monitoring teams. Hard copies of the CFMS and HPCS information, including trends of the various available parameters, are also available.

1.2.5 Dose Assessment

The dose assessment procedures used in the TSC are contained in EPIP S023-VIII-40.100. Dose assessments under normal conditions are performed using the Emergency Assessment and Response System (EARS) computer program in the HPCS. The EARS program can be run in an automatic mode (EARAUT) and in a manual mode (EARMAN). In the automatic mode, readings from numerous instruments (including meteorological data, effluent data, and exposure rate data from onsite and offsite locations) are available at the TSC's HP-9845 intelligence terminal. In the manual mode, the instruments are read manually and then keyed into the computer system.

The NRC Staff found that the dose assessment capability at the TSC is adequate with the qualification that neither the licensee nor its contractor has completed a systematic verification of the EARS computer program. This systematic verification is necessary to satisfy the requirement in Paragraph 8.2.1.h of Supplement 1 to NUREG-0737. The licensee is in the process of verifying the EARS program.

As a result of the discussion on the open item during the exit interview (see Section 5.0), a meeting between some of the NRC team members and licensee representatives was held immediately following the exit interview. This meeting concerned the efforts accomplished and to be accomplished by the licensee to verify the EARS computer program. The licensee committed to providing correspondence to the NRC Team Leader describing the verification program and providing the results. The licensee's April 12, 1984 letter, which has been included as Attachment B, addressed some of the items related to verifying the EARS program and provided some dose assessment results.

1.2.5.1 Source Terms

The descriptive variables and calculation methods used are adequate to determine source terms for potential leakage pathways for SONGS Units 2 and 3. The effluent monitors for each unit consist of two condenser air ejector monitors (one normal range and one high range), a containment purge and plant vent wide range monitor and particulate and iodine sampling of the condenser air ejector and purge exhaut streams. In addition, each unit has a fuel handling area vent monitor and there is a plant vent monitor that serves both units. Each containment building has an airborne monitor, two high range area radiation monitors, two general area safety-related area radiation monitors and two other area radiation monitors. There are four radiation monitors (two low range and two high range) on each unit's main steam lines. Also, offsite monitors exist in each of the nine landward sectors radiating from the site. A containment leakage rate of 1.6 CFM (approximately 1% of the total containment volume per 24 hours) is assumed, unless the Technical Support Leader has more current reliable data.

The licensee uses data from PASS (Post Accident Sampling System) as the primary method for estimating the degree of core damage in an accident. This data includes the identity of isotopes released from the core, respective ratios of the specific activities of those isotopes, and the percent of source inventory observed to be present in the samples. The SONGS 2/3 procedures relate results from PASS to the the following core damage categories: No Fuel Damage, Initial Cladding Failure, Intermediate Cladding Failure, Major Cladding Failure, Initial Fuel Pellet Overheating, Intermediate Fuel Pellet Overheating, and Major Fuel Pellet Overheating. Core temperature readings will yield additional indications of degree of core damage. Primary coolant background activity is available as prior normal primary coolant sampling results. An alternate procedure, for situations in which the PASS data is unavailable, uses containment radiation level dose rate measurements and possible releases to containment as a gross indicator of reactor core damage. EPIP SO23-VIII-40.100 describes a method of determining iodine and noble gas source terms from these measurements. It should be noted that this method assumes a LOCA scenario at time t=0 with a post-accident containment atmosphere isotopic inventory based upon Table 12-2-6C of the FSAR. The accuracy of this method must be recognized as scenario dependent. It is recommended that the licensee exend this method to other accident scenarios. Another alternative would be use of assumed design basis or severe accident source terms, such as TID-14844, Event V, or TMLB' (Generalized from WASH-1400). A mobile field monitoring and sampling capability is also available to provide source term projections during releases beyond containment.

It is recommended that the relative usefulness of the three ex-containment accident radiation monitors be determined with respect to their usefulness in evaluating unmonitored release magnitudes via containment penetration pathways, since these releases are often difficult to assess. Also the use of an excontainment flow rate of 1.6 CFM for containment penetration pathway should be verified.

1.2.5.2 Meteorology

The meteorological information directly available to the EARS system from the primary tower is wind direction and speed at the 10 and 40 m levels; vertical temperature difference between the 10 and 40 m levels; sigma theta, dry bulb temperature and dew-point temperature at the 10 m level; and precipitation near ground level. Also, wind direction and speed, and sigma theta data at the 10 m level are directly available from the backup tower. In the event that site meteorological data are not available, a procedure exists whereby weather information can be obtained from the National Weather Service at San Diego via telephone. Two atmospheric transport and diffusion models are utilized: a straight line gaussian diffusion model with characteristics similar to those presented in Regulatory Guide 1.145, and a varible trajectory plume segment model which utilizes wind fields based on plant site climatological data.

The meteorological variables and calculational methods provide an adequate characterization of the dispersion of effluents to a distance of at least ten miles from the plant site. The onsite meteorological monitoring systems have historically provided reliable indication of meteorological variables which are readily accessible from the emergency response facilities.

1.2.5.3 Computerized Dose Assessment

The EARS program has the capability to estimate dose rates and cumulative does in 16 sectors at 5 distances. Dose rates and cumulative doses to the whole body, skin and thyroid from the major pathways of immediate exposure (i.e., exposure to direct radiation from the plume and ground shine, exposure from inhalation of radionuclides) can be estimated and compared with the criteria for the various emergency classes for San Onofre. All releases are appropriately treated as ground level releases for this site. The EARS program is capable of providing estimated dose rates and cumulative doses within a 15 minute interval. Uncertainty in regard to dose estimates is appropriately factored into decisionmaking by the Health Physics Leader using his own judgement, as opposed to quantitative uncertainty analysis.

The following are recommendations for improving the program.

(1) Include a subroutine on the EARS program to calculate cumulative surface contamination levels (e.g., $\mu Ci/m^2$ for important radionuclides).

(2) Review the format of one table entitled "Radiological Action Level Table" printed out by the EARS program (Attachment C). The format of the table is confusing because a "*" is listed next to the calculated "Emergency Class Criterion," rather than next to the calculated dose rates and/or doses due to the accident that exceed a specific criteria. The "*" should be placed next to the calculated dose rate and/or doses due to the accident, and a symbol should be placed following the "*" to indicate which criterion is exceeded.

(3) Review the format of one figure printed out by the EARS program (Attachment D). The figure contains the title "Edge Dose Rate and Type: ________________ __________,"
(numerical dose rate (body organ).
and presents lines showing the plume at different times following the accident. The information contained in the figure is confusing because the figure contains multiple edges to which the plume edge dose rate stated in the caption might apply. The higher dose rate at the centerline of the plume should also be provided.

(4) Include a table of atmospheric dispersion factors averaged over the period of release for various distances and directions from the plant. Currently, atmospheric dispersion factors are provided for only one location (at the Exclusion Area Boundary), and this makes it difficult to reconcile differences between doses estimated by EARS and doses estimated by other computer programs available at NRC and in the industry.

(5) Include a table of all meteorological data (i.e., wind speed, wind direction and atmospheric stability) used as input to the dose rate and cumulative dose computation on each computer output.

1.2.6 Conclusion

Based on the above findings, this portion of the licensee's program meets the requirements of Supplement 1 to NUREG-0737.

1.3 Functional Capability

1.3.1 Operations and Control Room Support

The functional capability of the TSC was evaluated by presenting a NRC developed accident scenario to key members of the licensee's staff normally assigned to the facility during an emergency. Licensee personnel responded to the postulated circumstances by describing their actions and how the equipment and supplies available in the TSC would be used. The evaluation showed that the TSC would be adequately staffed and capable of performing the assigned functions. The responsibilities for dose projections (assessments), licensee protective action recommendations and offsite notifications remain in the TSC and are not transferred to the EOF.

1.3.2 Conclusion

Based on these findings, this portion of the licensee's program meets the requirements of Supplement 1 to NUREG-0737.

2.0 Control Room Response

2.1 Staffing

There are sufficient onshift personnel to perform the functions identified in Table 2 of Supplement 1 to NUREG-0737 (Table B-1 of NUREG-0654, Revision 1). The onshift Health Physics Foreman, or Senior Health Physics Technician, performs the required dose projections before the TSC is manned. An onshift administrative person, assigned to all three units, performs the communicator's functions during an emergency. An onshift crew of five(5) Emergency Services Officers, who are registered Emergency Medical Technicians, provide the site with a firefighting, rescue and first aid capability.

2.2 Dose Assessment

EPIP SO23-VIII-40.100, Source Term and Dose Assessment, provides two procedures for assessment of doses: (1) the EARS computer program; and (2) a manual procedure. Since the EARS program is evaluated in Sections 1.2.5 and 4.2.5, the following concerns only the manual assessment. The manual portion of the procedure is intended to be used by shift personnel in the CR during the first 30 minutes after an abnormal event is declared (prior to activation of the TSC).

The method for manual assessment is adequate to rapidly scope the magnitude of potential impacts, and to classify the emergency provided that the individual is sufficiently trained in this area. These procedures are consistent with NRC's models; however, the bases for some parameters are not clearly stated and made it difficult to completely check these procedures.

Source terms are estimated by manually reading the numerous radiation detection monitors using the procedure in EPIP SO23-VIII-40.100, Attachment 1. Some ambiguity was observed in the labeling of radiation detection monitor scales in the rear panel board in the CR.

The meteorological assessment consists of determining X/Q values from measurements of wind speed and atmospheric stability and identifying the affected sector(s) from measurements of wind direction. Meteorological measurements from the primary tower are recorded on strip charts in the CR. Wind direction and speed at the 10 m level and vertical temperature difference between the 10 and 40 m levels are recorded. This procedure is adequate. However, it would be helpful to include explicit instructions as to how to obtain average values of the meteorological parameters from the strip charts over time periods of about 15 minutes.

Dose assessments are made by using a dose assessment work sheet (EPIP SO23-VIII-40.100, Attachment 2, p. 1). Units are not given for the atmospheric dispersion factors and dose conversion factors. References are not provided for the atmospheric dispersion factors, dose conversion factors, and time decay factors.

The following improvements are recommended.

(1) Provide explicit instructions on how to obtain appropriate values of the parameters from strip charts and indicators in the control room.

(2) Provide units on all tables and worksheets.

(3) Provide references for methodologies used.

2.3 Conclusion

Based on these findings, this portion of the licensee's program meets the requirements of Supplement 1 to NUREG-0737.

3.0 Operational Support Center (OSC)

3.1 Physical Facilities

3.1.1 Design, Location and Habitability

The OSC is located in Room 403 which is on the 70 foot level of the Units 2/3 Auxiliary Building. During non-emergency periods, this room is the Health Physics Radiation Exposure Permit Office. This two (2) room complex totals approximately 600 ft^2. Being located in the Units 2/3 Auxiliary Building, the OSC is part of a structure built to NRC Seismic Class 1 structural requirements which is the same as that described for the TSC in Paragraph 1.1.1. Personnel to be assigned to emergency teams congregate in the hallway outside the OSC until needed. The OSC uses the normal ventilation system in the Auxiliary Building which does not provide any HEPA or charcoal filters to reduce airborne contamination. The ventilation system does provide temperature and humidy control. The OSC is located in an area where radiation levels of less than 0.25 mr/hr. are expected during operations with 1% defective fuel cladding.

If radiological or other conditions necessitate the abandonment of the OSC, the licensee has identified alternate locations for these functions. EPIP SO123-VIII-80, Emergency Group Leader Duties, designates the "Lobby 30' elevation outside Control Room" as the alternate location for the Units 2/3 OSC. This alternate location is provided with the same radiological protection as the TSC and CR. The licensee stated that a structural change is to be made in the lobby area in the near future which will require the Unit 1 OSC to be designated the Units 2/3 alternate OSC location. The licensee also noted that, if the Unit 1 OSC is uninhabitable, the Unit 1 TSC can be used as the alternate OSC location. The Unit 1 TSC has the same habitability protection as the Units 2/3 TSC. Although EPIP SO123-VIII-80 addresses the subject of evacuating the OSC to an alternate location, the procedure does not provide information on what equipment and materials should be relocated. Interviews disclosed that the maintenance tool cart would be taken to the alternate location. In addition personnel assigned to the OSC would be expected to take those items necessary for them to perform their functions in the alternate location. EPIP SO123-VIII-32, Local Area Evacuation and Accountability does provide general guidance on evacuating a local area, such as the OSC.

Diagrams and status boards have been placed on the walls of Room 403 for use during an emergency. The diagrams were schematic drawings of the various Unit 2 and common areas (by floor level) of the plant. Comparable Unit 3 schematics were available to be posted if the emergency involved that Unit. The status boards provided appropriate operating data and information on emergency teams dispatched from the OSC. Radiological data would be recorded on the schematics.

3.1.2 Equipment and Supplies

The OSC has been supplied with appropriate equipment which has been stored in emergency cabinets located in the OSC and in the hallway outside the OSC. The radiological instruments and equipment available provide a capability to measure anticipated dose rates under accident conditions, levels of contamination and collect samples of airborne activity. Some protective clothing, including respiratory protective equipment, is available; however, the protective clothing at the access control point is expected to be the main supply of such items. A variety of personnel monitoring devices, including 0-5 R and 0-100 R direct reading dosimeters, are kept in the emergency cabinets. The inspection disclosed that the monitoring equipment was within the calibration period and tests showed the portable monitors' batteries were in good condition. Copies of inventories were posted on the doors of the emergency cabinets and the same inventory surveillance as used for the TSC applies to the OSC (see Section 1.1.3). The equipment and supplies stored in the OSC emergency cabinets appear to be appropriate for the functions of the OSC.

The OSC also has support materials for the emergency teams sent into the plant for emergency repairs or corrective actions. A maintenance tool cart on wheels contains various items (e.g. bolt cutter, ropes, wrecking bars, sledge hammer, hydraulic jack, life-lines and hacksaw) of a general nature that might be needed. The OSC contains a complete set of hard copy general plant arrangement drawings, P&ID's and electrical one line schematics. The licensee maintains a library of vendor manuals and other maintenance related documents in the Maintenance Shop that are used during normal maintenance activities. These manuals and documents are available and would be used during emergency situations.

3.1.3 Communications

The communicaions systems existing in the OSC have been described in Paragraph 1.1.4 above. The OSC has a base radio station that allows communications with inplant emergency teams and onsite and near site monitoring teams via hand-held radios provided to the teams. The onsite PAX telephone system and the Pacific Telephone system serve as backup communications capabilities for the inplant and onsite/near site teams respectively. The February 29, 1984, emergency preparedness exercise identified a possible communications problems between the OSC and the near site monitoring teams. The licensee said that this problem has been identified as a matter involving coordination of the use of channels between the base radio stations located in the TSC and OSC. According to the licensee corrective action on this item is being implemented.

3.1.4 Conclusion

Based on the above findings, this portion of the licensee's program meets the requirements of Supplement 1 to NUREG-0737.

3.2 Functional Capability

3.2.1 Staffing

The functional capability of the OSC was evaluated by presenting a NRC developed accident scenario to key members of the licensee's staff normally assigned to the facility during an emergency. Licensee personnel responded to the postulated circumstances by describing the actions that would be taken and by demonstrating how the equipment and supplies available in the OSC would be used. The evaluation showed that the OSC would be adequately staffed and capable of performing the assigned functions.

3.2.2 Operations

During the functional capability assessment of the OSC, the question was asked, "How would the SRO in the CR (during an accident) be kept informed of valve and breaker position changes resulting from manipulations performed during emergency repair actions?" Subsequent discussions with CR Operators and maintenance personnel resulted in a failure to identify any formal training or procedural requirements addressing this special case. While CR operators felt that operations personnel accompanying repair teams would keep them informed, no written policy or procedure was documented to insure that this information reached them in a timely manner. EPIP SO123-VIII-30 contains a direction for the OSC Operations Coordinator to keep the Operations Leader in the CR informed of repair evolutions in progress, but does not contain specific guidance on updating system status (e.g., valve and breaker positions). It is recommended that station maintenance procedures and the training program for operators and maintenance personnel be revised to include a method to insure that the CR is kept informed of all changes in system status resulting from emergency repair work in progress.

3.2.3 Conclusion

Based on these findings, this portion of the licensee's program meets the requirements of Supplement 1 to NUREG-0737.

4.0 Emergency Operations Facility (EOF)

4.1 Physical Facilities

4.1.1 Design, Location and Habitability of the Primary EOF

The EOF is a designated area in the Training and Education Center located on the Japanese mesa area controlled by SCE. This site is just east of Interstate Highway 5 and about one(1) kilometer from SONGS. The EOF encompasses about 13,400 feet^2 of space that is expected to accommodate about 78 persons. During normal periods of use much of this area serves as office space for the SCE training staff. The EOF has 18 inch thick concrete walls and ceiling and 3 inch thick steel doors, all of which provide a protection factor of 120 for 0.7 MeV gamma photons. The HVAC system for the EOF provides temperature and humidity control of the facility. The HVAC system, which includes a HEPA filter, can be manually placed in a recirculating mode of operation that either bypasses or incorporates the HEPA filter. The EOF has been designed to limit exposures to persons working there during an emergency to 5 rems whole body and 30 rems thyroid dose based upon a worst case source term release scenario. There is a sprinkler system on the roof of the EOF that can be activated to wash off the deposited radionuclides from the plume. The radionuclides can also be washed away from the building with hoses at pre-established outlets. THe EOF has adequate lighting, restroom facilities and other features essential for its operations. The facility has been constructed to meet or exceed the California Uniform Building Code and will withstand adverse conditions of high winds and floods. The EOF was found to be as described in the enclosure to the March 31, 1982 letter from Ken Baskin, SCE, to the NRC (Frank Miraglia, Chief, Licensing Branch No. 3) and Section 7.0 of the Emergency Plan for Units 1, 2 and 3, dated October 1982.

4.1.2 Design and Location of the Backup EOF

The licensee has identified their division office in Santa Ana as the backup EOF. This facility is approximately 35 miles from SONGS and about two (2) miles from the Orange County Emergency Operations Center. Amendment 8 to Facility License No. NPF-15 (Unit 3) included the Commission's approval of this site for the backup EOF. The division facility provides more than an adequate amount of office space for the EOF functions. It also provides extensive telephone communications and hard copy capabilities as well as sufficient parking space and a landing pad for helicopters. The property is completely fenced. Status boards are available for use if needed. The backup EOF can receive all of the information provided to the EOF. The Emergency Support Organization Procedures Manual addresses the use of the backup EOF; however, the Emergency Plan does not presently include a discussion of the backup EOF.

The licensee stated that the next revision to the Emergency Plan would include a description of the backup EOF.

4.1.3 Equipment and Supplies

The EOF technical library meets or exceeds the TSC library (see Section 1.1.3 above). In addition the extensive technical library maintained by the training and education organization is also available for use. The Training and Eduction Center library is located in the same building but outside the area designated as the EOF.

A variety of radiation detection and measurement instruments are available in the EOF. These instruments are adequate to monitor personnel exposure and contamination and radiological conditions in the EOF under accident situations. Radiation monitoring equipment and sampling materials are also available for use by persons assigned to perform offsite surveys and/or environmental monitoring. The instruments available in the Health Physics Laboratory (located in the EOF) are used for training purposes as well as during emergencies. This laboratory instrumentation includes a multi-channel analyzer and proportional counting equipment. The equipment in the Chemistry Laboratory (also located in the EOF) is used for training purposes and to support emergency activities.

Film badges and direct reading dosimeters with ranges of 0-200 mR and 0-5 R are available to monitor exposures received by personnel working in the EOF.

Various other additional supplies necessary for the functions performed in the EOF are also available. A decontamination area and supplies are present in the EOF.

4.1.4 Communications

The communications systems existing in the EOF have been addressed in Section 1.1.4 above.

The appraisal included discussions with licensee personnel concerning the notification and subsequent manning of the EOF. The Corporate Emergency Control Center, which is manned 24 hours a day and 7 days a week, initiates the EOF personnel callout sequence. Key personnel are notified by beeper and others are contacted via a call tree procedure. The Emergency Support Organization (ESO) procedures (EOF procedures) do not identify the 10 positions considered by the licensee to be the critical or key positions necessary for the manning of the EOF. Discussions with licensee personnel indicate that response times and notification procedures have not yet been verified by a full implementation. A March 22, 1984 memo signed by Mr. F. C. Jackely, concerning helicopter pick-up for essential

EOF personnel, indicates that a rapid means of delivering essential personnel to the EOF exists if it should be needed.

The licensee should verify the response times for the critical EOF personnel by some form of testing. Also information contained in the March 22, 1984 memo concerning helicopter pickup should be included in tne ESO procedures.

4.1.5 Power Supply

The EOF is provided with two sources of backup power. There is a standby (approximate 200 kW) diesel generator, whose capacity is more than adequate to supply the electrical needs of the EOF, and is operational within 30 seconds after the loss of offsite power. Backup power for the communications systems is supplied by batteries which can supply the needs for eight (8) hours.

4.1.6 Conclusion

Based on the above findings, this part of the licensee's program meets the requirements of Supplement 1 to NUREG-0737.

4.2 Information Management

4.2.1 Variables and Parameters

The variables and parameters available in the EOF are the same as for the TSC, see Section 1.2.1 above.

4.2.2 Critical Functions Monitoring System

The CFMS has been described in Section 1.2.2 above.

4.2.3 Health Physics Computer System

The HPCS has been described in Section 1.2.3 above.

4.2.4 Manual Information Systems

The licensee uses some manual methods to display and disseminate information in the EOF. Status boards for displaying reactor operating and environmental monitoring data are posted on the walls near the area occuppied by the representatives of the offsite agencies. Various maps of the area around SONGS have been posted on the walls in the central area of the EOF. Some of the maps are use to record envirnonmental monitoring data and wind/plume direction. One of the maps displays the locations of the sirens that comprise the Community Alert Siren System. Forms and calculational sheets are also used. Hard copies of outputs from the CFMS and HPCS are distributed to persons in the EOF.

4.2.5 Dose Assessment

All of the EARS dose assessment capabilities that are available in the TSC are also available in the EOF (see Section 1.2.5). Since personnel in the EOF's Offsite Dose Assessment Center (which includes representatives from SCE and the adjacent counties) use the same model that the TSC uses, the licensee's model is consistent with that use by offsite authorities. In addition, EOF personnel can call up all of the assessments made by the TSC through the EARS system. The EOF Offsite Dose Assessment Center has the primary responsibility for using field monitoring data to refine previous dose projections and for estimating dose in the ingestion pathway. The EARS program does not directly compute ingestion doses, but computes exposure due to ground disposition. These dose rates are used to deploy radiological field monitoring teams.

Since the EOF will be staffed with a corporate meteorologist, additional meterological services are available such as meteorological forecasts and assessments of the uncertainties in the assessments provided by the EARS system for existing meteorological conditions. In addition to EARS, meteorological tools in the EOF include a system for obtaining regional National Weather Service data and regional and local forecasts. The data acquisition system and the presence of a meteorologist appear to provide the maximum capability for meteorological evaluations that are required in dose assessment and for protective actions decision making.

Suggested areas for improvement are the same as those in Section 1.2.5.

4.2.6 Conclusion

Based on the above findings, this portion of the licensee's program meets the requirements of Supplement 1 to NUREG-0737.

4.3 Functional Capability

4.3.1 Operations and TSC Support

The functional capability of the EOF was evaluated by presenting a NRC developed accident scenario to key members of the licensee's and Orange County's staff normally assigned to the facility during an emergency. The individuals responded to the postulated circumstances by describing the actions that would be taken and by demonstrating how the equipment and supplies available in the EOF would be used. The evaluation showed that the EOF would be adequately staffed and capable of performing the assigned functions.

4.3.2 Conclusion

Based on these findings, this portion of the licensee's program meets the requirements of Supplement 1 to NUREG-0737.

5.0 Exit Interview

On March 30, 1984 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. In addition to the NRC Team Leader, the team members, and headquarters suppport person, the following NRC personnel were also present: E. L. Jordan, Director, Division of Emergency Preparedness and Engineering Response; R. A. Scarano, Director, Division of Radiological Safety and Safeguards, Region V; M. D. Schuster, Chief, Security Licensing and Emergency Preparedness Section, Region V; H. Rood, Project Manager, Units 2/3; P. Stewart, Resident Inspector. The licensee was informed that no deficiencies were identified during the appraisal. One item, relating to the independent verification of the dose projections provided by the HPCS, was identified as still being open. The licensee believed that such a verification had already been made. A meeting between licensee representatives and three of the NRC team members was scheduled to further discuss this matter immediately following the exit interview.

The licensee was informed that some recommendations for improving the emergency response facilities, equipment and employee actions were identified during the appraisal and they would be documented in the appraisal report. The following recommendations were specifically mentioned during the exit interview:

a. The labeling of the radiation monitor readouts in the CR that are used to make the initial dose projections should be examined to make sure they correspond to the identifications in EPIP SO23-VIII-40.100. Also, the ability of the assigned health physics personnel to make the calculations in EPIP SO23-VIII-40.100 should be confirmed.

b. Consideration should be given to making advance preparation for moving the OSC to the designated alternate location.

c. There is a need for some method to assure that the CR is kept informed of changes to systems and equipment made by the emergency teams.

ATTACHMENT A

Individuals Contacted

SCE: SONGS

*J. Haynes, Station Manager
*C. Anderson, Emergency Planner
D. Barreres, Supervisor, Fire Protection
*D. Bennette, Radiological Emergency Engineer
C. Bostian, Software Engineer
*L. Bray, Radiological Engineer
*K. Conley, Computer Engineer
J. Droste, Assistant Manager, Technical
A. Elkhart, NSSS Engineer
J. Forde, Emergency Planner
R. Jensen, Foreman, Health Physics (Units 2/3)
K. Johnson, Supervising Engineer, NSSS Engineering
*P. Knapp, Manager, Health Physics
M. Lisitza, Shift Superintendent (Units 2/3)
G. Morgan, Manager, Station Operations
J. Mortenson, Supervisor, Chemistry (Units 2/3)
H. Newton, Supervisor, Plant Maintenance (Units 2/3)
J. Reilly, Supervising Engineer
P. Schofield, NSSS Engineer
J. Summy, Supervisor, Computer Maintenance and Operations
O. Trinhue, I&C Foreman
J. Wambold, Manager, Maintenance

SCE: Corporate

*G. Buzzelli, Emergency Planning Coordinator
*P. Dooley, Supervisor, Emergency Planning
D. Evans, Nuclear Engineer
P. Handley, Associate Emergency Planning Specialist
*F. Jackley, Manager, Nuclear Affairs and Emergency Planing
R. Krieger, Supervisor, Unit 1 Licensing
S. Marsh, Meteorologist
E. Medling, Corporate Health Physics Supervisor
D. Pilmer, Manager, Nuclear Engineering and Safety
*R. Reiss, QA Engineer
J. Wallace, Emergency Planning Specialist
K. Wells, Nuclear Engineer

Orange County

M. Fleet, Radiation Safety Officer
J. Hartranft, Health Physicist

*Denotes those present at exit interview on March 30, 1984.

Persons Present at March 30, 1984 Exit Interview Only

K. Baskin, Vice President, Nuclear Engineering, Licensing and Safety Department
P. Eller, Manager, Station Security
P. King, Supervisor, Operations QA
C. Luckey, Supervisor, Corporate Telecommunications
G. Noel, Administrator, General Training
T. Phifer, Compliance Engineer
R. Zemenski, Compliance Engineer