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REGION III

Report No. 50-331/81-03

Docket No. 50-331 License No. DPR-49

Licensee: Iowa Electric Light and Power Company
Post Office Box 351
Cedar Rapids, IA 52406

Facility Name: Duane Arnold Energy Center

Inspection At: Duane Arnold Site, Pale, IA

Inspection Conducted: September 8-16, 1981

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Inspection Summary

Emergency Preparedness Appraisal on September 8-16, 1981 (Report No. 50-331/81-03)
Areas Inspected: Special announced appraisal of the state of onsite emergency preparedness at the Duane Arnold Energy Center involving 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 304 inspector-hours onsite by four NRC inspectors and one consultant.
Results: No items of noncompliance or deviations were identified; however, several significant findings were identified in the areas of emergency organization (Section 2.1), training (Section 3.2), emergency facilities and equipment (Section 4), procedures (Section 5), and coordination with offsite agencies (Section 6.2.2).

DETAILS

1.0 Administration of Emergency Plan

1.1 Responsibility Assigned

Responsibilities at the Corporate level for emergency planning are assigned to the Manager, Nuclear Licensing and Fuels. This individual is designated the Emergency Planning Coordinator (EPC) and is responsible for developing and maintaining the Corporate and DAEC Emergency Plan. The IELP Director, Nuclear Generation, who is designated as the Emergency Response and Recovery Director, exercises overall direction and control of site and corporate emergency response activities and coordinates with local, State, and federal authorities. The EPC has an Emergency Planning Assistant who provides support in all emergency preparedness activities. No individual at the site functions in an Emergency Planning capacity. Selected site personnel periodically review the Emergency Plan as members of the Operations Committee and provide recommendations to the Safety Committee Chairman.

1.2 Authority

Personnel assigned emergency functions are given authority to perform assigned duties as directed by the Emergency Coordinator (Chief Engineer) or his alternate. Personnel with emergency response functions automatically assume their emergency response positions whenever the DAEC Emergency Plan is activated. Overall direction and control of site and corporate emergency response activities is exercised by the Emergency Response and Recovery Director.

1.3 Coordination

Coordination of various licensee organizations in areas related to emergency planning occurs through a committee framework, which reports to the chairman of the Safety Committee. The EPC is responsible for coordinating offsite and onsite planning activities.

1.4 Selection and Qualification

Personnel responsible for assigned emergency plan functions follow the selection criteria as outlined in ANSI N18.1. In addition, a list of qualifications for the individuals assigned to the planning effort are described in the IELP Plan.

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

- The emergency planning function should also be assigned to an individual who is onsite so that the planning function would have continual viability and site specific input.

- The selection criteria established for emergency planning personnel should be stated as generic criteria that would apply to these positions, rather than a list of the qualifications that the present incumbents possess.

1.5 Quality Assurance of Emergency Preparedness Program

The inspectors interviewed the corporate manager of IELP Quality Assurance Department, who outlined the corporate QA program and the station Quality Control Program. He understood the requirements of 10 CFR 50.54(t) and indicated that an independent audit of the emergency preparedness program will be conducted in March of 1982. He indicated that contracted support may be necessary to conduct an extensive audit.

The manager, corporate QA is independent of the onsite and offsite emergency response organization. However, he does have an emergency procedure and is indicated in the corporate organization. His role during an emergency is QA/QC only. This is acceptable.

The manager, corporate QA has an onsite QC staff which reports directly to him. These individuals may be part of the March 1982 audit. The onsite QC staff will also be used as exercise/drill observers.

QA performed an audit of the emergency plan implementing procedures; however, no independent audit of the entire emergency preparedness program has been conducted. Currently, audit procedures or check lists have not been developed specifically to audit the Emergency Preparedness Program.

Based on the above findings, this portion of the licensee's program is adequate.

2.0 Emergency Organization

2.1 Onsite Emergency Organization

The inspectors were unable to verify that an effective onsite emergency organization has been established based upon a review of the emergency organization and responsibility assignments. An organizational structure chart is included in the DAEC Plan.

The plan identifies the following onsite emergency organization: Emergency Coordinator, Site Radiation Protection Coordinator, Technical Support Center Supervisor, Operational Support Center Supervisor, and Control Room Coordinator. This organization lacks expertise in the following areas: Maintenance Management, Administrative Support, and Security Support. These are critical postions whose functions must be managed during an emergency.

Security should have responsibility for notification, site personnel accountability, and exclusion area access control. Administrative Support is required for procurement practices, supplies, and clerical support. Maintenance Management should provide mechanical, electrical, and instrumentation emergency repairs; direct maintenace crews; and coordinate with technical and radiological personnel.

The existing onsite emergency organization includes individuals who are qualified to provide an adequate line of succession. The Shift Supervising Engineer acts as the initial Emergency Coordinator, thus ensuring 24 hour/day coverage. The Chief Engineer is responsible for the selection of personnel. Formal selection criteria are established indicating staff qualifications for these emergency positions. These qualifications follow the regulatory guidelines of NUREG-0731 (Guidelines for Utility Management Structure and Technical Resources).

Main responsibilities for the onsite organization include:

Emergency Coordinator

- Insure activation of the DAEC Emergency Plan, which includes accident classification.
- Insure notification of local, State, and federal officials.
- Provide initial recommendations to State and local authorities.
- Coordinate with the corporate emergency response organization.
- Coordinate efforts to mitigate consequences of the emergency and return the plant to a stable and safe condition.

Site Radiation Protection Coordinator

- Conduct initial evaluation and assessment of the onsite and offsite radiological hazards.
- Supervises monitoring teams in and around the plant.
- Assesses need for protective actions for onsite and offsite personnel and coordinates recommendations with the Emergency Coordinator.

Control Room Coordinator

- Provides direction and assistance to the Shift Supervising Engineer (SSE).
- Assists the SSE in coordinating reactor operational activities.
- Monitors reactor activities to ensure that it is operated and maintained in a safe condition.

Technical Support Center Supervisor

. Activates TSC.

. Provides supervision and direction over the TSC personnel.

Operational Support Center Supervisor

. Provides Supervision and direction over OSC personnel.

. Determine Status of accountability and report results to Emergency Coordinator.

. Provides onsite and offsite monitoring teams.

Walkthroughs and interviews with management personnel determined that these personnel were aware of their emergency responsibilities and authority. Each were trained in the emergency plan and procedures.

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

. The emergency response organization does not provide all needed management and technical positions to provide necessary emergency response. The positions that are lacking include Administrative Support, Security Support, and Maintenance Support.

2.2 Augmentation of Emergency Organization

2.2.1. Onsite Emergency Organization

The licensee has established a management and supervisory duty officer call system. Personnel always on 24 hour/day call include: two dedicated trained communicators, an Emergency Coordinator, and a Site Radiation Protection Coordinator. Other management personnel who are usually on 24 hour/day call include: TSC Supervisor, OSC Supervisor, and a Control Room Coordinator. Other management personnel may be included on the duty roster in the future.

The licensee plans to develop an improved duty officer pager system. This will include identical frequency pagers for several management and supervisory personnel. The inspectors agreed with the licensee regarding this approach.

Other onsite emergency response personnel are notified by security guards under the direction of the Shift Lieutenant of the Guards. Procedures are established with a prioritized phone call out list to ensure that the design objectives of Table B-1 of NUREG-0654 are met. Several security guards were interviewed and demonstrated a working knowledge of their tasks. Several Shift Lieutenants indicated that no off hours drills have been conducted to ensure that the design objectives of Table B-1 are met. The licensee plans to conduct one of these drills in the near future.

Tag boards are provided in the OSC for conducting predefined tasks in a timely manner. These tasks include: (1) in-plant surveys; (2) habitability monitoring at assembly areas; (3) personnel monitoring; (4) rescue and emergency repair; (5) emergency monitoring onsite; (6) emergency monitoring offsite; (7) communication and records control; (8) chemical analysis; and (9) control room communicator (STAs). Personnel assigned and trained in these tasks will, upon arrival onsite, take their tag and immediately begin implementation.

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

- Conduct an offhours shift augmentation drill to ensure the duty officer system and procedure call out list meet the design objectives of Criterion II.B.5 of NUREG-0654, Revision 1. Records should be maintained of these drills, which should be conducted quarterly.

2.2.2. Offsite Emergency Organization

The augmentation of the offsite emergency organization is made by contacting the corporate duty officer. The Director, Nuclear Generation is responsible for activating the corporate organization. This organization will be activated for a Site Area or General Emergency and may be placed in standby for lesser emergencies. The Director, Nuclear Generation assumes the position of Emergency Response and Recovery Director at the EOF.

The following personnel assignments and main responsibilities for the corporate organization are:

- Emergency Response and Recovery Director

  Activate corporate emergency plan and coordinate EOF activities with the onsite Emergency Coordinator.

- Radiological Assessment Coordinator

  Directs offsite monitoring teams after activation of the EOF, performs Dose Projection Calculations, and provides protective action recommendations.

- Emergency News Center Director

  Ensures that accurate and timely information is provided to the public; coordinates press releases and news media briefings with local, State, and Federal public information officers; and controls rumors.

. Radiological and EOF Manager

Responsible for coordinating and directing all offsite radiological monitoring and dose assessment programs, and supervising activities within the EOF.

. Emergency Support Manager

Responsible for providing direction and assuring proper execution of requests from the Emergency Response and Recovery Director and from technical engineering and support services which are necessary to assist in the recovery effort.

. Technical and Engineering Support Supervisor

Responsible for providing direction and assuring proper execution of requests for technical and engineering services. Areas of assistance include: directing technical support staff and analyzing plant conditions; providing experienced personnel for the plant staff; developing off-normal emergency procedures; and implementing contracts and agreements with Architect/Engineer or Nuclear Steam System Supply consultants and contractors.

. Support Services Coordinator

Responsible for coordinating and directing support capabilities such as administration, communications, transportation, security, procurement of equipment, safety, personnel support, and others as requested by the Emergency Support Manager.

The Onsite Emergency Coordinator reports to the Emergency Response and Recovery Director during emergencies. The Emergency Response and Recovery Director has available to him legal advisors, insurance and risk managers, and other IELP corporate management at the Vice President level.

Key members of this organization can be contacted 24 hours/day using a radio pager system. The organization was developed on a functional basis along IELP existing organizational lines.

Several key members of the Corporate emergency response organization were interviewed to ensure awareness of their responsibilities and tasks. In general, these members were aware of their role during an emergency.

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

3.0 Training and Retraining

3.1 Program Establishment

The formal emergency response training program is documented in Section O of the DAEC Emergency Plan, and in Section E of the IELP Emergency Plan. Details of the program were outlined in EPIP 6.2 "Training and Drills," and CPIP 4.3, "Training and Drills." The plan requires initial training and annual refresher training for personnel called upon to perform emergency functions.

Site Training Program

Site personnel not involved in emergency response received initial emergency plan training in the General Employee Training (GET) and refresher training is required every two years. The Emergency Plan training was separated into four basic modules. The four modules were:

Module 1 Emergency Monitoring Course.
Module 2 OSC Supervisors Course.
Module 3 TSC Supervisors Course.
Module 4 Emergency Coordinator Course.

Attachment 1 to EPIP 6.2 specified the various DAEC personnel groups and the training module(s) required for each group. The total material described above includes all the functional areas of emergency activity covered in the plan.

Training consisted primarily of lecture type classroom instruction. Lesson plans are basically a course content outline and were provided for each category of training. However, the lesson plans did not include specific performance objectives or a defined basis for valid determination of the individuals ability to perform the assigned emergency tasks. Written examinations were required with a test score of 70% or better to pass, but hands-on demonstrations or walk-throughs were not generally indicated. A review of training records showed that walkthroughs and hands-on demonstrations were frequently used as part of the training, and were documented.

First Aid training and Fire Brigade training programs were included as part of the training program. The inspector deemed these programs adequate.

The contents of the emergency plan training courses given were adequate, except for specific training on potential or anticipated unusual conditions resulting from an emergency.

Personnel training was well documented by attendance records specifying date, time, subject, length of training period, instructor, and attendance. A wall chart was used which listed all plant personnel by name, the type of training they had received, and when refresher training was due.

In reviewing the training records it appeared in numerous instances that the ±25% tolerance allowed in required training frequency had been used to lengthen the frequency of annual training to 14 or 15 months and two years frequency to 2½ years.

No formal system exists for training emergency plan response personnel to significant changes in the plan or the implementing procedures if changes occurred between annual training sessions. Administrative Control Procedure (ACP 1401.11) had been used in some instances to inform selected personnel of plan or procedure changes. This system provided for routing of the information but no training in the changes was conducted.

Corporate Training Program

The IELP Emergency Plan, Section E.1 and CPIP 4.3 assigned to the EPC the responsibility for coordinating the corporate training program. No documented training program had been developed for corporate or offsite agency personnel, and no formal plans or schedules were established.

Some documentation was in place to indicate that Emergency Plan indoctrination and familiarization lectures had been given to most corporate personnel. The quality of the documentation and the lack of formal schedules and personnel lists identifying individuals and training needed did not permit the inspector to determine the extent of training given.

Some letters had been issued notifying personnel of training to be given and requesting attendance. Attendance records were available for those sessions. Informal outlines and teaching aids were available.

The training of contracted support personnel has not been provided for although the licensee representative stated that the need was recognized and a program would be developed.

Since a formal training program had not yet been developed, provisions for notification and training of emergency response personnel of changes in the plan and procedures were not established.

Formal criteria for the selection of personnel for emergency plan assignments was established for twelve key positions in the IELP Plan. Recommended levels of education and experience were defined.

3.2. Program Implementation

Site training records and walkthroughs with licensee personnel demonstrated that training on the emergency plan and implementing procedures had been given. The site training program appeared adequate.

The corporate and outside agency personnel training appeared to be deficient in that a formalized plan and schedule had not been established and adequate training of outside agency support personnel had not been conducted. Interviews with outside agency personnel indicated a lack of general health physics training. Specifically, no health physics training had been provided to fire protection and ambulance personnel.

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

- Develop and implement a formal training plan and schedules for corporate and offsite agency support personnel including health physics training for fire department and ambulance personnel.

- Provide specific training to emergency response personnel on what to expect under unusual plant conditions, such as components and areas with high radiation levels, magnitudes of radiation increases, and changed nuclide composition; and include specific training to health physics technicians on plume monitoring techniques.

In addition, the following matters should be considered for improvement:

- Develop formal lesson plans to include specific performance objectives, hands-on practice, and walkthroughs.

- Review the use of the ± 25% time tolerance allowed on training and retraining frequency to meet the intent of the requirements.

- Develop and implement a formal system for alerting and training emergency response personnel on significant changes in the plan and/or procedures between scheduled training sessions. Training on these changes should be conducted using techniques similar to initial training to assure individual ability to perform assigned tasks.

- Improve the quality of documentation of training performed at the corporate level and to offsite agency support personnel

4.0 Emergency Facilities and Equipment

4.1 Emergency Facilities

4.1.1. Assessment Facilities

4.1.1.1. Control Room

The inspectors observed that the Control Room had adequate copies of the IELP and DAEC Emergency Plans and necessary EPIPs and Plant Emergency Instructions, e.g., PEIs. In addition, the Control Room contains a copy of the Iowa State, Linn and Benton County Emergency

Plans. Adequate primary and backup communications exist to the Technical Support Center (TSC), Operational Support Center (OSC), NRC, and offsite local and State agencies. Control Room operating staff were familiar with the use of this equipment. Two closed circuit television cameras were also present in the Control Room, and are used to provide access to data on the front panel of the Control Room in the TSC.

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 examined the permanent TSC facilities, equipment, and procedures. The equipment presently in place appears to be adequate with the exception of the Safety Parameter Display System (SPDS) which must be installed in accordance with the schedule set forth in NUREG-0696. This is an Open Item.

The licensee has currently installed a closed circuit television system providing two cameras in the Control Room with two television screens in the TSC. The inspectors observed the operation of this system and determined that the resolution of the system was poor and the display of colored indicating lights was black and white. This does not provide color-coded assessment information. Many of the parameters necessary for assessment actions could not be seen by either of the TV cameras. Some examples are Area Radiation Monitors, all meteorological instrumentation, offgas radioactivity releases and flows, and containment suppression pool cooling parameters. All of these instruments are located on panels behind the main Control Room panels. Although use of this system is acceptable on an interim basis, full acquisition capability of Regulatory Guide 1.97 parameters directly in the TSC must be accomplished in accordance with the schedules set forth in NUREG-0696. This is an Open Item.

The inspectors timed the walking distance between the TSC and Control Room. They determined it to be less than a five minute walk without use of the elevator. The Control Room is two stories above the TSC.

The TSC contains all communications systems described in the DAEC Emergency Plan, and meets the regulatory positions of NUREG-0654, Revision 1. The area designated for NRC use contains two commercial telephones as well as an ENS and HPN extension.

Radiological habitability monitoring of the TSC will be accomplished by continuously monitoring the radiation levels inside the TSC, and at the intake of the TSC ventilation system. In addition, EPIP 2.2 specifies that airborne sampling in the TSC will be conducted. In the event the TSC is not habitable, the Control Room has been designated as the backup TSC.

The inspectors observed that an adequate and functional independent ventilation system exists for the TSC. Prefilters, particulate (HEPA) and charcoal filters are installed in the ventilation system, and this system is capable of intake isolation and shifting to a filtration/adsorption mode upon detecting high radiation levels.

Shielding of the TSC has been designed in accordance with Task Item II.B.2. of NUREG-0737; i.e., limit personnel exposures to 5 rem to the whole body over a 30-day period.

The TSC is sized to provide adequate working space for twenty-five personnel, including working space for five NRC personnel. However, the entire TSC is currently occupied by permanent offices and the licensee's document control center. This is in direct contradiction to the licensee's submittal dated January 3, 1980, which included the "Design Criteria and Conceptual Design Description for the Technical Support Center for Iowa Electric Light and Power Company Duane Arnold Energy Center." Section 3.1 of this submittal states, in part, the TSC will not be used for permanent office work space. As a result of this use, the TSC is not in an operational state of readiness. No provisions have been made to specify where each individual reporting to the TSC is to locate, or how the current layout of desks, chairs, tables, etc. is to be utilized. This must be corrected so that the TSC can be fully operational within five minutes of manning.

Since document control is normally located in the permanent TSC, current records, procedures, Technical Specifications and various schematics and drawings are readily available. Several areas in the TSC contain copies of the DAEC Emergency Plan and Implementing Procedures.

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

- The TSC should be placed in an operational state of readiness. The exact location (e.g., desk, table) for each individual who reports to the TSC should be easily identified. This functional layout should be included in the DAEC Plan and EPIP 2.2. The use of the TSC in regards to permanent office space must be in accordance with the licensee's January 3, 1980, submittal.

4.1.1.3 Operational Support Center

The Operational Support Center (OSC) is as described in the DAEC Plan and EPIP 2.1 (Activation and Operation of the OSC). The OSC is large enough to accomodate all assigned personnel, and is operated under the direction of the OSC Supervisor. All emergency equipment and supplies specified in the plan were found operable and within calibration by the inspectors. In addition to the plant paging system and normal telephones, two dedicated phone links between the OSC, Control Room, and TSC are available. Because

of its size, one of these dedicated phones is located at each end of the OSC. The OSC does not provide personnel protection from direct radiation and airborne contaminants; however, provisions are made to routinely sample the OSC for habitability. EPIP 4.1 specifies that if the OSC is not habitable, personnel shall be redirected to an alternate assembly point.

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

4.1.1.4 Emergency Operations Facility (EOF)

The permanent EOF is located 10 miles southeast of the facility in the Iowa Electric Towers, on the fourteenth floor. An Emergency News Center is located on the sixth floor of this building (see Section 4.1.4). This EOF is as specified in the Emergency Plan, and contains enough space for all personnel assigned to the EOF (e.g., exceeds 75 square feet/person). Working space for Federal, State, and local officials is provided. Installation of all equipment described in the IELP Plan has not yet been completed; e.g., dedicated communications channels between the EOF and NRC, State EOC, and County EOCs. Some assessment equipment such as maps and a computer terminal are located in the EOF, but installation of the SPDS and other data display systems has not been completed. The EOF contains several complete sets of plant records, P&ID drawings, complete plant procedures, FSAR, design and Technical Specifications, DAEC and IELP Emergency Plans, corresponding implementing procedures, and one copy of the Iowa State, Linn County, and Benton County Emergency Plans. The EOF also contains adequate supplies of radiological instrumentation and personnel protective equipment. This EOF should meet the regulatory positon of NUREG-0696; however, the licensee has not submitted their response to the NRC request to provide conceptual design information for the staff to evaluate the EOF. The EPC stated that they planned to make this submittal in conjunction with their upgraded meteorology submittal prior to January 1, 1982. The permanent EOF contains adequate primary and backup communications equipment as per NUREG-0654, Revision 1, except as noted above.

Personnel assigned to report to the EOF will report to their normal work area, with the exception of the Emergency Response and Recovery Director, Radiological and EOF Manager, and Emergency Support Manager. These individuals have specific offices within the EOF. The licensee should include in their NRC submittal a layout diagram showing where all personnel would be located.

The EOF is an Open Item pending completion of the data display systems and review of the conceptual design submittal. As an interim EOF it is acceptable.

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

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

Currently, the licensee has no capability to collect post-accident samples from the primary coolant system (RHR), drywell or suppression pool air, or secondary containment under accident conditions. This is a generic problem with most BWR reactor designs. If a post-accident sample is necessary under accident conditons, the licensee will obtain samples by using their normal sample location.

The licensee is currently installing a permanent post-accident coolant and containment air sampling system. This system should be fully operational by January 1982. The system will be capable of sampling primary coolant from RHR system and directly from the Jet Pump. Both dissolved gas and liquid samples are obtainable from the system. Demineralized water dilution capability of 100:1 is also provided for hot samples. The system will be installed in the access control area near the HP office.

Dry well air, suppression pool air, and secondary containment air samples can be obtained from this same system. Radioiodine and particulate samples are collected through a special chamber designed with heavy shielding. Shielded transportation carts will be available for movement of elevated radiation samples.

Analysis of post-accident coolant and containment air samples will be conducted in the normal onsite laboratory if available. Samples will be purged of noble gases prior to analysis and liquid samples further diluted to acceptable counting levels.

Based on the above findings, this portion of the licensee's program is adequate for interim use only. Because the permanent system is not operational, and no procedures or training exist, this area is an Open Item and will be examined at a later date.

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

The inspectors examined the licensee's interim post-accident effluent sampling and analysis capability. Currently, the licensee has installed noble gas effluent monitors for the reactor building exhaust, turbine building exhaust, and offgas exhaust.

Three reactor building exhaust monitors are located at the 855 foot level of the refueling floor. Counts per hour and flow can be directly obtained from the monitor panel. These monitors are low range and will be offscale for releases greater than 1 Ci/sec. Due to this, the licensee has temporarily installed intermediate and high range shielded probes at this sample location. The

readout for the intermediate monitors is located at the panel. Readout for the high range monitor is located remotely at the OSC.

A turbine building roof exhaust sampling station for noble gases, radioiodine and particulates has been temporarily installed at the 730 foot level of the turbine building. Turbine building exhaust activity and flow is remotely measured at this sampling station; however, the flow meter reading is ambiguous. Flow is measured in CM/HR, but the log sheet for recording sample results has flow in CFM. Further, the walk-through with H.P. personnel verified that they were unsure of what actual flow rates were. Radioiodine and particulate samples must be normally obtained locally from the sample station. No real time inline monitor currently exists for those radionuclides.

An interim normal and high range offgas effluent monitoring system is installed to measure small releases and large volume release rates. The normal range system is capable of determining a source term up to 1 Ci/sec. The high range system is remotely read out at the OSC, and can measure a source term of up to 4×10^{4} Ci/sec.

The remote readout scaler (RM16) at the OSC has a four position switch which allows readings of the high range offgas monitor, and three channels of high range reactor building exhaust monitor. The switch indicator is incorrectly labeled in accordance with operating procedures. The switch is marked as follows: Offgas, A, B, and C. The procedure is labeled 1, 2, 3, and 4. This is ambiguous.

Post-accident sampling of radioiodine and particulates is conducted by obtaining grab samples from the normal location of the monitors. This is unacceptable for a permanent system. In the interim, the licensee has prepared emergency procedure RP-13.2, Emergency Sample Retrieval and Analysis. The procedure gives detailed guidance on how and where to collect reactor building, turbine building, and offgas samples. Capability to obtain both particulate and radioiodine samples exists. The procedure requires the user to remove the old filter and cartridge and replace with new ones. It does not require silver zeolite cartridges as replacements. Further, walkthroughs with H.P. technicians indicated that they would not do this. This is a deficiency which must be corrected. Only six silver zeolite filters were available on site and these were locked up in the TSC.

Analysis of these samples will be conducted by the normal onsite laboratory.

The licensee is currently planning to install three post-accident real time inline monitors. This should be completed during the upcoming October outage. Each exhaust pathway will be monitored. Data display will be remotely available in the TSC on the computer with display on CRTs. Hardcopy will also be available. The system

purchased is manufactured by Koman Science. The system is capable of real time noble gas measurements from 10^{-7} uCi/cc to 10^{5} uCi/cc. Three individual detectors are available to measure this range with automatic switching to the next higher range.

Particulates and halogens can be measured up to 10^{2} uCi/cc. Stack concentrations beyond these levels will peg the inline detectors. As a result of this, remote sampling will be necessary.

Remote sampling will be conducted at the sample stations which are located in the following areas: 855 foot Reactor Building refuel floor; 780 foot Turbine Building level; and first floor of the main stack. Due to high radiation levels in the Reactor Building from a R.G. 1.3 source term, this area will not be accessible for sample retrieval. Accordingly, the licensee is also installing remote sampling capability of this pathway. Sample ports will be located on top of the Turbine Building. A dedicated portable sampling kit will be available for these samples. Sample retrieval for the Turbine Building and main stack exhaust should be accessible under accident conditions. Installation of the permanent system is an Open Item.

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

- Obtain sufficient silver zeolite cartridges for replacement cartridges for post-accident effluent sampling. These cartridges should be readily available in the emergency team lockers located in the OSC.

The following matters should be considered for improvement:

- Properly label the turbine building exhaust flow monitor and change the procedure to ensure proper flow units are recorded.

- Properly label the remote switch for the high range noble gas scaler.

4.1.1.8 Post Accident Liquid Effluent Sampling

The inspectors examined the facilities for post-accident liquid effluent sampling and analysis. These facilities are equivalent to those used under normal conditions. Postulated accidents involving liquid effluents should not warrant special facilities for performing the sampling; however, special remote handling equipment should be obtained to deal with elevated radwaste samples.

Process liquid radwaste must pass through a radiation monitoring system prior to canal discharge. If levels are too high the monitor will alarm on the Radwaste Panel and isolate the discharge. A Radwaste Operator is currently onshift.

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

. Obtain radwaste sampling equipment for handling elevated radwaste samples under accident conditions.

4.1.1.9 Offsite Laboratory Facilities

Offsite laboratory support for low level and environmental sample analysis is provided by the Iowa State Hygienic Laboratory located approximately 30 miles from the plant site. In addition, environmental sample analysis can be provided by vendors as part of the routine environmental sampling program.

Backup support laboratories for analysis of high level samples was not provided. The licensee recognized that offsite high level sample analysis support was needed. Discussions have been held with the BWR owners group on providing a centralized laboratory support facility.

Currently, no adequate offsite laboratory analysis capability exists for counting these samples if the onsite lab is lost. The licensee currently has a 2" NaI multichannel analyses system mounted on a two wheel dolly. The licensee claims this system is portable; however, the inspectors do not agree. Further, this system is currently being used to monitor radioiodine air levels in the permanent TSC.

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

. Establish offsite laboratory facilities which have the capability of environmental and high level sample analysis. This can be done in conjunction with the offsite reassembly area described in Section 4.1.2.1.

4.1.2 Protective Facilities

4.1.2.1 Assembly/Reassembly Areas

The inspectors examined the assembly areas which are located as described in the DAEC Emergency Plan, namely the OSC, the Bechtel changehouse building, the Security Control Point, and the TSC. EIP 4.1 describes which personnel go to each assembly area. With the exception of the Bechtel changehouse, all other assembly areas contain an Area Radiation Monitor. As part of the assembly procedure, all assembly areas will be monitored for radiological contamination to ensure habitability. However, if the assembly area is not habitable or an offsite evacuation is necessary, the licensee has made no provisions for an area offsite to reassemble

and monitor evacuees. MSA supplied air pacs are located in the OSC, as well as a large supply of protective clothing. Emergency lighting is installed at the OSC, and flashlights are also available.

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

- Establish an offsite reassembly area where evacuees may reassemble, be monitored for possible contamination, and decontaminated if necessary.

4.1.2.2 Medical Treatment Facility

A medical treatment facility was provided onsite near the access control point, which is part of the OSC. The firstaid room was readily accessible to the controlled area and to personnel decontamination supplies, showers, survey instrumentation, and communication equipment. Adequate emergency first aid equipment and supplies appeared to be available.

Directing and controlling the administration of radio-protective drugs is described in EPIP 4.2; however, no supplies of thyroid blocking agents or procedures for administering them existed.

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

- Develop procedures for administration and establish supplies of radio-protective drugs and include action levels for use, storage locations, and control.

4.1.2.3 Decontamination Facilities

Decontamination facilities including shower, sinks, survey instruments, and supplies were available at the OSC. In addition, personnel decontamination kits, instrumentation and procedures were available at the Control Room, IE Tower building, and Mercy Hospital.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but when the offsite reassembly area described in Section 4.1.2.1 is established, provisions for personnel decontamination at this area should be included.

4.1.3 Expanded Support Facilities

The licensee had made no formal provisions for work facilities/resources or communications for contractor and non-licensee augmentation personnel. Discussions with licensee personnel indicated that additional space supporting resources and communications would be readily available at and near the EOF, but that supplemental

facilities at the site would require temporary trailer housing and added communications would be difficult. He stated that a new PBX (telephone) system will be installed in approximately one year which should make communication links more available.

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

. develop formal provisions for expanded support facilities (mobile trailers, communications, other resources) necessary for contractor and non-licensee augmentation personnel.

4.1.4 News Center

The licensee currently has plans for establishing a news media center on the sixth floor of the IE Tower building in Cedar Rapids. The Emergency News Center Director is responsible for establishing and operating the media center whenever activated. The Emergency News Center will be equipped with copying equipment, a public address system, and audio visual equipment for making presentations. The facility can accommodate up to 200 media representatives. If additional space is necessary, a theater across the street from the IE Tower Building is designated for use to accommodate media personnel. Although this theater is of adequate size, the licensee does not have a Letter of Agreement with theater management to assure availability of the theater. The licensee has made arrangements to install a bank of pay telephones in the lobby for use by the press.

The licensee indicated that the Emergency News Center would be used as a joint facility for State, local, and federal representatives. This joint concept was not procedurally developed. Security and access control measures will be established and the press restricted to the sixth floor.

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

. Develop a procedure that explains how the news media center will be used by State, local, federal and licensee spokespersons to coordinate public information activities and conduct media relations.

. Develop a Letter of Agreement with the Paramount Theater for use as an alternate Emergency News Center.

4.2 Emergency Equipment

4.2.1 Assessment

4.2.1.1 Emergency Kits and Survey Instrumentation

Emergency kits had been established at the Control Room, OSC, EOF, and Mercy Hospital. Inspection of the kits showed location and contents of the kits were as specified in the plan and procedures except for miscellaneous items which were on order. In the OSC, the emergency kits consisted of several locked cabinets with supplies segregated by shelf to correspond to equipment needed for each tag board assignment. It was observed during walkthroughs using these supplies, that providing a suitcase or package for each shelf would help assure that all necessary supplies were taken and aid in timely transport of supplies. It was also noted that an instrument check source should be made available at the emergency cabinets for functional testing of instruments before use.

Section I of the DAEC Emergency Plan states IELP personnel at the DAEC site have been provided instrumentation which has the capability to detect and measure radioiodine concentrations in the air in the site vicinity as low as 5E-08 uCi/cc under field conditions in any kind of weather. It was noted that this instrumentation was not available to the field survey teams and that the equipment was not portable without extensive setup and recalibration. Discussion with licensee personnel showed that existing practice provided for field survey teams to return to the site with air samples for evaluation. Capability to detect and measure field radioiodine concentrations in air of at least 1E-07 uCi/cc without regard to the presence of noble gases and resulting background radiations must be provided. Equipment for taking, packaging, or preserving environmental samples was not provided in the offsite monitoring teams' emergency kits.

Radiation detection and measurement instruments in the kits were included in the routine instrument re-calibration program and were in current calibration. It was noted that not all respirators in the emergency kits were bagged and, for the particulate filter respirators, it was not possible to determine if inspection and radiological surveys had been performed.

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

- Provide portable instrumentation to field survey teams capable of detection and measuring radioiodine concentrations in air of at least 1E-07 uCi/cc without regard to the presence of noble gases and resulting background radiation.

In addition, the following matters should be considered for improvement:

- Package emergency supplies in a suitcase or other easily transportable container to prevent loss of portions of the supplies during movement and to aid in transport.

- Provide instrument check sources in emergency cabinets to facilitate functional testing of instruments before use.

- Bag face masks of emergency respirators to maintain cleanliness and retard deterioration.

- Provide a system to inform and assure the respirator user that the respirator has been inspected and surveyed.

- Provide dedicated equipment and supplies in emergency kits for emergency environmental monitoring. A limited scope program for taking and assaying water, soil, vegetation, and milk samples for quick assessment should be developed.

4.2.1.2 Area and Process Radiation Monitors

FSAR Sections 7.12 and 7.13 describe the fixed process radiation monitoring system and Area Radiation Monitoring (ARM) system respectively at the DAEC. The description covers the name, location, type, range, and number of the monitors, along with the environmental design characteristics. Direct readout capability in the Control Room for all ARMs and most process monitors exists. Intermediate and low range Reactor Building Exhaust and Turbine Building Exhaust can only be readout locally. In addition, high range instrumentation for these process monitors is readout in the OSC (see Section 4.1.1.7). The calibration and source checks for these monitors are specified in instrument maintenance and radiation protection procedures.

All ARM and process radiation monitoring systems described in the DAEC Plan other than the high range containment monitors were installed and operable. The licensee plans to install two containment monitors that are capable of measuring 1E+7 R/hr dose rates in containment. EALs for these monitors have not yet been developed. Installation calibration and development of EALs for the containment radiation monitor is an Open Item.

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

4.2.1.3 Non-radiation Process Monitors

Chlorine is used by the licensee for routine chlorination of plant service water. The DAEC Plan does contain EALs for toxic gases. Although there are no chlorine monitors in the intake for the Control Room ventilation or other ventilation systems, the licensee is capable of monitoring chlorine concentrations using RPP 7.5 and the appropriate sampling equipment. This

portable chlorine sampler is maintained in the OSC. Most licensee personnel interviewed were unaware of this chlorine monitoring availability. All individuals capable of acting as Emergency Coordinators should be trained in the availability of this monitoring system, and the conditions under which it should be used to determine EALs.

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:

- Emergency Coordinators should be trained in the availability of the portable chlorine concentration sampler and the conditions under which it should be used to determine EALs.

4.2.1.4 Meteorological Instrumentation

The bases for the review of the licensee's meteorological measurements program included Regulatory Guides 1.23 and 1.97, and the criteria set forth in NUREG-0654, 0696, and 0737.

The licensee provided a brief description of the meteorological measurements program in Sections H & I of the DAEC Emergency Plan with reference to Section 2.4 of their FSAR. The integration of meteorological data into the licensee's dose assessment scheme was described in EPIPs 3.3a and 3.3b. The inspectors reviewed the licensee's preventative maintenance program and schedule maintained by Instrument and Control (I&C) personnel.

The inspectors determined that the licensee's meteorological capabilities address the requirements of NUREG-0737, Task Item III.A.2 and the criteria set forth in NUREG-0654, Appendix 2 in adopting the compensating measures to milestone three. The meteorological measurements system can provide the basic parameters necessary to perform the dose assessment function, namely, wind direction and speed and an estimate of atmospheric stability. Data from the meteorological measurements system are provided on strip charts located in the control room.

All measurement systems appeared to be in operation and were scheduled for calibration shortly. The licensee's preventative maintenance program consists of a multi-tiered, graded set of review, surveillance and calibration activities that provides reasonable assurance that appropriate data will be available for use; however, this program is not covered by a controlled procedure. In the event of system unavailability, the licensee has made provisions for access to alternate data sources that may be characteristic of the site; i.e., Cedar Rapids FAA station. The applicability and use of the available information should be described to provide the necessary parameters for performing dose projections.

Control room personnel are advised by the Load Dispatcher (equipped with NOAA Weather Wire) in the event severe weather conditions could impact the site area. Provisions have been made for transmission of meteorological information from the plant to offsite authorities using a combination of communication systems. Direct telephone access by NRC staff to individuals responsible for performing dose calculations can be accomplished using the NRC Health Physics Network.

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

- The licensee's preventative maintenance program should be formalized to represent controlled procedures for the following activities: operational reviews, surveillance, and calibration. These procedures should be unambiguous and self-contained, and should be representative of state-of-the-art practices.

- An alternate atmospheric stability categorization scheme should be outlined in the offsite dose assessment procedures to obtain stability categorizations based on data provided from the licensee's alternate source of meteorological data (Cedar Rapids FAA Station).

4.2.2 Protective Equipment

4.2.2.1. Respiratory Protection

The licensee has made available for emergency response personnel several self-contained breathing respirators. Monthly operational checks made of these respirators include: (a) visual inspection for damage, (b) regulator operation, (c) low pressure alarm check, and (d) leakage check.

The inspectors observed licensee personnel conducting these checks and determined that the operational checks are adequate except for proper storage of the face mask. Those kits examined did not provide plastic bags for the face masks to prevent mask deterioration.

Respirators are located in the Control Room, OSC, Health Physics Access Control Point, EOF, and Assembly Area. Full face piece respirators are also available.

A refilling station for the self-contained breathing tanks is located in the locker room and would be habitable under most accident conditions.

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

4.2.2. Protective Clothing

The inspectors examined several emergency lockers and observed that an adequate supply of protective clothing is provided for emergency response personnel. In addition, several new lockers have been purchased which contain several hundred sets of protective clothing. These lockers are presently stored in the administration building.

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

4.2.3 Emergency Communications

The inspectors conducted a review of the onsite and offsite available communications. All of the equipment identified in the plan was in place and operational. Emergency communications resources include, radio systems, a microwave system, normal and dedicated telephone systems, and a radio pager system.

A 24 hour/day capability exists to notify NRC, State, and local authorites. Certain communications equipment at the plant that is not used on a routine basis is not part of a routine periodic testing program. The plan calls for periodic tests to be conducted on all systems in the plant. A more definitive policy and procedure needs to be developed (see Section 5.5.1).

Each of the following key communications links have a primary and backup system:

* Emergency response activation equipment.

* Communications between the facility and the EOF.

* Communications between the facility and the NRC.

* Communications between the facility and state and local EOC's.

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

4.2.4 Damage Control/Corrective Action and Maintenance Equipment and Supplies

The OSC contains emergency equipment kits for one instrument technician, two electricians, and a mechanic. Other damage control needs include temporary shielding and decontamination supplies and equipment. Individual emergency kits have been set up to meet all needs other than temporary shielding which is available onsite. Extra equipment, if required, can be obtained through the Institute for Nuclear Power Operations (INPO) "Notepad" service, to which the licensee has access.

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 DAEC 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. Adequate quantities of emergency reserve supplies are maintained at minimum stock levels. These supplies are maintained in the OSC.

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

4.2.6 Transportation

There were five vehicles assigned to the facility: two security vehicles (four wheel drive), one environmental survey vehicle (four wheel drive), one operations vehicle (four wheel drive), and a maintenance pickup. Three vehicles routinely carried two way communications when in use and were subject to recall for site use if needed. An agreement was in place with the Palo Ambulance Service to provide ambulance service on call.

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

5.0 Emergency Implementing Procedures

5.1 General Content and Format

The implementing procedures for the licensee's corporate and site emergency plans were reviewed. All procedures were arranged in the same format with the following general headings: (1) purpose, (2) applicability, (3) responsibilities, (4) instructions, (5) references, and (6) attachments. This format coincided with the licensee's administrative procedure (ACP 1410.2, Preparedness Plan Implementing Procedures dated August 2, 1979) for procedure format. This ACP procedure was out of date in that the correct title of the emergency plan was not used but the guidance in the procedure was followed.

In some procedures there appeared to be inconsistencies in use of title identifications. In EPIP 4.1 the responsibilities section included the Shift Supervising Engineer, Security Shift Supervisor and the Operations Support Center Supervisor while the instruction section assigned numerous actions to the Emergency Coordinator.

The implementing procedures made reference to existing plant procedures in areas of administration, security, health physics, fire protection, and maintenance. Not all procedures referenced were available. (See Section 5.4.3.1.)

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

- Update administrative procedures to cover the existing emergency plan and procedures.

- Review and revise implementing procedures to assure consistent use of titles in assigning responsibities and actions.

5.2 Emergency, Alarm and Abnormal Occurrence Procedure

The inspectors reviewed the licensee's Plant Emergency Instructions (PEIs) Plant Abnormal Operating Instructions (PAOIs) and Refueling Emergency Instruction Procedures. PEIs are primarily used for protection of the reactor core and containment and PAOIs deal with less severe abnormalities. With the exception of Procedure J.1 (High Gaseous Radiation Outside of Plant), all procedures reviewed do not adequately interface with the emergency plan. Those procedures that describe emergency conditions which warrant classification of an event do not direct the primary user (Station Reactor Operator) to inform the Shift Supervising Engineer (SSE) to implement the DAEC Emergency Plan. This action should be described as a subsequent operator action or followup action by the operator to remind the SSE to classify the event and implement the Emergency Plan.

Failure of Emergency Operating Procedures to adequately interface with the Emergency Plan is a generic problem at DAEC. It became quite clear during this appraisal that the DAEC operating personnel don't feel they need to activate their Emergency Plan unless there are sufficient radiological releases occuring. Interviews and walkthroughs with SSEs indicated that some accidents will require that some type of protective action recommendation (i.e., shelter or evacuation) must be given to offsite agencies. Currently, very little guidance is provided to the SSE with regards to making protective action recommendations based on degrading reactor conditions.

The following PEIs, PAOIs and Refueling Accident Emergency Procedures must, as a subsequent operator action, ensure that the SSE has been notified and directed to classify the event and if necessary initiate the DAEC Emergency Plan:

Plant Emergency Instruction

B.1 - Unidentifiable leakage of 5 GPM or higher
B.2 - Identifiable leakage of 25 GPM or greater
B.5 - High Drywell Pressure
B.6 - Low Reactor Vessel Level
B.7 - Steam Line Flows (Major Steam Line Break)
B.8 - Reactor Water Cleanup High ΔFlow
B.9 - Relief Valve Fails to Close
B.10 - Safety Valve Fails to Close
B.11 - LOCA - Small line Break

B.12 - LOCA Large Break
B.13 - LOCA - Small Break Outside Containment
C.1 - Small Steam Line Break Outside Drywell
C.2 - Large Steam Line Break Outside Drywell
D.2 - Loss of Shutdown Margin
E.1 - Fires
F.2 - High Radiation within the Plant
F.3 - ARM Alarms
F.4 - Atmospheric Exhaust and Ventilation System Radiation Monitor
J.1 - High Gaseous Radiation Outside Plant
J.2 - High Radioactive Liquid Release from the Plant

Plant Abnormal Operating Instructions

C.1 - Loss of Offsite Power
C.2 - Loss of Main Generator and Auxiliary Transformer
C.4- Loss of Startup and Standby Power to an Essential Bus
C.5 - Loss of All Power to an Essential Bus
C.14, 15, 16 - Loss of Vital DC Power
G.1 - Loss of All River Water Supply
I. - Emergency Service Water System Failure
T. - Loss of Primary Containment Integrity

Other Emergency Operating Procedures which also do not interface with the Emergency Plan include: Flood, Tornado, Earthquake, Loss of Fuel Pool Water Level, and several Refueling Emergency Instruction Procedures.

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

. The above listed procedures must include a statement to direct the Reactor Operator to notify and direct the SSE to classify the emergency in accordance with the DAEC Emergency Plan. This statement should be a subsequent operator action to be taken after accident mitigating actions. The statement should be in bold print and bordered.

5.3 Implementing Instructions

The Emergency Plan Implementing Procedures (EPIPs) for the DAEC are not position titled but are arranged by functions only. Responsibilities of emergency response personnel were defined throughout the EPIPs and no formal coordinating procedure or checklist existed. For example, responsibilities of the EC were defined in EPIPs 1.1, 2.1, 2.2, 3.1, 3.2, 3.3, 4.3, 4.4, 5.1, and 5.2. Implementing these duties requires reliance on memory, thus increasing the potential for overlooking necessary actions and delaying the decision-making process.

It became quite clear from interviews and walkthroughs that procedures by title for key emergency response individuals would be useful for them to fulfill their tasks. Some groups, such as security, have already begun to develop their own checklists implementing their functions. Not

all groups in the Emergency Response Organization have done this. Interviews with DAEC and IELP management reflected the need to develop checklists for members of the Emergency Response Organization.

EPIP 1.1. (Determination of the Emergency Action Level) was reviewed by the inspectors and determined to be inadequate. The procedure does not provide guidance for the EC to make recommendations to offsite agencies based on deteriorating reactor core conditions. This is a major deficiency in DAEC emergency response planning. During walk-throughs of SSEs several General Emergency scenarios were presented. In all cases, the SSE correctly classified the event; however, when asked what protective action recommendation he would make, they recognized the need to do something but they were not sure what to do. The procedure failed to provide the guidance.

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

- Develop an Emergency Coordinator Procedure which orchestrates the implementation of all required actions to be taken by the EC. These actions must include: accident classification, site evacuation, protective measure recommendations to offsite agencies, initial direction of inplant radiation surveys, collection of critical plant samples for accident assessment, and initial notification of the Emergency Response Organization. Further, checklists must be developed to ensure other members of the Emergency Response Organization will implement their required actions (i.e., activation of OSC and TSC, site accountability, trend analysis of plant and radiological parameters, offsite radiological monitoring, search and rescue, first-aid, and followup dose projections).

5.4 Implementing Procedures

5.4.1 Notifications

Upon determining that an EAL has been exceeded, the SSE initiates the notification sequence as specified in EPIP 1.2. EPIP 1.1 states that emergency response organizations may be activated for man caused and natural emergencies at the discretion of the Emergency Coordinator. This is in direct contradiction with the Emergency Plan, which requires full emergency response activation for a Site Area or General Emergency, and onsite activation for an Alert. The licensee stated that this is in the procedure to implement the plan under conditions not listed in the EALs. This should be clarified in this procedure.

Nowhere in either EPIP 1.1 or EPIP 1.2 are the emergency notifications referenced to indicate who will be notified based on the emergency classification, or which segments of the response organization will be activated. This must be specified in EPIP 1.2 or developed in a separate procedure or checklist designed for use by the Acting Emergency Coordinator. Although this notification procedure does specify that the NRC, State, counties and Emergency

Coordinator will be notified for any emergency classification, it does not include notification of the Emergency Response and Recovery Director, and thereby cannot assure that the IELP Plan will be implemented, since this individual is responsible for IELP Plan implementation.

If notification procedures commence, the Shift Technical Advisor (STA) acts as the primary notifications caller. If activation of the onsite emergency response organization is directed by the Acting Emergency Coordinator, the STA also notifies the Security Shift Supervisor, who will ensure that security force communicators notify all personnel required to activate the TSC and OSC.

The licensee currently telephones all personnel and organizations that must be notified. These phone numbers are listed in the procedure, along with the office extension number. The procedure does not specify how backup communications systems for notification of offsite agencies can be used (e.g., point to point radio, and IWAS). Planned messages which have been incorporated into the procedure are used to notify all organizations and individuals; however, messages to offsite organizations do not include protective action recommendations or other information specified in Criterion II.E.3 of NUREG-0654, Revision 1. Information specified in this criterion must be included in these planned messages to offsite organizations. These messages must include a recommendation on whether or not the prompt notification system for the public should be activated. Based on interviews with offsite agencies (see Section 6.1), the inspectors determined that an adequate authentication scheme for initial notification to offsite agencies exists.

Notification of corporate response personnel (i.e., manning of the EOF) is ensured by the Emergency Response and Recovery Director (ERRD). Once the ERRD has been notified, he will initiate CPIP 1.2, Personnel Assignment and Notifications. Based on the classification of the event, a phone tree system is utilized to activate the EOF within one hour, and provide supporting staff within four hours.

The licensee is in the process of acquiring a pager system to be used for shift augmentation (see Sections 2.2.1 and 2.2.2). When this system is operational, EPIP 1.2 and CPIP 1.2 should be revised to incorporate the use of this system.

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

. The following must be specified in EPIP 1.2: (1) the Emergency Response and Recovery Director will also be called by the Shift Technical Advisor for any emergency classification; (2) the full activations shall be performed for any Alert, Site Area, or General Emergency, with activation at the discretion of the Emergency Coordinator for an Unusual Event; and (3) planned messages to offsite agencies must be included in EPIP 1.2 which

satisfy the regulatory positon of Criterion II.E.3 of NUREG-0654. Revision 1. These messages shall also include a recommendation on whether or not the prompt notification system for the public should be activated.

The following matters should be considered for improvement:

- EPIP 1.1, Sections 2.0 and 4.5.2 should be reworded to say "Other events not included in these EALs may be classified as an Unusual Event, Alert, or Site Area Emergency at the discretion of the Chief Engineer (Emergency Coordinator) or the Shift Supervising Engineer," rather than the sentence referring to man-caused and natural emergencies.

- Include a description on the use of the backup communications available (IWAS and point to point radio) for notifying offsite agencies in EPIP 1.2.

- When the duty officer paging system becomes operational, EPIP 1.2 and CPIP 1.2 should be revised to incorporate the use of this system.

5.4.2 Assessment Actions

The procedures which orchestrate the implementation of the accident assessment scheme are as follows:

- Activation and Operation of the OSC (EPIP 2.1)

- Activation and Operation of the TSC (EPIP 2.2)

- Initial Dose Projections (EPIP 3.3a)

- Follow-up Dose Projections (EPIP 3.3b)

- Dose Assessment and Protective Action Recommendations (CPIP 2.1)

Using these procedures, some operational and radiological data are gathered for the purpose of assessing the potential for or results of radiological releases; however, these procedures do not provide for the collection of all necessary plant data needed to assess what operational actions may be required to mitigate the consequences of an accident. These responsibilities are defined in the DAEC Plan for the Control Room Coordinator but there is no procedure for his use to assist him in the implementation of his responsibilities.

Overall responsibilities for the assessment of the radiological consequences of the accident rest with the Site Radiation Protection Coordinator (SRPC) for offsite activities, and the Radiological Assessment Coordinator (RAC) for offsite activities. Neither one of these individuals has procedures which would enable them to determine the consequences of an event based on a potential radiological release, nor can they determine whether offsite protective action guides will be exceeded based on a potential release (e.g.,

using current meteorology and containment activity or radiation levels). There are no procedures to determine the magnitude of any resulting contamination based on a radiological release nor are there procedures for assessing the potential dose to man via all pathways as a result of this contamination, and making appropriate protective action recommendations for the ingestion pathway EPZ. (See Section 5.4.2.12.)

Although EPIP 2.1 assembles several monitoring teams, none of these teams have been designated to collect containment atmosphere or primary coolant samples to assist in determining the potential source term of radioactive material available for release.

Action levels have been established to recommend protective actions based on actual submersion exposure rates only. These are described in EPIP 3.3.a and 3.3.b. Both of these procedures are technically inaccurate. Both procedures are based solely on submersion dose at the maximum ground level concentration due to an elevated release, yet both procedures require that the source term be based on reactor and turbine building releases as well as stack releases. Both the reactor building and turbine building release points are effectively ground level releases. Further, since the dose is solely a submersion dose, exposures due to direct radiation from a plume overhead have been completely ignored.

Although offgas and Stand By Gas Treatment (SBGT) radioactive source terms can be determined in the Control Room, this can not be done for the turbine building exhaust. This situation will be corrected when the new airborne effluent monitoring system is installed. (See Section 4.1.1.7.) If Control Room instrumentation is offscale, initial computation of the source term of a release for all pathways other than the turbine building exhaust can be determined from a monitor located in the OSC.

There are provisions to immediately update State and local agencies in the event protective action recommendations must be changed.

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

- Develop a technically accurate dose assessment procedure that will account for radioactive exposures due to both direct radiation from the plume and submersion in the plume for either a ground level or elevated release.

- Develop procedures for use by the Control Room Coordinator, Site Radiation Protection Engineer (SRPE) and Radiological Assessment Coordinator (RAC) to ensure that operational and radiological assessment parameters will be collected, recorded, and trend analysis performed. Procedures must also be developed to allow the SRPE and RAC to determine whether protective action guides may be exceeded based on a potential release, and assess the consequences of offsite

contamination due to an actual release. The procedure for use by the SRPE must include the prioritization of sampling vs. survey activities for the inplant survey teams.

5.4.2.1 & 5.4.2.2. Offsite and Onsite Radiological Surveys

Radiological Surveys are conducted by the licensee using EPIP 3.1 (Onsite Radiological Monitoring)and EPIP 3.2 (Offsite Radiological Monitoring). The equipment needed to perform these surveys is stored at the OSC, and described in EPIP 2.1. All equipment is inventoried quarterly to assure its availability for use.

Although EPIP 2.1 specifies what equipment is to be taken by the survey teams, no procedure is available describing the use of this equipment, especially during emergency situations. A procedure should be included to describe step by step actions which will be followed to ensure the collection of a representative air sample with a minimum of noble gas interference. For surveys, this procedure should specify the methods to be used to determine whether the team is outside or inside plume. This procedure should also describe the means for documenting the results of surveys by the field teams, limitations and precautions, and the means for labeling samples collected.

No provisions have been made to select predetermined sample/survey points for ease in identification of locations. Survey teams are equipped with a copy of the latest plat book, and location information is transmitted to the EOF using available building landmarks, property lines, bends in road, or intersections shown in the plat book.

The Site Radiation Protection Coordinator and Radiological Assessment Coordinator are responsible for documenting survey/sample results for onsite and offsite surveys respectively. This information is documented on the emergency monitoring log, which includes space for radiation levels, location, date, time, airborne activity concentrations, surface contamination levels, team members' names, and team member pocket dosimeter readings. This form should also include the instrument mode (open window, closed window).

EPIP 3.1 and 3.2 describe the methods of communication to be used, and the means by which transportation is obtained for the offsite monitoring teams.

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

. A procedure must be written for the monitoring teams use to specify how to collect a representative air sample minimizing noble gas interference, the means to determine whether the team is near or in the plume, the means for labeling samples

collected, the means for documenting the results of surveys by the teams, and emergency limitations and precautions.

The following matters should be considered for improvement:

- Include on the Emergency Monitoring Log a description of the instrument mode used for the radiation survey results (e.g., open window or closed window).

- Select predetermined offsite sample/survey points for ease in identification of locations.

5.4.2.3 In-Plant Radiological Surveys

EPIP 3.1, Onsite Radiological Monitoring, provided the direct guidance for all in-plant radiological surveys. This procedure provided general instructions and referred to other procedures for specific instructions. Adequate guidance for radiation protection under emergency conditions was not provided in the referenced routine plant procedures (see Section 5.4.2.1.).

Instructions for recording of survey data were included in the procedure and appropriate forms were located in the emergency kits. Labels and bags were also provided for identifying and packaging particulate air sample filters and cartridges. Provisions were included for reporting results to the OSC and TSC Supervisors, but no instructions were provided to the teams regarding disposition of data sheets, samples taken, or other pertinent information.

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:

- Provide instructions to radiological survey teams on disposition of survey data sheets, samples, and other pertinent information.

5.4.2.4, 5.4.2.5, 5.4.2.6 & 5.4.2.7 Post-Accident Sampling and Analysis of Primary Coolant and Containment Air

The licensee has developed interim post-accident sampling procedures for existing sampling facilities. Procedure 13.3 (Rx Coolant Sampling and Analysis) and 13.4 (Containment Atmosphere Sampling and Analysis) were reviewed by the inspectors. The procedure adequately covers limitations and precautions which would be expected during an emergency. These procedures are limited due to accessibility for procurring a sample. Both reactor coolant and containment air samples must be obtained by entry into the Reactor Building. This area would be well over 100 R/hr under accident conditions with a R.G. 1.3 source term. The licensee has done the best they can with existing facilities.

Procedures for the permanent systems have not been developed. This is an Open Item.

5.4.2.8 & 5.4.2.9 Stack Effluent Sampling and Analysis

The inspector reviewed RPP 13.2 (Emergency Procedure for Sample Retrieval and Analysis) and deemed this procedure adequate, except as noted below. Special precautions and limitations are indicated in the procedure ensuring that the user is aware of these. Access routes emphasizing the safest path for obtaining the sample are indicated. Location and range of the ARMs is also specified.

Detailed step by step procedures on how to collect, label, and bag samples is indicated in RPP 13.2. Training has been provided to health physics personnel on the use of the procedure. This was verified by several walkthroughs with these personnel.

As stated in Section 4.1.1.9 (Effluent Sampling Equipment and Facilities) insufficient quantities of silver zeolite cartridges are available onsite for cartridge replacement.

Procedure RPP 13.2 requires the user to replace cartridges with the normal charcoal type during accident conditions. This is unacceptable. When silver zeolite cartridges are obtained in sufficient quantities, this procedure must be changed to direct the user to replace cartridges with silver zeolite.

This is an Open Item pending correction of Section 4.1.1.7.

5.4.2.10 & 5.4.2.11 Liquid Effluent Sampling and Analysis

Currently, no liquid effluent radwaste sampling procedure for accident conditions exists. Interviews with several radwaste operators indicated that normal sampling procedures would be used. If elevated samples were identified, the radwaste operator would contact the chemistry department. However, no backshift chemistry technicians are currently available.

Under most accident conditions, high level radwaste would be held up in storage tanks for process. The licensee believes that augmented radwaste facilities would be part of the Recovery Action Plan.

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

. Develop radwaste sampling procedures for handling elevated radwaste samples.

5.4.2.12 Radiological Environmental Monitoring Program (REMP)

The DAEC environmental monitoring program is provided by a vendor with site personnel providing routine sample collection. No specific provisions were made in the plan or procedures for implementing an emergency environmental monitoring program or for determining whether protective action recommendations for the ingestion pathway EPZ must be made. The licensee has also failed to address this issue in their Emergency Plan [see Appendix C, Planning Standard 50.47(b)(10)].

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

- Procedures must be developed to immediately assess environmental impacts of releases for the water, soil, vegitation, and milk pathways. These procedures should include provisions for making appropriate recommendations to State and local officials based on immediate needs to restrict public intake (i.e., place cows on stored feed, secure public water intake, restrict crop usuage).

5.4.3 Protective Actions

5.4.3.1 Radiation Protection During Emergencies

EPIPs 3.1 (Onsite Radiological Monitoring) and 3.2 (Offsite Radiological Monitoring) provide the details for implementing radiation protection during emergencies. These procedures made numerous references to the routine site radiation protection procedures (RPPs). The routine RPP procedures, with the exception of the 13 series, did not address or consider emergency conditions. The licensee will use routine procedures for personnel dosimetry, exposure records access controls, and survey records.

EPIP 2.1 describes the emergency assignments of health physics personnel through the Emergency Assignment Tag Board Duties system. Duties assigned include in-plant surveys, assembly area habitability, surveys of assembly area personnel, rescue and repair monitoring, onsite surveys, and offsite surveys. No specific assignments were made for dosimetry, decontamination, and access control. In addition, no specific provisions were included for expansion of the respiratory protection program, decontamination facilities, or dosimetry system in event of an emergency.

The 13 series of RPP procedures were identified by title as addressing emergencies. These procedures were incomplete; however, because only emergency dose limits, injuries, emergency (interim) sampling and analysis, and calibration of emergency (interim) monitors were addressed. EPIP 3.3a and 3.3b referenced RPP 13.5 which was deleted in the RPP Manual. RPPs 13.2, 13.3, and 13.4 addressed emergency procedures for sample retrieval and analysis under accident conditions, but were not specifically referenced in any of the EPIPs. The above procedures and RPP 13.7 should be reissued as EPIPs.

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

- Review and revise the Radiation Protection Procedures to be used during an emergency to include precautions and limitations, and guidance necessary under accident conditions (i.e, effects of elevated levels of nobel gases on the measurement of radioiodine, potential for evolution of radioactive gases from liquid samples, effect of infusion of radioactive gases into ion chamber dose rate instruments, etc.).

In addition, the following matters should be considered for improvement:

- Establish specific assignments for functions required for radiation protection during emergencies not defined in existing emergency plan, i.e., dosimetry access control, etc.

- Review EPIPs to assure that procedures referenced in the EPIPs exist.

- Reissue those Radiation Protection Procedures that only address emergency or accident actions as EPIPs.

5.4.3.2. Evacuation of Owner Controlled Area

The DAEC Site Evacuation procedure is EPIP 4.1; however, this procedure is primarily an assembly procedure. EPIP 4.1 states that the Shift Supervising Engineer (SSE) should sound the evacuation alarm upon determining that an evacuation is necessary; however, Section 4.1 of EPIP 2.1 states that the SSE shall initiate EPIP 4.1 for any event classified as an Alert or greater. This should be made explicit in Section 3.1 of EPIP 4.1 (SSE responsibilities).

Evacuation routes to assembly areas are marked with posted arrows and signs. These assembly areas are as described in the Plan and procedures. EPIP 4.1 was reviewed by the inspectors and found acceptable with respect to site assembly only.

EPIP 4.1 states that if the OSC or Contractor Change House are not habitable, personnel will be directed to an alternate offsite assembly point. No such assembly point currently exists (see Section 4.1.2.1). Further, EPIP 4.1 does not state that evacuation offsite of non-essential personnel shall be accomplished for all Site Area or General Emergencies unless radiological environmental conditions prohibit. This is a significant weakness in this procedure, which only states that site evacuation may be required based on the severity of the event. The procedure does state that the Emergency Coordinator will authorize offsite evacuation, and that monitoring of personnel will be accomplished at the alternate offsite location by Health Physics personnel directed by the OSC Supervisor.

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

- Specify in the procedure that an offsite evacuation of all non-essential personnel shall be conducted for any Site Area or General Emergency unless radiological environmental conditions prohibit.

In addition, the following matters should be considered for improvement:

- Clearly specify in Section 3.1 of EPIP 4.1 that the Shift Supervising Engineer is responsible to initiate the evacuation/assembly alarm for any event classified as an Alert or greater.

- When the offsite relocation center is established, it should be designated in EPIP 4.1 with a map of the evacuation routes to be taken from the site to this area.

5.4.3.3 Personnel Accountability

Section J.2.4.2 of the DAEC Emergency Plan states that if an evacuation/assembly is required, the names of missing individuals will be ascertained within 30 minutes and all onsite individuals will be accounted for continuously thereafter. Section 4.3 of EPIP 4.1 deals with the accountability of onsite personnel. EPIP 4.1 does not specify that this accountability must be accomplished within 30 minutes. To assure continued accountability, shift security personnel will set up access control points at the TSC, Control Room, and Contractor Change House; however, these control points may be deleted by the Emergency Coordinator. No provisions are made to set up an access control point in the locker room assembly area of the OSC. The licensee plans to test EPIP 4.1 during the exercise scheduled for October 28, 1981.

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:

- Specify in EPIP 4.1 that accountability will be accomplished within 30 minutes, and clarify the means by which all assembled personnel will be continuously accounted for thereafter.

5.4.3.4 Personnel Monitoring and Decontamination

Attachment 4 to EPIP 2.1 provided for survey of assembled personnel at the two onsite assembly areas. The procedure did not provide for recording the names of individuals surveyed. Discussions with licensee personnel indicated that documentation of personnel contamination would be completed using routine forms but personnel not found contaminated would not be recorded. Provisions were included

for reporting survey results to the OSC Supervisor who was, in turn, responsible for reporting this information to the Site Radiation Protection Coordinator.

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

. Establish a system for identifying personnel surveyed at assembly points to assure that all personnel are surveyed.

5.4.3.5 Onsite First-Aid/Rescue

EPIP 4.2, (First-Aid, Decontamination and Medical Support) and 4.3 (Rescue and Emergency Repair Work) address the licensee's provisions for onsite first aid and rescue. The appropriate methods for receiving, recovering, transporting, and handling injured persons and the priorities between contamination levels and severity of injury are discussed. These procedures require a Health Physics Technician be assigned to each rescue team and that he accompany contaminated victims transported from the site.

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

5.4.4 Security During Emergencies

Procedures for security measures to be taken in an emergency were provided in various EPIPs and in the Security contingency procedures. These procedures were in accordance with the requirements of Appendix C, to 10 CFR 73. The Security personnel had developed informal but documented check lists for their emergency actions and walkthroughs with personnel indicated actions were well understood.

Based on the above findings, this portion of the licensee's program appeared acceptable.

5.4.5 Repair and Corrective Actions

EPIP 2.1 provides for the activation of maintenance teams, who will report to the locker room with their respective tool kits dressed in full protective clothing and await instructions from the OSC Supervisor. EPIP 4.3 (Rescue and Emergency Repair Work) requires the OSC Supervisor to setup emergency repair teams and dispatch them as directed by the Emergency Coordinator. Each team will always consist of one Health Physics Technician who will provide radiation protection monitoring. Communications with repair teams is via the Operations Radio System, and links the team with the OSC, TSC, and Control Room. Prior to entry into the plant, repair team members are briefed by the Shift Supervising Engineer, TSC Supervisor, and OSC Supervisor.

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

5.4.6 Recovery

EPIP 5.1 (Deactivation of the Emergency Plan) and EPIP 5.2 (Recovery and Re-entry) deal with recovery operations. For all events classified as an Alert or greater, EPIP 5.1 is not clear in assigning the responsiblity or organizational authority for declaring that a recovery phase is to be entered.

The provisions described in EPIPs 5.1 and 5.2 that define an "under control" situation are inadequate. Some specific General Emergency sequences, such as loss of containment cooling, would fit the description in these procedures for "under control." This definition should be changed to indicate that the plant is in a stable state, necessary plant operating equipment is functioning properly, and there is no potential for uncontrolled radiological releases.

EPIP 1.1 specifies that notification of all organizations or individuals required by the former EAL will be made. Formal notification to these organizations is the responsibility of the Emergency Response and Recovery Director. Individual EPIPs are deactivated in accordance with EPIP 5.1.

The recovery organization is described in Section 2.2.2. The Emergency Response and Recovery Director has the authority to completely reorganize the management structure of the emergency response organization during a recovery mode.

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

- Revise EPIP 5.1 and EPIP 5.2 to indicate the stable plant parameters necessary to downgrade an emergency classification. These parameters shall take into account potentials for uncontrolled radiological releases.

The following matter should be considered for improvement:

- Specify in EPIP 5.1 who has the final authority for downgrading/deactivating emergency classification levels and declaring that a recovery phase is to be entered.

5.4.7 Public Information

The Emergency News Center Director coordinates all press briefings and media activities, public information activities, and local, State, and federal public information efforts. The Emergency News Center Director is the Vice President of Corporate Affairs. This person will function as the official spokesperson for the utility during an emergency, whether the Emergency News Center has been activated or not.

The DAEC and IELP Plans and procedures adequately describe how the public information function will be addressed in an emergency situation. The specific means for disseminating public information have been identified. Sample public information messages have been developed, and an ongoing program for periodically informing the public on key emergency preparedness and radiological concepts has been established.

IELP customer service representatives will be utilized to provide a rumor control service at the Emergency News Center. This function will also be the responsibility of the Emergency News Center Director.

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

5.4.8 Fire Protection Procedures

The inspector reviewed the DAEC Fire Plan and Procedures to ensure adequate interface exists with the DAEC Emergency Plan. The procedure clearly indicates that the Shift Supervisory Engineer (SSE) has overall onsite command responsibility in the case of a plant fire. The SSE by this procedure is responsible for assessing the fire situation and declaring the type of emergency as defined in the Emergency Plan.

The Security Shift Supervisor acts as the Fire Brigade Leader and has been trained in this task. However, according to DAEC procedures this person has other major tasks during an emergency which include site accountability, area access control, and notification of licensee personnel. In accordance with NRC requirements an additional SRO will be on shift by July 1982. The inspectors feel that the additional SRO should be trained to be the Fire Brigade Leader thus relieving the Security Shift Supervisor of that responsibility.

The inspector reviewed all eighteen fire preplans and verified that safety related equipment is listed. The fire preplan system should enable the SSE to classify safety related emergencies and implement the DAEC Emergency Plan.

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

. Fire Brigade leadership should be under the direction of a SRO. The Security Shift Supervisor should be relieved of this responsibility thus allowing more flexibility for other emergency actions required to be implemented; i.e., security plan, accountability, site access control, and notification. This action should be accomplished after July 1982 when minimum shift staffing will include two SRO's.

5.5 Supplemental Procedures

5.5.1 Inventory Operational Check and Calibration of Emergency Equipment and Supplies

EPIP 6.3 (Maintenance of Emergency Facilities, Equipment, and Supplies), provides the instructions for inventory and maintenance of emergency equipment, facilities, and supplies. This procedure specifies the location of the emergency materials and provides specific inventory lists. Inventory of emergency kits was required quarterly and first-aid supplies monthly. Inventories conducted were documented in accordance with the procedure.

Provisions for inventory, operability checks and location of communication equipment were not specifically provided, nor did the procedure include provisions to check the operability of equipment or replace limited life items such as batteries.

Responsibilities for ensuring performance of inventories of emergency kits and supervision of the calibration and testing of radiation monitoring equipment was assigned to the Radiation Protection Engineer. Reference was made to the RPPs for specific instrument calibration procedures.

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

- Develop procedures to identify the location and provide for inventory and operability checks for all emergency communications equipment.

The following matter should be considered for improvement:

- A procedure should be provided to assure the operability of emergency kit equipment and periodic replacement of limited life items such as batteries.

5.5.2 Drills and Exercises

The inspectors reviewed EPIP 6.2 (Training and Drills), CPIP 4.2 (Exercises), and CPIP 4.3 (Training and Drills) to ensure that requirements specified in the DAEC and IELP Plans are implemented. All drills and exercises are planned and scheduled by the Emergency Planning Coordinator. The EPC is responsible for the development of scenarios for each drill. Support agencies are included in preparation for drills and exercises involving their participation.

The annual exercise is designed to include the activation of the OSC, TSC, EOF, and Emergency News Center. The medical emergency drill, radiological monitoring drill, one of the health physics drills, and the federal communications drill will be conducted in conjunction with the annual exercise. Fire drills are conducted in accordance with the DAEC Fire Plan (quarterly), and

the remaining health physics drill is conducted semi-annually. A communications check is conducted monthly by the Security force with the State Office of Disaster Services and Linn and Benton Counties. Security also conducts a radio communications check with the Linn and Benton County Sheriff on each daily shift. These communications checks are only conducted by Security at the Security facility. No provisions exist to test communications from the EOF, TSC, and Control Room to both the NRC Headquarters and Region III Operations Center as required by 10 CFR 50, Appendix E, Section IV.E.9.d.

A written report regarding each drill is prepared within five days of the drill and submitted by the observers to the EPC. The EPC maintains all records of drills, and submits a report to the Chief Engineer, who is responsible for the implementation of all corrective actions at the DAEC. The EPC prepares a formal evaluation of the exercise based on IELP and offsite agency critiques. Section 4.1.2 of CPIP 4.4 (Periodic Plan and Procedure Review) requires the documenting of recommended changes in the Plan or procedures during the annual review process. In the case of procedures, changes should be initiated if required as soon as identified rather than waiting for the annual review.

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

- A procedure must be established and implemented to ensure that communications checks from the EOF, TSC, and Control Room to the NRC Regional and Headquarters Operations Centers are performed monthly.

In addition, the following matter should be considered for improvement:

- Changes to procedures (EPIPs and CPIPs) should be made upon determination that a change is needed rather than waiting for the annual review.

5.5.3 Reviews, Revision, and Distribution of Emergency Plans and Procedures

CPIP 4.4 (Periodic Plan and Procedure Review) and EPIP 6.1 (Maintenance of the EPIPs) describe how the Emergency Plans, EPIPs, and CPIPs are reviewed and revised. Quarterly reviews of notification lists and all telephone numbers are performed by the EPC. If necessary, the appropriate EPIPs are revised to incorporate changes identified. The EPC is responsible for reviewing all EPIPs on an annual basis, and incorporating changes required in the Plans or procedures based on the results of drills and exercises. In addition, the EPC performs a monthly review of all EPIPs to ensure that they can be implemented, and initiates temporary changes to appropriate EPIPs based on facility changes. The DAEC Plan, IELP Plan, EPIPs, and CPIPs have been reviewed, approved, and updated as required; however, no documentation exists indicating that the

quarterly review of telephone numbers required no procedural revisions. This should be done to verify that the requirements of Section 4.1.1 of CPIP 4.4 have been met.

Procedure revisions to the EPIPs are done in accordance with ACP 1402.2 which governs all procedure revisions at the site. Revisions to the CPIPs are prepared by the EPC and approved by the EPC and Assistant Vice President for Nuclear Generation.

The Nuclear Generation Division prepares and distributes changes to the emergency response plans and procedures; however, the list of individuals and outside organizations on the approved distribution list is not included as part of this procedure (CPIP 4.4). In addition, the Administrative Supervisor is responsible and has the authority for issuing, revising, and assigning serial numbers or names to all controlled documents (ACP 1402.4). Both the EPIPs and DAEC Plan are controlled documents. This is a contradiction in responsibilities between CPIP 4.4 and ACP 1402.4. The inspectors found several locations (Control Room, Admin. Supervisor Office, EOF emergency kit, etc.) where the old preparedness plan was still located. These should have been removed when the current plans were implemented. During a walk-through with one of the Acting Emergency Coordinators the inspectors observed him try to use the old preparedness plan. This lack of control in the distribution of the Emergency Plans is in part due to the contradiction in responsibilities for the distribution of the Plan and implementing procedures.

EPIPs regarding notifications of personnel have been sanitized to the point of being useless for review. EPIPs submitted to the NRC for review should include all information necessary to ensure that the procedure is functional. Actual telephone numbers need not be included in the procedures; however, names, format, etc. must be included in the appropriate procedures.

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

- All plans and Procedures should be distributed both onsite and offsite in accordance with ACP 1402.4. The controlled distribution list should be maintained by the Admin. Supervisor, who functions with regard to all Emergency Plans and Procedures as described in ACP 1402.4. The out-of-date preparedness plans should all be destroyed. Copies distributed to NRC should not be sanitized to the point of rendering them useless.

5.5.4 Audit

CPIP 4.4 (Periodic Plan and Procedure Review), states that the Chairman of the Safety Committee is responsible to conduct an annual independent audit of the emergency response program. The

EPC is responsible to ensure that review and audit findings are evaluated and corrections are incorporated into the emergency response program. The audit covers a review of the following: (1) emergency response plans (both DAEC and IELP), (2) implementing procedures and practice, (3) training, (4) readiness testing, (5) equipment, and (6) interfaces with State and local governments. The procedure also states that the audit may be conducted in conjunction with the exercise. The procedure does not indicate whether the auditors on the audit team have any direct responsibilities for implementing the emergency preparedness program. This procedure should be more specific by identifying who actually performs the audits.

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

- Specify in CPIP 4.4 who actually performs the audits of the emergency preparedness program. This description should also specify that the auditors have no direct responsibilties for implementing the emergency preparedness program.

5.6 Human Factors Engineering

The inspectors examined human factors engineering of emergency response facilities equipment, decisional aids, and procedures to ensure impediments relevant to decision making will be minimal. Areas examined included the following: radiological effluent and area monitors; flow gauges; color coding of instruments, procedure tabbing; and communications equipment.

All emergency plan implementing procedures examined did not have index tabs for ready access. Walkthroughs with response individuals clearly indicated that tabs would speed up decision making. Color coding of key procedures should be considered.

The containment high radiation monitors are not color coded corresponding to accident classifications, nor are decisional aids posted next to the detectors indicating what these readings mean. Shift Supervisors interviewed during the appraisal indicated no knowledge relevant to those readings.

Communications equipment located in the Control Room, TSC, and EOF are color coded. Those phones in the TSC and Control Room used for plant and corporate communications are not located in places of operation where needed. Instead, all the phones are located in a row next to each other. Accordingly, TSC communicators will all be talking in the same immediate vicinity. This will cause excess noise.

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

- Tab all EPIPS for quick access.

- Color code the containment high range radiation monitor in accordance with accident classifications.

- Locate telephones in the TSC and Control Room in areas where assigned functions are to be implemented.

6.0 Coordination with Offsite Groups

6.1 Offsite Agencies

Palo Volunteer Fire Department

The Palo Fire Department, which is a volunteer fire department, will respond to fires at the DAEC. The department has very limited equipment. It is anticipated that fire department personnel, once in the plant, would use DAEC equipment and be directed by DAEC personnel. If the situation at the plant is beyond the capability of the Palo personnel, a mutual aid agreement would be evoked and support from the Cedar Rapids Fire Department requested.

Annually, the DAEC offers training that basically involves a tour of the plant and some classroom training on the radiation hazard. The last training session included a film on fighting radiological fires and was well received by the Palo personnel. Additional training is needed in fighting hydrogen fires.

The Palo Fire Department official interviewed indicated that when drills occurred, the Palo Department was told that their participation was not required. The Palo Fire Department wants to be included in future drills and exercises.

The Palo Fire Department has a copy of an outdated DAEC Emergency Plan. Palo personnel do not have any radiation detection training or equipment.

The existing Letter of Agreement with the Fire Department/Ambulance service is weak in that capabilities and responsibilities are not clearly delineated.

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

- Strengthen the program of training, drilling, and exercising with the Palo Fire Department.

- Improve the Letter of Agreement with the Palo Fire Department and Ambulance Service to describe the capabilities and responsibilities that will be expected in responding to incidents or emergencies.

- Provide a timely distribution of Emergency Plans and revisions to offsite agencies.

Palo Ambulance Service

The Palo Ambulance Service is operated by the Palo Fire Department. This ambulance service has agreed to respond to all problems at DAEC requiring medical emergency treatment. At the present time, the service will treat a contaminated victim, but will not transport the victim to a medical facility. The transporting of contaminated victims is handled by the Area Ambulance Service in Cedar Rapids. Palo Ambulance Service personnel are not trained in emergency radiological response techniques. Protective clothing for ambulance team members is provided by the DAEC. The concerns expressed in the previous section regarding training, drills, and exercises also apply to the Palo Ambulance Service.

Palo rescue personnel are not trained for advanced care, but are basic EMTs. Because of this, backup support is provided to the Palo Ambulance Service by the Linn County Sheriff's Department Rescue Squad on each call.

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

Linn County Sheriff's Department

Personnel interviewed at the Sheriff's Department were well versed in emergency response roles and procedures for responding to an incident at the DAEC. The dispatcher interviewed knew the proper notification and callback procedures with regard to an incident at the DAEC. Responsibilities for traffic control, notification, evacuation, and security were understood. Communications with the plant are tested on a daily basis.

The Sheriff's Department participates in periodic drills with the licensee, one of which involved implementing a mock evacuation notification of affected residents.

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

Mercy Hospital, Cedar Rapids, Iowa

Administrative, radiological, and emergency room personnel at Mercy Hospital were interviewed, and their radiation decontamination facility and radiation emergency equipment were inspected. While hospital personnel were unfamiliar with the specific Letter of Agreement with DAEC, the general responsibilities for responding to an incident were understood as well as the specific equipment and procedures needed for treating victims.

An emergency procedure has been developed by the Head Nurse in the Trauma Center for dealing with radiologically contaminated patients. One room has been specially adapted for this purpose and includes a shower with special water containment capability and a separate ventilation capability. In general, the facility seemed well designed and well equipped to deal with a contamination problem.

The licensee provides Mercy Hospital with an emergency decontamination kit that is kept at the hospital. A licensee representative periodically (every two months at the minimum) checks the kit. The inventory of items contained in this kit is included in the EPIPs.

Training was identified as a deficiency that hospital personnel were attempting to correct. The Head Nurse is scheduled to attend a radiation preparedness course in the near future. Plans are also under way to obtain a REACT video training course that would be used to train Trauma Center staff in house.

Participation in drills occurred twice a year and appeared to be satisfactory. A simulation of a contaminated victim would occur that would test the system from the ambulance service, through actual treatment at the Trauma Center. A good relationship has been established with the licensee in regard to drills.

The same problems that were identified by the Palo Fire Department were mentioned again at Mercy Hospital; those being the need for an updated Letter of Agreement, and the need for a current copy of the DAEC Emergency Plan.

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

University of Iowa, Iowa City, Iowa

The University of Iowa Hospitals and Clinics have agreed to act as a backup facility for treating radiologically contaminated victims from the DAEC. The personnel interviewed appeared competent to treat radiation injuries with the equipment and facilities available in the role of a backup to Mercy Hospital.

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

6.2 General Public and Transient Populations

6.2.1 Information Distribution

A mailing of approximately 70,000 emergency planning brochures was sent to most residents (90%) in the ingestion exposure pathway EPZ. This brochure covered topics such as nuclear definitions, nuclear power plant concepts, and specific emergency information. Residents were advised of the areas that could be affected, how they would be notified of an incident, and specific evacuation information. In

addition, these brochures were distributed to area hotels, motels, hospitals, and other public buildings. Very little feedback has been received regarding the information disseminated, therefore no plans presently exist for changing the content of the brochure. The licensee has no plans to actively seek public input regarding the content of the brochure. Plans are underway; however, for placing the evacuation information in the local telephone book.

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:

- Expand distribution of the annual emergency information brochure to fully cover the transient population, including signs, decals, and posted notices as indicated in Section G.2.1.4 of the DAEC Emergency Plan.

- Establish a means for allowing public input in the content of the public information brochure and its distribution.

6.2.2 Prompt Notification of the Public

A review of the licensee's records indicated that an adequate prompt public notification system will be installed which meets the design objectives of Appendix 3 to NUREG-0654, Revision 1; however, these records have not been submitted to the NRC for review. Twenty-seven sirens have been purchased and are going to be installed during October 1981. An engineering study conducted by the licensee has been finished indicating siren locations. Basically twenty-three 125 dB and four 115 dB sirens will be installed. In addition, existing sirens will be included as part of the warning system. All prompt notification will be by outdoor sirens.

The design of the system includes: (1) 100% notification for the public within 0 to five miles; (2) all major populated zones from five to ten miles (which includes Atkins, Urbana, Alburnett, Robins, Center Point, Cedar Rapids, Marion and other cities and towns); (3) and the remaining population (<10%) to be notified by ground level mobile sirens or emergency vehicles and airborne sirens located on fixed wing aircraft.

This system will be activated by a coded radio frequency. Linn County has just received their license for the system and Benton County is awaiting approval. Pending no FCC licensing problems, these sirens should be operational by the end of October 1981. The existing sirens in Cedar Rapids are activated by land line.

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

- Provide documentation which technically supports whether the prompt public notification system meets the design objectives of Appendix 3 in NUREG-0654, Revision 1. The licensee's submittal must indicate when the system will be fully operational.

6.3 News Media

No program has been developed or implemented to train news media representatives in nuclear power terminology, concepts, and emergency plans. This is also discussed in Sections 3.1 and 3.2. News media training must be accomplished by April 1, 1982. If this is not completed by this date, the licensee will be in noncompliance with 10 CFR 50.54(q). This is an Open Item pending the implementation of this program.

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

7.0 Drills Exercises and Walkthroughs

7.1. Drills and Exercises

The inspectors interviewed cognizant individuals at both the corporate and site level regarding the administration of drills, exercises, and critques. To date the licensee has not held any exercises, but one is scheduled for October 28, 1981. Although site personnel have been involved in several drills conducted to date, the licensee has not formally documented the results of these drills nor have they taken credit for the conducting of these drills as part of their required program. A member of the emergency planning staff has prepared an action item list to correct deficiencies identified during these drills. This list is updated on a weekly basis, but it is not part of the quality assurance program.

Communications checks with the state and local agencies have been conducted on a monthly basis; however, no checks with the NRC as required by 10 CFR 50, Appendix E, Section IV.E.9.d have been conducted (see Section 5.5.2).

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

7.2 Walkthroughs of Emergency Response Personnel

The inspectors conducted several walkthroughs of the following emergency tasks: emergency detection, notification, protective action decision making, offsite environmental monitoring and air sampling, dose calculations, and post-accident effluent sampling. Corporate emergency response personnel were also interviewed relevant to their roles and responsibilities during an emergency.

The onsite emergency response walkthroughs included several Shift Supervisory Engineers, Assistant Chief Engineer of Operations, Assistant Chief Engineer of Radiation Protection/Security, several Health Physics Technicians, Radwaste Operators, several security guards and security supervisors, and several HP supervisors.

Most individuals interviewed were aware of their emergency responsibilities and roles. Training was provided to those interviewed. As indicated throughout this report, both procedures and training failed to provide adequate guidance for proper protective action decision making.

An environmental monitoring walk-through was conducted with two HP technicians (HPTs). The HPTs were instructed to conduct plume monitoring and air sampling in a designated offsite area. The inspectors learned that the HPTs were not trained properly relevant to locating the plume. Only gamma measurements were conducted instead of beta and gamma. The HPTs were unaware that the plume could be over them and air sample results would yield ambiguous information. The inspectors instructed them in the proper techniques.

Walkthroughs with an HPT regarding post-accident effluent sampling clearly indicated a lack of knowledge of the existing interim system. He was unaware of locations of certain parameters such as exhaust flow and monitor readings. Interviews with other HPTs also indicated a general lack of knowledge of the system and reading locations, yet the SSE is relying on these HPTs to assist in implementation of the dose assessment procedures.

Interviews and walkthroughs with the primary Radiological Assessment Coordinator indicated that additional training in Health Physics should be provided.

Interviews and walkthroughs with several Radwaste Operators indicated that their function during an emergency does not include collection or analysis of post-accident samples such as primary coolant, station effluents, or containment atmosphere. However, it is the licensee's intent to use these people to collect post-accident samples. Additional training is necessary.

Based on the above findings, this portion of the licensee's program appears adequate; however, improvements in the following areas are necessary:

. Conduct walk-through training for all Shift Supervisory Engineers and Health Physics Technicians after correction of identified deficiencies in Appendix A of this report. Particular attention should be given to those areas where major changes have been made.

8.0 Licensee Action on Previously Identified Items Related to Emergency Preparedness

For the purposes of tracking, all of the following previously identified items are considered closed, and those items not completed have been reopened in this report. These previously identified items are as follows:

- Inspection Item (331/79-04): Problems with emergency radio and telephone communication identified during emergency drills.
- Procedures for offsite dose estimation are unnecessarily complex and need to be simplified.
- Not all emergency directors have been trained on how to execute the offsite dose estimation procedures.
- Not all RCTs who may be called upon to implement emergency procedures are trained to do so, and only cursory training has been provided to those trained.
- The pulse height analyzer system used to analyze routine and non-routine samples has not been reliable, and no backup system exists to ensure that emergency samples could be analyzed promptly if the existing Geli is inoperable.
- Availability of operable high and intermediate range portable survey instruments needs to be improved to ensure that emergency response requirements can be met.
- Sufficient quantities of functional instruments to meet the needs of the "Emergency Assignment Board Tag Duties" procedure were not available in the emergency kits.

9.0 Persons Contacted

DAEC Station Personnel

*D. Mineck, Chief Engineer
*D. Wilson, Assistant Chief Engineer - Rad Protection/Security
B. York, Assistant Chief Engineer - Operations
K. Young, Radiation Protection Engineer
*E. Parsons, HP Supervisor
*A. Western, Contracted HP
*J. Sparano, Security Supervisor
R. Anderson, Training Supervisor
J. Davis, Administrative Supervisor
L. Willie, Shift Lt. of the Guard
D. Gibson, Shift Supervisory Engineer
R. Potts, Shift Supervisory Engineer
R. Zook, Shift Supervisory Engineer
S. Funk, HP Technician
A. Reese, HP Technician

M. Davison, HP Technician
K. Coppes, HP Technician
K. Konzem, HP Technician
E. Wienola, Operator
M. Larson, Radwaste Operator
C. Brown, Radwaste Operator
T. Matta, Radwaste Operator
M. Nicholson, Radwaste Operator
*J. Vinquist, Assistant Chief Engineer - Technical Support
*B. Dye, Radiation Protection Engineer Assistant
*J. Kerr, Staff
*D. Tepley, Operations Supervisor
*J. Van Sickel, Staff

IELP Corporate Personnel

*L. Root, Assistant Vice President - Nuclear Generation
*D. McGaughy, Director Nuclear Engineering
*K. Meyer, Manager Nuclear Licensing and Fuels
R. Salmon, Nuclear Licensing and Fuels Engineer
*R. Portz, Assistant Emergency Planning Coordinator
*E. Matthews, QA Manager
P. Ward, Corporate Engineer
*D. Reeves, Consultant

*Denotes those present at the exit interviews.

Non DAEC/IELP Employees

T. Beuter, Undersheriff, Linn County Sheriff's Department
W. Bjornsen, Linn County Civil Defense
S. Zamastil, Chief, Palo Volunteer Fire Department
W. Rogers, Assistant Administrator, Mercy Hospital
T. Trosky, Area Ambulance Service Department Supervisor
T. Heath, Head Nurse, Mercy Hospital
D. Williamson, Special Assistant to the Director, University of Iowa Hospital
W. Twaler, Radiation Protection Officer, University of Iowa Hospital
R. Lowe, Associate in Department of Surgery and Family Practice, University of Iowa Hospital

10. Exit Interview

The inspectors and senior management from NRC headquarters and the region met with licensee representatives (denoted in Paragraph 9) at the conclusion of the appraisal on September 16, 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.