U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report Nos. 50-295/81-13; 50-304/81-09

Docket Nos. 50-295; 50-304 License Nos. DPR-39; DPR-48

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

Facility Name: Zion Nuclear Generating Station, Units 1 and 2

Inspection At: Zion Site, Zion, IL

Inspection Conducted: June 29 - July 10 and July 14, 1981

Inspectors: M. P. Phillips 8/24/81

J. P. Patterson 8/24/81

E. Markee 8/24/81

Approved By: W. L. Axelson, Acting Chief, Emergency Preparedness Section (Team Leader) 8/25/81

C. J. Paperiello, Chief, Emergency Preparedness and Program Support Branch 8/25/81

Inspection Summary

Emergency Preparedness Appraisal on June 29 - July 10, and July 14, 1981 (Reports No. 50-295/81-13; 50-304/81-09)

Areas Inspected: Special announced appraisal of the state of onsite emergency preparedness at the Zion Nuclear Generating Station involved seven general areas: Administration of the Emergency Preparedness Program; Emergency Organization; Training; Emergency Facilities and Equipment; Procedures which Implement the Emergency Plan; Coordination with Offsite Agencies; and Exercises and Drills. The inspection involved 459 inspector-hours onsite by four NRC inspectors and two consultants.

8109100325 810826
PDR ADOCK 05000295
Q PDR

Results: No items of noncompliance or deviations were identified; however, several significant findings were identified in the areas of emergency organization (Section 2.2.2), meteorological measurements (Section 4.2.1.4), backup communications (Section 4.2.3), procedures (Section 5), and coordination with offsite agencies (Section 6).

## DETAILS

### 1.0 Administration of Emergency Plan

#### 1.1. Responsibility Assigned

Responsibilities from the Corporate level for emergency planning begin with the Division Vice President, Nuclear Stations who serves as the Corporate Command Center (CCC) Director or Recovery Manager for the Generating Station's Emergency Plan (GSEP). The Radioecology/Emergency Planning Supervisor serves as the Corporate Emergency Planning Coordinator (EPC) and reports to the Division Vice President, Nuclear Stations. The EPC has a staff of Health Physicists and Meteorologists to assist him in implementing his responsibilities.

At the Zion Station, the Administrative and Support Services Assistant Superintendent has the responsibility to coordinate station compliance with the requirements of GSFP and provide a training program to ensure knowledgeable performance by assigned personnel. A GSEP Committee has been formed, which is chaired by this superintendent. The committee's main function is to identify and resolve emergency preparedness problems at the Zion Station. Currently, the committee meets monthly. Members of the committee include expertise from the following departments: (1) Operations, (2) Training, (3) Rad/Chem, and (4) Technical.

#### 1.2 Authority

Personnel assigned an emergency function are given authority to perform assigned duties by GSEP in specific tables in the plan. The Shift Engineer serves as the Acting Station Director in the event of an emergency. For CECo, the Station Director is in charge of the overall onsite emergency response and reports to the CCC Director or Recovery Manager (depending on the accident classification) during an emergency. The Shift Foreman becomes the Acting Station Director if the Shift Engineer becomes unavailable.

The Recovery Manager is the designated individual from CECo who has requisite authority and knowledge to manage the overall nuclear plant recovery operations.

#### 1.3 Coordination

Coordination of the onsite and offsite organizations and the corporate emergency organizations is the responsibility of the Administrative and Support Services Assistant Superintendent.

#### 1.4 Selection and Qualification

Selection criteria for personnel responsible for assigned emergency plan functions are based on the individual's normal responsibilities in the same organization and follow ANSI N18.1.

1.5 Quality Assurance of the Emergency Preparedness Program

The corporate and site administration relies on the QA organization to audit the emergency preparedness program, which includes the plan and implementing procedures. They ensure performance in the area of training and training records, exercises and drills, and documentations and implementation of corrections to deficiencies reviewed and considered valid.

The corporate manager of QA was interviewed during the LaSalle emergency preparedness appraisal.[1/] The Manager of Quality Assurance (QA) for the Zion Station outlined his QA program for assuring the quality, consistency, approvals and distribution of the GSEP and Station Emergency Plan Implementing Procedures for the Zion plant. The QA program included the review of the following:

* Training and training records

* The station emergency plan and distribution of changes

* The calibration of process radiation monitoring systems, effluent monitoring systems, health physics instrumentation, and rad/chem laboratory equipment

QA records indicated that an audit of the GSEP and Zion EPIP's was conducted on May 27-29, 1981, and deficiencies were identified for correction. The QA inspector prepares an inspection procedure based on his review of the plan and procedures.

The QA inspection procedure changes for each audit depending on what areas the QA inspector wants to examine. The inspection procedure is approved by QA management prior to the audit; however, no overall policy exists to ensure that all areas, including adequancy of interface with offsite agencies, are audited at least once during the year. Further, QA inspectors independently pick the areas to be examined in the Emergency Plan, rather than QA management. Audit deficiencies identified that EPIP-340-1 was not being fully implemented and a quarterly drill for the first quarter of 1981 was not conducted.

The program provided a complete audit to ensure that corrective actions were implemented and required recourse actions be taken by the manager QA for items not resolved by the required response date.

Plant QA department personnel are independent from the station management and report to QA management in Chicago. The inspector interviewed Mr. G. Abel of the Corporate QA Department regarding the audit provisions of 10 CFR 50.54(t). The licensee indicated that a contracted audit firm will be independently examining the Zion facility. Areas to be examined will include the GSEP. The licensee also indicated this audit will be examining technical areas as well as administrative areas.

1/ IE Report No. 50-373/81-14; 50-374/81-09

Based on the above findings, these portions (1.1. 1.2, 1.3, 1.4, and 1.5) of the licensee's program appear to be acceptable; however, the following matter should be considered for improvement:

. The licensee should develop a QA procedure to ensure all areas of Emergency Preparedness as specified in the GSEP and EPIPs are audited.

2.0 Emergency Organization

2.1 Onsite Emergency Organization

The inspectors verified that an effective emergency organization was in place by review of the emergency organization and responsibility assignments. An organizational structure chart is shown in Figure 2.1, which delineates the management structure for the various functional areas. The organizational implementation ensures that an Acting Station Director is onsite in the Control Room at all times. Each Station Group Director's position includes at least three individuals qualified to act as that Director to ensure a line of succession for all positions. The Station Superintendent is responsible for the selection of all individuals needed to fill the various GSEP Director positions. There is no formal documented selection criteria established; however, this selection is usually based on the normal working duties of these individuals and the standards developed by the Institute of Nuclear Power Operations (INPO), i.e., Rad/Chem Supervisor becomes Rad/Chem Director, Maintenance Assistant Superintendent becomes Maintenance Director, etc.

Main responsibilities for GSEP Station Group Directors include:

Station Director

* Classify emergency conditions and make appropriate notifications

* Activate the GSEP Station Group and ensure adequate manning

* Supervise and direct the onsite emergency organization

* Establish communications, both onsite and with appropriate offsite organizations

* Implement emergency and recovery efforts

* Order evacuation and/or assembly of nonessential personnel

* Recommend protective actions for the offsite public

Operations Director

* Staff OSC and Control Room, and augment as necessary

* Initiate immediate corrective actions to limit or contain emergency

* Direct switching and valving operations, and equipment operators

* Verify that the Station Superintendent and System Power Load Dispatcher were contacted

Technical Director

* Identify critical data points and control parameters that should be monitored

* Assist the Rad/Chem Director for onsite radiological matters

* Evaluate vital plant parameters during emergency

* Provide technical support to the Station Director

Maintenance Director

* Assist in rescue operations by providing necessary equipment

* Request additional equipment to expedite recovery and restoration

* Direct the total onsite maintenance and equipment restoration effort

Stores Director

* Obtain and deliver to point of need all parts, protective equipment, and materials needed in recovery operations

Administrative Director

* Provide food, lodging, and administrative services for station personnel

Security Director

* Maintain security at the nearsite EOF (when activated)

* Maintain plant security and personnel accountability at all times

Rad/Chem Director

* Provide inplant and nearsite radiation surveys

* Direct bioassay procedures for onsite personnel

* Ensure adequate radiological protective measures are in place for onsite personnel

* Ensure that personnel are decontaminated, if necessary

* Determine the extent and nature of radiological problems onsite and initially offsite until the Environs Director arrives

* Set up a group to receive injured or contaminated personnel and perform first aid duties

All of the senior Station Group Directors along with one alternate were interviewed and found to be aware of their emergency responsibilities and authority. Each had a working knowledge of the emergency plan and the implementation of the sections for which they are responsible, but some of these Directors were not familiar with the responsibilities of their counterparts at the EOF.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matter should be considered for improvement:

* The Station Group Directors should be familiar with the EOF procedures describing comparable positions in the EOF organization

## 2.2 Augmentation of the Emergency Organization

### 2.2.1 Offsite Emergency Organization

The augmentation of the offsite emergency organization is made by contacting the Corporate Command Center (CCC) Director. Either he or the designated CCC Duty Officer activates the corporate personnel shown in Figure 2.2 for the less serious emergencies such as an Alert. When a Site Area or General Emergency is declared, the full offsite recovery organization is dispatched to the nearsite Emergency Operations Facility (EOF) to support the onsite emergency organization. This expanded augmentation is shown in Figure 2.3, which delineates the management structure for the various functional areas. Each offsite Director or Manager position includes several individuals qualified to act as that Director to ensure a line of succession for all positions. The Division Vice-President, Nuclear Stations is responsible for the selection of all individuals needed to fill the various offsite GSEP Director positions. There is no documented selection criteria established; however, the standards developed by INPO are used in their selection.

Main responsibilities for offsite Directors and Managers include: public information; overall management of the emergency, including repair and corrective actions; offsite radiological assessment; radwaste operations; manpower planning; and logistical support.

Supporting contractors and vendors are specified in the plan, and written agreements are in effect as reviewed in the licensee's procedure by the inspectors.

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

2.2.2 Onsite Emergency Organization

The Acting Station Director (usually the Shift Engineer) initially augments the onsite emergency organization by implementing EPIP 320-1, Activation of the GSEP Station Group. During other than normal working hours he notifies the Operating Engineer on call to activate the Station Group using a phone tree procedure. This procedure has been tested by the licensee on two separate occasions, the latest of which was conducted on June 1, 1981. From initiation to completion of the calls it took 32 minutes, with all Station Group Directors contacted within 28 minutes. However, no Rad/Chem Technicians were called, nor are they listed in the callout procedure. With the exception of Rad/Chem Technicians, all expertise specified in Table B-1 of NUREG-0654 required to respond within 30 and 60 minutes of an emergency could have responded within this time frame. The inspectors based this on the approximate driving time from the individuals residence added to the time after the drill began when the individual was contacted.

Based on the above findings, the following action must be taken to achieve an acceptable program:

* Procedure EPIP 320-1 must be revised to include Rad/Chem Technicians in the call out list, and the call out lists must be prioritized to ensure augmented staffing as per the regulatory position of Table B-1, in NUREG-0654.

3.0 Training/Retraining

3.1 Program Established

The inspectors reviewed the onsite training program and discussed the training offered by CECo for offsite support groups. A training program for initial orientation and annual retraining of onsite personnel is in place. Of this training, the GSEP training currently requires about one hour of the initial orientation and one-half hour during retraining. However, plans are to increase the GSEP training to one-half day to one day in the near future.

Job specific training for individuals is provided following initial training. The equipment attendant operators, for example, receive 26 weeks of general systems classroom/hands-on training. After classroom training, each EA receives 13 weeks of on-the-job training in the Zion facility.

A written record of each employee's training is maintained by the training supervisor. Plans are to computerize these records in the near future. The onsite training program is dynamic to meet changing needs.

Offsite support personnel (i.e., sheriff, fire department, ambulance and hospital personnel) are invited annually by the licensee to participate in an onsite familiarization and training program. This annual invitation, from the licensee, is provided by letter that describes the type of

training offered. Hospital and ambulance personnel are trained by Radiation Management Corporation (RMC), a consultant to the licensee. RMC submits their training report to the Production Training Manager - Corporate Headquarters. News media personnel are trained by the Corporate Public Information Staff. News media training has recently been completed.

According to site training personnel, instructors are selected by station and corporate training supervisors and are trained by outside consultants to meet criteria promulgated by corporate policy and recently published INPO guidelines.

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

3.2 Program Implementation

The inspectors conducted several walk-throughs with shift control room engineers, shift engineers, shift foremen, radiation chemistry technicians, station emergency organization directors (and their alternates), and security personnel. These walk-throughs demonstrated that the results of the training program are adequate, and the station personnel are adequately trained in both their routine and emergency duties. The walk-throughs of the Acting Station Directors indicated a thorough knowledge of the GSEP and EPIPs. Even though several procedures used as part of the walk-through were inadequate, the users were able to identify these inadequacies and make correct decisions.

The inspectors reviewed training records of several employees and found them to be both indicative of the training received and complete.

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

4.0 Emergency Facilities and Equipment

4.1 Emergency Facilities

4.1.1 Assessment Facilities

4.1.1.1 Control Room

Inspectors observed that the Control Room had adequate copies of the Emergency Plan and necessary Emergency Plan Implementing Procedures and Emergency Operating Procedures, e.g., EOP's and AOP's. Adequate primary and backup emergency communications exist to the Technical Support Center (TSC), Operational Support Center (OSC), corporate office, and offsite local support agencies. Control Room (CR) operating staff were familiar with the use of this equipment.

Emergency equipment located in the CR included: (1) a radiological emergency kit with high range dose rate instruments and high range dosimeters; (2) emergency lighting; (3) MSA supplied air respirators; (4) portable fire extinguisher; and (5) fixed area radiation monitor.

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

4.1.1.2 Technical Support Center (TSC)

The inspectors observed the permanent TSC facilities, equipment and procedures. The facilities appear to be adequate with the exception of the ventilation system, which is to be installed by October 1982. The equipment presently in place appears to be adequate with the exception of the Safety Parameter Display System (SPDS) and Offsite Dose Calculation System (ODCS), which are due to be fully operable by October 1982. The permanent TSC will be tested during the upcoming July 29, 1981, exercise. At that time, all necessary communications equipment, records, procedures, technical documents, and habitability monitoring equipment will be installed. Regulatory Guide 1.97 parameters will be in place on the SPDS by October 1982.

The licensee has not submitted a layout diagram to NRC describing how the criteria described in NUREG-0696 will be met with regard to the positioning of working space for the 26 personnel that will normally be present in the TSC. The inspectors were told by the licensee that the NRC space would be in a hallway directly north of the Control Room. According to the diagram of the TSC submitted to the NRC on June 1, 1981, this same area would be occupied by cabinets. This area is approximately four feet wide, and would be unacceptable for meeting the regulatory position of NUREG-0696, Section 2.4, regarding space of the TSC. This section specifies that TSC working space shall be sized for five NRC personnel. Also a separate room adequate for at least three persons to be used for private NRC consultations is specified in Section 2.4. As described to the inspectors, it appears the current utilization of space in the TSC will not meet the regulatory position of Section 2.4, NUREG-0696. Final approval of the TSC will be made by the NRC Division of Emergency Preparedness, provided all criteria in Section 2 of NUREG-0696 are met.

Based on the above findings, this portion of the licensee's program is an open item pending completion of the TSC.

4.1.1.3 Operations Support Center (OSC)

The inspectors evaluated the OSC for compliance to NUREG-0654 and NUREG-0696, and the OSC appears to be adequate in the areas of fixed communication, protective clothing, radiological monitoring, high range personnel dosimetry, radiation sampling equipment, survey maps, and respiratory protection. NUREG-0696 suggests that the licensee provide backup facilities from which to perform the OSC functions if the OSC becomes uninhabitable. Currently the licensee makes no such provisions. The OSC does not have radiation signs or portable transceivers.

Based on the above findings, the licensee's program appears adequate; however, the following item should be considered for improvement:

- OSC emergency personnel should have immediate access to additional radiological monitoring equipment, portable transceivers, and radiation signs.

4.1.1.4 Emergency Operation Facility (EOF)

The interim nearsite EOF is located approximately 1/2 mile west of the facility, in the Westinghouse Training Center lunch room, which has limited space. This area is too small to function by itself as the interim EOF; however, in the event of a real emergency the licensee could take over the entire building. The licensee should develop a procedure to implement the activation of the entire facility, including a layout diagram showing where all personnel would be located. Currently, only communication equipment is permanently installed. Some assessment equipment such as maps and an IBM computer terminal is also located at the EOF. If an emergency happened today, this facility would be limited due to the lack of equipment. No procedures, P & ID drawings, radiological monitoring or habitability equipment are located at the facility as of July 9, 1981. Significant improvements are required for the EOF in order for it to fulfill its design function. This was made known to the licensee during this appraisal.

The licensee indicated that all necessary equipment for functional operation of the EOF will be installed prior to the July 29, 1981, exercise. A draft equipment inventory procedure for EOF supplies is currently being prepared. In that list, proper radiological equipment and supplies for habitability monitoring of the EOF are provided.

The inspectors examined the licensee's current draft proposal for a permanent EOF to be built this fall next to the Westinghouse Training Facility. The new facility will be a two-story hardened building approximately 120 ft. by 65 ft. It will be located at the south side of the training building. Space for personnel assigned to the EOF will exceed 75 sq.ft/person, and is more than adequate. Working space for Federal, State and local officials will be provided. Counting and laboratory equipment will be installed and space for news media personnel will be provided. Radiological monitoring and assessment equipment will also be provided. This EOF should meet the regulatory position of NUREG-0696; however, CECo's June 1, 1981, submittal did not provide conceptual design information for the staff to evaluate the EOF.

The EOF is an Open Item at this time. The inspectors will re-examine the interim EOF to ensure that adequate supplies and equipment are in place. This re-examination will take place during the July 29, 1981, exercise.

The licensee committed at the Exit Interview to equip the EOF with adequate supplies of radiological monitoring equipment, protective clothing, procedures, FSAR, Fire Protection Plan, and P & IDs. The inspectors indicated to the licensee that their June 1, 1981, submittal (re: ERF Conceptual Design) does not contain the needed information for the staff to evaluate the adequacy of the permanent EOF. The inspectors requested the licensee submit the needed information relevant to conceptual design information for the EOF as per NUREG-0696.

Based on the above findings, this portion of the licensee's program appears to be acceptable; however, the following matter should be considered for improvement:

. The licensee should develop an EPIP for activation of the entire EOF building utilizing sufficient working space to adequately support all licensee and other personnel required to be present.

4.1.1.5 & 4.1.1.6 Post-Accident Coolant Sampling and Analysis and Containment Air Sampling and Analysis

The inspectors examined the interim post-accident sampling and analysis systems and procedures, and conducted a walkthrough using this system. The present system is adequate for small core damage accidents only. A new Sentry High Range Sampling System (HRSS) is currently being installed.

The Sentry Model can automatically dilute samples 1000:1 and provide for insertion of a sample into a shielded cask for transportation. The system also provides capability for primary containment air sampling.

The analysis capabilities discussed here are common to all of the radioactive isotopic analysis requirements at the licensee's facility. Several GeLi computer based counting systems are located near the Radiation Protection Office, and have between 2 and 4 feet of concrete plus 3 inches of steel for shielding. If this room is not suitable for counting or is not habitable, there is a portable intrinsic germanium detector system with computer diskette storage capabilities for recording data. The stored data can then be taken to the computer for analysis, and if this computer is not accessible, the data can be analyzed at CECo headquarters or at other CECo nuclear facilities.

Based on the above findings, the sampling capability is an open item pending installation and testing of the new system and development of procedures for its operation.

Based on the above findings, the radioisotopic analysis capability at Zion appears to be adequate.

4.1.1.7 Post-Accident Gas, Particulate, and Iodine Effluent Sampling and Analysis

The inspectors examined the sampling and analysis system and procedures presently available, and determined that these facilities, equipment and procedures are adequate for only small core damage accidents. The licensee has committed to install a Sentry effluent sampling skid.

The licensee plans to install a Sentry Model Sampling Skid which has a grab sample capability. This system is scheduled to be installed by January 1982. Pending its installation and training on the collection of grab samples, this is an Open Item, and will be examined at a later date.

4.1.1.8 Post-Accident Liquid Effluent Sampling and Analysis

The inspectors have examined the facilities for Post Accident Liquid Effluent Sampling and Analysis. These facilities are equivalent to those used under normal conditions. The inspectors determined that the liquid effluent discharges from the plant are by way of a Lake Discharge Holdup

Tank which can be sampled for radioactivity levels. When full, the licensee can switch to backup tanks. The postulated accidents involving liquid effluent release under a general emergency apparently will not be of sufficient radioactivity to warrant special procedures for the Rad/Chem Technicians performing the sampling.

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

4.1.1.9 Offsite Laboratories

The licensee's procedure ED-21 addresses the offsite laboratories. Appendix I of this procedure lists the capability, equipment, and the analyses that can be performed by each of the offsite laboratories operated by Eberline. They are located in West Chicago, Illinois and Albuquerque, New Mexico. Appendix II of procedure ED-21 lists the services that will be provided by Hazelton Environmental Science, located in Northbrook, Illinois. In addition to these two contractors, the licensee has available the counting labs at their Dresden, LaSalle, and Quad-Cities Nuclear Stations. Both Hazelton and Eberline list sufficient capability to satisfy the emergency requirement for offsite laboratory services.

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

4.1.2 Protective Facilities

4.1.2.1 Assembly/Reassembly Areas

The inspectors examined the assembly/reassembly area which is located in the main machine shop. This area has a radiation emergency kit equipped with direct radiation monitoring devices, radiation rope and signs, and protective clothing. MSA supplied air pacs are located in an adjacent hallway. Emergency lighting is available to this area from the main station equipment storage office. This office is part of the assembly area.

Air sampling capability is not maintained at the assembly area; however, the Rad/Chem Director will ensure that this area will be monitored during an emergency. This task is currently covered in procedures.

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

4.1.2.2 Medical Treatment Facilities

The inspectors examined the medical treatment facilities and kits, and determined that the immediate treatment capability for minor injuries is adequate. This facility is consistent with the description in the plan and procedures. The kits are mostly sterilized bandages, dressings, and contain no antiseptics, drugs or oxygen supplies.

Based on the above findings, this part of the licensee program appears to be adequate.

4.1.2.3 Decontamination Facilities

The inspectors reviewed the decontamination facility and equipment. Two full decontamination kits are supplied by Radiation Management Corporation (RMC). A licensee representative indicated that inventory and/or replacements were made quarterly by RMC. The supplies within the kits appear to be adequate to cope with several badly contaminated individuals. In addition to the RMC kits, there are numerous decontaminating agents and stacks of clothing to handle general contamination problems. Survey and air sampling are provided in the room; however, there was apparently no wound probe for use in the Decontamination Room. The decontamination facility is consistent with the description in the plan and procedures.

Based on the above findings, the licensee's program appears to be adequate, however, the following area should be considered for improvement:

* Wound monitor probe should be included in the first-aid/decontamination facility

4.1.3 Expanded Support Facilities

The inspectors examined Expanded Support Facilities. The licensee will augment emergency resource personnel from Dresden, LaSalle, and Quad-Cities Nuclear Power Stations. Space is available for contractor (i.e., Westinghouse and Sargent Lundy) in the interim EOF, if this EOF includes the entire Westinghouse Training building. Space for five NRC personnel is also provided in the interim EOF. Adequate communications (i.e., three separate outside phone lines) are available to support these NRC personnel. If additional resources are needed, i.e., trailers, they can be provided through the Corporate Command Center's Manpower and Logistics Director. Additional communications equipment can be provided through the Communications Director.

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

4.1.4 News Center

The licensee is currently using the Zion-Benton Township Moose Lodge in Winthrop Harbor as the news media center. This is located approximately one mile northwest of the nearsite EOF, where the Emergency News Center Director is stationed. This news media center is equipped with eleven telephones and the licensee has made provisions with Illinois Bell to install sufficient pay telephones in an emergency to meet the needs of the press. At the time the EOF is activated, corporate public information staff would bring copying and audio-visual equipment to the news center. Security at this center will be provided by the Station Security Director. The news center is designed to accomodate over 100 members of the press.

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

4.2 Emergency Equipment

4.2.1 Assessment

4.2.1.1 Emergency Kits and Survey Instrumentation

The inspectors examined the emergency kits and survey instrumentation. The kits were found at locations as specified in EPIP-550-1. The Zion Station EPIP's were located in the fixed, onsite emergency supplies trailer that is maintained as a repository for offsite emergency surveillance equipment and supplies.

All kits and survey instrumentation locations contained the specified equipment. EPIP's were found in the emergency supply trailer instead of the EG and ED procedures as specified in attachment A of EPIP-550-2. However, the licensee is currently designing a series of new portable kits, and modifying all of the procedures that might be incorporated (see Section 5.4.2.2).

Essential health physics equipment, at critical locations throughout the Station, included radiation detection and rate monitoring instruments, self-reading dosimeters (0-200 mr, 1R, 10R and 100R), pencil chargers, supplied air and filtered air masks, and Silver Zeolite filters for the air samplers. Two locations stocked small amounts of emergency clothing, and supplied air masks.

The emergency trailer located near the north gate contains full face filtered masks, air and environmental sampling supplies, flashlights, batteries, blankets, step-off pads and other needed supplies. The air sampling equipment (for environmental sampling) operates off of standard 12 volt car batteries.

Communications equipment for field teams is currently maintained in the security access Patrol Station building. However, procedures do not stipulate that the equipment is available for use at this building (see Section 5.4.2.2).

Based upon the above findings, this portion of the emergency preparedness program appears to be adequate.

4.2.1.2 Area and Process Radiation Monitors

FSAR Section 11.3.11, "Process Radiation Monitoring System", describes the fixed radiation area and process monitors used at the Zion Plants. The description covers the location, name, type, range and number of the monitors, along with the environmental design characteristics. The design characteristics adequately define the temperature, relative humidity, pressure and radiation background conditions for which the system was defined. Direct readout capability in the control room for these monitors is defined.

Technical Specification 3.14 provides the out-of-service, functional checks and calibration requirements mandatory for the area and process monitors. The calibration procedures for these monitors are specified in the licensee's Instrument Maintenance Radiation Surveillance (IMRS) procedures.

Currently the licensee has plans (Modification No. 80-41) to monitor direct radiation levels from the eight steam lines from both Zion units. This pathway could lead to an unmonitored release of radionuclides to the environment during a S/G tube accident. Further, the licensee has plans to develop Emergency Action Levels (EAL's) for these monitors which will readout and alarm in the two reactor Control Rooms. The detection units will be energy compensated GM tubes.

The licensee plans to install two containment monitors that are capable of measuring $2 \times 10^{8}$ R/hr dose rates in containment. The EAL's are currently developed and found in the GSEP.

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

At the time of this appraisal, the licensee's planned new steam generator steam line and containment monitors were not installed and operable. The EAL's for the steam line monitor also have not been developed. This is an open item.

4.2.1.3 Non-Radiation Process Monitors

Chlorine and other potentially toxic chemicals are either not used at the Zion Station or else they are in such small quantities that process monitors are not necessary. External hazard analysis for this site has indicated that the transportation or manufacture of toxic gases is not routinely conducted in or through this area. However, the inspectors learned from interviews with local government officials that hazardous chemicals are and have been transported on a nearby railroad approximately one mile from the site. Two to three years ago a train derailment involving releases of anhydrous ammonia caused a precautionary evacuation of the nearby Illinois Beach State Park. The inspectors informed the licensee of this occurrence. Further, the inspectors relayed this information to the Division of Nuclear Reactor Regulation for input to NUREG-0737 task item III.D.3.4 (Control Room habitability).

Based upon the above findings, this portion of the licensee's emergency preparedness program appears to be adequate.

4.2.1.4 Meterorological Instrumentation

The inspectors examined the meterological capabilities of the meterological tower at the licensee's facility and the licensee's ability to access this information. The meterological information that is available at the tower is apparently acceptable based on the requirements of NUREG-0654,

Appendix 2. There are no procedures to access the information from the meteorological tower, which must come from the meteorological consultant by way of a telephone call. Additionally, at the time of this inspection, no one in the control room nor the other persons responsible for dose assessment were sure that this information was available immediately 24 hours per day. The licensee agreed at the exit interview to institute a standing order for Control Room personnel providing the 24-hour telephone number of the meteorological consultant.

The upgraded meteorological program has been reviewed against the criteria in Appendix 2 of NUREG-0654, Revision 1. The information reviewed was Commonwealth Edison's Generating Station Emergency Plan with Zion Station Emergency Plan Annex (April, 1981), and the Offsite Dose Calculation System (July, 1980, Revision 2).

The first criterion on NUREG-0654, Appendix 2 requires the capability of making meteorological measurements. The primary meteorological system is described in the ODCS. A 250-foot instrumented primary tower is located at a distance of about 760 m from the lake. There are areas wherein the criteria for the primary meteorological measurements system set forth in NUREG-0654, Appendix 2 and proposed Revision 1 to Regulatory Guide 1.23 that are not met. These are:

1. Table 3 of the ODCS lists the primary and backup meteorological measurements. For Zion, vertical temperature difference ($\Delta T$) between the 35- and 125-foot levels is the primary parameter. To be in reasonable agreement with the position in Regulatory Guide 1.23, (i.e., $\Delta T$ measurement between 10 and 60 m), these parameters should be interchanged, i.e., 35-250 primary, and 35-125 backup. All ED procedures should be revised accordingly.

2. Based on the licensee's evaluation, lake breeze conditions occur about 10% of the time at Zion. There is no indication that supplementary meteorological measurements are available in real time to define airflow through the plume exposure emergency planning zone (10 mile radius) from the plant during these conditions. It is our position that a procedure be established and equipment be installed and/or accessed to determine actual air flow in real time. Full upgrading may be staged in accordance with the implementation schedule provided in item III.A.2 of NUREG-0737; however, compensatory procedures must be developed immediately and implemented.

3. Non-recording indicators on wind direction and speed, from a short mast atop the Unit 1 containment, are located in the Control Room. In order to obtain meteorological information from the primary system, a computer terminal located in the TSC and Control Room is utilized to provide hourly averaged values. It is our position that an analog recording system consisting of RG 1.97 meteorological parameters be installed in the Control Room in accordance with the implementation schedule provided in item III.A.2 of NUREG-0737, and the current mast atop Unit 1 Containment should be removed.

The licensee's load dispatcher has excellent tracking of weather conditions through the monitoring of a National Weather Service teletype with alarm capability. The load dispatcher keeps the station appraised of all local storms as well as the severe storms.

The second criterion in NUREG-0654, Appendix 2, a system for making real-time predictions of the atmospheric effluent transport and diffusion, has been described in the ODCS, Appendix A. A method is described for determining routinely, Emergency Action Levels, if any, using effluent release rates from monitored release points. An "on-command analysis" is briefly described in which wind speed and atmospheric stability along with the release rate are used to directly calculate dose as function of distance and names the affected 22 1/2 degree sector. The basic diffusion model is straight line Gaussian, based on plume spread rates with distance as a function of Pasquill atmospheric stability classes defined by $\Delta T$, and $\sigma_\theta$. The model and input parameters may not be reasonable for the Zion site, which is a coastal site subject to lake influence, especially for the assessment of effluent trajectories. An analysis of the reasonableness of this assessment capability in the context of the overall emergency plan must be presented or this capability must be modified.

The licensee's Environmental/Emergency Coordinator is the individual responsible for making offsite dose projections, and is specified in procedure ED-1 as the official contact with State and Federal radiological assessment personnel. He is located at the EOF.

The installation and implementation of the upgrade in meteorology specified in Appendix 2 of NUREG-0654 is currently in progress. This is an Open Item.

Based on the above findings, the following action must be taken to achieve an acceptable program:

- The licensee shall provide an analysis of the reasonableness of the "Class A" model for the Zion facility, and if necessary, modify this model to take in account lake influences, particularly as it affects plume transport characteristics.

The following matters should be considered for improvement:

- Correct $\Delta T$ measurements for the Zion tower (i.e., $\Delta T$ measurement between 10 and 60 m) to be in reasonable agreement with the position in RG 1.23. ED procedures should be revised to incorporate this change.

- Install an analog recording system consisting of Regulatory Guide 1.97 meteorological parameters in the Control Room in accordance with the implementation schedule provided in Task Item III.A.2 of NUREG-0737. In addition, the wind speed and direction indicators from the mast on top of Unit 1 Containment should be removed.

4.2.2 Protective Equipment

4.2.2.1 Respiratory Protection

The inspectors reviewed the availability and amount of respiratory equipment that would be available in an emergency. Onsite supplies of both self-contained (filtered) and supplied air masks are adequate, as well as the facilities for recharging the supplied air bottles. Additional respiratory equipment, in an emergency event, could be obtained from other nuclear plants owned by the licensee, or obtained from the supplier for sustained recovery work following an emergency event.

Based upon the above findings, this portion of the licensee's emergency preparedness program appears to be adequate.

4.2.2.2 Protective Clothing

The inspectors reviewed the availability of protective clothing onsite that would be used during an emergency. There was an ample supply of protective clothing, ranging in sizes from extra small to extra large, which would be accessible during emergency conditions. Additional supplies could be obtained either from the licensee's other nuclear plants or from vendors for sustained recovery operations.

Based upon the above findings, this portion of the licensee's emergency preparedness program appears to be adequate.

4.2.3 Emergency Communications

The inspectors conducted a review of the onsite/offsite available communications. All the equipment identified in the plan was available except for the backup microwave/phone communications system, which is scheduled to be installed by September 1981. There is a 24 hour per day capability to notify NRC, state, and local authorities. The inspectors found no provisions for routinely checking the operability of these emergency communications devices and equipment, even though the plan specified that some of this equipment will be tested monthly. Although the licensee did not check the NARS system, the State of Illinois does perform a daily check of the system.

Each of the following key communications networks have a backup:

* Emergency response initiation equipment

* Equipment to communicate between the facility and near site EOF

* Equipment to communicate with NRC Headquarters and Region

* Equipment to communicate between the facility and the Corporate Command Center

* Equipment to communicate between the facility, local, and State EOC's

There is no backup communications link between the facility and the Wisconsin Division of Emergency Government in Madison, WI, even though a considerable portion of Wisconsin is within the plume exposure EPZ.

Based on the above findings, the following actions must be taken to achieve an acceptable program:

* The licensee shall install a backup communication system, such as the National Warning System, between the facility and the Wisconsin Division of Emergency Government in Madison, Wisconsin

* The licensee shall establish and implement a program to test the ability to contact the Illinois ESDA, Wisconsin Division of Emergency Government, and local agencies on a monthly basis as specified in Section 8.3.2.1 of the generic GSEP

4.2.4 Damage Control/Corrective Action and Maintenance Equipment and Supplies

Needs for onsite damage control include temporary shielding, lifting equipment, welding equipment, high level radiation waste handling storage capability, and decontamination supplies and equipment. These needs have been met from onsite equipment and supplies as determined by an interview with the Maintenance Assistant Superintendent. Extra equipment, if required, can be obtained from Dresden, LaSalle, or Quad-Cities Nuclear Stations through the Manpower and Logistics Director at the Corporate Command Center (CCC).

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

4.2.5 Reserve Emergency Supplies and Equipment

The Zion Station has an inventory of supplies, including: protective clothing, radiation detection instruments, respiratory equipment, first aid supplies, decontamination supplies and equipment, and dosimetry for the radiological environmental monitoring teams. In addition, Zion Station can obtain supplies including compatible radiation protection instrumentation, communications, and transportation equipment from Dresden and LaSalle sites.

The Stores Director has procedures to obtain emergency reserve supplies from nearby vendors. Section 5.5.1 of this report identifies procedural deficiencies regarding inventory, calibration and operational checks of emergency equipment.

Adequate quantities of emergency reserve supplies are maintained at specified minimum stock levels. Supply area is located in the main machine shop.

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

4.2.6 Transportation

Although the licensee maintains two station pick-up trucks and one duty car for use by station personnel, there are no provisions to ensure transportation will be available at the time of an accident for offsite monitoring teams. A memo issued by the Assistant Superintendent for Administration and Operational Support to the Station Superintendent on June 25, 1981, states that environmental monitoring teams will require priority to use one or both of the station's pick-up trucks; however, there is no reply confirming their priority as station policy. An ignition key to the station pick-ups is kept in the Rad/Chem office, but personnel interviewed indicated that there were several sets of keys at the station. Neither of the station trucks is equipped with any form of communications equipment. They are both large enough to hold all required monitoring equipment and supplies. The portable walkie-talkies, which are to be taken in the vehicle, will transmit and receive from within the vehicle. The licensee is currently making arrangements to acquire a vehicle dedicated to emergency field team use.

Based on the above findings, this portion of the licensee's program appears to be acceptable; however, the following should be considered for improvement:

* Acquire a dedicated vehicle or establish and implement a system to ensure one or both of the station pick-up trucks will be immediately available for use by the field monitoring teams

5.0 Emergency Implementing Procedures

5.1 General Content and Format

The inspector reviewed all of the GSEP implementing procedures. With the exception of the Station Group Directors' procedures (EPIPs 120-1 through 180-1) all procedures were arranged in the same format with the following general headings: (a) purpose, (b) references, (c) prerequisites, (d) precautions, (e) limitations and actions, (f) procedure (the actual body of the procedure), (g) checklists, and (h) technical specification reference. This format coincides with the licensee's administrative procedure (ZAP-5-51-5) for procedure format. Procedures were written to cover all of the functions specified in the GSEP, and were organized such that each GSEP Director has one procedure.

With the exception of the Station Director's procedure, none of the Station Group Directors' procedures are in the format specified by procedure ZAP-551-5. Further, these procedures are for the most part ambiguous. For example, EPIP-130-1 under logistics implies that there are at least two Technical Directors; however, the plan states that there is only one Technical Director. Numerous procedures under the logistics section specify several locations for that Director to be. The section of the procedure covering responsibilities states what the responsibilities are, but does not procedurally describe what duties or tasks must be performed to meet those responsibilities.

Based on the above findings, the following action must be taken to achieve an acceptable program:

* Revise all Station Group EPIP Procedures (e.g., EPIP-120-1 through EPIP-180-1) other than the Station Director's procedure to meet the format outlined in administrative procedure ZAP-5-51-5, to agree with the responsibilities outlined in the GSEP, and to describe the means by which those responsibilities will be implemented.

5.2 Emergency, Alarm and Abnormal Occurrence Procedures

The licensee has Emergency Operating Procedures (EOPs) and Abnormal Occurrence Procedures (AOPs). One set (EOPs) is primarily used for the protection of the reactor core and containment, and the other (AOPs) deals with less severe abnormalities. The inspectors reviewed these procedures and determined that most of the EOPs and AOPs do not adequately interface with the emergency plan. Those procedures that describe emergency conditions which warrant the classification of the event do not direct the user (Nuclear Station Operator) to inform the Shift Engineer of a possible GSEP condition. The failure of procedures to interface is a significant finding which could lead to a failure to classify and report the event in a timely manner. The following EOP and AOP procedures, which deal with events listed in the Emergency Action Levels (EALs), must require, as a subsequent operator action, that the Shift Engineer be notified to classify the event and initiate the GSEP, if required:

a. EOP 0 Safety Injection/Accident Diagnostic

b. EOP 2 Reactor Control System Malfunction

c. EOP 4 Turbine/Generator Emergency

d. EOP 5 Emergency Boration

e. EOP 6 Fuel Handling Emergency

f. EOP 7 Station Blackout Operation

g. EOP 8 Main Steamline or Feedline Break

h. EOP 9 Loss of Reactor Coolant

i. EOP 10 Steam Generator Tube Rupture

j. EOP 11 Inadequate Core Cooling

k. EOP 12 Failure of Reactor to Trip

l. AOP 1 Excessive Primary Plant Leakage

m. AOP 3 Refueling Cavity Uncontrolled Loss of Level or Spent Fuel Pit Loss of Level

n. AOP 4 Control Room Inaccessibility

o. AOP 5 Radiation Monitoring System - High Activity Alarm

p. AOP 10 High Reactor Coolant Activity

q. AOP 11 $O_2/H_2$ Explosive Mixture

r. AOP 14 Inadequate Auxiliary Feedwater Supply

s. AOP 15 Loss of Instrument Bus

t. AOP 16 Loss of all Auxiliary Feedwater

Based on the above findings, the following action must be taken to achieve an acceptable program:

* The EOPs and AOPs listed above shall contain statements to direct the Reactor Operator to inform the Shift Engineer of a GSEP condition requiring possible classification of an event.

5.3 Implementing Instructions

Separate GSEP procedures exist for each Director in the GSEP organization. The Shift Engineer or Acting Station Director has complete authority over the initial operations of the Station Group, and is responsible for the initial classification of an event under GSEP and making the proper initial notification and recommendations. Individual emergency classifications, e. g., Unusual Event, Alert, etc., comprise headings for actions to be taken in the Station Director's procedure. The emergency classification is made based on observable information which is available using the procedure entitled "Classification of GSEP Conditions," (EPIP-330-1).

The Station Director (Acting Station Director) Implementing Procedure (EPIP-110-1) is used by the Shift Engineer or his alternate (Shift Foreman) if a GSEP condition exists. This procedure directs the Acting Station Director to classify the event under GSEP, and references him to the implementing procedure used to classify the event. Depending upon the classification, the Acting Station Director is required to perform various actions including notifications and activation of the various onsite groups. Notification actions are specified in this procedure, which also references the procedure used for activating the various onsite groups. The Station Director procedure (EPIP-110-1) contains the following significant deficiencies: it does not specify or reference what protective action recommendations to offsite agencies will be made depending on the event; and it does not direct Rad/Chem Technicians to survey or collect samples, as appropriate.

During a walkthrough of Shift Engineers, several General Emergency scenarios were presented to determine the actions that would be taken. In all cases, the Shift Engineer correctly classified the event, and performed all required actions; however, when asked what protective action recommendations he would make, he was unable to determine from his procedures what to do. The Shift

Engineers during the walkthrough did not direct the Rad/Chem Technicians (RCT's) under their supervision to make any onsite surveys or perform any sample collections. During the first hour of an Emergency, survey and sample results could prove critical in the determination of the source term for a radioactive release, especially if certain Control Room instruments become inoperable or go off scale.

Based on the above findings, the following action must be taken to achieve an acceptable program:

* The licensee shall revise the Station Director procedure (EPIP-110-1) to: (a) include the protective action tables from the GSEP (Tables 6.3-1, 6.3-2, and 6.3-3) and reference their use in the recommendation of protective actions for the public, and (b) direct RCT's to conduct appropriate surveys or sample collections until the arrival of the Rad/Chem Director. Re-training shall be conducted for all Station Directors relevant to changes in this procedure.

## 5.4 Implementing Procedures

### 5.4.1 Notifications

For all emergency classifications, the Acting Station Director's procedure (EPIP-110-1) specifies who is to be notified (including phone numbers), what onsite organizations need to be augmented, and in what order these actions are to be implemented. A separate referenced procedure (EPIP-320-1) is actually used to augment the onsite organization. Procedure EPIP-110-1 does not cover notification of the NRC for events required by either 10 CFR 20.403 or 10 CFR 50.72. All NRC notifications are made using the Emergency Notification System (ENS) red phone.

Figure 5.4 shows the means by which offsite agencies are notified based on the emergency classification. There is a direct phone connection between the Control Room and the System Power Load Dispatcher. Since most notifications of offsite agencies will normally be made by the Corporate Command Center Director, the licensee has set up a duty officer system, requiring that one of the individuals qualified to act as the CCC Director be on 24 hour a day call. This ensures that a CCC Director is available at all times. In addition, the CCC Director on call leaves a phone number where he can be reached with the System Power Load Dispatcher whenever he travels from home. This form of local notification was set up by the State of Illinois and agreed to by the licensee. This system has been demonstrated to be timely.

Notifications to offsite groups (including Wisconsin) are made using the NARS form. The Operations Director's procedure (EPIP-120-1) includes a verification that the System Power Load Dispatcher and the Station Director have been notified.

When initial notification and augmentation is performed, planned messages are not used to ensure persons contacted know what the emergency class is and where they are to report. This type of message should be included in the activation of the GSEP Station Group (EPIP-320-1) procedure. This

procedure specifies who is to be notified depending on what the emergency classification is, and how this notification is to be accomplished. Currently, Health Physics, Operations, and Maintenance supervisors are on a duty roster system. None of the other Station Group Directors are on call, and the GSEP phone directory and EPIP-320-1 list three persons for most of these Director functions.

EPIP-320-1 does not prioritize the call lists so that the TSC can be at least partially manned within 30 minutes, nor does it ensure sufficient Rad/Chem personnel will be available to perform inplant, onsite, and offsite radiological surveys. This is further discussed in Section 2.2.2 of this report, and is a significant deficiency which must be corrected so that decisional functions of the TSC can begin as soon as possible.

Although the CCC Director is required to notify ESDA and the Wisconsin Division of Emergency Government of recommended protective actions, his procedure does not contain Tables 6.3-1, 6.3-2, or 6.3-3 of the GSEP which describe protective action recommendations based on plant conditions. These Tables should be included in his procedure (CC-1) and referenced therein. Procedure CC-1 does specify which offsite support organizations are to be notified and the degree to which offsite augmentation is implemented based on the emergency classification. The CCC Director will notify all of the personnel required to man either the CCC or both the CCC and EOF using a prioritized telephone call list located in the last section of the GSEP. To assure that this phone list is available to all CCC Directors, two copies of the GSEP, one for home and one for the office, are provided. As a personal reference, most CCC Directors carry a plasticized phone list in their wallets.

The Technical Support Manager is responsible for assembling and directing a technical support staff. His procedure (EOF-2) states that he should activate the Technical Support personnel using the call list in the GSEP telephone directory which is supposed to list names of qualified persons for each of various technical disciplines, such as core theory, transient analysis, metallurgy, etc. However, the current GSEP telephone directory does not contain any such list of names. In cases where the EOF is activated, the Advisory Support Director's procedure (EOF-10) specifies that this group will consist of a senior representative of the NSSS supplier, the NRC, a public information official from the licensee (usually a Vice-President), and appropriate authoritative consultants.

The current EPIP-700-1 procedure, which is the emergency phone list, does not agree with the personnel assignments, as they were described to the inspector, for the Rad/Chem Director and Environs Director.

Based on the above findings, this portion of the licensee's program appears to be acceptable; however, the following matters should be considered for improvement:

* Protective Action Tables in the GSEP should be incorporated and referenced in the CCC Director's procedure (CC-1)

* Procedure EPIP-700-1 and EPIP-320-1 should be revised to incorporate the names of personnel currently filling the positions of Rad/Chem Director and Environs Director

* Incorporate planned messages in EPIP-320-1 to include as a minimum the emergency classification and the location where the person contacted should report

* Technical support personnel should be listed in the GSEP telephone directory for each of the various technical disciplines

5.4.2 Assessment Actions

The licensee has interim assessment methods available to make a rapid estimate of offsite dose from an unplanned release of radionuclides. These methods are established in EPIP-380-1. The exception to this is the Steam Generator safety/relief valve pathway to the environs. For this exception, there is no clearly defined interim procedure for quantifying the release and resultant offsite dose (see Sections 4.2.1.2 and 5.4.2.2).

If the Station and/or Auxiliary Ventilation monitors are offscale, the procedure that would be used is RP-1740-1. If these monitors fail, an annunciator would alarm in the Control Room.

There is no one overall procedure to orchestrate the implementation of assessment in terms of decisions to escalate, de-escalate, take corrective actions, and recommend protective actions onsite and offsite during emergency events. EPIP-350-1, described above, however, does provide a conservative rapid method for determining the rate of environmental releases of radionuclides and a means to make offsite protective action recommendations based on the release. EPIP-360-1 (Site Evacuation of Non-Essential Personnel) provides a generic basis for defining the accessability of the main assembly area, and site evacuation of non-essential personnel. EPIP-180-1 defines the dose rate (100mR/hr) and contamination ( 7.5E-10 uCi/ml) action levels for relocation of the assembly area. EPIP-110-1 describes the escalation of emergency events, including habitability of the TSC and the OSC for all classes of emergencies. EPIP-330-1 describes the conditions and emergency action levels (with the exception of a site area emergency for a steam generator tube rupture) necessary for escalation and de-escalation of emergency classes. However, recommended protective actions are not covered by these procedures (see Section 5.3). Corrective actions are defined in the Emergency Operating Procedures, EOP's-0 to 12. Thus 18 procedures orchestrate the implementation of emergency assessment and decisions except for recommended offsite protective actions.

The only established assessment priority item defined (EPIP-350-1) for the RCTs is obtaining radioactive containment samples for determining offsite release rates. The Rad/Chem technicians are also assigned to other pre-designated teams such as first aid, assembly areas, damage control and fire fighting. There is, therefore, potential for a conflict of priorities. However, the RCTs interviewed on walk throughs demonstrated their adequacy in forcing priority decisions.

There are provisions in the ED procedures for immediate notification of the state and county officials and for assessing changes in offsite releases of radionuclides. ED-20 provides forms for information that would be provided to the Illinois Department of Nuclear Safety. However, there are no provisions for follow-up verification or continuous updating of such information.

The licensee is currently installing radiological assessment equipment and instrumentation that should meet the criteria established in NUREG-0737. This installation, once operational, should provide increased accuracy in offsite dose projections should a postulated LOCA event occur.

Based upon the above findings, this portion of the licensee's emergency preparedness program appears to be adequate.

5.4.2.1 &
5.4.2.2 Offsite and Onsite Radiological Surveys

EG-1 describes the offsite sampling that would be implemented following release of radionuclides from the plant to the environment. Initially these procedures will be used by the site Rad/Chem Director until the Environs Group Director assumes his duties.

The scope of EG-1 includes dispatching environmental teams to monitor suspected plumes or release points, and the taking of air, milk, surface and water samples. EG-2 contains maps that identify the locations of standard monitoring points within each sector around the site. These maps provide general locations for the precise directions and route maps provided in EG-1.

Procedure EG-1 specified that monitoring teams must have, as a minimum, an air sampler and Cutie Pie (CP) survey instrument. Although the minimum instrument requirements are made, no reference is made to where they are located nor how they should be used. Communications equipment is also not addressed by any procedure. The licensee plans to correct these items as soon as new offsite emergency kits are constructed. These kits will include high range dosimeters.

The EG-1 procedure states under the precautions section: "In the event that radiation levels at or beyond the site boundary are suspected to be significantly elevated, personnel performing surveys will require dosimetry such as film badges and pocket dosimeter to ascertain their accumulated radiation exposures."

EG-2 defines the offsite monitoring teams methods to locate designated monitoring sites. No methods on how to identify the center line of radioactive plume(s) are described. Further, the precaution's section of the procedure does not address the potential need for respiratory protection with charcoal canisters when the teams search for a plume or collect samples in downwind sectors that are known or suspected to have a radioactive plume.

Provisions exist in EG-11 for collection, labeling and recording the results gathered in offsite radiological surveys.

The Zion Station EPIP's contains EPIP-330-3, that describes the environmental sample collection locations. This procedure appears to be redundant with EG-1. It is not clear which procedure would be used in the field.

The licensee currently has plans to monitor the habitability of the Control Room, assembly areas, TSC, OSC, and other locations for radiation and contamination levels following initiation of an emergency. Currently, the Zion Station has no interim in-plant radiation monitoring procedure for determining the quantity of radioactivity released or potential offsite dose from the steam generator safety/relief valve release pathway. Significant environmental releases could occur via this pathway with no current means for initial curie quantification or offsite dose assessment.

EG-7 prescribes methods to facilitate the accurate transmission, reception and recording of voice messages and conversations when communicating about environmental matters by phone or radio. This procedure has been designed for use by the environs group.

Based upon the above findings, the following action must be taken to achieve an acceptable program:

* A procedure must be written for the field teams use to specify which instruments are to be used in various circumstances (such as the instrument and means to determine whether or not the team is inside a plume), what equipment is needed (e.g., respirators, high range dosimeters, air sampling tripods, portable generator, etc.), the means for documenting results, and what information must be communicated to the EOF.

The following should be considered for improvement:

* An interim procedure that uses sampling techniques and/or portable dose rate instrumentation to quantify and verify gaseous releases from the S/G safety/relief valve pathway should be developed.

* Consider elimination of the Zion Station EPIP 330-3, and modification of EG 1 and/or 2 to include the general street map locations used in EPIP-330-3.

At the time of this appraisal, the licensee's planned new environmental emergency kits were not complete; however, all necessary items had been ordered. This is an open item.

5.4.2.3 In-Plant Radiological Surveys

Routine in-plant surveys are currently conducted using radiation protection procedures (e.g., RP-1480-2 for contamination, and RP-1280-2 for dose rates). EPIP 099-1 lists the plant procedures other than EPIP's that fulfill requirements stated in Section 9.2 of the GSEP. Review of the listed procedures showed that: (1) with the exception of RP-1740-1 and RP-1740-3, there are

no provisions for precautions, limitations and actions such as are found in EPIPs for emergency situations, and (2) other RP's that are not listed in EPIP 099-1 (e.g., 1350-12 and 13, RP-1190, RP-1250, and RP-1470-4) may also be required for use during an emergency, and therefore should be reviewed to determine their precautions and limitations for use during an emergency. The inspectors determined from reviewing existing EPIPs and RPs that several RP procedures (the 1740 series) will only be used during an emergency, and therefore these procedures must be EPIPs. This is important because licensee GSEP audits do not examine RPs, and further, Appendix E of 10 CFR 50 requires submittal of EPIPs to the NRC.

Based upon the above findings, the following actions must be taken to achieve an acceptable emergency preparedness program:

* Provide an indepth review of established radiation protection procedures that are routinely used and would also be used in emergency situations and modify EPIP-099-1 accordingly.

* Modify all radiation protection procedures that will be used in an emergency, so that precautions, limitations and actions for emergency situations are appropriately covered. These procedures, if used only for emergency situation, shall be in EPIPs rather than RPs.

5.4.2.4,
5.4.2.6, &
5.4.2.8 Post-Accident Primary Coolant Sampling, Containment Air Sampling, and Stack Effluent Sampling

The inspectors examined the procedures dealing with these sections and determined that they appear to be adequate for limited fuel failure accidents.

The Sentry Systems previously mentioned in Sections 4.1.1.5 and 4.1.1.7 do not presently have operating procedures written. These procedures should contain: (a) checklist to guide the sample system operator through the necessary steps to collect the sample, (b) what equipment needs to be used, (c) a means to assure personnel exposure limits are not exceeded, (d) means for sample identification, and (e) the means to perform sample dilution, if necessary, to assure the counting deadtime limit of 20% is not exceeded.

The lack of these procedures is an open item, and will be reviewed during a future inspection.

5.4.2.5.
5.4.2.7.
5.4.2.9. &
5.4.2.11 Post-Accident Primary Coolant Analysis, Containment Air Analysis, Stack Effluent Analysis and Liquid Effluent Analysis

The inspectors examined the procedures for these sections, and determined that they appear to be adequate. A discussion of the analysis equipment is contained in Section 4.1.1.5. The procedures should contain a provision

to immediately signal when an Emergency Action Level has been reached based on data reduction results. The procedures should contain specific instructions concerning when to relocate counting equipment when background radiation levels become too high and when to charge the dewar of the portable intrinsic Ge detector with liquid nitrogen to assure analysis can be completed within the time frame specified in NUREG-0737.

Based on the above findings, the licensee's program appears to be adequate, however, the following items should be considered for improvement:

* Specify elevated radiation levels which would require relocation of laboratory capability and specify relocation area.

* Specify action levels (e.g,. anticipated loss of laboratory capability) which warrant charging portable intrinsic germanium dewars with liquid nitrogen to assure timely operability.

* Procedures should contain a provision to immediately signal when an EAL has been reached based on sample results.

5.4.2.10 Liquid Effluent Sampling

The inspectors have examined this procedure and have determined that it is apparently adequate. This is the same procedure used by the licensee during normal conditions. This procedure should specify what conditions may warrant increased attention on the part of the user during accident conditions, such as what types of protective clothing should be worn, monitoring of radiation levels, an alert that high radiation levels may exist, and special care in handling a relatively "hot" sample.

Based on the above findings, the licensee's program appears to be acceptable, however, the following matter should be considered for improvement:

* Include in the sampling procedure precautions and limitations for use during accident conditions

5.4.2.12 Radiological Environmental Monitoring Program (REMP)

Emergency environmental monitoring is coordinated by the Environs Director using procedure EG-1. This procedure covers sampling of air, land, vegetation, water, milk, and offsite doses using TLDs. These are done when deemed appropriate by the Environs Director. If a full REMP program is deemed appropriate for a particular emergency, the management structure outlined in procedure ED-1 would be followed. The Environs Director would be responsible for supervising all field personnel involved in surveys or sample collection. The Environmental Director would be responsible for arranging with contractor laboratories for all sample analysis. Both of these individuals report to the Environmental/ Emergency Coordinator, who also would be the official contact with State and Federal radiological assessment personnel. The licensee has the ability to implement this monitoring program through the assignment of personnel from other CECo nuclear stations, and has Letters of Agreement with Eberline, Hazelton, and Science Applications Incorporated to provide additional personnel for monitoring and analysis if requested by the Environmental Director.

The personnel performing the sample collections and surveys would be using the EG procedures. This program could also include the Station's Environs Team. These procedures, however, do not cover the method and instrumentation for radiation surveys, what instrumentation should be taken by each team, or survey/sample data collection forms. The procedure EG-11 also describes how to collect all samples, but the title of this procedure makes no reference to this.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matter should be considered for improvement:

* Expand the EG procedures to include sample/survey data collection forms and a description of their use, and instrumentation needed.

5.4.3 Protective Action

5.4.3.1 Radiation Protection During Emergencies

RP-1190-1, Zion Radiation Protection General Procedures, addresses personnel exposures under emergency conditions. This procedure, dated November 23, 1976, limits the whole body dose to 25 rems for emergencies. This whole body dose limitation is not related to the type of action that an employee may take during an emergency. Section 6.5.1 in the GSEP authorizes 25 rems to protect facilities, eliminate serious unplanned releases of effluents, or to control fires. Section 6.5.1 further allows up to 75 rems to the whole body for life saving actions. The Zion Station EPIP-099-1 does not reference RP-1190-1. EPIP-370-1, Rescue and Recovery, authorized 100 rems whole body dose for the saving of life (see Section 5.4.3.5 of this report). The licensee is aware of these PAG differences and indicated they are working on resolution of this matter. Procedure RP-1190-1 is a negotiated procedure with the union.

RP-1740-8 specifies the use of Potassium Iodide (KI) as a thyroid blocking agent for emergency exposures of radioiodines. Other RP's (in the 1700 series) are also used for emergency events. Additional evaluation of the applicability of routine health physics procedures to emergency situations needs to be accomplished (see Section 5.4.2.3). There is no overall procedure for health physics during emergency situations.

Provisions for dosimetry service for unusual situations or emergency conditions appear adequate. Procedures that delegate specific authority for health physics during emergency events are covered in the EPIPs.

Based upon the above findings, this portion of the emergency preparedness program appears to be adequate. (See other referenced sections for improvement requirements and recommendations).

5.4.3.2 Evacuation of Owner Controlled Areas

Licensee will evacuate site personnel for a Site Area or General Emergency unless radiological environmental conditions prohibit. The Station Director initiates the relocation of onsite personnel. Evacuation routes are shown on

sketches in the Emergency Plan but are not included in Procedure No. EPIP-360-1, Site Evacuation of Non-Essential Personnel. Locations of assembly areas are found in the Plan. The Main Machine shop has been designated as this area. A continuous two minute siren signals all personnel, except those with emergency responsibilities, to the assembly area.

The procedure requires that the Security Director account for all personnel, and ensures that the Rad/Chem Director will determine whether a release is in progress thus ensuring the safest evacuation route.

If instructed to evacuate the site, non-essential personnel will report to one of the three relocation sites: (1) Generating Station 16-Waukegan, (2) CECo Waukegan District Headquarters, or (3) The Westinghouse Training Center (EOF). The Security Director will establish traffic control points, if necessary, and will account for personnel at the relocation center chosen by the Station Director.

Based on the above findings, the licensee's program appears to be acceptable, however, the following should be considered for improvement:

* Include diagrams of evacuation routes in EPIP-360-1.

5.4.3.3 Personnel Accountability

The inspector reviewed procedure EPIP-170-1 (Security Director). The general format and content of this procedure does not meet the administrative standards established by the Zion Station. (See Section 5.1). Security will utilize a computer system to discern last known whereabouts of missing personnel and advise each department. The foreman of each department will advise security when missing personnel are located.

Accountability drills have been conducted and have demonstrated the capability to account for all personnel within 30 minutes.

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

5.4.3.4 Personnel Monitoring and Decontamination

The inspectors reviewed procedures EPIP-180-1, 360-1, 370-2, and RP-1470-4. These procedures appear to be adequate to assure that individuals will be properly decontaminated once contamination is detected. Provisions are maintained to ensure that site evacuees can be decontaminated if necessary. RCT monitoring teams will be dispatched to ensure that site evacuees are monitored and decontaminated.

Based on the above findings, the licensee's program appears to be adequate.

5.4.3.5 Onsite First-Aid/Rescue

The inspectors reviewed the procedures EPIP-370-1 and 370-2 for Rescue/Recovery and First Aid/Decontamination. The procedures appear to be adequate, with the exception of exposure guidance to rescue workers. The

exposure guidelines in procedure EPIP 370-1 are not consistant with EPA 520/1-75/001 nor are they consistant with the GSEP. EPIP-370-1 should specify 75 rems to the whole body for lifesaving actions in accordance with the GSEP and EPA-PAGs. The procedures also should specify the limits for exposure to the thyroid, as specified in the GSEP and EPA-PAG.

Based on the above findings, the following action must be taken to achieve an acceptable program:

* The exposure guidelines specified in EPA 520/1-75/001 and GSEP for Emergency Workers shall be included in the procedures.

5.4.4 Security During Emergencies

The inspectors interviewed the Station Security Director regarding the measures to be in effect during station emergencies. The Security Director will instruct the guard force regarding these actions. Basically the guard force will remain "on post" immediately following the declaration of an emergency. All guard force members have portable radios to communicate from their assigned post.

The inspectors interviewed several members of the guard force and determined that they were adequately trained in the GSEP. If hazardous conditions exist in the guard post area, the Rad/Chem Director will inform the Security Director to move the guard force.

All the guard force members are currently monitored with film badges.

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

5.4.5 Repair and Corrective Action

Repair and corrective actions are not addressed with a specific Implementing Procedure. Repair and corrective action will be directed by the Maintenance Director. There is no specific procedure in the EPIP series which addresses safety considerations for repair or corrective action teams. These teams would normally be accompanied by a Rad/Chem Technician, who is under the direction of the Rad/Chem Director. The Rad/Chem Director is responsible for the radiation protection and dosimetry aspects of each task, giving attention to A.L.A.R.A. considerations in the planning, but the means for ensuring this is not described in his procedures (see Section 5.1).

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

5.4.6 Recovery

The CCC Director (during limited activation) or the Recovery Group Manager (full activation) has the authority to deactivate the GSEP organization. The procedure used (either CC-1 or EOF-1) specifies that he will close out or recommend reduction in emergency classification by briefing NRC and the State of Illinois. For emergencies serious enough to activate

the EOF, the Recovery Operations Procedure, EOF-9, specifies how the emergency classification is reduced. This is based on an evaluation of stabilized plant conditions in comparison with the Emergency Action Levels. This procedure also states that the emergency classification reduction is made after consultation among NRC representatives, state officials, company officials, and the NSSS vendor. The positions in the recovery organization are shown in Figure 2.3.

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

5.4.7 Public Information

The inspector reviewed the Information Director's procedure (CC-4) and the Emergency News Center Director procedure (EOF-4) to verify adequate scope and content. The Information Director is responsible for collecting, verifying, and disseminating information on emergency situations to the public via the news media. Upon activation of the nearsite EOF, the Information Director will support the Emergency News Center Director.

Major duties of the Information Director include determining the nature of the emergency and its potential effect on the public, issuing approved press releases, coordinating the release of information with other involved agencies, and disseminating internal information to licensee personnel. Major duties of the Emergency News Center Director at the EOF are scheduling and presiding over press conferences or briefings at the Emergency News Center; having available a technical spokesperson at all press conferences or briefings; coordinating information releases with Federal, State, and local agencies, as well as other companies involved in the emergency; responding to information requests from the news media, including arranging interviews; and establishing coordinated arrangements for dealing with rumors.

The methods for accomplishing the duties assigned to the various public information Directors are described in the licensee's public information plan titled "Major Nuclear Incident Plan Public Information," Revision 0 dated September 8, 1980. This plan includes the means for contacting members of the newsmedia, and locations for the Emergency News Center. The Emergency News Center described in this plan is not the same as the actual location for the Zion facility.

Based on the above findings, this portion of the licensee's program appears to be acceptable; however, the following matter should be considered for improvement:

* Revise Attachment B (Major Nuclear Incident Plan Public Information) to EOF-4 and CC-4 to describe the current location of the Zion Emergency News Center.

5.4.8 Fire Protection

The inspectors examined several fire preplans to determine if these procedures would key the user to the Emergency Plan. The preplans do not adequately interface with the Emergency Plan. The preplans should indicate to the user if the fire can affect safe shutdown equipment and thus request the user to notify the Shift Engineer of a possible Emergency Plan condition and request him to classify the emergency as per EPIP-330-1.

Walkthroughs with some Shift Engineers and Shift Foremen (Fire Brigade Chief) indicated that it is difficult to determine from the fire alarm panel in the Control Room whether the fire can or cannot affect safe shutdown equipment.

Several preplans which were examined indicate what safety related equipment can potentially be affected by the fire. The preplans are streamlined and easy to read. Adequate human engineering factors have been applied.

The inspectors discussed the above noted problem with a licensee operations engineer. The licensee agreed with the inspector's concern and indicated that these fire preplans would include a statement which will key the user to notify the Shift Engineer of a possible GSEP condition.

Based on the above findings, this portion of the licensee's plan appears to be acceptable, but the following should be considered for improvement:

* The licensee should include in the preplans a statement to request the Shift Engineer to classify fire emergencies in accordance with EPIP-330-1.

5.5 Supplemental Procedures

5.5.1 Inventory Operational Checks and Calibration of Emergency Equipment, Facilities and Supplies

The licensee has three procedures covering the inventory of Emergency Equipment, Facilities and Supplies: EPIP-550-1, EPIP-550-2 and RP-1740-5. These procedures cover:

| PROCEDURE NO. | ITEM LISTED |
|---|---|
| EPIP 550-1 | Stretcher approximate locations<br>First Aid Kit locations<br>Oxygen Administering Equipment location<br>Respiratory Equipment Locations<br>Mobile Radiological Emergency Kit<br>Rad. Emergency Kit Locations<br>Personnel Decontamination |
| EPIP 550-2 | Emergency Trailer Supplies |

| PROCEDURE NO. | ITEM LISTED |
|---|---|
| RP-1740-5 | Emergency Generator Testing (monthly)<br>Rad. Detector battery check (monthly)<br>Pocket Dosimeter Calibrations (annual)<br>Respiratory Protection Inventory (monthly)<br>Decon Area Supplies (Consultant Controlled)<br>Emergency Equipment Inventory (annual)<br>Auxiliary Bldg. Mobile kit seal inspection (monthly)<br><br>Form 1740-5-1 - (Record form)<br>Form 1740-5 (Supply checkoff form) |

Review of these procedures shows that: (1) these procedures do not interface with each other, (2) except for the trailer, inventory is either approximate or nonexistent, (3) there are no provisions for immediate replacement of missing critical emergency preparedness items when inventoried, nor replacement when such items are being repaired or calibrated, (4) emergency supplies were being ordered during the appraisal period, and (5) current inventory test and calibration procedures focus on health physics equipment only. Therefore, although some emergency equipment appears to be checked or tested regularly, there are no written procedures to inventory, operationally check, or replace equipment, and existing procedures do not reflect actual inventory.

Based upon the above findings, the following actions must be taken to achieve an acceptable program:

* Existing procedures for inventory, operational checks and calibrations of emergency equipment must either be cross-referenced or a new procedure developed to cover such aspects. In addition, the minimum number of each inventoried item required for emergency response must be documented on inventory sheets, including provisions for replacement of missing critical items. These procedures must include provisions to test all emergency equipment, facilities and instruments and to record all such tests.

5.5.2 Drills and Exercises

Drills and exercises are administered by either the corporate staff or the Training Supervisor and the Assistant Technical Staff Supervisor. Fire drills are coordinated by the Fire Marshal. Procedure CC-13, the Exercise and Drill Program, describes the program which implements the requirements in GSEP. Written scenarios are prepared for each exercise, as required by the procedure, and are coordinated with appropriate state and local agencies and/or support organizations. Critiques are conducted as soon as possible after each drill/exercise to evaluate both procedural adequacy and station preparedness and capabilities.

The inspectors reviewed the critique document that was written following a recent drill on communications and substantiated the licensee's follow-up actions.

Quarterly communications and fire drills, annual medical and radiological monitoring drills, semiannual Health Physics drills and an annual exercise are conducted.

Site medical drills are coordinated with Radiation Management Corporation (RMC). RMC submits video tapes of the drill and a critique to the licensee following the drills.

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

5.5.3 Reviews, Revision and Distribution of Emergency Plan and Procedures

The station procedures are prepared or revised in accordance with Administrative Procedure ZAP 5-51-4.

This procedure identifies the originator, Procedure No., Revision No., date the originator signs the pending procedure, the description of the procedure and department head approval. Further, onsite reviews and required approvals are identified by check marks next to the position title. The determination of who approves each type of procedure is addressed and distribution of procedures is determined in accordance with ZAP 5-51-4.

In an interview with the office supervisor, the approval mechanism and the mechanism for determining the onsite and offsite distribution of controlled emergency preparedness documents were defined.

Corporate Emergency procedures are prepared by cognizant corporate staff, reviewed by the Radioecology/Emergency Planning Supervisor, and approved by the Division Vice-President, Nuclear Stations.

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

6.0 Coordination with Offsite Groups

6.1 Offsite Agencies
Waukegan Coal Generating Station

The inspectors visited this station on July 7, 1981. The Shift Engineer was interviewed as to his responsibilities if an accident occurred at the Zion Nuclear Station. He was not familiar with the GSEP manual, nor was he aware that his station was designated as an off-site relocation area for the nuclear station personnel. This situation will be rectified shortly, since a Zion Station Quality Control representative was present with the inspectors for this interview.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matter should be considered for improvement.

The Waukegan Generating Station Shift Engineer or other person(s) designated to have responsibilities for accomodation of Zion Station evacuees should be properly informed and trained and provided with a copy of GSEP.

U.S. Coast Guard-Milwaukee, Wisconsin

The inspectors interviewed the Commander of the Milwaukee based U.S. Coast Guard contingent. He informed the inspectors that his group's jurisdiction was limited to Lake Michigan waters down to the Illinois state line. The Chicago based Coast Guard group patrols the northern portion of Lake Michigan from Chicago to the Wisconsin Line. Upon inquiry the Commander of the Coast Guard Station stated that his group had no radiation detection devices, film badges, dosimeters, or radiation protection clothing. These agencies should be supplied with such equipment and protective gear through the Federal Emergency Management Agency (FEMA). The Commander interviewed seemed competent and ready to cooperate in the event of a nuclear accident at the Zion Nuclear Plant; however, as of this date, the Letter of Agreement with the licensee has not been signed by the U. S. Coast Guard. The inspection team is investigating this matter as one of several in the Letters of Agreement Section also in Section 6.1.

An inspector interviewed the Commander of the U.S. Coast Guard base stationed in Chicago, Illinois. He told the inspector that he had a copy of GSEP in his office, and that he was familiar with his unit's role in the event of a nuclear accident. Some of his personnel have had training in operating radioactivity measuring equipment. He has also received a letter from the Zion Generating Station offering such training, but he has not yet been able to adjust his schedule to permit some personnel to take the licensee's training. He mentioned that he felt the primary duty of his unit in an emergency would be to set up safety zones and cordon off water areas from shipping vessels and stray boats. Also he stated that a liaison exists between his unit and the Glenview, Illinois, Naval Station, specifically for the use of two helicopters based there. The inspector was satisfied that the Commander was knowledgeable of his role in an emergency and that his unit could perform capably if required in an emergency.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matter should be considered for improvement:

* Through FEMA both the Milwaukee and the Chicago U. S. Coast Guard Stations should be supplied with radiation detection instruments, film badges, dosimeters and any other related equipment necessary for radiation protection

Kenosha County Wisconsin Sheriff

The Kenosha County Sheriff and two of his Captains were interviewed by the NRC inspectors on July 7, 1981. Sheriff personnel were all familiar with the NARS phone and its usage as well as the National Alert Warning Alert System (NAWAS) phone which was installed by the Wisconsin Division of Emergency Government. The communicators/dispatchers on duty demonstrated their knowledge of when and how to utilize these two emergency phones.

The Sheriff did not object to having both the NARS and NAWAS phones to answer in time of emergency . From the interviews the inspectors felt all persons contacted were cognizant of their responsibilities and would respond satisfactorily in the event of a nuclear emergency from the Zion Nuclear Plant.

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

Victory Memorial Hospital, Waukegan, Illinois

On July 6, 1981, NRC inspectors visited Victory Memorial Hospital, interviewed emergency room personnel, and inspected their radiation decontamination facility and radiation emergency equipment which would be used to monitor individuals arriving from the Zion Nuclear Plant in the event of a nuclear emergency.

The Zion Nuclear Plant has a Letter of Agreement with Victory Memorial Hospital. The hospital has agreed to provide medical care to injured personnel who are overexposed or could be radioactively contaminated. The hospital is well-equipped with facilities and supplies to care for two patients at a time in their decontamination facility. This facility is a self-contained room with tile floors and ceiling, well lighted and containing two separate floor drains leading to a waste tank separate from the normal sewer lines, to hold the radioactive water. A locked cabinet contains: instruments measuring alpha, beta, and gamma radiation levels, Cs-137 standard check sources, gloves, clothing, film badges and dosimeters. This equipment is inventoried quarterly by a licensee representative; however, there is no procedure in the licensee's EPIPs for inventorying these items. The list of items and checklist has been kept as a separate appendix by the Rad/Chem foreman, but it is not incorporated in the EPIPs.

Guides for emergency room personnel consist of three charts mounted on the wall of the decontamination facility listing the basic steps with sketches of the procedures for decontaminating an individual.

The Acting Supervisor of the Emergency Room expressed a good understanding of her responsibilities and procedures to follow in response to an emergency involving radioactively contaminated injured personnel. The facilities, supplies, and medical staff provided by the hospital were consistent with the Letter of Agreement.

The licensee has contacted the hospital to participate in drills and exercises scheduled by the licensee.

Based on the above findings, the following action must be taken to achieve an acceptable program:

* Include in the EPIP's a procedure for inventorying the emergency equipment at the hospital including a list of items, quantities, amounts to keep on inventory before reordering, and time interval for inventories with place for date and signature of licensee representatives performing the inventory.

Lake County Sheriff

The Lake County Sheriff's office was visited by NRC inspectors on July 6, 1981. Personnel were interviewed and some of the facilities were observed.

The Chief Deputy was aware of the Sheriff's Office responsibilities, and he understood what action his office would take in response to an emergency at the Zion Nuclear Station. Two dispatchers from the communication's room were interviewed, but neither seemed sure of how to activate the NARS phone or in what order to notify their superiors in the event of an emergency. They could not locate the NARS form while the inspectors were present. Additional training including better communication between the dispatchers and their immediate supervisors regarding procedural steps to take when notified of a nuclear emergency at the Zion Nuclear Plant is recommended. The inspectors were informed that such training will be offered by ESDA in the near future.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following should be considered for improvement:

* Training should be given to the dispatchers/communicators at the Lake County Sheriff's office by the licensee. Any additional training to be provided by ESDA would also be beneficial.

Zion Fire Department

This department along with the Zion Police Department and the Zion Rescue Department were each sent separate Letters of Agreement. The Mayor's office of Zion, Illinois, prefers that one letter be sent to the Zion City Council from the licensee. As yet no Letter of Agreement has been signed which would commit the Fire, Police and Rescue Departments to respond in the event of a nuclear accident from the Zion Generating Station (See section on Letters of Agreement for more specific information).

This department was also visited on July 6, 1981, by the NRC inspectors. Fire Department personnel have had radiation protection training at the Zion Generating Station. The Lieutenant on duty expressed concern about communications within the Zion plant based on actual prior experience. Radios have difficulty transmitting within the plant. Another item of concern was that the Zion site uses positive pressure in their Scott air-packs, while those used by the fire department use pressure demand. The fire department's Scott air packs can be filled at Zion at 2400 p.s.i.g. which is amenable to their units as defined in Procedure No. RP-1310-7.

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

Zion Police Department

This department was also visited by the NRC inspectors on July 6, 1981. After interviewing the Lieutenant as well as two of the communicators/dispatchers, the inspectors felt assured that all concerned were familiar with the NARS phone, knew how to activate their response and how to verify incoming calls on the NARS. They seemed professional in their response capabilities and competent to respond in the event of a nuclear accident from the Zion Generating Station.

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

Zion Rescue Squad

The Zion Rescue Squad is a separate city governmental group reporting directly to the Office of the Mayor. It works closely with the Zion Fire Department and consists of five full time personnel and 19 volunteers. RMC provides training for the Rescue Department members. This group is on 24 hour call. The inspectors were satisfied that this group was well trained and competent to respond if needed during a licensee emergency.

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

Letters of Agreement

A review of the licensee's files confirmed that signed Letters of Agreement exist between the Superintendent, Zion Generating Station, and the following off-site support agencies. These letters and their confirmation dates are as follows:

1. Victory Memorial Hospital - January 1, 1981
2. Lake County, Illinois ESDA - December 30, 1980
3. Illinois State Police - January 2, 1981
4. Safe-Way Ambulance Service - January 9, 1981
5. Illinois Department of Public Health - January 7, 1981
6. Kenosha County (Wis.) Office of Emergency Government - January 2, 1981
7. United States Department of Energy - January 12, 1981

There are several other Letters of Agreement initiated by the licensee to off-site support agencies which remain unsigned, among which are some in which disagreement on the terms of the letter were cited by the off-site agency. Those agencies whose cooperation and services have not yet been obtained by the licensee are as follows:

1. Zion Rescue Department
2. Zion Fire Department
3. Zion Police Department
4. Zion ESDA
5. Lake County, Illinois Sheriff
6. United States Coast Guard
7. Waukegan ESDA
8. Illinois ESDA

There is presently a disagreement between the City of Zion and the licensee in that the Mayor of Zion wants the licensee to send its Letter of Agreement to the City Council of Zion, rather than the separate letters to the Police, Fire and Rescue Departments as was originally done. An Illinois ESDA representative (on assignment from Commonwealth Edison) informed the inspector that he expects the City of Zion to sign a Letter of Agreement after the July 29, 1981, exercise. Certain political considerations which previously interfered with the City of Zion signing the letter no longer exist per information from the ESDA representative.

The inspector contacted the GSEP Coordinator and got assurance that his management will take positive steps at once to see that the other off-site support agencies with unsigned Letters of Agreement will be contacted again and agreement reached between the two parties. A revised Letter of Agreement has been drafted which will be sent to these agencies.

Based on the above findings, the following action must be taken to achieve an acceptable program:

* Letters of Agreement shall be made with those off-site support agencies listed in the second list of eight in the preceding paragraphs. This shall be accomplished as soon as possible. Followup by the GSEP Coordinator and his management superiors is required.

6.2 General Public and Transient Population

6.2.1 Information Distribution

Emergency information pamphlets on what to do in case of an emergency at the Zion Nuclear Station have been mailed to the general permanent population within the ten mile EPZ. The licensee indicated some minor feedback was received about the pamphlets. These pamphlets are likely to be available to residents during an emergency if the residents heed the instructions in the letter to the residents. The licensee plans to conduct an attitudinal survey to determine the success or failure of the program. Feedback relevant to the pamphlets may be used for changes.

The information in these pamphlets, which were developed in conjunction with the Illinois Emergency Services and Disaster Agency and the Wisconsin Division of Emergency Government, includes the following: information on radiation, actions to take in the event of an emergency, and the means by which they would be notified of an emergency. The licensee has committed to an annual distribution of these pamphlets.

District Superintendents of the licensee were instructed to deliver the pamphlets to major businesses where a reasonable number of transient workers are expected, as well as major parks, recreation areas, and motels within the EPZ. This was done for the EPZ areas within the State of Illinois, such as the Illinois Beach State Park, but it has not yet been done in Wisconsin. Further, these pamphlets have not been posted in public places where they could be read by the transient population.

Based on the above findings, the following actions must be taken to achieve an acceptable program:

* Coordinate with the State of Wisconsin and distribute public information pamphlets to areas in Wisconsin where the transient adult population within the ten mile EPZ may read a copy.

* Post the public information pamphlets or equivalent information in public places within the ten mile EPZ, such as the Illinois Beach State Park and adjacent campgrounds.

6.2.2. Prompt Notification of the Public

The licensee indicated that a Thunder-bolt siren which is on order will be installed on the south side of the site, outside the protected area, near the Crib House. This siren will also be equipped with a strobe light. The purpose of the siren and strobe light is to warn near site beach users and offshore boaters. The range of the siren is unknown but it should be sufficient to warn boaters and park users out to three miles, depending on weather conditions. Activation of the siren will be controlled by a remote radio signal/activation device from the Control Room. Installation of the system will begin after the July 29, 1981, exercise.

Currently, CECo has not installed a prompt public notification system meeting the design objectives of Appendix 3 of NUREG-0654. This was required as of July 1, 1981. Established schedules for the system are as follows:

| ITEM | DATE |
|---|---|
| Survey Complete | Complete |
| Equipment Bids Solicited | Complete |
| Equipment Ordered | August 17, 1981 |
| Equipment Received | December 14, 1981 |
| Equipment Installed | March 22, 1982 |
| Fully Operational | April 22, 1982 |

10 CFR 50, Appendix E, Section IV.D.3 requires, in part, that the licensee shall demonstrate by July 1, 1981, that administrative and physical means have been established for alerting and providing prompt instructions to the public within the plume exposure pathway EPZ. The design objective shall be to have the capability to essentially complete the initial notification of the public within the plume exposure pathway EPZ within about 15 minutes.

Contrary to the above, the licensee has not demonstrated compliance with this part of the rule. Enforcement in this area will be considered by NRC Headequarters based on the licensee's response to the July 1, 1981, letter issed by the Regional Director. This is being done for all licensees on a generic basis.

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

. The licensee has not demonstrated that administrative and physical means have been established for alerting and providing prompt instructions to the public within the plume exposure pathway EPZ. The licensee will be responsible for ensuring prompt alerting and notification of the public in accordance with the Commission's regulations.

6.3 News Media

The inspectors discussed the current news media program established by the licensee relevant to disseminating and coordinating accurate information to news media organizations. A Reporter's Guide brochure has been prepared and covers the following subjects: Operating cycle of a PWR, radiation, emergency planning, training, and a glossary of common reactor/radiation terms. The licensee indicated that the Reporter's Guide will be disseminated to radio/tv/newspaper media personnel prior to the scheduled Zion Exercise. Training for media personnel was recently conducted by the licensee, and special press days for briefing and tours are conducted in conjunction with the annual exercise.

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

6.4 NSSS Vendor Walk-Through

The inspectors interviewed and performed a walk-through with the Westinghouse representative maintained onsite. The NSSS vendor, Westinghouse, is capable of supplying reactor technical assistance, remote reactor analysis capability, onsite and offsite radiological survey assistance, and personnel support. Westinghouse has a response capability that, if the company Lear Jet is available, will enable the Westinhouse Response Team to arrive within two hours. The NSSS vendor representative's task during a GSEP emergency is to notify Westinghouse - Pittsburgh and report first to the OSC and then to the TSC to begin transmitting data to the Westinghouse computer for analysis. The Westinghouse Response Team will report to the EOF for instructions.

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

7.0 Drills and Exercies

7.1 Walk-Through of Inplant/Field Radioiodine Analysis

The inspectors performed a walk-through with three Radiation Chemistry Technicians using an Eberline SAM-II radioiodine instrument and procedure RP-1740-4, and determined that there are several basic problems with the procedure for operating this equipment. This procedure indicates that it is to be used only when the GeLi systems are not operating, but the licensee has indicated that the equipment will also be used for field monitoring of radioiodine.

The procedure does not state on which counting shelf the instrument was calibrated. The procedure does not describe the assembly and connection of associated equipment. The calibration graph of uCi vs. counts per minute was poorly labeled. The equation to determine iodine concentration in the procedure is incorrect. These findings are all a direct result of personnel walk-throughs.

Based on the above findings, the following action must be taken to achieve an acceptable program:

* Procedure RP-1740-4, operation of the Eberline Sam II, shall be revised to include the following: (a) specify assembly (e.g., which counting shelf level, electrical hook-up, etc.) and methods necessary to measure $10^{-7}$ uCi/cc iodine in the presence of noble gasses; (b) clarify the numerical scaling on the calibration graph of uCi iodine vs. counts per minute; and (c) correct the equation to determine iodine concentration.

## 8.0 Licensee Action on Previously Identified Items Related to Emergency Preparedness

### 8.1 Health Physics Appraisal Items (IE Inspection Reports No. 50-295/80-05; and 50-304/80-04)

For the purposes of tracking, the following previously identified significant appraisal finding and item of noncompliance are considered closed, and those items not completed have been reopened in this report. The previously identified finding and item of noncompliance are as follows:

. The Radiation/Chemistry Department's emergency response capability needs significant improvement, especially in the areas of training, procedures, facilities, and equipment.

. Contrary to Technical Specification 6.2.A.4, a pulse integrator, five 100 R self-reading pocket dosimeters, a large waste container, an air sampler tripod, and a set of keys to the environmental monitoring stations were missing from the Zion Station Emergency Trailer during the week of March 17, 1980.

### 8.2 Confirmatory Order dated February 29, 1980

(Closed) Establish on-site emergency preparedness manning levels on each shift as contained in Table 1 of the Order (D.1). In the May 28, 1980, letter responding to the Order, the licensee stated that CECo had established these manning levels. In addition, Figure 4.2-2 of the GSEP requires minimum shift manning requirements which are in agreement with Table B-1 of NUREG-0654, Revision 1.

(Closed) Emergency Action Levels shall be revised to require notification of the NRC for all events in the emergency classes described in NUREG-0610, September, 1979, (B-3). Both the GSEP, Section 6.1, and the station EPIP's specify that the NRC will be notified for all events in the emergency classes described in NUREG-0610, September, 1979. Appendix C of this report specifies required upgrading of the specific Emergency Action Levels for each of the emergency classes described in Appendix 1 of NUREG-0654.

(Closed) Training of personnel in EPIPs (B.5). This is discussed in Section 3 of this report.

(Closed) Upgraded meteorology and real time forecasting (F.2). The licensee submitted their proposed Offsite Dose Calculation System (ODCS), which describes the means for upgrading meteorological monitoring at the Zion site. They are currently in the process of implementing this program, and have available in the interim a 24 hour per day forecast capability from their meteorological contractor, Murray and Trettel. For the purpose of tracking, this item will be considered closed as it relates to the confirmatory order, and will be tracked and reopened in this report.

9.0 Persons Contacted

CECo Zion Station

*K. Graesser, Superintendent
*G. Pliml, Assistant Superintendent for Administration
L. Soth, Assistant Superintendent for Operations
*C. Schultz, Training Supervisor
*M. Andrews, Chemist
*F. Rescek, Lead Health Physicist
R. Budowle, Assistant Technical Staff Supervisor
*G. Trzyna, Training Instructor
F. Ost, Station Health Physicist
R. Smith, Security Director
B. Harl, Quality Assurance Coordinator - Onsite
*C. Ginn, Quality Control Inspector - Onsite
*J. Murphy, Quality Control Inspector - Onsite
*M. Krysiak, Quality Control Inspector - Onsite
*E. Shamlin, Quality Control Inspector - Onsite
E. Fuerst, Operations Engineer, Unit One
J. Gilmore, Operations Engineer, Unit Two
J. Mariani, Operations Engineer
*D. Howard, Rad/Chem Supervisor
M. LePage, Office Supervisor
R. Ryan, Computer Staff, CECo
J. White, Computer Staff, CECo
R. Mayer, Computer Staff, CECo
M. Hansen, Administration Assistant
K. Kofron, Assistant Superintendent for Maintenance
R. Lummis, Rad/Chem Foreman
G. Dix, Maintenance - Electrical Master Mechanic
G. Ptasienski, Rad/Chem Technician
M. Mazzuca, Rad/Chem Technician
A. Davis, Rad/Chem Technician
G. Peterson, Technician
G. Harten, Storekeeper
T. Saksefski, Assistant Storekeeper
A. Miosi, Technical Staff Supervisor
L. Scott, Public Information Staff, CECo

L. Leonard. Public Affairs Staff, CECo
*J. Golde., Supervisor, Radioecology/Emergency Planning, CECo
L. Litterski, Meteorologist, CECo

Non CECo Employees

J. Donaldson, Chief Deputy, Lake County (IL) Sheriff's Department
S. Davis, Acting Supervisor-Emergency Department, Victory Memorial Hospital
R. Grossi, Superintendent, Illinois Beach State Park
D. LaBelle, Lieutenant, Zion (IL) Fire Department
T. Poulsen, Chief, Zion Rescue Department
G. Ohmstad, Lieutenant, Zion Police Department
G. Sonquist, County Sheriff Kenosha, Wisconsin
R. Parmentier, Lieutenant, US Coast Guard, Milwaukee, Wisconsin
D. Trettel, Meteorologist, Murray & Trettel
D. Trass, Meteorologist, Murray & Trettel
Captain Berenson, US Coast Guard, Chicago, Illinois (by telephone)
M. Marks, Technician, Murray & Trettel
*F. Johnson, Zion Coordinator, Illinois Emergency Services Disaster Agency (Assigned from CECo)

*Denotes those present at the exit interviews.

10. Exit Interview

The inspectors and senior management from headquarters and the region met with licensee representatives (denoted in Paragraph 9) at the conclusion of the appraisal on July 10, 1981. The inspectors summarized the scope and findings of the appraisal. A detailed technical exit interview was also conducted at the conclusion of the appraisal with licensee representatives of those technical areas which needed improvement.

The licensee committed to provide a standby order or procedure, instructing the operating Shift Engineers, Shift Control Room Engineers, Shift Foreman and certain GSEP Directors (Rad/Chem, Environs and Station) which will enable them to acquire current meteorological data from the licensee's contractor. (Section 4.2.1.4) This order was issued on July 10, 1981, and verified by the inspectors to be in the Shift Engineers office on July 14, 1981.

The licensee committed to provide necessary radiological equipment and reactor assessment supplies such as procedures, P & IDs, FSAR, and fire protection plans in the interim EOF prior to the July 29, 1981, exercise.

ANNEX A

FIGURES

FIGURE 2.1

GSEP STATION GROUP ORGANIZATION

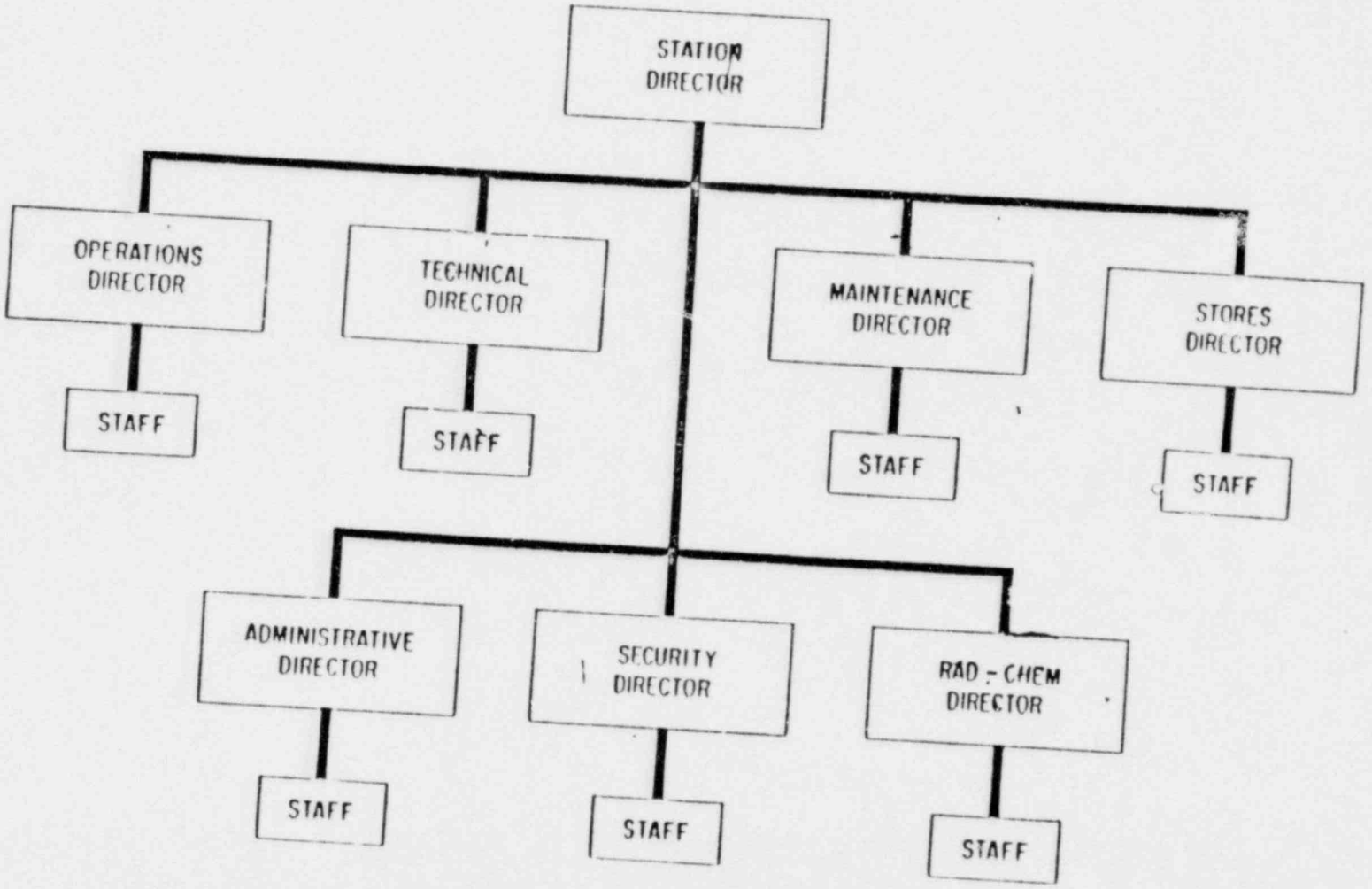


FIGURE 2.2

LIMITED RESPONSE OFFSITE GSEP ORGANIZATION

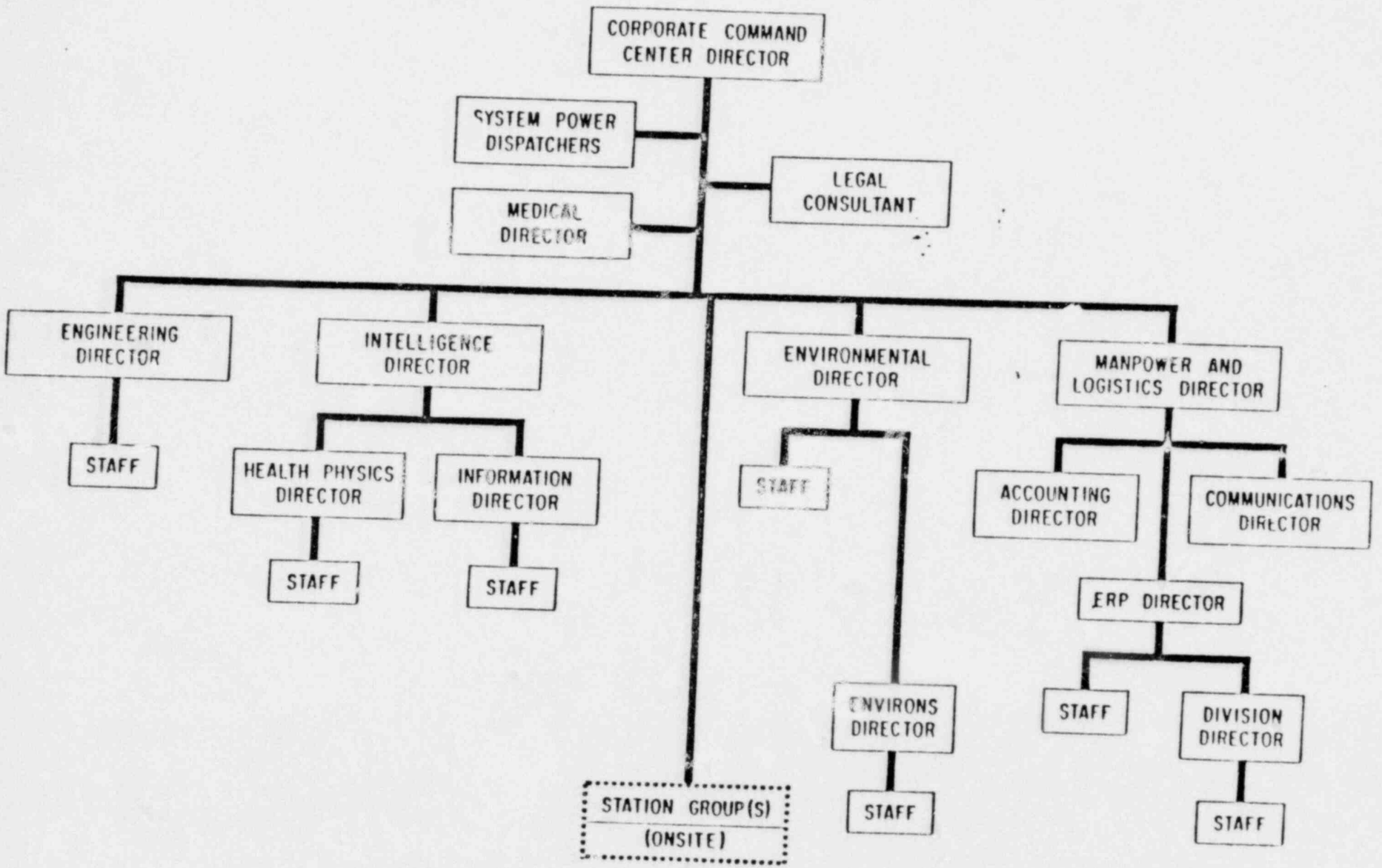


FIGURE 2.3

FULL RESPONSE OFFSITE GSEP ORGANIZATION

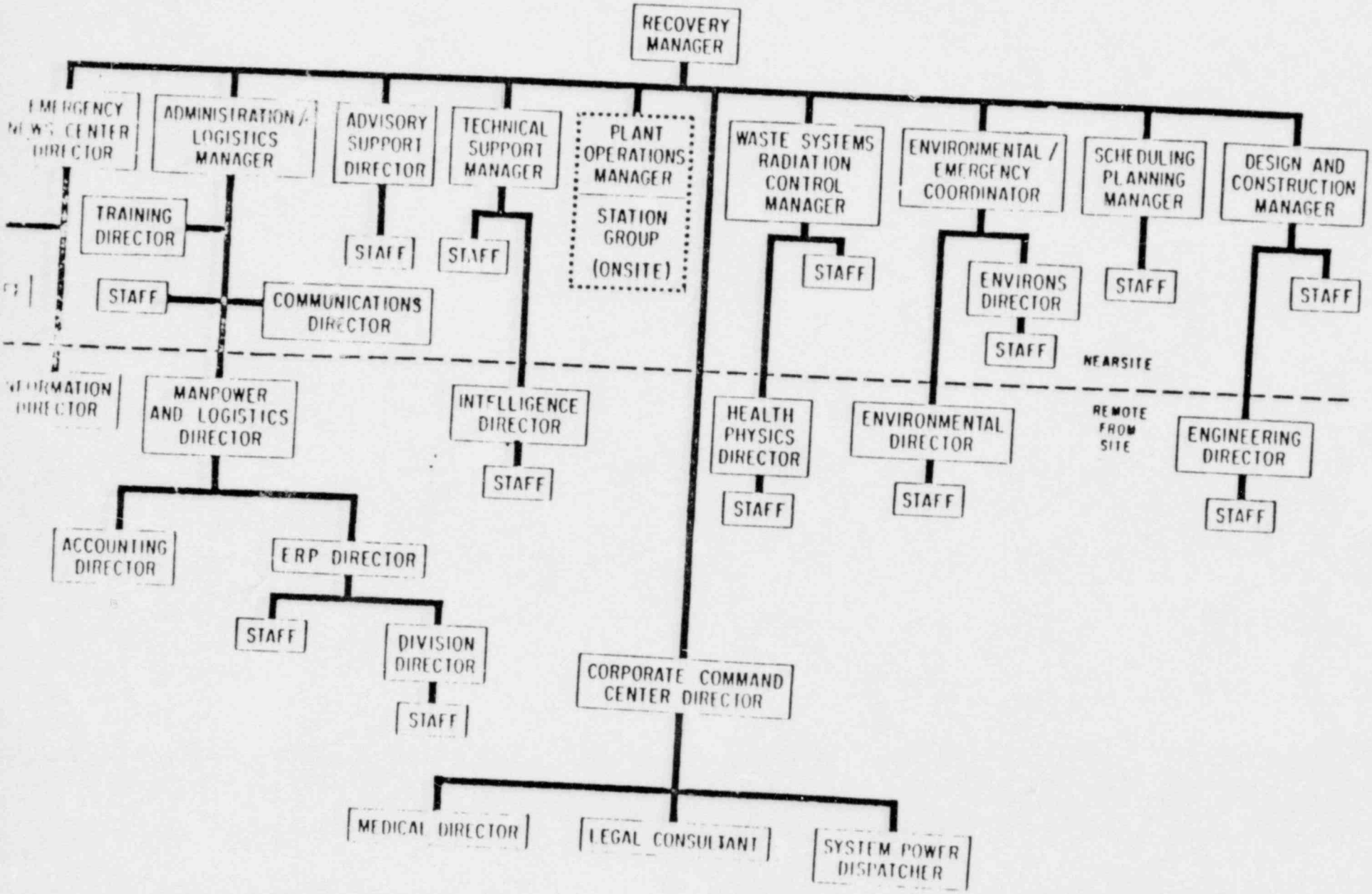
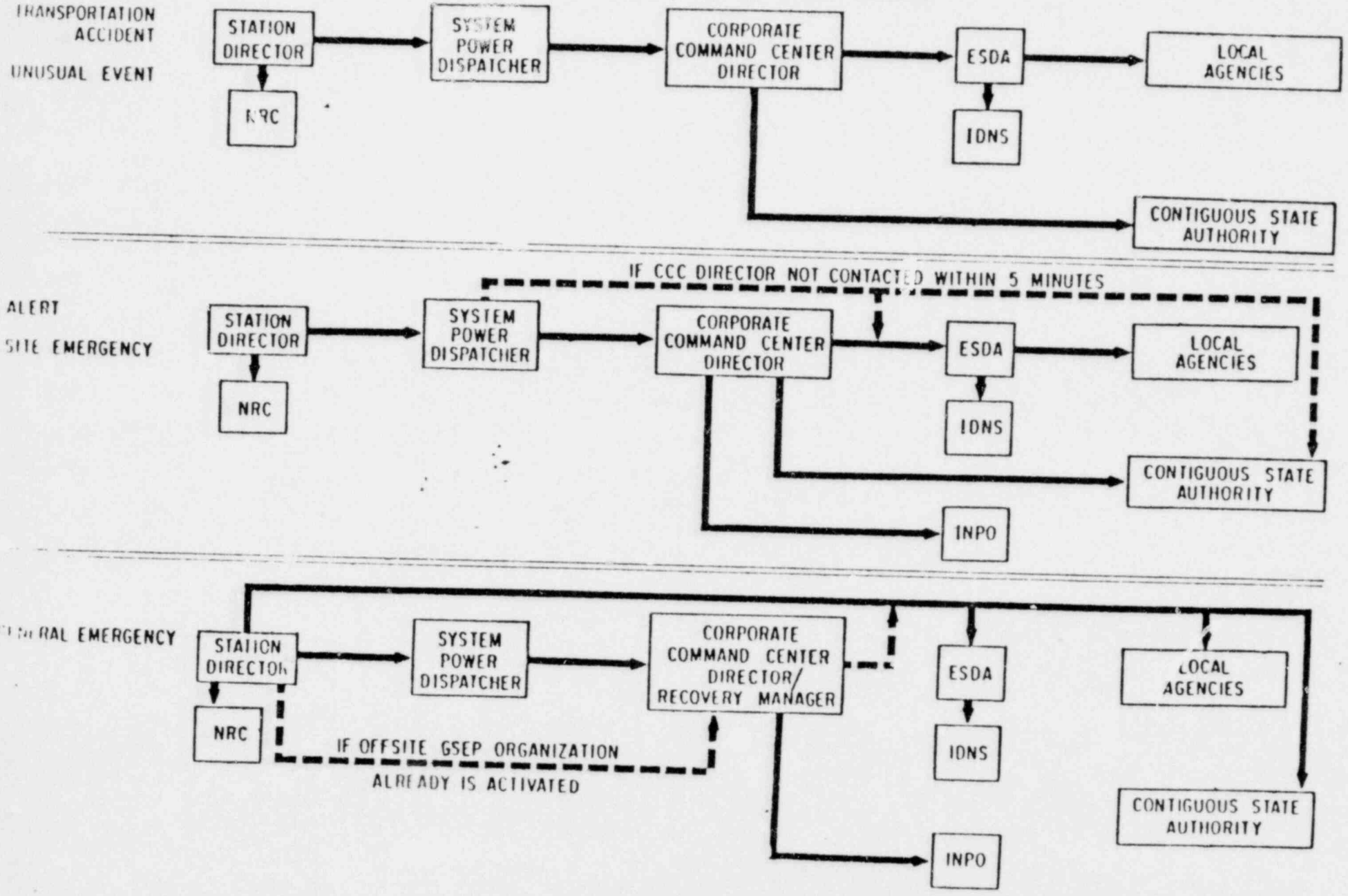


FIGURE 5.4

SIMPLIFIED EMERGENCY NOTIFICATION SCHEME