ENCLOSURE 1

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-361/96-04
50-362/96-04

Licenses: NPF-10
NPF-15

Licensee: Southern California Edison Co.
P.O. Box 128
San Clemente, California

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

Inspection At: San Onofre Site, San Diego County, California

Inspection Conducted: April 29 through May 3, 1996

Inspectors: Arthur D. McQueen, Emergency Preparedness Analyst
Plant Support Branch

Thomas R. Meadows, Reactor Safety Inspector
Operations Branch

Approved: Blaine Murray 5/16/96
Blaine Murray, Chief, Plant Support Branch Date
Division of Reactor Safety

Inspection Summary

Areas Inspected (Units 2 and 3): A routine, announced inspection was conducted of the operational status of the emergency preparedness program including changes to the emergency plan and implementing procedures; emergency facilities, equipment, and supplies; organization and management control; training; internal reviews and audits; effectiveness of licensee controls; emergency event reports; and offsite communication capabilities.

Results:

Plant Support

- Changes to the emergency plan and implementing procedures were properly reviewed and submitted to the NRC (Section 2).
- An effective relationship with offsite emergency response organizations was maintained (Section 2).
- Emergency facilities, equipment, and supplies were maintained in a proper state of operational readiness (Section 3).

- An appropriate number of emergency response personnel were trained and qualified. The emergency planning organization was fully staffed with qualified personnel (Section 4).

- Emergency response organization members were adequately trained to successfully perform their emergency functions (Section 5).

- Fire brigade training was well conducted and current. The fire protection facility and equipment was well organized and in good working condition (Section 5.2).

- The performance of operating crews in implementing emergency response actions during walkthrough scenarios was excellent. Classification of emergency events, notifications to offsite response agencies, and formulation of protective action recommendations were in accordance with approved procedures and appropriate to scenario events. Effective communications and emergency operating instructions usage were demonstrated by the crew teams (Section 5.3).

- Quality assurance audits and surveillances of emergency preparedness and planning were performed by qualified personnel and were of proper scope, depth, and effectiveness (Section 6).

- An effective system of controls was maintained regarding safety issues, events, or problems which emphasized early detection and elevation to an appropriate management level. Timely, effective implementation of corrective actions was noted (Section 7).

- No emergency event was declared at the site since the last routine emergency preparedness inspection (Section 8).

- Offsite communication capabilities were diverse and redundant. A survivable method to communicate with offsite agencies would likely exist during and following a severe natural event (Section 9).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting

- Attachment 2 - Emergency Preparedness Inspection Scenario Summary

- Attachment 3 - Licensee Offsite Communications Capability (TI 2515/131)

DETAILS

1 PLANT STATUS

During this inspection, both units operated at full power.

2 EMERGENCY PLAN AND IMPLEMENTING PROCEDURES (82701-02.01)

The inspectors reviewed changes in the licensee's emergency plan and implementing procedures to verify that these changes had not decreased the effectiveness of emergency planning and that the changes were reviewed properly and submitted to the NRC.

Since the previous inspection, one emergency plan revision (Revision 6.2) had been implemented. The change in this revision was to revise procedures for distribution of public information in the site emergency planning zone. The change indicated emergency planning information will be published in local telephone directories. Review of this revision by the NRC is pending coordination between NRC headquarters and the Federal Emergency Management Agency. The licensee had performed a documented review in accordance with 10 CFR 50.54(q) to determine that the revision did not decrease the effectiveness of emergency preparedness.

The inspectors also reviewed documentation pertaining to selected emergency plan implementing procedure changes of the 18 revisions or temporary change notices implemented since the last routine inspection. The inspectors reviewed changes in procedures and noted that marked changes were consistent with regulatory requirements and the licensee's commitments. Review, approval, and distribution of the plan and procedure changes were conducted in accordance with Emergency Plan Implementing Procedure SO123-VIII-0.100, Revision 1, dated December 28, 1995.

The licensee maintained an effective relationship with offsite agencies and coordinated changes in emergency action levels with those agencies annually or as appropriate. Changes in emergency actions levels were reviewed and concurred in by state and local emergency response organizations. This coordination occurred as part of the monthly Interjurisdictional Planning Committee meetings. It also occurred virtually daily by telephone and/or E-mail by means of a computer area network. The inspectors reviewed Letters of Agreement established with support agencies and determined that they were reviewed annually and were updated as required.

3 EMERGENCY FACILITIES, EQUIPMENT, INSTRUMENTATION, AND SUPPLIES (82701-02.02)

The inspectors toured onsite emergency facilities and reviewed the licensee's emergency equipment inventories and maintenance to verify that facilities and equipment were maintained in a state of operational readiness.

A tour was made of each emergency response facility which included the inspection of various equipment items, instrumentation, and supplies. Facilities inspected were the control room, technical support center, operations support center, one onsite monitoring team vehicle and response kit, backup operations support center, backup technical support center, and the emergency operations facility. The facilities were observed to be well maintained and ready for emergency use. Random inspections were performed of radiation monitoring and respiratory equipment at each emergency response facility. All selected items were verified as being in calibration or had been appropriately inspected on a scheduled basis. Equipment and supplies placed in response facilities and in emergency equipment lockers matched scheduled inventories. Current copies of the implementing procedures and emergency telephone directories were maintained in all facilities. Emergency plan copies were located in the operations support center, the technical support center, and the emergency operations facility Primary and backup communications in each facility were as described in the emergency plan. The inspectors reviewed documentation pertaining to inventories, testing, and maintenance of emergency response facilities and noted that they had been performed as required by procedures.

Since the last routine emergency preparedness inspection, the only significant changes in emergency response facilities were redesign of the technical support center and the emergency operations facility. In both cases, walls or partitions were removed to expand facility space in order to accommodate collocation and integration of NRC responders with utility responders. The redesigns were facility enhancements.

4 ORGANIZATION AND MANAGEMENT CONTROL (82701-02.03)

The inspectors reviewed the emergency response organization staffing levels to determine whether sufficient personnel resources were available for emergency response. The emergency planning organization was reviewed to ensure that an effective programmatic management system was in place.

The Southern California Edison emergency preparedness staff for the San Onofre Nuclear Generating Station consisted of two organizational elements. The site emergency planning group was responsible for onsite emergency planning and reports to the site emergency preparedness manager, who reports to the vice president and site manager. The onsite group had seven personnel assigned to support onsite activities. The emergency planning and public affairs group was responsible for offsite emergency planning and reports to the vice president for engineering/technical services. The offsite emergency planning group had five personnel assigned for this function. The inspectors found both groups were staffed with appropriately qualified, trained, experienced, and motivated personnel.

The site emergency response organization had over 1000 personnel. The primary callout system for activating the emergency response organization was by pager. A recall telephone-based machine was also used. The machine will continue calling until each position in the emergency response organization is

filled. A list of personnel trained and experienced to function in emergency response organization positions was maintained by site emergency planning. The emergency planning staff has a goal of filling each emergency response organization position with three trained candidates.

The emergency response organization roster provided to the inspectors had 81 positions listed. Twelve had only two incumbents, and one position had only one incumbent. The review verified that none of the positions with less than three incumbents were regulatory based and required minimum staff as established in Table 5-1 of the emergency plan. The site emergency planning supervisor indicated that a review of the positions, which were below the desired level of three incumbents, would be conducted to insure no shortfall in necessary response positions. All personnel were called in the event of an emergency response organization activation, and a response organization was then staffed by those reporting to emergency response facilities. Unnecessary responding personnel were released for subsequent shifts or other duties. Positions were designated as a vacancy by the cognizant division. Upon transfer or departure of an incumbent, his/her replacement was designated by the cognizant manager.

5 TRAINING (82701-02.04)

The inspectors reviewed the emergency response and fire protection training programs and interviewed selected individuals to determine whether these personnel had received the required training and complied with the requirements of the licensee's administrative procedures and emergency plan, 10 CFR 50.47 (b)(15), and 10 CFR Part 50, Appendix E.IV.F.

5.1 Emergency Response Training Program

The program for training and qualification of emergency responders was specified in Procedure S0123-XXI-1.11.3, "Emergency Plan Training Program Description." Qualification included required initial training and annual refresher training as well as specialized training in specific response functions. The inspectors reviewed records of training and determined that they were current. The current qualification status of individuals in the emergency response organization was maintained in the training information management system and audited monthly by the emergency preparedness training coordinator. Response personnel interviewed were knowledgeable of their emergency response duties and responsibilities.

5.2 Fire Protection Training Program

The program for training and qualification of fire protection responders was specified in Procedures S0123-XXI-20, "Fire Department Program," and S0123-XIII-21, "Fire Drill Procedure." Qualification included required initial training and annual refresher training as well as specialized training in specific response functions. The inspectors reviewed records of training and

determined that they were current. The current qualification status of individuals in the fire response team was maintained in the training information management system and audited daily by the station's fire department training coordinator.

The inspectors interviewed the station fire chief, walked down the station fire facilities, reviewed training records for annual training and drill participation, and found the training current. Fire protection training records were reviewed and key personnel interviewed to ascertain that fire drill participation was current and that local support organizations participated as required. The training was well conducted and was beneficial to those in attendance. The fire protection facility and equipment was well organized and in good working condition.

5.3 Walkthroughs with Operating Crews

The inspectors conducted a series of emergency response walkthroughs with three operating teams of one Unit 2/3 crew to evaluate the adequacy and retention of skills obtained from the emergency response training program. One walkthrough scenario was developed by the facility, reviewed by the inspectors, and administered to the crews to determine, through demonstrated performance, whether control room personnel were proficient in their duties and responsibilities as emergency responders during a simulated accident scenario. Attachment 2 to this inspection report contains a narrative summary of the walkthrough scenario.

The inspectors observed three teams, each performing as a Unit 2 crew, using the control room simulator in the dynamic mode. The scenario consisted of a sequence of events requiring an escalation of emergency classifications, culminating in a general emergency. The scenario was developed to run approximately 90 minutes. The inspectors observed the interaction of the response crews to verify that authorities and responsibilities were clearly defined and understood. The walkthroughs also allowed the evaluation of the crews' abilities to assess and classify accident conditions, utilize abnormal and emergency operating instructions, perform dose assessments, develop protective action recommendations, and make corresponding notifications to offsite authorities.

The performance of the operating crews during walkthrough evaluations was generally excellent with the following key observations noted:

- Crews demonstrated good communications practices. Communication was three way and professional with easily understandable directions and repeat backs.

- The crews responded well to alarm annunciations, utilized emergency operating instructions well, and successfully mitigated the events.

- For all three crew teams, the emergency action level declarations were accomplished accurately and in a timely fashion.

- Protective action recommendations were appropriately made in accordance with plant conditions and calculated dose assessments using a new computer software system that improved timeliness and the accuracy of the dose assessments.

- Notifications to other agencies were made in a timely manner. One improvement item was discussed with the emergency planning staff pertaining to validation of notification forms by the emergency coordinator. It was noted that there was inconsistency in documenting approval of notification forms by the emergency coordinator among the three crews. It was subsequently determined by emergency planning that this issue was identified during a drill in Mid-1995, but action had not been taken to proceduralize notating emergency coordinator approval on notification forms. The licensee indicated that the procedure updating will be given a higher priority for completion.

All three operating crew teams successfully mitigated the events using good command and control techniques. Team members practiced self checking and fully supported other team members' actions.

6 INDEPENDENT AND INTERNAL REVIEWS AND AUDITS (82701-02.05)

The inspectors met with quality assurance personnel and reviewed independent and internal audits of the emergency preparedness program performed since the last inspection to determine compliance with the requirements of 10 CFR 50.54(t)

The inspectors reviewed and discussed with a quality assurance supervisor and a lead auditor, the most recent annual audit (SCE Quality Assurance Audit Report SCES-510-95) of the emergency preparedness program which covered the period from December 1, 1994, through December 1, 1995. The audit team members were well qualified. All team members were certified auditors with current lead auditor recertification as set forth in the licensee's Quality Assurance Procedure SO123-XII-2.19, which incorporated certification criteria to perform audits in accordance with ANSI Standard N45.2.23 and NRC Regulatory Guide 1.144. The team included experienced personnel familiar with emergency planning. The inspectors reviewed the audit plan, scope of the audit, and the audit check list for the 1995 audit. The audit was thorough and complete. One corrective action request was issued from the audit and was in the final corrective action step. The audit report was issued to appropriate levels of management at the plant.

Since the last routine NRC emergency preparedness inspection, the quality assurance organization conducted six surveillances and an activity observation report related to emergency preparedness. The surveillance observations were reviewed by the inspectors and were verified as being appropriate to observed activities and findings. Results of surveillances and observations were incorporated into the annual audit.

Quality assurance maintained a tracking system which established suspense dates for response by cognizant managers for items identified in a report that required corrective actions or improvements. Corrective action requests or problem review reports were issued for tracking each audit finding and enhancement item.

7 EFFECTIVENESS OF LICENSEE CONTROLS (82701-02.06)

The inspectors reviewed the adequacy of the licensee's controls systems pertaining to safety issues, events, or problems. The review included discussions with quality assurance and emergency preparedness staff personnel and review of procedures and documentation of problem identification, root cause analysis, management review of problem identification and solution, and corrective actions.

The licensee's controls systems were effective in identifying, resolving, and preventing problems by providing for review of such areas as corrective action systems, root cause analyses, safety committees, and self assessment in the area of emergency preparedness. The principle tools for tracking corrective actions were recently introduced and consisted of event reports and action requests. Other tools available in managing corrective actions included: corrective action requests, problem review reports, root cause evaluations, site problem reports, nuclear safety concerns, and the nuclear action tracking system.

The primary tracking systems used by site emergency preparedness for tracking problems, issues, etc. were event reports and the nuclear action tracking system.

Personnel at the site were instructed in the use of the systems in their site general employee training. They were encouraged to initiate the appropriate documentation through their supervisors but were also instructed in the existence of an employee "hotline" by which such items could be reported anonymously. The organizational elements for reviewing and approving major issues identified for correction were the site effectiveness review committee and the action review committee.

Emergency planning events and action items were in the process of being entered into the new event reporting system during this inspection. The inspectors reviewed a sample emergency planning event and the quarterly emergency drill findings and determined that the corrective action program was properly implemented.

8 ONSITE FOLLOWUP OF EVENTS AT OPERATING POWER REACTORS (93702)

No emergency event had been declared at the site since the last routine emergency preparedness inspection.

9 REVIEW OF TEMPORARY INSTRUCTION 2515/131, LICENSEE OFFSITE COMMUNICATION CAPABILITIES (2515/131)

This temporary instruction was implemented to perform the following: (1) gather information on the licensee's capabilities to communicate with state and local government authorities during and after a severe natural event, and (2) gather information on licensee communication contingency procedures. Consistent with the requirements contained in the temporary instruction, the inspection findings are documented in an attachment to this report (see Attachment 3). The results of this review indicated that a proper method for communicating with the offsite agencies would likely exist during and following a severe natural event.

10 REVIEW OF UPDATED FINAL SAFETY ANALYSIS REPORT COMMITMENTS

A recent discovery of a licensee operating their facility in a manner contrary to the Updated Final Safety Analysis Report (UFSAR) description highlighted the need for a special focused review that compares plant practices, procedures, and/or parameters to the UFSAR descriptions. While performing the inspections discussed in this report, the inspectors reviewed the applicable portions of the UFSAR that related to the areas inspected. The inspectors verified that the UFSAR wording was consistent with the observed plant practices, procedures, and/or parameters pertaining to emergency preparedness.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

*C. Anderson, Supervisor, Site Emergency Planning
*K. Bellis, Manager, Emergency Planning and Public Affairs
*B. Culverhouse, Emergency Planning Coordinator, Emergency Planning and Public Affairs
*J. Dale, Emergency Plan Training Steward, Nuclear Training Division
*K. Fowler, Engineering Specialist, Site Emergency Planning
*R. Garcia, Emergency Planning Engineer, Emergency Planning and Public Affairs
*G. Gibson, Manager, Compliance
*R. Hall, Instructor, Nuclear Training Department
*P. Handley, Supervisor, Emergency Planning, Emergency Planning and Public Affairs
P. Hawkins, Supervisor, Telecommunications
*D. Herbst, Manager, Site Quality Assurance
*R. Kaplan, Compliance Engineer
*M. Knowlton, Supervisor, Quality Assurance
*W. Marsh, Manager, Regulatory Affairs
*C. Meddings, Engineer, Site Emergency Planning
*M. Morgan, Emergency Planning Engineer
G. Mueller, Quality Assurance Engineer, Nuclear Oversight Division
P. Obradovic, Senior Engineer, Telecommunications
*D. Nunn, Vice President, Engineering and Technical Services
*G. Plumlee, Supervisor, Regulatory Compliance
K. Rauch, Manager, Operator Training
*D. Richards, Engineer, Site Emergency Planning
*D. Seever, Emergency Preparedness Technical Specialist
*M. Tarango, Engineer, Site Emergency Planning
*W. Zintl, Manager, Site Emergency Preparedness

The inspectors also held discussions with and observed the actions of other station and corporate personnel.

*Denotes those present at the exit interview.

2 EXIT MEETING

An exit meeting was conducted on May 3, 1996. During this meeting, the inspectors reviewed the scope and findings of the report. The licensee did not identify as proprietary any of the materials provided to, or reviewed by, the inspectors.

SCENARIO SUMMARY

INITIAL CONDITIONS

The scenario takes place on a Sunday dayshift. Unit 2 is at full power in the middle of the fuel cycle. High pressure safety injection (HPSI) pump 2P018 is out of service for repair of the mini flow isolation valve. Auxiliary Feedwater (AFW) pump 2P140 is out of service for repairs to the turbine governor. Unit 3 is at full power. The on-shift crew includes the Unit 2 and Common operating staff, an on-shift HP supervisor, and the on-shift Nuclear Operations Assistant.

RCP SHEARED SHAFT AND 65 GPM LEAK

At the outset of the scenario, vibration alarms occur on reactor coolant pump (RCP) 2P002. These are followed immediately by a reactor trip caused by a sheared shaft event on that RCP. Due to the reduced flow and delayed reactor trip characteristics of this event, approximately 7% of the fuel pins in the reactor core reach DNB and develop pinhole leaks in the cladding. This results in RCS activity of 42 μCi/gm dose equivalent Iodine 131. The sheared shaft causes damage to the seal pack on the RCP, which results in a 65 gpm leak to the containment. The fallen impeller also causes damage to the pump casing. The operators will carry out post trip activities, and commence a cooldown of the RCS.

When the leak rate is estimated, the Shift Superintendent should classify the emergency as an ALERT in accordance with EAL B2-1 in SO123-VIII-1, "Recognition and Classification of Emergencies". He should assume the Emergency Coordinator position and declare the event in accordance with SO123-VIII-10, "Emergency Coordinator Duties". He should immediately direct control room operators to notify on-site personnel using public address announcements and on-site siren activation in accordance with SO123-VIII-30, "Operations Leader Duties". He should then direct the on-shift Nuclear Operations Assistant to initiate recall of emergency response personnel, and notifications to local and state agencies in accordance with SO123-VIII-30.5, "Shift Communicator Duties". The Shift Superintendent should also direct that an on-shift operator notify the NRC via the Emergency Notification System (Red Phone).

There would be no offsite protective action recommendation made by Edison for these conditions.

RCS LEAKAGE INCREASES AND SITE AREA EMERGENCY

The fallen RCP 2P002 impeller contacted the casing, creating a crack. At t=30 minutes, the crack propagates through the wall, increasing the RCS leak rate to 250 gpm. This leakage is greater than the charging pump capacity. Pressurizer pressure and level lower, and the pressurizer level control system automatically lowers letdown flow and starts additional charging pumps. A Safety Injection Actuation Signal (SIAS) will initiate when pressurizer pressure reaches the automatic actuation setpoint. The operators should continue the cooldown and depressurization of the RCS toward shutdown cooling system entry conditions.

The Shift Superintendent should classify the new plant conditions as a SITE AREA EMERGENCY in accordance with EAL B3-1. He should immediately declare the event, and order site siren activation and PA announcements to direct non-Emergency Response Personnel to proceed to assembly areas prepared to leave the site. He should also direct notifications be made to the offsite jurisdictions and the NRC.

SCENARIO SUMMARY(continued)

An offsite protective action recommendation should be made to evacuate the state park beaches adjacent to the site.

At t=45 minutes, stresses due to the cooldown cause the crack in the RCP casing to widen. RCS leakage increases to 1500 gpm by t=60 minutes. During this period containment pressure increases to about 7 psig. The operators may elect to initiate containment spray (CS). If so, train B CS valve 2HV9368 will fail to open, and train A CS pump 2P012 will trip due to failure of the motor. These failures ensure a high iodine source term for offsite dose projections later in the scenario.

FAILURE OF CONTAINMENT AND GENERAL EMERGENCY

At t=60 minutes, a seam fails on the containment penetration for the letdown line in room 209 on the 30 ft elevation of the penetration building, releasing radioactive material from containment to the plant vent stack via the ventilation system. Plant vent stack radiation monitors 2RE7865 and 2RE7808 trend upward and alarm. Containment pressure indications in the control room slowly trend down, indicating that the source of the release is the containment atmosphere.

Containment radiation monitors 2RE7820A, and B display greater than 10 rem/hr, indicating clad damage has occurred. This condition, combined with the containment breach and the LOCA meets the criteria for a GENERAL EMERGENCY in accordance with EAL B4-1. The Shift Superintendent should declare the event, and direct site siren activation and PA announcements directing all non-Emergency Response Personnel to evacuate the site. He should also direct notifications to offsite jurisdictions and to the NRC.

The offsite protective action recommendation for these conditions should be to evacuate the state park beaches adjacent to the plant, and to shelter all sectors to the 10 mile Emergency Planning Zone boundary.

The Shift Superintendent should also direct the HP supervisor to calculate an offsite dose. The dose at the exclusion area boundary for a four hour release would be 32 mrem TEDE, and 688 mrem CDE thyroid. This dose projection confirms that the offsite protective action recommendation is appropriate.

TERMINATION

The scenario will be terminated after the offsite dose has been calculated and the Emergency Notification Form for the GENERAL EMERGENCY written notifications has been composed.

ATTACHMENT 3

Licensee Offsite Communications Capability (TI 2515/131)

Information gathered concerning the licensee's communication capabilities focused on two key areas: (1) the licensee's capabilities to communicate with state and local government authorities during and after a severe natural event, and (2) applicable communication contingency procedures. The inspectors interviewed members of the site emergency preparedness staff and corporate telecommunications organizations and reviewed detailed documentation of systems provided by the senior engineer, telecommunications, to obtain the information.

1. Capabilities

The licensee maintained eight different methods for communicating with state and local authorities: (1) telephone circuits leased from Pacific Bell, (2) commercial voice and facsimile telephone lines, (3) telephone connection to the United States Marine Corps telephone system at Camp Pendleton, California, (4) direct connect line to the Marine Corps Fire Department, (5) various assigned radio channels, (6) local law enforcement and state radio channels, which included the Marine Corps Provost Marshall and the Federal Bureau of Investigation at San Diego, (7) microwave system pointing north and south, and (8) cellular telephones.

The primary method of contacting the State of California Office of Emergency Services was by "Blue Phone." Contact with local offsite emergency response agencies was by "Yellow Phone." These were inter-agency telephone systems on leased circuits from Pacific Bell. They were non-switched and were not subject to blocking or switch failure. The first backup method used was Pacific Bell commercial voice and facsimile circuits.

Additional means besides the backup circuits that could also be used included:

- Private automatic exchange lines, which were telephone extensions from the Southern California Edison telephone exchange located at the San Onofre Nuclear Generating Station. The circuits were carried by Pacific Bell.

- Offsite dose assessment center radio for communication to Loma Ridge (Orange County Emergency Operations Center and Police and Fire Dispatch Center) and select local fire stations.

- Hospital emergency alert radio for communications between emergency preparedness vehicles and local hospitals.

- State Park Radio for communications with state park headquarters and rangers at the site adjacent beach park.

- "Black Phone" which was an extension with access to the US Marine Corps telephone network as well as the Pacific Bell network via San Diego.

- "Orange Phone" which was a direct connect to the US Marine Corps Fire Department.

- Local law enforcement radio to communicate with the US Marine Corps Provost Marshall and the Federal Bureau of Investigation, San Diego.
- Cellular telephones.
- San Onofre Fire Department Kings radio which provided radiocommunications with various fire departments in San Diego and Orange Counties using "mutual aid" frequencies.
- Microwave system pointing north and south.
- The corporate business recovery plan also included the use of amateur radio to carry information just after a major event, if needed.

The primary means (Blue and Yellow) utilized leased cable facilities. The leased cables were mixed use. "Yellow Phone" voice and data to San Diego locations went through the microwave tower pointing south. "Yellow Phone" voice and data to locations in Orange County and north were carried on the microwave system headed north. This included the Orange County Emergency Operations Center (Loma Ridge). San Onofre Nuclear Generating Station does not use satellite uplinks/downlinks.

The control room nuclear operations assistant had access to all primary and backup communications systems. The technical support center had access to all systems plus all radio communications. The emergency operations facility had access to all special telephones, the offsite dose assessment center radio system, non-Southern California Edison radiation monitoring teams on frequency modulation (FM) radio, fire department, and the Orange County Command Center.

The State Emergency Operations Center "Blue Phone" included dedicated voice to stack and effluent monitors. Backup was Pacific Bell commercial lines. The local emergency operations centers had access to the "Yellow Phone," Pacific Bell system, and offsite dose assessment center radio direct or via relay.

None of the circuits listed above rely on the relay of an event notification via an intermediate offsite organization in order to reach the authority responsible for implementing offsite protective actions.

2. Vulnerabilities

The licensee indicated an earthquake with a ground rupture was the only major susceptibility since the majority of the telephone lines were underground. Other hazards reviewed by the licensee in emergency planning were grass fires, flooding, tsunamis (30 foot waves), and high winds (100 mph winds).

Communication circuits that shared a common cable run or conduit external to the plant included all lines going to city emergency operations centers, which had a common cable run. The two county emergency operations centers used separate microwave links from the site.

Common susceptibility of components in both the primary and first backup circuits to wind, missile, flood, or fire damage included the Pacific Bell cable heading north - circuits to San Clemente, San Juan Capistrano, Dana Point, and State Parks.

The emergency operations facility, the microwave building, radio building and auxiliary warehouse service building communications room were designed and built to the 1971 version of the Uniform Building Code. All these buildings were Seismic Class 3.

Loss of the emergency operations facility communication room would affect the "Yellow Phone." Backup and alternate systems could be affected to varying degrees depending on which building was damaged and the extent of the damage. The "Yellow Phone" and "Blue Phone" were above ground from the emergency operations facility to the San Clemente city limits; from there on it was underground.

For circuits listed above using microwave or radio antennae, the wind load rating was 100 miles per hour at the emergency operations facility and at the offsite agency emergency operations facilities.

Radios were in the radio building near the microwave building and had battery and generator backup. Each of the five main communications rooms had dedicated battery systems at their different locations. Each "Yellow Phone" system at the emergency operations centers had their own separate uninterruptable power supply systems.

No circuits would be disabled by a loss of all offsite power or a station blackout. The communications systems were fed off different load centers onsite; therefore, they did not share a common power supply so that a loss of this power supply would affect more than one circuit. All the communications systems had dedicated battery power supplies and those battery-powered backup power supplies were dedicated to the communications systems. Corporate communications criteria established an 8 hour minimum as the useful lifetime of the circuit under blackout-loading conditions.

The primary systems were dedicated lease lines and were not subject to clutter with traffic concerning the external event so that it would be difficult for the licensee to get a message across these circuits. The backup commercial lines were subject to clutter.

3. Contingency Procedures

The licensee's nuclear organization and the telecommunications' organizations had versions of the business recovery plan which contained contingency procedures for restoring communications after a severe natural event. One of three communications priorities in the Nuclear Organization Business Recovery Plan was to restore or provide alternate off-site communications. The administration and logistics manager was responsible for communication restoration. Three supervisors and 10 technicians were dedicated to the San Onofre Nuclear Generating Station communication systems, and were onsite or on call at all times. With the exception of some weekend shifts, onsite

coverage by a communications technician was almost fulltime. A group of ten communications technicians and managers were on the site emergency callout roster, which was activated upon declaration of an alert at the site.

The procedure for recovery of communications was contained in the telecommunications Natural Disaster Procedure Guide and was validated; however, no training was conducted.

All the communications systems were redundant. Some spare parts existed onsite, but there was no huge inventory. Parts were available from other areas in accordance with the corporate business recovery plan.