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NUCLEAR REGULATORY COMMISSION

REGION II  
101 MARIETTA STREET, N.W.  
ATLANTA, GEORGIA 30303

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Licensee: Duke Power Company  
422 South Church Street  
Charlotte, NC 28242

Docket Nos.: 50-413 and 50-414

License Nos.: CPPR-116 and CPPR-117

Facility Name: Catawba 1 and 2

Inspection at Catawba site near Rock Hill, South Carolina

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SUMMARY

Inspection on November 8-18, 1983

Areas Inspected

This special, announced inspection involved 486 inspector-hours on site and 19 inspector-hours offsite in the area of an emergency preparedness appraisal.

Results

Of the areas inspected, no violations or deviations were identified. However, ten appraisal deficiencies were identified in the following areas: Training Program Establishment (3.1), Transportation (4.2.6), Onsite (Out-of-Plant) Surveys (5.4.2.2), In-Plant Radiological Surveys (5.4.2.3), Radiation Protection During Emergencies (5.4.3.1), Evacuation of Owner-Controlled Areas (5.4.3.2), Onsite First-Aid/Rescue (5.4.3.5), and Security During Emergencies (5.4.4).

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## INTRODUCTION

The purpose of this special appraisal was to perform a comprehensive evaluation of the licensee's emergency preparedness program. This appraisal included an evaluation of the adequacy and effectiveness of areas for which explicit regulatory requirements may not currently exist.

The appraisal scope and findings were summarized on November 18, 1983, with those persons indicated in Section 9 of this report.



## 1.0 ADMINISTRATION

### 1.1-1.4 Responsibility Assigned, Authority, Coordination, Selection and Qualification

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(1) and (16); 10 CFR 50, Appendix E, Paragraph IV.A and G; criteria contained in NUREG-0654, Sections II.A and P; and criteria in ANSI N3.1.

An inspector reviewed Sections A and B of the Catawba Nuclear Station (CNS) Emergency Plan (EP) and Section B of the corporate Crisis Management Plan (CMP) which is incorporated into the site EP by reference. The licensee has a full-time site Emergency Preparedness Coordinator (EPC) and a corporate Emergency Response Coordinator (ERC). The EPC provides lead responsibility for the coordination of all emergency plan activities and reports to the Licensing and Projects Engineer. He, in turn, reports to the Superintendent of Technical Services, who reports to the Station Manager. The line of authority is clear and the EPC appears to have adequate authority to effectively coordinate the emergency plan.

The EPC is a member of the Station Review Committee and participates in other review activities which provide a means for the integration and coordination of emergency planning with other activities at the site. In addition, the EPC interacts informally at all levels at the site and coordinates with local offsite agencies, the general public and the news media as required. The ERC coordinates with all State and Federal agencies, the general public, and the news media as required. Coordination between the EPC and the ERC is clearly defined in their job descriptions, the EP, and the CMP.

The selection criteria for all personnel with emergency planning responsibilities are contained in their job descriptions. All site personnel and the corporate ERC appear to meet the selection criteria. In addition, their skills are kept current by providing training on an annual basis. The EPC is receiving 40 hours per year of technical training, attends at least one 40-hour offsite emergency planning course per year, and attends INPO's annual Emergency Preparedness Seminar.

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

## 2.0 EMERGENCY ORGANIZATION

### 2.1 Onsite Organization

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(1) and (2); 10 CFR 50, Appendix E, Paragraph IV.A; criteria in NUREG-0654, Sections II.A and B; and criteria in ANSI N3.1.

An inspector discussed the emergency organization with licensee representatives and reviewed selected portions of the licensee's EP concerning the roles and responsibilities of various individuals in the emergency organization. Except as specified below and in paragraph 3.1, the licensee appears to have considered all necessary functions for the onsite emergency organization and has either provided procedures and training, or plans to do so. However, while the description of the emergency organization in the EP includes the management structure for nearly all appropriate functional areas down to the working level, the decontamination function was omitted.

Since the Shift Supervisor acts as the Emergency Coordinator until the Station Manager reaches the site, 24-hour emergency coverage is always available and the procedures provide adequate authority to the Shift Supervisor to assure that, as Emergency Coordinator, he may initiate all appropriate actions including notifications and recommendations to offsite authorities. In addition, the line of succession for the Emergency Coordinator is clearly specified.

Onsite emergency assignments are on the basis of routine organizational functions. In addition, the interfaces between and among the onsite functional areas are clearly delineated in the EP and Catawba Nuclear Station Directive (CNSD) 3.8.4.

Based on the above findings, this portion of the licensee's program appears to be adequate. However, the following item should be considered for program improvement:

- Indicating in the EP and the EIPs the persons down to the working level in the onsite organization, by position or title and name, who are assigned the responsibility for decontamination activities. (413/83-42-01 and 414/83-35-01)

## 2.2 Augmentation Organization

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(1) and (2); 10 CFR 50, Appendix E, Paragraph IV.A; and criteria in NUREG-0654, Sections II.A and B.

The corporate personnel who will augment the EP are specified by position in the CMP. These people are selected on the basis of their normal duties so that only emergency plan overview training and training in applicable procedures is required to support their function. All of the required functions are provided for by the CMP and provisions are made for supplementing the health physics staff beyond 24 hours under accident conditions.

In addition to augmentation by corporate personnel, the EP and CMP provide for technical assistance from contractors, private organizations, and local ambulance, medical, hospital and fire-fighting support. The interfaces between the onsite functional areas and these offsite support groups are clearly defined by letters of agreement, contracts, and memoranda of understanding, as applicable. An inspector contacted representatives of a selected portion of these offsite support groups and verified that they understood their authorities and responsibilities in supporting an emergency.

In Figure B-1 and Section B.5 of the EP, the licensee has committed to the minimum requirements for on-shift staffing and augmentation specified in Table B-1 of NUREG-0654, Section II.B. However, the licensee has used 45 and 75 minutes in specifying their "capability for additions". An inspector cautioned the licensee that this is the upper time limit for meeting the stated 30- and 60-minute goals. In addition, the following problems were discussed with the licensee:

- (1) The licensee has not demonstrated by drills or through a study the capability of meeting the time criteria for the minimum augmentation staffing in Table B-1.
- (2) Section 5.2 of CNSD 3.8.4, "Onsite Emergency Organization", allows one hour for Phase I activation. This does not conform to the 30-minute criterion, and it is unclear that the five persons who will respond in Phase I activation are sufficient to meet the criteria in Table B-1.
- (3) Section 5.3 of CNSD 3.8.4 allows 1-4 hours for Phase II activation, which is only acceptable if the licensee can assure meeting the 60-minute staff augmentation criterion within at least 75 minutes.

The licensee committed to review and revise CNSD 3.8.4 as necessary and perform a study or drills to verify the capability of meeting the criteria in Table B-1 of NUREG-0654.

Based on the above findings, this portion of the licensee's program appears to be adequate. However, the licensee has committed to completing the following items for program improvement by February 15, 1984:

- Reviewing and revising CNSD 3.8.4 to assure meeting the minimum staff augmentation criteria in NUREG-0654, Section II.B, Table B-1. (413/83-42-02 and 414/83-35-02)
- Performing a study or drills to verify the ability to meet the minimum staff augmentation criteria in NUREG-0654, Section II.B, Table B-1. (413/83-42-03 and 414/83-35-03)

### 3.0 TRAINING

#### 3.1 Program Established

This area of the licensee's program was reviewed with respect to the requirements of 10 CFR 19; 10 CFR 50.47(b)(15) and (16); 10 CFR 50, Appendix E, Paragraph IV.F; criteria in NUREG-0654, Sections II.O and P; and criteria in ANSI/ANS 3.7.3.

The inspector reviewed selected portions of the licensee's EP and EIPs related to the training of various onsite and offsite personnel. The inspector also reviewed training records, schedules, and plans. Discussions of training activities were held with training department and emergency preparedness personnel.

Section 0.4 of the EP indicates that specialized training will be provided to various functional groups in the onsite emergency organization. However, descriptions of specialized initial training and periodic retraining programs for security and fire-fighting personnel and repair and damage control teams are not included in the EP (or in the EIPs), as required by 10 CFR 50, Appendix E, Part IV.F. The inspector was able to determine that suitable training/retraining programs, although not described in the EP, are established for the Fire Brigade and for security personnel. The licensee has not (contrary to the listing in the EP, Section 0.4) established a training program for repair and damage control teams; in fact, licensee personnel acknowledged that the need for such a function in the emergency response organization has not been identified.

CNSD 3.8.4 (included in the EIPs) specifies that overview retraining will be provided annually to all emergency organization personnel, and that specialized training will be given to various functional groups within the emergency organization on a periodic basis, "as the need arises". This provision is inconsistent with the EP, Section 0.5, which specifies annual retraining for onsite as well as offsite emergency response personnel.

CNSD 2.5.2 distributes responsibility for the onsite training program among the CNS Emergency Preparedness Coordinator and several sections of the plant organization. The drawbacks of such a fragmented approach appear on initial examination to be largely mitigated by the use of a centralized recordkeeping system managed by the Training and Safety Section. This system provides for both hard-copy and computer documentation of emergency response training. Unfortunately, it appears that there is typically a rather long delay between a training session and the submission by the instructor of documentation for processing by the Training and Safety Sections. The licensee documents attendance at classes and satisfactorily evaluates student performance by means of a written test and/or by demonstration of the ability to perform an assigned task. However, there is at present no method whereby the Training and Safety Section can use the computerized attendance records to track a student's participation in those courses required for his or her emergency function. Consideration should be given to upgrading the computer system to provide a feasible method for such tracking.

Instructors have been assigned to teach the various courses presently established in the emergency response program curriculum. Although the inspector was satisfied that qualified instructors have been selected, this selection has been done on a case-by-case basis rather than through the use of established criteria. Each instructor's file contains a listing of credentials intended to justify selection of that instructor for a particular course.

The training program for operator personnel in dose projection methods has not been developed since neither the computer-based nor the manual method for dose projection is yet available. The training program for chemistry personnel in procedures related to the Post-Accident Sampling System (PASS) has not yet been developed since the PASS installation is not complete. The licensee is fully committed to developing and implementing training programs in these two areas.

Based on the above findings, the following deficiencies must be corrected prior to exceeding 5% reactor power:

- The licensee has not established the composition of repair/recovery teams as an integral function of the onsite emergency organization, nor developed and administered a specialized training program for the personnel who will staff such teams, with the description of said training program included in the EP as per 10 CFR 50, Appendix E, paragraph IV.F. (413/83-42-04 and 414/83-35-04).
- The licensee has not included (or referenced) in the EP a description of the emergency response training programs for security personnel or the Fire Brigade as per 10 CFR 50, Appendix E, paragraph IV.F. (413/83-42-05 and 414/83-35-05).

Further, based on the above findings, the following portion of the licensee's program was found to be incomplete. This area will be reviewed during a future inspection:

- Establishment and implementation of training programs for (1) operator personnel in dose projection methods and (2) chemistry personnel in procedures related to the PASS (413/83-42-06 and 414/83-35-06).

In addition, the following items should be considered for program improvement:

- Revising CNSD 3.8.4, Paragraph 7.3, to indicate that special training for certain groups in the emergency organization will be given on an annual basis (413/83-42-07 and 414/83-35-07).
- Establishing criteria for the selection and qualification of instructors (413/83-42-08 and 414/83-35-08).



### 3.2 Program Implemented

This area was reviewed with respect to the requirements in 10 CFR 50.47(b)(15) and (16); 10 CFR 50, Appendix E, Paragraph IV.F; and criteria in NUREG-0654, Sections II.O and P.

The inspector reviewed lesson plans and records of training given to selected members of the emergency response organization. Emergency organization personnel have received the first annual installment of overview training, in accordance with CNSD 3.8.4, Paragraph 7.2. Of the specialized areas of the training program which have been established (see Paragraph 3.1), all are implemented and current except for the following: (1) Protective action recommendations and emergency classification, (2) information transmission to offsite agencies, and (3) air sampling by offsite monitoring teams using a multichannel analyzer (equipment not yet received). [Item (3) is discussed further in Section 5.4.2.1 of this report.]

Based on the above findings, the following portions of the licensee's program were found to be incomplete. The licensee has committed to completing the following by February 15, 1984, in order to achieve an adequate program. These areas will be reviewed during a future inspection.

- Implementation of training in:

- (1) Emergency classification and protective action recommendations. (413/83-42-09 and 414/83-35-09)
- (2) Information transmission to offsite agencies. (413/83-42-10 and 414/83-35-10)

## 4.0 EMERGENCY FACILITIES AND EQUIPMENT

### 4.1 Emergency Facilities

#### 4.1.1 Assessment Facilities

##### 4.1.1.1 Control Room

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(8); 10 CFR 50, Appendix E, Paragraph IV.E; criteria in NUREG-0654, Section II.H; and criteria in ANSI/ANS 3.7.2.

The inspectors examined the Control Room facilities and interviewed Control Room emergency response personnel in five watch organizations. The Control Room is located in the Auxiliary Building. Both units are served from the mirror-image common control area. The Shift Supervisor's office is an enclosed area immediately adjacent to the main control area. The Control Room has been provided with an emergency ventilation system that provides for isolation upon detection of radiation or chlorine gas and closed-cycle filtration through redundant trains of HEPA filters and charcoal beds. The installation of the

emergency ventilation system has been completed and is in the final phase of startup testing with completion scheduled for February 1984.

Copies of the Catawba Emergency Plan and approved implementing procedures were available in the Control Room. However, numerous implementing procedures remain in the draft state and were not available in the Control Room for use by the operators during the walk-through interviews conducted with Control Room personnel as described in Section 7.0. Implementing procedures that remain to be completed include the following: all emergency operating procedures (EOPs), five abnormal procedures (APs, Nos. 11, 17, 18, 19, and 20) and the EPIP for performing dose assessment calculations in the Control Room (RP No. 11).

The communications equipment for the Control Room has not been completely installed. Installed at the present time are the facility PBX phones, direct commercial telephone lines and the emergency radio. The communications equipment that remains to be installed includes the following: the selective signaling phones (to replace the ringdown phones presently described in the EP), the NRC ENS ringdown telephone, and the intercom system for direct communication with the TSC and the OSC.

Based on the above findings, the following portions of the licensee's program were found to be incomplete. These areas will be reviewed during a future inspection.

- Provide the Control Room with approved copies of all emergency plan implementing procedures, including the EOPs, APs and the RP. (413/83-42-11 and 414/83-35-11).
- Complete installation of the communications equipment. (413/83-42-12 and 414/83-35-12).
- Upon installation of all Control Room communications equipment and the issuance of all approved emergency plan implementing procedures, complete the training of Control Room personnel in the use of the communications equipment and the procedures (413/83-42-13 and 414/83-35-13).

#### 4.1.1.2 Technical Support Center

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(8); 10 CFR 50, Appendix E, Paragraph IV.E; criteria in NUREG-0654, Section II.H; and criteria in NUREG-0578.

The inspectors reviewed the Emergency Plan, Section H.1.b., and CNSD 3.8.4, "Onsite Emergency Organization". The inspectors interviewed the Station Manager/Emergency Coordinator (TSC Manager) and other key TSC Staff personnel as to their duties, responsibilities, and functional relationships in the emergency organization.

The TSC is located on elevation 594 of the Service Building within a 2-minute walking distance of the Control Room but does require leaving the controlled habitability environment. The TSC has been provided with an emergency ventilation capability comparable to the system provided for the Control Room. The ventilation system contains a single train of HEPA filters and charcoal beds with a process radiation monitor for the automatic actuation of closed-cycle operation in the event radiation limits are exceeded. The installation of the radiation process monitors for the ventilation system has not been completed and the overall system is scheduled for final preoperational and startup testing in January 1984. In addition, the TSC has an installed area radiation monitor with direct readouts available to TSC personnel.

The inspectors examined the communications capability of the TSC as described in the EP and EPIPs. It was found that certain of the communications equipment had not been installed, as follows: the selective signaling telephone system (replaces the ringdown telephone system described in the current revision of the EP); the intercom system for dedicated communications with the Control Room, Shift Supervisor, and the OSC; the NRC telephones which include the ENS ringdown telephone and the FTS telephone; and the commercial and PBX telephone lines to the various TSC staff functional locations within the TSC. The radio communications system has been installed as well as a limited number of facility PBX extensions. The licensee indicated that the communications systems would be completed by February 1984. It was noted by the inspector that telephones required for TSC operation would be stored until needed for TSC activation. The inventory control of emergency equipment for the TSC did not contain a requirement for the periodic verification that sufficient telephones would be available.

The TSC has ample space to accommodate the TSC staff assigned to the area during emergency conditions. Included within the TSC is a dedicated space of ample size for use by the NRC. This area includes provisions for the ENS, FTS (2 lines), and commercial telephone lines (2).

The TSC location does not provide for face-to-face communications with Control Room personnel. However, plant parameter information is readily available directly from computer terminals and CRT displays in the TSC. Similarly, meteorological data and radiological information is available from the TSC computer terminals. As a backup, this data could be obtained directly from the Control Room over the dedicated intercom or telephone communication links. Status boards have been provided to display plant, meteorological, and radiological data.

Upon activation, TSC staff personnel bring to the TSC the necessary up-to-date plant information from controlled distribution locations; examples include the FSAR, operating procedures, facility drawings, and technical reference documents. Immediately available to TSC personnel are the facility records from the master document control library which is also located in the Service Building on elevation 594.

Based on the above findings, the following portions of the licensee's program were found to be incomplete. These areas will be reviewed during a future inspection.



- Complete the installation and testing of the TSC emergency ventilation process radiation monitor. (413/83-42-14 and 414/83-35-14)
- Complete the installation and testing of the TSC communications systems. (413/83-42-15 and 414/83-45-15)

In addition, the following item should be considered for program improvement:

- The periodic inventory of TSC emergency equipment should include the telephone instruments stored for emergency use. (413/83-42-16 and 414/83-35-16)

#### 4.1.1.3 Operations Support Center

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(8); 10 CFR 50, Appendix E, Paragraph IV.E; criteria in NUREG-0654, Section II.H; and criteria in NUREG-0578.

The inspectors reviewed the Emergency Plan, Section H.1.c. and examined the location of the OSC within the facility. The OSC was found to be the onsite emergency response staging area separate from the Control Room and the TSC where certain emergency response support personnel base their operations during an emergency. The OSC is located outside the Control Room near the Unit 2 side in the Auxiliary Building on elevation 594 and encompasses an area of approximately 400 square feet. The OSC has not been provided with any emergency habitability protection comparable to the Control Room or the TSC. However, should the OSC become uninhabitable, the licensee has ample room in the Control Room to relocate the OSC function and personnel.

Primary and backup communications utilizing the facility PBX system, a dedicated intercom system (partially installed), and portable FM radios were available for communications with the Control Room, TSC, and dispatched team personnel.

Based on the above findings, this portion of the licensee's program appears to be adequate. However, the following item should be considered for program improvement:

- Evaluating during an exercise the effect of the small size of the OSC on the ability of the OSC to carry out its assigned emergency response functions. (413/83-42-17 and 414/83-35-17)

#### 4.1.1.4 Emergency Operations Facility (EOF)

This area was previously inspected. The results of that inspection are found in Report Nos. 413/83-23 and 414/83-20.

#### 4.1.1.5 - 4.1.1.8 Post Accident Sampling and Analysis

These areas will be inspected at a later date.

#### 4.1.1.9 Offsite Laboratory Facilities

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraph IV.E; and criteria in NUREG-0654, Sections II.C and H.

The Environmental Radiological Laboratory at the McGuire Nuclear Station serves as the primary laboratory facility for the analysis of offsite environmental samples. An inspector toured the Environmental Radiological Laboratory and found that the laboratory is well equipped and prepared to provide support as needed. The laboratory utilizes sophisticated analytical equipment which is checked each day prior to use. The laboratory also participates in the EPA Laboratory Intercomparison Studies Program and has an internal audit program utilizing prepared standards, blanks, spikes, and replicates. In addition, once each year, new calibration standards are purchased. Calibrations are performed quarterly.

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

#### 4.1.2 Protective Facilities

##### 4.1.2.1 Assembly/Reassembly Areas

This area was previously inspected. The results of that inspection are found in Report Nos. 413/83-23 and 414/83-20.

##### 4.1.2.2 Medical Treatment Facilities

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(12); 10 CFR 50, Appendix E, Paragraph IV.E; criteria in NUREG-0654, Section II.L; and criteria in ANSI/ANS 3.7.1.

The medical facilities are still under construction and could not be evaluated.

Based on the above finding, this portion of the licensee's program was found to be incomplete. This area will be reviewed during a future inspection. (413/83-42-18 and 414/83-35-18)

##### 4.1.2.3 Decontamination Facilities

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(8), (10), and (11); 10 CFR 50, Appendix E, Paragraph IV.E; and criteria in NUREG-0654, Sections II.J and K.

The inspector evaluated this area through a review of the EP and EIPs, discussion with licensee representatives, and an inspection of selected facilities.

Except for the women's change room near the Health Physics offices, construction of the onsite decontamination facilities has not been completed. The licensee anticipates completion of these facilities by January 1, 1984.

Provisions for decontamination at the evacuation-relocation sites ("Alpha" and "Bravo") are not yet in place. The licensee plans to stock a spray-foam agent for personnel decontamination at those sites, since shower facilities are not available.

Based on the above findings, this portion of the licensee's program was found to be incomplete. This area will be reviewed during a future inspection (413/83-42-19 and 414/83-35-19).

#### 4.1.3 Expanded Support Facilities

This area was previously inspected. The results of that inspection are found in Report Nos. 413/83-23 and 414/83-20.

#### 4.1.4 News Center

This area was previously inspected. The results of that inspection are found in Report Nos. 413/83-23 and 414/83-20.

### 4.2 Emergency Equipment

#### 4.2.1 Assessment Equipment

##### 4.2.1.1 Emergency Kits and Emergency Survey Instrumentation

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(8) and (9); 10 CFR 50, Appendix E, Paragraphs IV.B and E; and criteria in NUREG-0654, Sections II.H and I.

The inspector reviewed EPIP HP/O/B/1000/6 (which includes kit inventories) and inspected various emergency kits. All kits inspected were found to be adequately stocked, and the contents were as specified in the inventories except for deviations noted therein. These deviations consist primarily of items that are on order, including a portable ion chamber, silver zeolite cartridges, and a multichannel analyzer (MCA) for each of five Environmental Survey Kits. The MCA will be used to measure the concentrations of radioiodine and radioparticulates in air samples.

The inspector reviewed selected records to confirm that survey instruments are functionally checked monthly and are calibrated quarterly in accordance with the procedures. The Health Physics Section has developed procedures (1003 series) for the calibration of emergency radiation instruments. Instrument calibration is currently done at the McGuire Nuclear Station using a commercial calibration device, but the licensee has ordered an identical unit for use at CNS and expects delivery by mid-December 1983.

The inspector noted a potential generic problem with all of the various types of emergency kits. Copies of procedures in the kits are stamped with the following: "For Information Only - Not to be Used for Application". The inspector discussed with licensee personnel the need to maintain controlled copies of procedures in the emergency kits. The licensee indicated that this matter will be reviewed.

Based on the above findings, this portion of the licensee's program was found to be incomplete and will be re-evaluated during a future inspection (413/83-42-20 and 414/83-35-20).

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

- Using controlled copies of procedures in emergency kits instead of the present "information" copies. (413/83-42-21 and 414/83-35-21).

#### 4.2.1.2 Area and Process Radiation Monitors

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraphs IV.B and E; criteria in NUREG-0654, Sections II.H and I; and criteria in NUREG-0737.

Currently, there are 24 area radiation monitors (ARMs) installed in Unit 1. Of these monitors, 23 read out in the Control Room and one in the Technical Support Center. Of the 23 monitors in the Control Room, two are not wired to detectors and four are marked as spares. One of the ARMs (IEMF-14) will need to be relocated, according to the licensee. None of the ARMs have been calibrated, and the calibration procedures are not yet written and approved. Once calibration is completed, a preoperational test will be run prior to turnover for station use. This work should all be completed by March 1984.

Two high-range containment monitors ( $10^8$  rads/hr) and the steam-line monitors have not been installed. It is likely that these monitors will also be operational by March 1984. The EALs contained in the EIPs indicate that an initiating condition for a General Emergency is a reading of  $10^4$  rads/hr, and for a Site Area Emergency, when the alarm annunciates. However, no technical basis for determining the EAL setpoints on the monitors at  $10^8$  rads/hr was available. No specific EALs have been established for the monitors on the steam line, nor has any technical basis been developed.

The inspector toured the locations of the Unit 1 ARMs that were installed, looked at the detectors, area readouts (where available), and Control Room readouts. No EALs were posted in the Control Room or the TSC near or on the instruments to indicate Site Area and General Emergency levels.

The inspector also reviewed 23 process monitors for Unit 1; these monitors were not all installed, and one in the TSC had been removed. The calibrations and the preoperational tests, as with the ARMs, should be completed by March 1984. Also like the ARMs, no EALs have been posted on or near the process monitors (PMs).

All of the ARMs and PMs are powered by redundant power supplies. The high-range containment monitors are to be placed on vital power, and the TSC process monitors are powered by the lighting circuit which is a redundant "blackout proof" circuit.

The high-range containment monitors have specifications to insure operability in the harsh operating environment of containment. The specifications are as follows:

- 1) Radiation lifetime =  $2 \times 10^8$  rads,
- 2) Accuracy within a factor of two over the  $10^{-10}$  rad/hour range,
- 3) Two alarm links,
- 4) Temperatures to 350°F,
- 5) Humidity 0 to 100% (saturated steam), 95% at 86°F electronics, and
- 6) Seismic parameters according to IEEE 344-1975 and LOCA and environmental parameters according to IEEE 323-1974.

All other ARMs have environmental operating specifications adequate for the environments in which they will operate.

The detector efficiencies for the installed PMs have been developed along with conversion factors for the Control Room curve book.

Based upon the above findings, the following portions of the licensee's program were found to be incomplete. These areas will be reviewed during a future inspection:

- 1) The installation, calibration, and preoperational tests of the area radiation and process monitors including the appropriate identification of same in the control room (413/83-42-22 and 414/83-35-22).
- 2) The high-range containment and steam-line monitor installations, calibrations, and preoperational tests (413/83-42-23 and 414/83-35-23).
- 3) A technical basis for the alarm settings of ARMs, high-range containment and steam-line monitors for Site Area and General emergencies (413/83-42-24 and 414/83-35-24).
- 4) The posting of the EALs for Site Area and General emergencies on or near the containment, steam-line, and other area radiation monitor readouts that are used as backups for the containment monitors (413/83-42-25 and 414/83-35-25).

#### 4.2.1.3 Non-Radiation Process Monitors

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraphs IV.B and E; criteria in NUREG-0654, Sections II.H and I; and criteria in NUREG-0737.

The inspector discussed the status of non-radiation process monitors with the licensee. These monitors included 28 steam generator level indicators, 2 feedwater storage tank level indicators, 9 pressurizer and reactor control loop temperature and pressure monitors, 4 containment pressure monitors, 4 boric acid tank level indicators, 4 Control Room ventilation intake chlorine monitors, and the seismic monitoring system.



The readouts for all the monitors listed in the above paragraph will be in the Control Room. To date, these monitors/indicators have not all been installed, calibrated, and preoperationally tested. The licensee anticipates completion of these tasks by March 1984. Some of the steam generator tasks had been completed for the hot functional tests that were underway at the time of this appraisal.

Based upon the above findings, this portion of the licensee's program was found to be incomplete. This area will be reviewed during a future inspection. (413/83-42-26 and 414/83-35-26)

#### 4.2.1.4 Meteorological Instrumentation

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraphs IV.B and E; criteria in Regulatory Guides 1.23, 1.97 and 1.101; criteria in NUREGs-0696 and -0737; criteria in NUREG-0654, Sections II.H. and I, and Appendix 2; and the requirements of Supplement 1 to NUREG-0737.

The meteorological towers and Control Room recorders were inspected and discussed with licensee representatives. The tower sensors have been removed for upgrading. The Control Room recorders have also been shut down for upgrade. The multipoint recorder is to be replaced by one from a different manufacturer.

The meteorological towers are located about 1200 to 1400 feet southwest of the center of the plant. On the 40-meter tower, wind speed and direction are detected at 40 meters and dewpoint and ambient temperature are detected at 10 meters. Only wind speed and direction are measured at the top of the 10-meter tower nearby; consequently, delta-T values are only available from the 40-meter tower.

Since the bases of the towers are 37 feet above plant grade, there was concern that ground-level releases could be affected by downslope or gravitic flow which might not be detected by the 10-meter instruments. A mobile 10-meter tower was set up at plant grade north of the plant and operated for 3 months in 1982. The data was consistent between the two points, indicating no downslope-flow effects of any significance.

Due to effects from the tower on the 40-meter wind sensors, the licensee stated that when the upgraded system is installed, the sensors will be moved upward to a point 15 feet above the top grating of the tower to minimize effects from the tower.

A licensee representative stated that a backup battery power supply will be provided for the tower signal conditioning equipment. Control Room recorders will be on a vital bus and failure of the meteorological transmission system will trigger an alarm in the Control Room.

The meteorological parameters will be input to the Operator Aid Computer (OAC) system. In case of an accident, meteorological data will be recorded on a disc, which then would be manually transferred to a disc drive for transfer to the VAX system for data storage. The VAX system is a company-wide computer containing the Class A dose assessment model and which can be accessed by TSC dose assessment personnel, CMC dose assessment personnel, and both the North Carolina and the South Carolina State EOCs.

Meteorological information for follow-up notification messages can be obtained from the Control Room recorders, printer, or computer video-display terminals. If the onsite system becomes inoperative, the Emergency Plan makes provisions for obtaining meteorological information from Douglas Airport at Charlotte, N. C. Procedure HP/O/B/1000/06, "Emergency Equipment Functional Check and Inventory", provides for monthly checks of the airport weather data and a cross-check against plant data. The EP makes provisions for weekly operability checks of the system.

A licensee representative stated that a NOAA radio was to be installed in the control room to ensure that the plant is provided with warnings of severe weather that may affect the site. It was also stated that when the equipment was operating, the meteorological system easily met the data availability goals.

The inspector reviewed calibration procedures and calibration data for the system during its last period of operation. The inspector stated that the procedures would need to be reviewed and updated for the upgraded system when it is installed. Dose assessment procedures currently available were reviewed and were found to make provisions for obtaining and using the meteorological data.

Based on the above findings, the following portions of the licensee's program were found to be incomplete. These areas will be reviewed during a future inspection.

- Install, make operational, and calibrate the meteorological tower sensors and the remaining required equipment, including connections to the Control Room recorders. (413/83-42-27 and 414/83-35-27).
- Ensure that the NOAA radio is installed and operational in the Control Room. (413/83-42-28 and 414/83-35-28).
- Establish a program to verify that data availability goals are met. (413/83-42-29 and 414/83-35-29).
- Ensure that equipment is installed and operational, procedures are issued and implemented, and personnel are trained in the transfer of data from the OAC system to the VAX system. (413/83-42-30 and 414/83-35-30).

#### 4.2.2 Protective Equipment

##### 4.2.2.1 Respiratory Protection

This area was reviewed with respect to the requirements of 10 CFR 50.74(b)(8); 10 CFR 50, Appendix E, Paragraph IV.E; criteria in NUREG-0654, Sections II.H and J; and criteria in NUREG-0041.

The licensee has a compressor located near the health physics office for refilling air bottles. Arrangements have been made for acquiring additional air supplies from the McGuire Nuclear Station to support emergency operations.

During the walk-through there appeared to be no SCBA equipment reserved near the OSC for use by the in-plant teams. A licensee representative indicated that the Control Room units would be used on an interim basis. These should be retained for the exclusive use of Control Room personnel.

Currently SCBA devices have not been placed at all designated locations.

Based on the above findings, this portion of the licensee's program was found to be incomplete and will be reviewed during a future inspection. (413/83-42-31 and 414/83-35-31)

##### 4.2.2.2 Protective Clothing

This area was previously inspected. The results of that inspection are found in Report Nos. 413/83-23 and 414/83-20.

#### 4.2.3 Emergency Communications Equipment

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(6); 10 CFR 50, Appendix E, Paragraph IV.E and G; and criteria in NUREG-0654, Sections II.E and F, and Appendix 3.

The licensee stated that the prompt notification system (sirens in the 10-mile EPZ) is approximately 75% tested and operational. The licensee has a 24-hour-per-day capability to notify NRC and state and local agencies.

Although an in-plant alarm system is in place, the licensee has identified problems with that system and has decided to replace it with a dedicated siren/strobe system, expected to be installed in 1984.

Using a combination of commercial telephones, selective signaling (planned for installation in December 1983), and radios, the licensee has developed a communications network which includes primary and backup modes for all offsite links.

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



#### 4.2.4 Damage Control/Corrective Action and Maintenance Equipment and Supplies

This area was previously inspected. The results of that inspection are found in Report Nos. 413/83-23 and 414/83-20.

#### 4.2.5 Reserve Emergency Supplies and Equipment

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(8); 10 CFR 50, Appendix E, Paragraphs IV.E and G; and criteria in NUREG-0654, Section II.H.

During the initial phase of an emergency, the licensee plans to rely on supplies and equipment maintained onsite to support emergency operations. Reserves, if needed, would be brought in from the McGuire Nuclear Station.

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

#### 4.2.6 Transportation

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(8); 10 CFR 50, Appendix E, Paragraph IV.E; and criteria in NUREG-0654, Section II.I.

The licensee has no vehicles dedicated to supporting an emergency response effort (except for an ambulance which will only be kept onsite until the end of the construction phase). Licensee personnel informed the inspector that arrangements have been made whereby 2 trucks (used routinely by Chemistry and Operations) and other available station vehicles will be assigned for use by offsite monitoring teams in an emergency. However, these vehicles are not always onsite, and it is possible that none would be immediately available at the time of an emergency. Moreover, the arrangements described above are apparently verbal and/or informal, since the inspector was unable to find any reference to such arrangements in the EP or the EIPs.

Based on the above findings, the following deficiency must be corrected prior to exceeding 5% reactor power:

- The licensee has not made adequate provisions to insure that 4 suitable vehicles are available for use at all times in support of the 4 ground-based Field Monitoring Teams specified in EPIP HP/O/B/1009/04 as per 10 CFR 50.47(b)(8). (413/83-42-32 and 414/83-35-32)

### 5.0 EMERGENCY IMPLEMENTING PROCEDURES

#### 5.1 General Content and Format

This area was reviewed with respect to the requirements of 10 CFR 50.47(b); 10 CFR 50, Appendix E; criteria in NUREG-0654, Section II.B; and criteria in Regulatory Guide 1.33.

For normal reactor operations, the Control Room staff uses Operating Procedures (OPs). These procedures can direct the staff to Abnormal Procedures (APs) or Emergency Operating Procedures (EOPs) in the event that complications arise to make operations abnormal. In some emergency cases (e.g., some fires, unauthorized personnel entry, or severe weather warnings), the Control Room staff would be notified by other Duke Power employees or an outside agency (NAWAS). However, the first indication of an emergency would most likely be received via the Control Room annunciator system.

When an annunciator alarms, the nuclear operator identifies the annunciator by letter and number (e.g., row B Column 8) and the annunciator panel by number (e.g., IV-B). Using the identification numbers, the operator then goes to the Annunciator Response Guides (ARs) for follow-up action guidance. Depending upon the nature of the annunciation, the guidance may refer the operator to the APs or the APs and the EIPs. The APs may refer the operator to the EOPs and, in some cases (e.g., operation of the seismic monitor), other instructions.

Review of the OPs, ARs, EIPs, and APs showed that: (1) the formats are generally adequate, (2) the appropriate references to and between ARs, APs, and EIPs are made, (3) the action steps are documented in sequential fashion, (4) the prerequisites, precautions, and conditions are specified where appropriate, and (5) in general, the procedures allow the application of judgment to implement actions and to apply Emergency Action Levels (EALs). However, the EOPs are only in draft form and some of the APs and EIPs have not been generated.

There is clear guidance in the EIPs concerning the authority and responsibility for performing the necessary tasks. Most procedures are specifically designed for certified nuclear operators, as these procedures refer emergency classification to the Emergency Coordinator. Once the Emergency Coordinator begins to classify an emergency, the EIPs are both available and used. All the required initiating conditions are specified in EIP RP/O/A/5000/01, for each class of emergency. The Protective Action Guides (PAGs) are specified in RP/O/A/5000/04 and 05.

The EIPs and other appropriate procedures have check-off sheets that require either the user to record his initials or indicate that the procedural step is not applicable (NA).

Duke Power Company uses a Procedure Major Change Process Record (Form 34811) to record all changes to procedures. In addition, a Nuclear Safety Evaluation Check List and an ALARA Check List are used to assist in the evaluation of procedures.

Based on the above findings, the following portion of the licensee's program was found to be incomplete. This area will be reviewed during a future inspection:

- Completion of the APs, EOPs, and EIPs (413/83-42-33 and 414/83-35-33)

## 5.2 Emergency, Alarm, and Abnormal Occurrence Procedures

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraph IV.B; and criteria in NUREG-0654, Sections II.D, H, and I.

The inspectors reviewed the EOPs, APs, and ARs to determine if these procedures require an evaluation of the initiating conditions relative to the EALs contained in the EP and EIPs. The EOPs (draft versions), APs (approved and draft versions), and the ARs (approved versions) were found to contain appropriate references to EIP RP/O/A/5000/01, "Classification of Emergency", as "subsequent action" to be taken by the operator in response to emergency conditions.

Based on the above findings, the following portion of the licensee's program was found to be incomplete. This area will be reviewed during a future inspection.

- Issue approved versions of EOPs (01 and 03) and APs (11, 17, 18, 19, and 20) (413/83-42-34 and 414/83-35-34)

## 5.3 Implementing Instructions

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraphs IV.C and D; and criteria in NUREG-0654, Section II.C, D, H, and I, and Appendix 1.

The inspectors examined the EIPs to verify that the requirements of the EP were implemented through appropriate instructions to emergency response personnel. The licensee's EIPs comprise a series of response procedures (RPs), health physics procedures (HPs), Catawba Nuclear Station Directives (CNSDs), a chemistry procedure (CP), and a performance test procedure (PT). Several EIPs had not been completed by the licensee and remain in the draft procedure state. These draft procedures include the following: RP #11; HP #s 3, 12, 17, 18, 19; and CP # 11. Specific findings as a result of the review of the completed EIPs by the inspectors were as follows:

1. Implementing instructions have been provided for use by the Emergency Coordinator in the EIPs.
2. The RPs in conjunction with CNSD 3.8.4, clearly designate the functional duties and responsibilities of the Emergency Coordinator, including initial notification and the recommendation of protective actions to offsite agencies, as responsibilities which may not be delegated.
3. Specific RPs have been written for each accident classification and provide for the appropriate notifications, staffing and activation of the ERFs, and assessments necessary for making protective action recommendations. In addition, the procedures provide guidance in formulating protective action recommendations for all the conditions specified in Appendix 1 to NUREG-0654 as clarified by NRC Information Notice 83-28.

4. The EALs specified in RP #1 are based on observable information readily available to Control Room personnel. It was noted by the inspector that a specific parameter value had not been provided for certain process radiation monitor EALs (EMF #s 33, 34, 48, and 53A/B) when used to specify an Alert or Site Area Emergency classification. Only the words "in alarm" were provided.
5. The implementing instructions provide references to more detailed procedures, as appropriate, in order to support the overall implementation of the EP.

Based on the above findings, this portion of the licensee's program was found to be incomplete. This area will be reviewed during a future inspection.

- Issue all EIPs in final, approved versions and train facility personnel in the use of these procedures (413/83-42-35 and 414/83-35-35).

In addition, the following item should be considered for program improvement:

- Specifying parametric values for the process radiation monitor values that currently state "in alarm" when used as EALs for accident classification. (413/83-42-36 and 414/83-35-36).

#### 5.4 Implementing Procedures

##### 5.4.1 Notifications

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(5) and (6); 10 CFR 50, Appendix E, Paragraphs IV.C and D; and criteria in NUREG-0654, Sections II.E, F, H, and J.

The inspectors examined RPs (02, 03, 04, and 05) and CNSD 3.8.4, which prescribe the methods for the notification of the onsite emergency organization and offsite agencies. The inspectors found that, for each class of emergency, a sequence of steps to notify, mobilize, and augment the onsite emergency organization and supporting organizations are specified. Preplanned messages were provided in the procedures as attachments containing a listing of persons and agencies who are included in the response scheme. The specific methods of notification (telephone, selective signaling, or beeper) were prescribed, with appropriate numbers listed. The tabulation of persons and agencies to be notified was found to be commensurate with the emergency classification. A method for authenticating messages to offsite agencies was provided in the preplanned message format.

During the walk-throughs (Section 7.2), it was found that the proper telephone number for contacting the State of South Carolina on holidays was not in the procedure nor was the commercial number for contacting the NRC should the ENS telephone be found inoperable.

Based on the above findings, this portion of the licensee's program appears to be adequate. However, the following item should be considered for program improvement:

- Including the State of South Carolina's night, weekend, and holiday telephone number and the commercial telephone number for the NRC in the appropriate procedures. (413/83-42-37 and 414/83-35-37).

#### 5.4.2 Assessment Actions

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraph IV.B; and criteria in NUREG-0654, Sections II.I, J, and M.

The overall area of assessment actions could not be properly evaluated due to the incompleteness of the procedures, training, and installation of instrumentation. This area will be reviewed during a future inspection (413/83-42-38 and 414/83-35-38).

##### 5.4.2.1 Offsite Radiological Surveys

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraphs IV.B and E; and criteria in NUREG-0654, Sections II.H, I, and K.

The inspector reviewed procedure HP/O/E/1009/04, "Environmental Monitoring For Emergency Conditions Within the Ten Mile Radius of Catawba Nuclear Station", examined the emergency kits and support equipment, and conducted interviews with members of the Field Monitoring Team (FMT).

The emergency kits did not contain respirators, keys for sampling stations, and silver zeolite cartridges. This equipment, in addition to radios and multi-channel analyzers, are on order.

The procedure did not include provisions for the following:

1. Verifying presence in the plume through beta measurements before attempting to collect an air sample.
2. Locating keys to the various sample stations and gates.
3. Reading the "in-flow" face of the cartridge.
4. Purging the cartridge to remove some of the noble gases.
5. Verifying the operability of the analytical equipment with a mock iodine source.



The Canberra-10 multichannel analyzer with germanium detector is used for the analysis of radioiodine. The instrument reads out directly in terms of concentration and thyroid dose rate. Presently, the Field Monitoring Teams (plant and offsite support) have not been trained on the use of this equipment. Members of the offsite teams have not been provided site-specific training to familiarize them with road maps and sampling points. Enclosure 5.6 to HP/O/B/1009/09 indicates that the "turnover of the TSC FMTs to CMC FMT (offsite support) shall occur at the intersection of SC 274 and SC 49". This may be an inconvenient place for the turnover due to the location of the plume and ongoing monitoring activities.

The procedure does not address the coordination of licensee monitoring activities with outside agencies.

Based on the above, this portion of the licensee's program appears to be adequate. However, the licensee has committed to completing the following program improvements by February 15, 1984:

- Providing training for the Field Monitoring Teams, including offsite support personnel, in the use of the Canberra-10 for field analyses of radioiodine cartridges and in site-area-specific features. (413/83-42-39 and 414/83-35-39).
- Providing sufficient equipment for all Field Monitoring Teams (FMTs). (413/83-42-40 and 414/83-35-40).
- Coordinating the FMTs turnover location based on existing conditions. (413/83-42-41 and 414/83-35-41).

In addition, the following items should be considered for program improvement

Modifying HP/O/B/1009/05 to include the following provisions:

1. Verifying presence in the plume through beta measurements before attempting to collect an air sample.
2. Locating keys to the various sample stations and gates
3. Reading the "in-flow" face of the cartridge
4. Purging the cartridge to remove some of the noble gases
5. Verifying the operability of the analytical equipment with the mock iodine source Ba-133 instead of Na-22. (413/83-42-42 and 414/83-35-42)

#### 5.4.2.2 Onsite (Out-of-Plant) Surveys

This area was reviewed with respect to the requirements of 10 CFR 50.47.(b)(9); 10 CFR 50, Appendix E, Paragraphs IV.B and E; and criteria in NUREG-0654, Sections II.H, I, and K.

There is no procedure which addresses the use and activities of an onsite monitoring team. Based on conversations with licensee personnel, the onsite team would be formed in part from the OSC under the direction of the TSC Surveillance and Control Coordinator and also by a Field Monitoring Team under the direction of the Field Monitoring Team Coordinator.

Based on the above findings, the following deficiency must be corrected prior to exceeding 5% reactor power:

- The licensee has not identified the means for providing onsite (out-of-plant) survey coverage during emergencies as per 10 CFR 50.47(b)(8). (413/83-42-43 and 414/83-35-43).

#### 5.4.2.3 In-Plant Radiological Surveys

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraphs IV.B and E; and criteria in NUREG-0654, Sections II.H and K.

HP/O/B/1009/09, "Guidelines For Accident and Emergency Response", provides the overall guidance for the direction and control of health physics activities during emergencies. This procedure primarily provides guidelines for the initial response as indicated by Sections 1.3 and 3.3, and Enclosures 5.2, 5.3 and 5.4. It does not consider, in a comprehensive manner, the potential in-plant radiological surveillance activities in support of fire, search and rescue, and contaminated injuries, repair, evacuation, sampling, and analyses.

HP/O/B/1009/05, "Personnel Monitoring For Emergency Conditions" provides guidance only for monitoring in support of an evacuation. Section 3.1 directs the team to ingest a KI tablet if a "high" radioiodine concentration is encountered. The value is not specified. The procedure does not even direct the team to measure airborne concentrations at that point.

HP/O/B/1009/07 provides guidance on in-plant particulate and iodine monitoring under accident conditions. No protective equipment (gloves as a minimum) is specified for handling the samples.

In general, the procedures do not appear to contain comprehensive guidance on in-plant monitoring activities. Specifically, the procedures do not

1. Identify the central collection point for all samples obtained by the team.
2. Provide exposure guidelines for retreating from areas or evacuating emergency workers from the emergency facilities and security posts (see section 5.4.3.2).

3. Contain in-plant maps on which to document radiological conditions.
4. Contain in-plant FSAR maps showing predetermined expected radiological conditions to aid in determining the most dose-saving routes.
5. Contain provisions for a buddy system in high dose-rate areas or under highly uncertain conditions.
6. Contain minimum protective clothing requirements for certain monitoring activities.

There was no self-contained breathing apparatus (SCBA) in the OSC kit. It was indicated that the equipment would be borrowed from the Control Room (see section 4.2.2.1, "Respiratory Protection").

Based on the above findings, the following deficiencies must be corrected prior to exceeding 5% reactor power:

The licensee has not:

- Established a procedure considering the overall responsibilities and priorities for health physics support of potential emergency activities as per 10 CFR 50.47(b)(8) and (9). (413/83-42-44 and 414/83-35-44).
- Provided adequate protection for emergency workers via a "buddy system" under emergency dose-rate and unstable plant conditions as per 10 CFR 50.47(b)(8) and (9). (413/83-42-45 and 414/83-35-45).

In addition, the following items should be considered for program improvement:

- Using in-plant maps to document radiological conditions (413/83-42-46 and 414/83-35-46).
- Using in-plant maps showing predetermined or expected radiological conditions from the FSAR to aid in determining the most dose-saving routes. (413/83-42-47 and 414/83-35-47).
- Specifying minimum protective-equipment requirements for monitoring support activities (413/83-42-48 and 414/83-35-48).

#### 5.4.2.4 - 5.4.2.11 Post-Accident Sampling and Analysis

These areas will be inspected at a later date.



#### 5.4.2.12 Radiological and Environmental Monitoring Program

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraphs IV.B and E; criteria in NUREG-0654, Section II.I; and criteria in NUREG-0737.

Provisions for the collection and evaluation of environmental TLDs and samples are contained in HP/O/B/1009/04, "Environmental Monitoring for Emergency Conditions Within the Ten Mile Radius of Catawba Nuclear Station." This procedure contains provisions for collecting samples in the 10-mile EPZ. The state and the corporate office will provide for collecting and analyzing samples in the 50-mile ingestion EPZ. HP/O/B/1009/20, "Procedure For Estimating Food Chain Doses Under Post Accident Conditions", Section 3.6, indicates that environmental samples will be analyzed at the Radiological Environmental Laboratory at the McGuire Nuclear Station.

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

#### 5.4.2.13 Dose Projection

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(9); 10 CFR 50, Appendix E, Paragraph IV.B; and criteria of NUREG-0654, Section II.I.

The three basic procedures used for projecting the offsite dose are currently being revised. They are:

- (1) HP/01/B/1009/06 (HP-06), "Alternate Method For Determining Dose Rate Within the Reactor Building"
- (2) HP/O/B/1009/13 (HP-13), "Offsite Dose Projection - Uncontrolled Release of Radioactive Material through the Unit Vent"
- (3) HP/O/B/1009/13 (HP-15), "Offsite Dose Projection - Uncontrolled Release of Gaseous Radioactive Material Other Than Through The Unit Vent".

The initial dose assessment procedure which is to be used by Control Room personnel is still in draft form: RP/O/A/5000/11, "Protective Action Recommendations Without the OAC".

The following are comments about each basic procedure:

- (1) HP-06 describes an alternate method for determining the dose rate within the reactor building in the event the reactor building monitor is inoperable. This procedure requires a person to make a dose-rate measurement at the personnel hatch. During an accident dose rates in the area are estimated to be as high as  $2 \times 10^4$  Rads/hr. This suggests that this data may not be obtainable throughout the range of the accident. It should be noted that this is a backup method.

The assumptions used in developing the relationship between the dose inside the reactor building and the dose at the hatch were not available for review. Also the interference dose rate outside of the hatch due to sources external to the reactor building had apparently not been analyzed.

- (2) HP-13 describes the method for projecting potential offsite doses following a release of radioactive material through the unit vent. The licensee indicated that the facility was designed such that all internal releases would pass through the unit vent, with the exception of design leakage. This procedure uses a computerized system called ODCAR2. The licensee plans to replace this system with a corporate-based computerized model.

The manual method described in the procedure calculates a 2-hour dose. A true projected dose, based on the expected duration of release, is not determined. Guidelines for determining the expected duration of the release are not provided in the procedure. The procedure does not indicate the need for an advanced weather forecast. Also, it does not provide guidance for immediately reassessing the projected dose after conditions change.

- (3) HP-15 describes the method of projecting dose based on the design leakage from the reactor building. The procedure is currently being revised.

None of the equations have a time factor explicitly defined, yet they are indicated to be 2-hour dose projections. The explanation of the assumptions and constants used in developing the equation was not available for review.

Based on the above findings, this portion of the licensee's program appears to be adequate. However, the licensee has committed to completing the following program improvement items by February 15, 1984:

- Completing the Control Room initial dose assessment procedure (413/83-42-49 and 414/83-35-49).
- Analyzing the reliability and availability of the alternate method for determining dose rates in the reactor building (413/83-42-50 and 414/83-35-50).
- Modifying the procedures to include:
  - a. A method of determining a true projected dose and comparing it to the EPA PAGs.
  - b. Guidelines for determining the expected duration of a release.
  - c. Guidelines for immediately reassessing the projected dose based on changed conditions (413/83-42-51 and 414/83-35-51).
- Describing the assumptions and constants used in developing the equations in HP/O/B/1009/15 (413/83-42-52 and 414/83-35-52).

In addition, a portion of the licensee's program was found to be incomplete and the licensee has committed to completing the following by May 1, 1984. This area will be reviewed during a future inspection.

- Complete the development of the computer software for the corporate-based dose assessment model and make it available for the use of dose assessment personnel. (413/83-42-53 and 414/83-35-53)

#### 5.4.3 Protective Action

##### 5.4.3.1 Radiation Protection During Emergencies

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(11); 10 CFR 50, Appendix E, Paragraph IV.B; and criteria in NUREG-0654, Section II.K.

HP/O/B/1009/09 (HP-09), "Guidelines for Accident and Emergency Response", contains the overall guidance for establishing the radiation protection program during emergencies.

The guidelines for emergency exposures and authorizations are not clear. The limitations on exposures to emergency workers do not appear to be consistent with EPA guidelines as required by 10 CFR 50.47(b)(11). An October 24, 1983 internal correspondence states that NRC regulations do not require the use of 75 rem whole body as the dose limit for life saving purposes and that no NRC regulation authorizes more than 3 rem/quarter for any purpose. Based on discussions with licensee personnel, the company position remains as stated in the letter, and they pointed out the letter also states, "The 25 rem limit does not preclude the Recovery Manager (located in the CMC in Charlotte) from authorizing up to 75 rem as necessary to save a life in specific cases". However, obtaining an authorization from the Recovery Manager may be time-consuming. Currently Enclosure 5.1, "Guidelines for Planned Emergency Exposure", to HP-09 places the same 25 rem limit for both saving a life and preventing extensive property damage. No thyroid limitations for emergency exposure have been stated.

Based on interviews with emergency workers, they appeared to be unfamiliar with the emergency exposure limits.

Section 4.4.1 of the procedure requires the establishment of "blanket dose extensions". It states, "Exposure Class 2 personnel shall not be extended beyond their weekly limit". Exposure Class 2 personnel are pregnant females. This suggests that the OSC could work pregnant females up to the weekly limit in support of emergency operations. This category of worker should be considered as nonessential personnel and evacuated. In addition, guidelines for protective actions have not been provided for security personnel remaining onsite following a site evacuation.

HP-09 also does not contain plans for expanding the respiratory protection program by acquiring bottled air for the SCBAs from an offsite supply source.

HP/O/B/1009/06 (HP-06), "Alternate Method For Determining Dose Rate Within the Reactor Building", requires a person to place a detector in contact with the center of the upper personnel hatch door to determine the internal radiation dose rate. Based on the dose-rate conversion equation in Section 4.1.2 of the procedure, the dose incurred performing this measurement could be very high.

The use of KI for minimizing the thyroid dose commitment is addressed in several procedures which appear to be inconsistent with respect to authorization and distribution conditions. No medical consultation or authorization higher than the Station Health Physicist is apparently required. For example:

- (a) HP-09 suggests the Station Health Physicist will "initiate, as necessary, HP/O/B/1009/16, 'Distribution of Potassium Iodide Tablets in the Event of a Radioiodine Release'". HP/O/B/1009/16, Section 4.1.1 states that persons exposed to a "significant amount of radioiodine... will be instructed by Health Physics Supervision to immediately register in the KI distribution center". Section 4.2 indicates that, once registered, "The Health Physics representative shall give one tablet to each person...". There appears to be no formal authorization but only instructions to register. In addition, Section 4.1.1 erroneously defines 520 MPC-hrs of radioiodine as  $4.6 \times 10^{-6}$  mCi/ml in one hour when the correct value for 520 mpc-hrs is  $4.6 \times 10^{-9}$  mCi/ml in one hour.
- (b) HP/O/B/1009/04 appears to indicate that the Field Monitoring Coordinator (FMC) solely would authorize the distribution of KI and at a much lower exposure. Section 3.4 states, "If the team members are expected to be exposed to I-131 in excess of 10 MPC-hrs ( $9 \times 10^{-12}$  uCi/ml), and directed by the FMC, each team member shall ingest a tablet of potassium iodide".
- (c) HP/O/B/1009/05 provides guidance to the team conducting personnel surveys at the Personnel Access Portal and Construction Personnel Exit Area. Section 3.1 states "If survey teams encounter high radioiodine concentration, they should ingest one tablet of Potassium Iodide as per HP/O/B/1009/16".

Based on the above findings, the following deficiency must be corrected prior to exceeding 5% reactor power:

- The licensee's procedures do not include exposure guidelines consistent with the EPA Emergency Worker and Lifesaving Activity Protective Action Guides as per 10 CFR 50.47(b)(11) (413/83-42-54 and 414/83-35-54).

In addition, the following items should be considered for program improvements:

- Localizing the responsibilities for authorizing emergency exposures (413/83-42-55 and 414/83-35-55).
- Removing from HP/O/B/1009/09 the implication that Class 2 personnel may be subjected to emergency exposures. (413/83-42-56 and 414/83-35-56).

- Making all emergency workers aware of the emergency exposure limitations (413/83-42-57 and 414/83-35-57).
- Making provisions for expanding the respiratory-protection supplies and equipment during emergencies to assure that an ample supply is maintained (413/83-42-58 and 414/83-35-58).
- Developing maximum dose and dose-rate guidelines for performing the upper personnel-hatch measurement, or making alternate arrangements to acquire the data (413/83-42-59 and 414/83-35-59).
- Clarifying the authorization and distribution of KI (413/83-42-60 and 414/83-35-60).

#### 5.4.3.2 Evacuation of Owner-Controlled Areas

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(10); 10 CFR 50, Appendix E, Paragraph IV.B; and criteria in NUREG-0654, Section II.J.

CNSD 3.0.7 is included among the EIPs. This procedure would be initiated following implementation of the immediate procedural actions specified in RP/O/A/5000/10 (RP-10), "Conducting a Site Assembly or Evacuation", which is also in the EIPs.

RP-10 requires the Shift Supervisor/Emergency Coordinator to make contact with the health physics duty supervisor for assessment of the radiological hazards that may be involved during an evacuation. Such an evacuation would only be made following a site assembly, where personnel accountability would be conducted at 23 or more specifically defined plant locations. The Shift Supervisor/Emergency Coordinator's contact with the health physicist would be to obtain assistance in deciding which of the two evacuation-relocation sites would be chosen. The procedure specifies the locations and requires the selection of the site "most opposite" the direction that the wind may carry releases of radionuclides.

Following consultation with the health physicist, RP-10 requires that the Shift Supervisor, or his delegate, sound a 20-second blast of the Site Evacuation Alarm and announce a site evacuation of nonessential personnel using a written message. Subsequent actions, specified in RP-10, require the Shift Supervisor to notify either the York County Sheriff's Department or the South Carolina Highway Patrol to assist in traffic control, and notify the evacuation-relocation site of the expected arrival of nonessential personnel. RP-10 also provides for securing from a site evacuation.

CNSD 3.0.7 requires that the Shift Supervisor/Emergency Coordinator appoint an Evacuation Coordinator who must be a "senior supervisor" who is not essential to control of the emergency at hand. The evacuation coordinator assumes command of the evacuees and acts as the communications link between the Shift Supervisor and the evacuees, and the agency assisting in traffic control for the evacuation. Should the Shift Supervisor not specify the coordinator, the senior member of



those evacuating is required to take charge of the evacuation. However, it is not clear how the senior staff members at the various locations will know who is senior. Further, RP-10 does not reference CNSD 3.0.7; consequently, it is not clear how the shift supervisor could now know that he should appoint the coordinator.

CNSD 3.0.7 also has provisions for evacuation during training and drills, along with enclosures for accountability reporting and a map for finding the designated evacuation-relocation site.

The criteria for determining the need for a site evacuation are specified in RP-10. They include: (1) a Site Area Emergency if plant conditions are rapidly degrading; (2) a General Emergency, or (3) other plant conditions that may be judged by the Shift Supervisor/Emergency Coordinator to warrant such actions. However, no specific radiological emergency action levels have been defined to assist the health physicist and Shift Supervisor/Emergency Coordinator in making prompt evacuation decisions. Site assembly criteria include high dose rates or airborne radionuclide levels within the auxiliary building. However, what is meant by "high" is not specified. Further, "high" dose rates within containment are not included, nor are provisions made to establish radiological monitoring at 22 of the 24 assembly locations or at the locations to be added in the near future. Unless the TSC is fully activated, radiation monitoring at the evacuation-relocation site is not provided for in the procedures.

HP/O/B/1009/05 (HP-05), provides for personnel monitoring during evacuations once the TSC has been activated and sufficient monitoring teams are available. However, there are no provisions for monitoring nonessential personnel during evacuations prior to the availability of supplemental monitoring teams. Section 3.1 of the HP-05 uses the term "high concentrations of radioiodines" instead of specifying an action concentration value (See section 5.4.3.1). Section 3.3 addresses the necessity of a complete checklist instead of the monitoring kit having an intact seal.

HP-05 does not reference CNSD 3.0.7 or RP-10. The note under Section 4.1.3 led the inspector to believe that no personnel monitoring would be provided if sufficient manpower could not be arranged. HP-05 does not address an alternative to onsite monitoring of nonessential personnel prior to evacuation if a release from the plant is occurring and monitoring can not be properly accomplished. Further, the monitoring procedure for contaminated vehicles in Section 4.8 can lead the monitoring team(s) to the assumption that nonessential personnel must be prevented from using their contaminated private vehicles even if there are insufficient vehicles to transport them to the selected evacuation-relocation site.

The RPs portion of the EIPs does not contain reference to other EIPs or other facility procedures; consequently, confusion exists between RP-10, CNSD 3.0.7, HP-05, and HP/O/B/1009/09 (HP-09). The licensee explained that the RPs pertain only to the Emergency Coordinator, the HPs to health physics personnel, the CP to the chemistry staff, and the CNSDs to all staff members. However, responsibilities in these procedures for personnel monitoring and naming of the Evacuation Coordinator are not specified in RP-10 or by reference to HP-09 or

CNSD 3.0.7. Verification that all personnel onsite have been notified of the emergency conditions and have followed instructions is discussed in Section 5.4.3.3 of this report.

Based on the above findings, the following deficiency must be corrected prior to exceeding 5% reactor power:

- The Site Assembly/Evacuation procedures do not include provisions for: (1) specific dose-rate and breathing-air levels of radionuclides within the reactor facilities for initiating site assembly and evacuation; (2) a way to establish dose-rate habitability at assembly locations; and (3) radiation surveillance at the relocation sites if the Technical Support Center is not fully activated as per 10 CFR 50.47(b)(10) (413/83-42-61 and 414/83-35-61).

In addition, the following items should be considered for program improvement:

- Developing a workable means for assuring the designation of the site Evacuation Coordinator (413/83-42-62 and 414/83-35-62).
- Modifying HP-05 as follows: (1) the Section 3.1 precaution regarding high radioiodine levels should include a specific concentration value; (2) clarify what to do with the monitoring list in Section 3.3; (3) reference CNSD 3.0.7 and RP-10; (4) specify the required manpower for monitoring in Section 4.1.3; (5) include provisions for monitoring personnel to be evacuated should site dose rates or airborne radionuclide levels be significantly higher than normal background, making surveillance impractical; and (6) clarify the policy on the use of privately owned, contaminated vehicles for transport to the relocation site based upon the need for transporting all personnel (413/83-42-63 and 414/83-35-63).

#### 5.4.3.3 Personnel Accountability

This area was reviewed with respect to the requirements 10 CFR 50.47(b)(10); 10 CFR 50, Appendix E, Paragraph IV.B; and criteria in NUREG-0654, Section II.J.

The procedures for personnel accountability in CNSD 3.0.7 apply to station personnel, contractor personnel, other Duke Power Company employees, and visitors who may be onsite during an emergency event. When the Catawba Nuclear Station is ready for fuel loading and the security gates are staffed, personnel onsite will all have security badges. Onsite personnel will have the location of their assembly point specified on the back of the security badges. CNSD 3.0.7 also makes provisions for determining who is responsible for personnel accountability, maintaining accountability following initial accountability, search and rescue for personnel not accounted for, and securing from a site assembly (however, see Section 5.4.4 below.). The inspector's evaluation of the accountability provisions in the EIPs indicated consistency with NUREG-0654 criteria. In addition, the single drill involving accountability showed that the licensee was able to complete accountability and identify missing personnel within the 30-minute criteria. Further, the licensee plans to conduct additional drills.

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

#### 5.4.3.4 Personnel Monitoring and Decontamination

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(10) and (11); 10 CFR 50, Appendix E, Paragraphs IV.B and E; and criteria in NUREG-0654, Section II.K.

The inspector reviewed HP/O/B/1009/05, "Personnel Monitoring for Emergency Conditions"; HP/O/B/1004/06, "Personnel Decontamination"; and CNSD 3.8.3, "Contamination Prevention, Control and Decontamination Responsibilities". These procedures are intended to address radiological monitoring and decontamination of nonessential workers ordered by the Emergency Coordinator to evacuate the site, but weaknesses in this area were discovered by the inspector (refer to paragraph 5.4.3.2 of this report for details). Procedure HP/O/B/1004/06 provides a form called "Contamination/Decontamination Survey Sheet" for recording data in the event personnel are found to be contaminated. Release limits for decontamination are specified. Any necessary follow-up assessment of contaminated individuals is to be under the jurisdiction of Health Physics. During an emergency situation, the Station Health Physicist will be advised of any personnel contamination problems by means of his communications link with the Surveillance and Control Coordinator at the OSC, under whose supervision the HP technicians perform personnel monitoring/decontamination activities.

Based on the above findings, this portion of the licensee's program (except as noted in Section 5.4.3.2 above) appears to be adequate.

#### 5.4.3.5 Onsite First-Aid/Rescue

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(10) and (12); 10 CFR 50, Appendix E, Paragraphs IV.B and E; and criteria in NUREG-0654, Sections II.K and L; and criteria in ANSI/ANS 3.7.1.

Onsite first-aid is provided by security personnel working in conjunction with safety personnel. Provisions for receiving, transporting, and handling personnel who may also be contaminated are contained in:

- (1) Procedure M-11, "Handling Contaminated Injuries" (in draft form).
- (2) HP/O/B/1009/08, "Contamination Control During Transportation of Contaminated Injured Individuals".
- (3) CNSD 2.11.1, "Personal Injury Procedure".



The responsibilities for the first-aid treatment, handling, and transportation of contaminated injured personnel is not clear. (See Section 5.4.4, "Security During Emergencies".) Also, the responsibility for search and rescue is not clear. CNSD 3.0.7 states that the Security/Fire Brigade will, if necessary, institute search and rescue operations to locate and retrieve unaccounted-for personnel. However, first-aid personnel (Security) were not aware of the voluntary nature of this activity or the emergency exposure limits for lifesaving activities.

Based on the above findings, the following deficiency must be corrected prior to exceeding 5% reactor power:

- The responsibilities for search and rescue are not unambiguously defined so as to specify the duties of individuals within the security organization as per 10 CFR 50.47(b)(2) and 10 CFR 50, Appendix E, Paragraph IV.A (413/83-42-64 and 414/83-35-64).

#### 5.4.4 Security During Emergencies

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(10); 10 CFR 50, Appendix E, Paragraph IV.B; criteria in NUREG-0654, Section II.J; and the requirements of 10 CFR 73, Appendix C.

This area was evaluated through discussions with licensee representatives, review of the Emergency Plan and Procedures, and review of Security Procedures. The inspector found that Security personnel have broad responsibilities during emergencies which include fire, first-aid, armed responder, damage control, and search and rescue.

First, the security organization's functional EP responsibilities are not clearly defined in existing procedures. For example:

- (1) CNSD 2.12.1, Section 4.3, states that Security will assume Fire Brigade responsibility during backshifts, holidays, and weekends.
- (2) The Safeguards Contingency Plan, pp. 2-10, states that Security force members would be assigned to the Fire Brigade if necessary.
- (3) CNSD 3.8.4, Section 6.8.1, states that the Fire Brigade will have its normal function of fire fighting and damage control in an emergency situation as needed.
- (4) CNSD 3.0.7, Section 4.1.3.3, states that if necessary, the Security/Fire Brigade will institute search and rescue operations to locate and retrieve unaccounted-for personnel.
- (5) Event 11, p. 1A of the Contingency Plan suggests that security will provide fire support if requested by the Shift Supervisor.

- (6) Health Physics procedure HP/O/B/1009/08, "Contamination Control During Transportation of Contaminated Injured Individuals", does not specifically address the need to contact Security for first-aid treatment and transportation.
- (7) RP/O/A/5000/09, "Collision/Explosion", does not consider a security response.
- (8) CNSD 2.11.1, "Personal Injury Procedure", Section 2.5, states that security has responsibility for treatment, transportation, and obtaining medical assistance for injured personnel during backshifts, weekends, and holidays.
- (9) M-11, "Handling Contaminated Injuries", assigns the Shift Security Lieutenant the responsibility of notifying the hospital. The Security Lieutenant assumed that the Control Room Shift Supervisor would have the major responsibility for initiating this notification.

Second, the complete set of procedures required to govern security force activities has not been developed. For example:

- (1) The Contingency Plan does not currently contain the procedures required by 10 CFR 73, Appendix C. These are in draft form.
- (2) The procedure covering the admittance of offsite emergency vehicles and personnel to the site is in draft form.
- (3) There are no guidelines for the radiological protection of security personnel remaining onsite following a site evacuation.
- (4) CNSD 2.12.2, which covers the Fire Brigade organization and training, is in draft form.

In general, the Station Security Procedures do not appear to be complete and comprehensive enough to cover all security activities in support of emergency operations such as fire fighting, first aid, search and rescue, damage control, and armed responder.

Third, the structure and composition of the Fire Brigade, with respect to Security personnel, is not clear. CNSD 2.12.2, Section 5.1, states that the Fire Brigade organization will consist of five primary units and one backup unit. Section 5.2 states that each primary unit will have a minimum of four Nuclear Equipment Operators and one Technical Services person. Further, "Each primary unit will be identified by the Operations shift designations". (The meaning of this statement could not be adequately explained.) The inspector determined that the Fire Brigade team is comprised of 5 members of Security per shift with the safety organization providing the leadership. In addition, Security personnel are considered to be the "first responders" in any situation involving injury or illness. Although Security has these key additional responsibilities, there appear to be no formal mechanisms for assuring that Security personnel can

maintain an adequate level of security and simultaneously discharge their emergency responsibilities as fire fighters, damage control personnel, first-aid personnel, armed responders, and search and rescue personnel. It should be noted that critical Security positions have been identified and one fire brigade team is identified for each shift. However, based on interviews with personnel assigned to the Fire Brigade, it appears that their specific emergency duties are not being unambiguously assigned on each shift. For example, of the three Fire Brigade members interviewed:

- (1) One was not aware of his assignment to the Fire Brigade team. He apparently would not have responded to a fire unless requested.
- (2) Given a fire and injury event simultaneously, one member indicated that he would go to the injured person instead of the fire.

Fourth, Security personnel with the primary responsibility for responding to an injury or illness are not being designated on the shift roster. Also, the armed responder team, repair/recovery team, and search and rescue team members are not being designated.

Based on the above findings, the following deficiency must be corrected prior to exceeding 5% reactor power:

- The responsibilities of Security personnel during emergencies are not unambiguously defined, including the interfaces between Security personnel, Security and other onsite response personnel, and offsite support groups so as to assure a timely response in an emergency as per 10 CFR 50.47(b)(2) and 10 CFR 50, Appendix E, Paragraph IV.A (413/83-42-65 and 414/83-35-65).

#### 5.4.5 Repair/Corrective Action

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(11) and (13); 10 CFR 50, Appendix E, Paragraph IV.E; and criteria in NUREG-0654, Sections II.K and M.

The inspectors reviewed RP/O/A/5000/12 (RP-12), "Control of Assessment and Repair Teams", and found that the procedure provides a means for dispatching teams of station personnel during an emergency to assess damage or repair a component. The procedure also provides a means for maintaining accountability and safety of the dispatched personnel, including protection from radiological hazards. This procedure requires the coordination of the Shift Supervisor and the HP Supervisor in the OSC and the Emergency Coordinator in the TSC. The procedure requires a listing of (and briefing regarding) the hazards which may be encountered and the types of protective equipment and clothing which may be needed. However, the procedure does not reference nor explicitly require that CNSD 3.8.8, "Radiological Work Practices", be addressed.

Based on the above findings, this portion of the licensee's program appears to be adequate. However, the following item should be considered for program improvement:

- Providing a reference or requirement in RP-12 that CNSD 3.8.8 be addressed to assure the radiological safety of the repair or assessment teams (413/83-42-66 and 414/83-35-66).

#### 5.4.6 Recovery

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(13); 10 CFR 50, Appendix E, Paragraph IV.H; and criteria in NUREG-0654, Section II.M.

The Emergency Plan specifies the organizational authority for declaring that a recovery phase is to be initiated. This authority rests with the Recovery Manager in the Crisis Management Center. Provisions exist for an evaluation of plant safety conditions as well as the in-plant and out-of-plant radiological conditions. The decision to de-escalate or terminate an emergency condition must be concurred in by the Senior NRC and State(s) representatives. Message notifications are to be made to Function Managers, the Emergency Coordinator, State and local officials, and the NRC. Key positions in the recovery organization are identified.

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

#### 5.4.7 Public Information

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(7); 10 CFR 50, Appendix E, Paragraph IV.D; and criteria in NUREG-0654, Section II.G.

The inspector talked with the site and corporate emergency preparedness staffs and reviewed the Crisis Management Plan and its implementing plans. The implementing plans (procedures) identify the organizations involved in news dissemination, the locations and methods of contacting them, the flow of information inside and outside of the company, and interim provisions for dissemination of information to the news media before the news center is activated.

The utility spokesman and alternates are specified, and the sources of information to be used by the spokesman are identified. The licensee has provided for coordination of information between the various organizations and the rumor control program is the assigned responsibility of the Industry/Agency Coordinator.

The licensee has conducted a series of public information seminars. Letters of invitation were sent to members of the public on a county-by-county basis.

Based on the above findings, this area appears to be adequate.

## 5.5 Supplementary Procedures

### 5.5.1 Inventory, Operational Check and Calibration of Emergency Equipment, Facilities, and Supplies

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(8); 10 CFR 50, Appendix E, Paragraph IV.G; and criteria in NUREG-0654, Section II.H.

EPIP HP/O/B/1000/06 covers the inventory, check, and calibration of emergency equipment and supplies. This procedure includes the related limits, precautions, and references, and specifies the frequencies for inventory, check, and calibration of:

- (1) the emergency vehicle;
- (2) the portable alternator;
- (3) the two-way low-band radios;
- (4) the self-contained breathing apparatus; and
- (5) the emergency kits (including batteries).

The frequency of weather information checks is also specified. The responsibilities for performing the inspection and tests are specified, and for correcting noted deficiencies.

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

### 5.5.2 Drills and Exercises

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(14); 10 CFR 50, Appendix E, Paragraph IV.F; and criteria in NUREG-0654, Section II.N.

The programmatic controls for the administration, scheduling, and conducting of emergency drills and exercises have been described in the EP, Section N, and the Crisis Management Plan (CMP), Section N. Facility procedure PT/O/B/4600/06 (PT-06), "Emergency Exercises and Drills", has been implemented since April 1983 for the purpose of conducting periodic exercises/drills to evaluate major portions of the emergency response capability and to develop and maintain key skills. The drills/exercises are administered by the Emergency Planning Coordinator in accordance with PT-06 which includes the following requirements as procedure elements:

- (1) Each drill and exercise is to be conducted in accordance with a time sequence of postulated events.
- (2) Observer comments are translated into corrective action recommendations by the Emergency Planning Coordinator.
- (3) Required documentation of corrective actions taken assures that an appropriate record of completed actions is maintained.



- (4) Frequencies for drills and exercises have been specified and include the participation of key onsite emergency organizations and offsite agencies.
- (5) Provisions have been made for backshift drills and exercises.

In addition, discussions with the licensee indicate that during the annual exercise the news media facilities and equipment are utilized at the Crisis Management Center. Actual events which require the activation of the Emergency Plan are not considered to take the place of planned drills or exercises.

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

#### 5.5.3 Review, Revision and Distribution

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(16); 10 CFR 50, Appendix E, Paragraph IV.G; and criteria in NUREG 0654, Section II.P.

Section P.4 of the CMP states that "The Emergency Response Coordinator will update the CMP and its Implementing Plans on at least an annual basis". The CMP also contains requirements for incorporating changes identified by drills and exercises. Consequently, the requirement for annual updating is in place.

Section P.4 of the CNS Emergency Plan states that "Review and updating of the EP shall be certified to be correct on an annual basis." The EP also contains provisions for incorporating changes identified by drills and exercises. However, the EP does not contain a requirement for updating the EIPs on an annual basis. CNS procedure, PT/O/B/4600/07, "Review of Emergency Plan and Procedures", requires "annual review" of the station EP and EIPs.

A review of the existing EIPs showed that nine health physics procedures (HP-01, HP-05, HP-06, HP-07, HP-08, HP-13, HP-15 and HP-16) and two CNSDs (CNSD 3.7.5 and CNSD 2.0.1) have not been updated in the past year.

PT/O/B/4600/07, described above, has three enclosures. Enclosure 13.1 lists the procedure number, procedure title, and the group responsible for generation and revision. Enclosure 13.2 provides a mechanism for formally proposing revisions, and enclosure 13.3 provides a review acceptance form for the EP and EIPs. The licensee plans to apply this procedure in January 1984.

The licensee has developed procedure PT/O/B/4600/05, "Coordination of Communications", that will be used to formally assure that phone numbers listed in the EIPs are either verified or modified once each quarter. Not all phones within the various facilities are currently installed. Plans are to initiate this procedure in January 1984.

Review of the distribution of the EP and EIPs has been made in accordance with an approved list by the document Control staff. The names, titles, and phone numbers currently in the EIPs were tested during the walk-throughs (see section 7.2).



Based upon the above findings, the following portions of the licensee's program were found to be incomplete. These areas will be reviewed during a future inspection.

- Implementation of the licensee's program for an annual review and/or revision of the EP and EIPs as provided for in PT/O/B/4600/07. (413/83-42-67 and 414/83-35/67)
- Implementation of the licensee's program for verification of the phone numbers listed in the EIPs as required by procedure PT/O/B/4600/05. (413/83-42-68 and 414/83-35-68)

In addition, the following item should be considered for program improvement:

- Including in the EP a statement that the EIPs will be reviewed and/or revised annually. (413/83-42-69 and 414/83-35-69)

#### 5.5.4 Audit

This area was reviewed with respect to the requirements of 10 CFR 50.54(t), 10 CFR 50, Appendix E, Paragraph IV.G; and criteria in NUREG-0654, Section II.P.

The inspector reviewed the licensee's Corporate auditing program by evaluating procedure 210 of the Quality Assurance Program, audit file SP-82-22 (audits conducted in the past twelve months), and through discussions with the audit staff. The emergency plans and procedures are audited once each year. Audits are made at Duke Power Corporation's three nuclear reactor stations, including Catawba, by three members of the Corporate auditing staff. The staff reviews procedure and plan provisions, checks equipment availability and compliance with calibration and inventory requirements, and discusses program operability with the station emergency preparedness staff. The audits include an evaluation of drills, and the intent is to accomplish one such evaluation annually at one of the three sites.

The Catawba personnel accountability drill was evaluated in 1983. Specific adverse program findings on all such audits have been assigned, for follow-up and resolution, to the Corporate emergency preparedness staff.

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

## 6.0 COORDINATION WITH OFFSITE GROUPS

### 6.1 Offsite Agencies

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(2) and (3); 10 CFR 50, Appendix E, Paragraph IV.A; and criteria in NUREG-0654, Sections II.B and C.

The inspector interviewed representatives of Piedmont Medical Center and the emergency preparedness offices in Mecklenberg, York, and Gaston Counties. The inspector also discussed emergency preparedness matters via telephone with representatives of the emergency management agencies for the States of North Carolina and South Carolina. All individuals contacted indicated that they believed their respective agencies could and would carry out their commitments in an emergency situation. All individuals contacted expressed satisfaction with the coordination efforts of the licensee in regard to the frequency and nature of training provided and the exchange of planning information.

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

## 6.2 General Public

This area was reviewed with respect to the requirements 10 CFR 50.47(b)(7); 10 CFR 50, Appendix E, Paragraph IV.D; and criteria in NUREG-0654, Section II.G.

The inspector reviewed the Catawba Nuclear Station Emergency Plan booklet that the licensee plans to mail to all persons within the EPZ. A minor revision to the booklet is currently in process, and the mailing is currently planned for January 1984. Booklets will be distributed to hotels within the EPZ as well as to the general population.

The licensee works closely with the state and local agencies, obtaining inputs and reviews on the content of the booklet that will be issued. The plan is to update (if necessary) and disseminate the booklet annually. The current contents include information about the possible effects of both natural radiation and possible emergency releases of radionuclides. The booklet also includes instructions for emergencies and follow-up contacts.

Signs are planned to be placed at boat docks, and signs and booklets will be placed at McDowell Park, Carowinds Theme Park, and Heritage Village, where large groups of people may congregate for recreation, including camping.

Based upon the above findings, the following portions of the licensee's program were found to be incomplete. These areas will be reviewed during a future inspection:

- Disseminating the emergency plan booklets to the general population and other specified groups. (413/83-42-70 and 414/83-35-70)
- Placing emergency signs at boat docks and other applicable locations (413/83-42-71 and 414/83-35-71)

### 6.3 News Media

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(7); 10 CFR 50, Appendix E, Paragraph IV.F; and criteria in NUREG-0654, Section II.G.

The inspector reviewed the licensee's news media program with the corporate staff, and looked at the news media center at the C. J. Miller auditorium in Charlotte, North Carolina. The licensee provides the necessary information and training for the North and South Carolina news media annually. They discuss emergency plans, points of contact for release of public information, the space (auditorium) allowed and phone availability, and the four emergency classes that could occur versus normal operations. These sessions are conducted prior to each exercise. The combined two-state media staffs are invited to these sessions each year.

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

## 7.0 DRILLS, EXERCISES, AND WALK-THROUGHS

### 7.1 Program Implementation

This area was reviewed with respect to the requirements of 10 CFR 50.47(b)(14), 10 CFR 50, Appendix E, Paragraph IV.F; and criteria in NUREG-0654, Section II.N.

The licensee's program of drills and exercises as described in Section 5.5.2 has been implemented under the cognizance of the Emergency Planning Coordinator. The inspector reviewed the results of five drills recently conducted and found these drills to have been performed in accordance with PT/O/B/4600/06 (PT-06). For those deficiencies identified during the drills, corrective action responsibility was assigned to an appropriate staff member. Drill-identified improvement items have been reviewed and incorporated into the applicable EIPs. The inspector examined the monthly and quarterly schedule of planned drills and exercises and found it to be responsive to the frequencies of drills and exercises prescribed in the Emergency Plan. A major exercise with full participation of the onsite organization and offsite agencies (states and counties) has been scheduled for February 1984.

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

### 7.2 Walk-Through Observations

Walk-throughs were conducted with five separate groups which were comprised of Shift Supervisors, Assistant Shift Supervisors and Control Room Operators. Each group was organized into a typical watch organization. The interviews were conducted in the Control Room where the Shift Supervisor has access to the equipment, indicators, and documentation/references that would normally be available to him. No requirements were placed on the operators to perform from memory; rather, they were provided with written guidance that stated they should perform in a manner consistent with their normal methods. A hypothetical

scenario was prepared by the inspector containing a sequence of degrading plant conditions that escalated the emergency classification from a Notification of Unusual Event, to an Alert, and then to a General Emergency. The watch organization was expected to discuss the indicators used to assess plant conditions, and determine the proper emergency procedure for response to the indicated conditions. This action by the operators was generally adequate. However, the limited number of approved procedures available (See Section 5.2) made a complete evaluation of this area impossible. The watch organizations were able to classify the emergency based on emergency action levels related to the indicators or data presented in the scenario. The classification procedure RP/O/A/5000/01, "Classification of Emergency", was used by the operators with little or no difficulty. Once the emergency classification was completed the Shift Supervisor was able to enter the appropriate procedure for notification of the designated members of the onsite organization and offsite agencies. Actual notification of selected offsite agencies was accomplished using the installed commercial telephone system. The preferred means of offsite agency notification, the selective signal telephone, has not been installed. Due to the lack of dose assessment procedures, the remainder of the scenario involving General Emergency conditions was talked through with the operators but no evaluation was made by the inspector.

A walk-through of dose projection calculations and field monitoring was conducted with health physics personnel. Based on the walk-through their performance was acceptable. However, not all of the necessary equipment was available to demonstrate the full range of their capabilities.

Based on the above findings, only a limited assessment of the area was made by the inspectors due to the incomplete status of the emergency response procedures, incomplete installation of communications equipment and incomplete status of the computerized dose assessment procedure. This area will be re-evaluated during a subsequent inspection. (413/83-42-72 and 414/83-35-72)

#### 8.0 FOLLOW-UP ON PREVIOUSLY IDENTIFIED EMERGENCY PREPAREDNESS ITEMS

(Closed) Improvement Item (413/83-23-C3 and 414/83-20-03): Page 2 of HP-05 has been revised to direct the Evacuation Facility Survey Team to the site selected by the Emergency Coordinator for offsite assembly.

(Closed) Improvement Item (413/83-23-04 and 414/83-20-04): A previous inspection identified the need for signs indicating turns in the routes to the offsite assembly areas. The licensee responded by providing maps for the evacuation leaders which are sufficient to guide site personnel, who are familiar with the area, to the evacuation assembly sites.

## 9.0 PERSONS CONTACTED

9.1 Licensee PersonnelDuke Corporate

J. Effinger, Senior Quality Assurance Specialist  
 C. Brackins, Senior Quality Assurance Specialist  
 E. Hudson, Senior Quality Assurance Specialist  
 R. Glover, Emergency Response Coordinator  
 \*R. Harris, Emergency Response Coordinator

McGuire Nuclear Station

W. M. Carter, Subunit Leader for Radiological Health  
 B. A. Broadway, Technician Specialist

Catawba Nuclear Station

J. Hampton, Station Manager  
 \*M. Bolch, Emergency Preparedness Coordinator  
 \*J. Cox, Superintendent of Technical Services  
 W. Deal, Station Health Physicist  
 \*A. Franklin, Superintendent of Administration  
 \*C. Graves, Superintendent of Operations  
 \*G. Smith, Superintendent of Maintenance  
 M. Brady, Shift Supervisor  
 S. Cooper, Shift Supervisor  
 J. Hill, Shift Supervisor  
 G. Ice, Shift Supervisor  
 P. Loss, Shift Supervisor  
 C. Skinner, Shift Supervisor  
 S. Bradshaw, Assistant Shift Supervisor  
 C. O'Dell, Assistant Shift Supervisor  
 M. Ravan, Assistant Shift Supervisor  
 R. Smith, Assistant Shift Supervisor  
 T. Williams, Assistant Shift Supervisor  
 W. Carroll, Security Shift Lieutenant  
 J. Minnicks, Security Shift Lieutenant  
 C. Wray, Health Physics Supervisor  
 F. Wilson, Health Physics Supervisor  
 H. McInvale, ALARA Planning Supervisor  
 E. Mode, Health Physics Supervisor  
 T. Anderson, Chief of Security  
 T. Mitchell, Superintendent of Transmission Lines  
 G. VanderVelde, Radioactive Material Control Supervisor  
 D. Waters, Safety Supervisor  
 G. Barrett, Training Supervisor  
 \*P. McAnulty, Training and Safety Coordinator  
 \*C. Hartzell, Licensing

In addition to the above, numerous operations, technical, craft, and professional personnel were contacted.

### 9.2 Other Organizations

- C. Johnson, Jr., Assistant Fire Chief, Bethel Fire Department
- W. Hicks, Engineer, Westinghouse Electric Corporation
- J. Carroll, Director, Municipal-County Emergency Preparedness Agency of York County (SC)
- B. Phillips, Director, Gaston County (NC) Emergency Management Department
- W. Broome, Administrative Officer, Charlotte-Mecklenburg County (NC) Emergency Management Office
- W. McSwain, Area Coordinator, South Carolina Emergency Preparedness Division
- E. Harris, Jr., Assistant Director, North Carolina Division of Emergency Management
- W. Young, Associate Administrator, Piedmont Medical Center
- R. Green, Director, Emergency Medical Service, Piedmont Medical Center

### 9.3 NRC

- \*P. Skinner, Senior Resident Inspector
- \*W. Cline, Region II, Emergency Preparedness Section

\*Attended management exit briefing on November 18, 1983.