UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

MAY 13 1992

Report Nos.: 50-413/91-18 and 50-414/91-18

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

Docket Nos.: 50-413 and 50-414 License Nos.: NPF-9 and NPF-17

Facility Name: Catawba Nuclear Station (CNS) Unit 1 and Unit 2

Inspection Conducted: March 16-19, and April 16, 1992

Inspector: G. B. Kuzo 10 May 1992
G. B. Kuzo Date Signed

Approved by: 5/12/92
J. P. Potter, Chief Date Signed
Facilities Radiation Protection Section
Radiological Protection and Emergency
Preparedness Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, unannounced inspection involved review of licensee Radiation Protection (RP) program activities including organizational changes and staffing levels, audit program status, administrative and operational radiological controls, external and internal exposure monitoring and assessment, and "As Low as Reasonably Achievable (ALARA)" program implementation; and review of NRC Information Notices (INs) and previously identified NRC enforcement issues.

Results:

Licensee RP organizational changes and audit program implementation met applicable Technical Specification (TS) conditions. Program strengths included facility housekeeping and cleanliness, audits and administrative exposure controls. External exposure surveillance and personnel monitoring activities were implemented properly. Operational radiological controls, including area posting and/or container labeling met TS and/or 10 CFR Part 20 requirements. Weaknesses regarding

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exposure and termination record documentation, internal exposure assessments and ALARA program documentation were identified. In particular, the licensee's ALARA program continued to be considered a program weakness. Detailed followup indicated all internal and external exposures were within 10 CFR Part 20 limits. Licensee corrective actions regarding previous enforcement issues were considered appropriate. In general, the licensee's RP program was considered adequate to monitor and protect worker health and safety.

The following non-cited violations (NCVs) were identified.

- Failure to post 10 CFR Part 21 documentation properly (Paragraph 3.c). NCV of 10 CFR Part 21.6 requirements with corrective actions initiated prior to completion of the onsite inspection.

- Failure to have adequate procedures to evaluate and subsequently to assess and assign proper internal exposure data for positive body burden analysis results (Paragraph 4.a). Violation of TS 6.11.1 with licensee corrective actions to be completed by May 29, 1992.

- Failure to follow procedures for completing post ALARA job reviews for selected maintenance activities (Paragraph 6). Violation of TS 6.11.1 with licensee committing to complete corrective actions by June 30, 1992.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

G. Courtney, Corporate Office
*P. Deal, Manager, Radiation Protection
#*J. Isaacson, General Supervisor, Radiation Protection
B. Kimray, General Supervisor, ALARA
*J. Lowery, Regulatory Compliance
J. Mode, General Supervisor, Radiation Protection
T. O'Donohue, Supervisor, Special Projects
L. Schlise, General Supervisor, Radiation Protection
G. Vandervelde, General Supervisor

Other licensee employees contacted included engineers, technicians, operators, and office personnel.

Nuclear Regulatory Commission

*P. Hopkins, Resident Inspector
W. Orders, Senior Resident Inspector
J. Zeiler, Resident Inspector

*Attended Exit Interview on March 19, 1992
#Participated in April 16, 1992 teleconference

2. Organization and Staffing (83750)

The inspector reviewed and discussed with cognizant licensee representatives the current RP organizational structure and qualifications of selected staff.

a. Organization

TS 6.2.1 details, in part, the establishment of onsite and offsite organizations for unit operation and requires lines of authority, responsibility and communication to be established and defined for the highest management levels through intermediate levels to and including all operating organization positions.

Licensee representatives informed the inspector that since the previous inspection of RP program areas conducted August 19-23, 1991, and documented in Inspection Report (IR) 50-413,-414/91-18 dated November 12, 1991, supervisory positions reporting to the RP Manager were increased from three to four, and included a supervising scientist and three General Supervisor positions. The changes were made to standardize the organizational structure for the nuclear production facilities within Duke Power Company (DPC). From review of the current organizational

charts, the inspector noted that supervisory positions and/or staff reporting to the Supervising Scientist and General Supervisor positions were detailed appropriately. From discussions with licensee representatives and observations of activities in progress, no concerns were identified regarding the changes to the organizational structure.

No violations or deviations were identified

b. Staffing and Qualifications

Licensee representatives informed the inspector that no significant changes were made to the scientist and shift staff levels. Cognizant licensee representatives stated that all supervisors had in excess of four years experience, and that, in addition, the majority of technicians were qualified to the criteria specified in ANSI 3.1. Licensee representatives stated that the rate of staff turnover continued to be minimal. However, from discussion with cognizant licensee representatives regarding extensive overtime worked, numerous administrative mistakes noted in RP records, and noted delays regarding completion of procedural revisions discussed during the previous inspection conducted in August 1991, the inspector noted that the temporary reassignment of two of the five scientist staff for training appeared to be having a negative effect on the timely completion and review of RP program activities. The inspector noted that the current small staff assigned to complete, in a timely and thorough manner, appropriate technical procedure and record reviews was a program weakness. Licensee representatives acknowledged the inspector's comments and stated that the issue would be evaluated.

No violations or deviations were identified.

3. Administrative Radiological Controls (83750)

During the inspection administrative controls/actions to meet selected 10 CFR Parts 19, 20, and 21; and TS requirements were reviewed. The review included posting of required Notices to Workers, audits and Radiological Incident Investigation Accounting (RIIA) Report program implementation, exposure records and extensions, and completion and issuance of termination reports.

a. Audits

TS 6.5.2.8 requires audits of facility activities to be performed under the cognizance of the Company Nuclear Review Board (CNRB) encompassing conformance of facility operation to all provisions contained in the TSs and applicable License Conditions at least once per 12 months, and the Process Control Program (PCP) and implementing procedures at least once per 24 months.

From discussions with cognizant licensee representatives, the inspector determined that no audits of the PCP program had been conducted since Audit, NP-91-[illegible], dated May 10, 1991. However, licensee representatives informed that inspector that at the time of the NRC inspection, a corporate audit of selected RP program areas was in progress. From discussion with selected auditors, the inspector determined that the current team was comprised of nine individuals, all of whom had completed the DPC Auditor Training Program. In addition, several team members had significant RP program experience as a result of previous assigned activities at other DPC facilities. The inspector noted that the audit was conducted in accordance with an audit plan and associated checklist, and that proposed program areas to be audited included, in part, dosimetry, surveillance and control, body burden analysis, source control, high radiation access control, technical specifications, ALARA, contamination control, qualifications and training, and respiratory protection. Further, the auditors stated that the program areas would be reviewed against the applicable sections of CNS Directives, DPC System Health Physics Manual, 10 CFR Part 20, and appropriate NUREGs and Regulatory Guides. However, from discussions with selected auditors, the inspector noted that the previous NRC findings documented in IR 50-413,-414/ 91-18, were not reviewed prior to initiation of the audit. The auditors stated that appropriate NRC inspection reports, if available, were reviewed prior to conducting audits. However, the noted report was not available to the auditors as of March 17, 1992.

The inspector noted that based on the training and qualification of the auditors, use of a detailed audit plan, and scope of the RP program areas reviewed, the audit program met TS requirements and was considered a program strength.

No violations or deviations were identified.

b. RIIA Reports

Licensee procedure HP/0/B/1009/22 Investigation of Personnel Contamination Events, dated October 10, 1991, and HP/0/B/1009/23, Possible Overexposures and Unusual Occurrences, dated February 12, 1991, provide guidance for identifying and correcting deficiencies and weaknesses for control radiation and radioactive material.

From discussion with cognizant licensee representatives the inspector noted that no administrative limits were exceeded since the previous inspection conducted in August 1991. In addition, RIIA Summary reports indicated that the 195 Personnel Contamination Events (PCEs) reported for the January 1, through December 31, 1991 period was approximately 66 percent of the 291 PCEs projected. The majority of PCEs reported during the fourth quarter, approximately 61 of 66 reported PCEs, were associated with the Unit 2 End-of-Cycle 4 (U2 EOC4) outage activities. Further, cognizant licensee representatives indicated that compared to 1990 when 625 RPEs were reported, the rate of CPEs dropped from 62.5 CPE per 100000 Radiation Work Permit-hours (CPE/100000 RWP-hrs) to 35.7 CPE/ 100000 RWP-hrs. Improvements in training and increased experience of work crews were identified as reasons for the noted decrease in PCEs.

No violations or deviations were identified.

c. Notices to Workers

10 CFR 19.11(a) and (b) require, in part, that the licensee post current copies of Part 19, Part 20, the license, documents incorporated into the license, license amendments and operating procedures, or that the licensee post a notice describing these documents and where they may be examined. 10 CFR 19.11(d) requires that a licensee post sufficient copies of Form NRC-3, Notice to Employees, to permit licensee workers to observe them on the way to or from licensed activity locations. 10 CFR 21.6 requires, in part, the licensee to post current copies of (1) regulations in this part, (2) Section 206 of the Energy Reorganization Act of 1974, and (3) procedures adopted pursuant to the regulations in this part, or a notice which describes the regulations/procedures, including the name of the individual to whom reports may be made, and states where they may be examined.

During tours of the licensee's facility, the inspector noted that Section 206 of the Energy Reorganization Act of 1974, and the appropriate sections of 10 CFR Part 21 were not posted nor were locations identified where the specific documents could be examined. Further, the inspector noted that although other required documents were posted or that notices of their location identified, licensee representatives were unaware of the requirements regarding 10 CFR Part 21. The inspector identified the failure to post the appropriate 10 CFR Part 21 documentation or notices to its location as an apparent violation of 10 CFR Part 21 requirements (50-413,-41/92-06-01) Subsequent to identification of the issue by the inspector, licensee representatives stated that the proper documentation and/or reference to its location would be posted in the appropriate bulletin boards prior to the end of the onsite inspection. The inspector informed licensee representatives that based on their actions the criteria specified in Section V.A of the Enforcement Policy were met and therefore the violation was not being cited.

One NRC-identified NCV for failure to post 10 CFR Part 21 documents properly was identified.

d. Form NRC-4

10 CFR 20.102(b) requires, under certain circumstances, the licensee to obtain a certificate on Form NRC-4, signed by the individual showing each period of time after the individual attained the age of 18 in which an occupational dose to radiation was received. This signed and completed form is to be obtained before permitting the individual in a restricted area to receive an occupational radiation dose in excess of the standards specified in 10 CFR 20.101(a).

Exposure extension requests are generated by supervision, approved by the ALARA group, and maintained on file by dosimetry personnel and are required to allow worker's to exceed licensee-established administrative limits.

To verify completion and maintenance of individual's Form NRC-4 and exposure extension approval forms, as appropriate, the inspector reviewed selected dosimetry records of licensee and contract workers engaged in previous U2-EOC6 outage activities involving the reactor head removal and replacement, steam generator maintenance operations, and pressurizer work. A completed Form NRC-4 was on file for all workers

selected, even if the limits of 10 CFR 20.101(a) were not exceeded. The inspector verified that extensions were evaluated and approved, as required. During review of an October 29, 1991 exposure extension approval for a contract employee working on a pressurizer heater, the inspector noted that the prior exposure results of 85 millirem were not entered properly into the data column representing the current whole body dose. Licensee representatives stated that error resulted from improperly transcribed data and that planned automation of the dosimetry record system was expected to eliminate the noted issue. Followup review of additional dosimetry records indicated no additional transcriptional errors and the error was noted as an isolated issue. Based on the observations by the inspector regarding the limited number of administrative exposure extensions approved, the licensee appeared to be controlling individual doses effectively.

No violations or deviations were identified.

e. Termination Reports

10 CFR 20.408(b) states that when an individual terminates employment with a licensee or completes work assignment in a licensee's facility the licensee shall furnish a report of the individual's exposures to radiation and radioactive materials within 30 days after the exposure of the individual has been determined by the licensee or 90 days after the date of termination of employment or work assignment, whichever is earlier.

Discussions with licensee dosimetry personnel indicated that the issuance of official exposure termination reports was the responsibility of the DPC General Office (GO). However, the inspector reviewed copies of selected dosimetry records for contractor personnel associated with October through December 1991 outage activities and verified that termination letters were issued within 30 days of the date on which the workers received their termination whole body count.

However, as a result of review of selected confirmed uptakes (Paragraph 4.a), one concern regarding the reporting of uptakes on the final termination reports issued to workers was identified. In particular, the inspector noted that although a worker was identified to have a confirmed uptake on approximately November 11, 1991, the licensee's "Individual Occupational Radiation Exposure Report," (termination report) dated

December 18, 1991, indicated "no identified uptake." From subsequent discussions, the inspector noted that onsite licensee representatives were unaware of the reason for the report's internal exposure information and that documentation was not available to explain the noted results. The inspector was informed indirectly that corporate personnel stated that the reference to "no identified uptake" indicated that the confirmed uptake was less than selected action levels, i.e., 10 percent maximum permissible body burden. The inspector noted that although reports to workers of internal exposures within 10 CFR 20.103 limits are not required, issuance of a final report stating "no confirmed uptake" to a worker having been involved in an internal exposure event resulting in a confirmed uptake was confusing without providing appropriate explanation. Licensee representatives stated that the inspector's concern would be evaluated.

No violations or deviations were identified.

4. Internal Exposure (83729)

The inspector reviewed licensee guidance and implementation of selected internal exposure control program areas to meet appropriate 10 CFR 20.103 requirements. Program areas reviewed included worker airborne maximum permissible concentration-hour (MPCa-hr) exposure assessment, bioassay program implementation, and in particular review of licensee evaluations of nonroutine potential internal exposure events.

10 CFR 20.103(a)(1) states that no licensee shall possess, use, or transfer licensed material in such a manner as to permit any individual in a restricted area to inhale a quantity of radioactive material in any period of one calendar quarter greater than the quantity which would result from inhalation for 40 hours per week for 13 weeks at uniform concentrations of radioactive material in air specified in 10 CFR Part 20 Appendix B, Table 1, Column 1.

TS 6.11.1 requires procedures for personnel radiation protection to be prepared consistent with the requirements of 10 CFR Part 20 and be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

a. Body Burden Analyses

10 CFR 20.103(a)(3) requires for purposes of determining compliance with the requirements of this section, the licensee to use suitable measurements of concentrations of radioactive materials in air for detecting and evaluating airborne radioactivity in restricted areas and in addition, as appropriate, to use measurements of radioactivity in the body, measurements of radioactivity excreted from the body, or any combination of such measurements as may be necessary for the timely detection and assessment of individual intakes of radioactivity by exposed individuals.

Licensee Health Physics (HP) procedure HP/0/B/1001/21, Operation and Calibration : Canberra Fast Scan - Body Burden Analysis, dated May 24, 1990, details the licensee's program for reviewing and evaluating positive body burden analysis. A reanalysis is required if iodine is identified in the final report. Further, positive results exceeding 0.5 percent of the maximum permissible body burden (MPBB) require an investigation count and results exceeding 10 percent maximum permissible organ burden (MPOB) require supervisory review.

The inspector reviewed and discussed with licensee representatives two positive body burden analysis results identified during termination body burden analyses conducted on November 5 and November 9, 1991, respectively. For the two workers, body burdens of approximately 4.1 and 27.17 nanocuries (nCi) of iodine 131 (I-131), were calculated. Subsequent review of the worker's assigned tasks indicated that the uptake most likely occurred during repair of a valve in Unit 2 containment on November 5, 1991. From review of stay-time and air-borne maximum permissible concentrations (MPCas) associated with the assigned tasks, the licensee had assigned 0.23 and 0.6 MPCa-hrs internal exposure to the individuals. Subsequently, the inspector requested licensee representatives to calculate internal exposure based on the measured body burdens. Resultant internal exposure values of 1.58 and 10.5 MPCa-hr, respectively, were calculated. During subsequent discussions, cognizant licensee representatives agreed that the more conservative internal exposure results should have been assigned to the workers. The inspector noted that the failure to have adequate procedures to evaluate body burden analyses, and subsequently to assess and assign internal exposures based on comparison of appropriate

air sampling, uptake, or other bioassay data was a violation of TS 6.11.1 (50-413,-414/91-06-02). Licensee representatives stated that a general procedural weakness had been identified previously regarding the lack of required review of positive burden analyses using established RIIA methods but that the procedural revision was not complete. Licensee representatives informed the inspector that HP procedure HP/O/B/1001/21 would be revised to include the noted updates by May 29, 1992. During an April 16, 1992 teleconference licensee representatives stated that applicable procedure revisions referencing required RIIA review of positive body burden results and calculation of MPCa-hr results and proper internal exposure assignments were expected to be complete by the committed date. The inspector informed licensee representatives that based on their actions the criteria specified in Section V.A of the Enforcement Policy were met and therefore the violation was not being cited.

HP Administrative Procedure 0-HPA-031, Personnel Monitoring of Internal Dose, dated October 15, 1989, requires initial, annual, and termination bioassay measurements for workers accessing the RCA. The inspector reviewed selected records of recently terminated or hired individuals and verified that whole body analyses were performed as required.

One NRC-identified NCV for failure to have adequate procedures to evaluate and subsequently to assess and assign proper internal exposure data for positive body burden analysis results was identified.

b. Respiratory Protective Program

10 CFR 20.103(c) permits the licensee to maintain and to implement a respiratory protective program that includes, at a minimum: air sampling to identify the hazards; surveys and bioassays to evaluate the actual exposures; written procedures to select, fit and maintain respirators; written procedures regarding supervision and training of personnel and issuance of records; and determination by a physician prior to use of respirators that the individual user is physically able to use respiratory protective equipment.

Revisions to procedural guidance in response to respiratory protection program weaknesses identified during an inspection conducted August 19-23, 1991, and documented in IR 50-413, -414/91-18 dated November 12, 1991, were reviewed and discussed with licensee

representatives. The identified weaknesses involved failure to have adequate procedures for use of respiratory protection equipment by RP technicians performing initial surveys of potentially contaminated areas, and for verifying Grade D air quality for supplied-air breathing systems.

° Respiratory Protective Equipment Issuance

10 CFR 20.103(c) permits the licensee to maintain and to implement a respiratory protective program that includes, at a minimum: air sampling to identify the hazards; surveys and bioassays to evaluate the actual exposures; written procedures to select, fit and maintain respirators; written procedures regarding supervision and training of personnel and issuance of records; and determination by a physician prior to use of respirators that the individual user is physically able to use respiratory protective equipment.

Changes to licensee procedure details regarding issuance of respiratory protective equipment for RP technicians conducting pre-job surveys were reviewed and discussed. As a result of the noted violation, licensee procedure HP/O/B/1000/04, Preparation of Radiation Work Permits (RWP) and Standing Radiation Work Permits (SRWP), dated December 31, 1991, was revised to include detailed guidance for use of respiratory protective equipment by RP personnel when conducting pre-job surveys. The procedure now requires respiratory protection/ engineering controls for RP personnel performing surveys when contamination levels are known (or anticipated) to exceed 100 000 disintegrations per 100 square centimeters (dpm/100 cm^2) and/or the survey itself is likely to create airborne radioactivity within the worker's breathing zone. From discussion with selected technicians and supervisors the inspector determined that RP personnel were aware of the procedural changes.

No violations or deviations were identified.

- Breathing Air Quality

10 CFR Appendix A, Footnote (d) requires adequate respirable air of the quality and quantity required in accordance with NIOSH/MSHA certification described in 30 CFR Part 11 to be provided for atmospheric-supplying respirators.

30 CFR 11.121 requires that compressed, gaseous breathing air meets the applicable minimum grade requirements for Type 1 gaseous air as set forth in the Compressed Gas Association (CGA) Commodity Specifications for Air, G-7.1 (Grade D or higher quality).

Recent initiatives and procedural changes to enhance verification of Grade D quality for the supplied-air breathing systems were reviewed and discussed with cognizant licensee representatives. Licensee representatives stated that breathing-air continued to be supplied by three permanent compressors, two trains which are utilized alternately to supply the station breathing air (VB) system and the other which is used principally to fill Self Contained Breathing Apparatus (SCBA) equipment. Verification of Grade D quality for the permanent station breathing air compressors continued to be the responsibility of the Industrial Safety group. Licensee procedure PT/O/B/4400/007, Collection of Breathing Air Samples and Calibration of Air System, dated November 14, 1991, for proper verification of Grade D air for plant breathing air compressor systems was changed in response to the noted violation. The inspector noted that the procedure specified appropriate Grade D air quality specifications as detailed in ANSI/G.7.1-1987. Air quality for the VB and SCBA system compressors is required to be verified on a quarterly basis with each train of the VB system to be sampled once per year, at a minimum. Verification and documentation of the compressor in operation during implementation of the quarterly testing is required. In addition, any other compressors providing supplied breathing-air are to be sampled during their initial use. Compressors providing supplied breathing-air which does not meet specified criteria are removed from service until additional tests verify acceptable Grade D quality. Although the procedure required appropriate testing of permanent and temporary compressor systems, the inspector noted that the

procedure did not require verification of Grade D quality following major maintenance activities associated with a compressor system. Licensee representatives agreed that major compressor maintenance could change the air quality and agreed to evaluate the need for additional guidance regarding this issue.

The third and fourth quarter 1991 breathing air quality results for the station VB and SCBA systems were reviewed in detail. Surveillances were conducted in accordance with the revised procedure with all results within Grade D specifications.

No violations or deviations were identified.

5. External Exposure (83750)

During the inspection, selected external exposure monitoring program guidance and/or results were reviewed and discussed in detail.

10 CFR 20.201(b) requires that each licensee make such surveys as may be necessary to comply with the requirements of Part 20 and are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present. As defined in 10 CFR 20.201(e), "survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions.

a. External Exposure Monitoring Results

10 CFR 20.101 requires that no licensee shall possess, use or transfer licensed material in such a manner as to cause any individual in a restricted area to receive in any period of one calendar quarter a total occupational dose in excess of 1.25 rems to the whole body; head and trunk; active blood forming organs; lens of the eyes; or gonads; 18.75 rems to the hands and forearms; feet and ankles; and 7.5 rems to the skin of the whole body.

The inspector reviewed the 1991 third and fourth quarter whole body cumulative exposures for both licensee and contractor personnel. The inspector verified that the assigned whole body quarterly doses were within 10 CFR Part 20 limits. Of the personnel monitored, the maximum recorded whole body doses were 282 and 1406 millirem (mrem) for the third and fourth

quarters, respectively. Maximum skin/extremity exposure results of 624/1535 mrem and 1535/1572 were reported for the third and fourth quarters, respectively.

No violations or deviations were identified.

b. Noble Gas Exposure

During the onsite inspection, changes implemented in response a violation identified during an inspection conducted August 19-23, 1991, and documented in IR 50-413,-414/91-18 dated November 12, 1991, were reviewed and discussed. The identified issue involved a nonconservative measurement bias (factor of 2X) and subsequent inadequate skin exposure assessment and assignment, resulting from use of plastic cover to shield the monitoring instrumentation. Licensee corrective actions included review of skin exposures from September 1987 through August 23, 1991. Based on the evaluation, skin exposure corrections of 200 mrem or greater were assigned and subsequently updated on individual workers' records as appropriate. For the data reviewed, only two individual's assigned dose corrections of 234 and 262 mrem exceeded the identified limit. All corrected results were less than 10 CFR Part 20.101 limits.

Additional corrective actions to the identified issue included revision of licensee RP procedure HP/0/B/1000/24, Responsibilities and Duties of a Dose Controller, dated October 19, 1991, to include measurement of noble gas concentrations using grab samples, determination of worker stay-times in noble gas environments, and appropriate beta dose conversion factors to calculate and assign skin doses to exposed personnel. The inspector informed licensee representatives that the current procedural guidance appeared adequate to evaluate worker exposure to noble gas concentrations.

In addition, the inspector reviewed the January 1 through March 15, 1991, skin exposure assessments for personnel exposed to noble gases. Based on calculations using grab sample noble gas concentration measurements and recorded stay-time data, dose rates for exposure to noble gases ranged from approximately 6 to 12 mrem/hr. Licensee representatives stated that the current dose rates were similar to values measured previously.

No violations or deviations were identified.

6. Program for Maintaining Exposures ALARA (83750)

10 CFR 20.1(c) states that persons engaged in activities under licenses issued by the NRC should make every reasonable effort to maintain radiation exposures a low as reasonably achievable. The recommended elements of an ALARA program are contained in Regulatory Guide 8.8, Information Relevant to Ensuring that Occupational Radiation Exposure at Nuclear Power Stations will be ALARA, and Regulatory Guide 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposures ALARA. The Regulatory Guides provide information relevant to attaining goals and objectives for planning and operating light water reactors and provide general philosophy acceptable to the NRC as a necessary basis for a program of maintaining occupational exposures as low as reasonably achievable (ALARA).

TS 6.11.1 requires procedures for personnel radiation protection to be prepared consistent with the requirements of 10 CFR Part 20 and be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

During the onsite inspection the licensee's ALARA program implementation was reviewed. Areas reviewed included management involvement in ALARA committee functions, ALARA activities conducted by both the RP ALARA and maintenance staff. From review of licensee records and discussion of ALARA program activities with cognizant licensee representatives the inspector noted the following observations and concerns.

- Licensee representatives informed the inspector that only one ALARA Committee meeting had been held since the previous NRC inspection conducted in August 1991 and documented in IR 50-413,-414/91-18. The lack of management involvement in the formal ALARA program was considered a continuing program weakness.

- RP ALARA staff planning initiatives and results for selected major outage tasks, including reactor head removal and replacement, SG eddy current testing, and reactor coolant pump maintenance resulted in continued reduction in dose commitment during the U2 EOC4 outage. The inspector discussed and reviewed implementation of HP/O/B/1001/39, Radiation Protection ALARA Planning Activities, dated August 27, 1990. In addition to extended reactor water cleanup, licensee representatives noted that improved training, increased experience of crews, increased shielding and preventative maintenance on equipment were contributing factors to the noted dose reduction.

- Maintenance pre-planning exposure estimates and ALARA pre-job meetings for activities performed in a radiation field ≥ 20 mR/hr or estimated to result in 100 mrem were conducted as required by Maintenance Management Procedure 1.9, ALARA Planning, dated June 13, 1990. However, from review of four maintenance group ALARA packages initiated between February 28 through March 4, 1992, no ALARA post-job evaluations were completed and documented in accordance with Section 3.6 of the procedure. The inspector informed licensee representatives that the failure to follow procedures for ALARA program implementation was a violation of TS 6.11.1 (50-413,-414/92-06-03). The inspector noted that the required documentation was essential for improving future ALARA estimates and initiatives. Licensee representatives stated that maintenance staff had problems in completing the current ALARA procedure and that a task group was formed to improve the current guidance. Licensee representatives indicated that corrective actions regarding the maintenance ALARA activities would be completed by June 30., 1992. The inspector informed licensee representatives that based on their actions the criteria specified in Section V.A of the Enforcement Policy were met and therefore the violation was not being cited.

One NRC-identified violation for failure to follow procedures for completing ALARA post-job reviews for selected maintenance activities was identified.

7. Facility Tours (83750)

During the onsite inspection, the inspector toured selected areas of the Unit 1 and Unit 2 Auxiliary Buildings, Turbine Buildings, and radioactive waste processing and/or storage locations. The inspector observed facility operations, and selected work activities to evaluate the implementation and effectiveness of the licensee's RP program. The following specific RP issues and concerns were noted and discussed with licensee representatives.

a. Instrumentation

All survey meters, whole body friskers, and hand and foot monitors in use within the RCA were observed to be operable, calibrated, and source-checked daily in accordance with licensee procedures.

No violations or deviations were identified.

b. Locked High Radiation Areas

TS 6.12.1 requires, in part, that for each high radiation area with radiation level greater than or equal to 100 mrem/hr but less than or equal to 1000 mrem/hr be barricaded and conspicuously posted as a high radiation area. In addition any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by a radiation monitoring device which continuously indicates the radiation dose rate in the area; a radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received; or an individual qualified in radiation protection procedures with a radiation dose rate monitoring device.

TS 6.12.2 requires that areas accessible to personnel with radiation levels greater than 1000 mR/hr at 18 inches to be provided with locked doors to prevent unauthorized entry in addition to the requirements of TS 6.12.1. The keys for the locked high radiation areas are to be maintained under administrative control.

During the inspection, the inspector toured various areas of the Auxiliary Building to verify implementation of radiological controls for high radiation and locked high radiation areas. The inspector observed that the licensee was controlling all areas with radiation levels greater than 100 mR/hr as locked areas. The control being provided those areas with radiation levels greater than 100 mrem/hr but less than 1000 mrem/hr was noted to be more stringent that TS requirements; however, the level of control was consistent with the licensee's RP procedure HP/O/B/1000/25, High Radiation Area Access.

In particular, the inspector reviewed the adequacy of the licensee control and posting of the 522 foot elevation which contains the residual heat removal pump, containment spray pump, and the auxiliary building sump areas. In addition to the proper posting of the door accessing the general area and display of dose rate maps, the inspector noted that postings were provided at the entrance to each cubicle/room/area and that "hot spots" were marked appropriately. The procedure required use of integrating, alarming

dosimeters, and "buddy" system requirements, and strict key access control by RP personnel. The inspector observed that high and locked high radiation areas were posted properly and maintained locked as required.

No violations or deviations were identified.

c. Labeling and Posting

10 CFR 20.203(a) requires, in part, that the radiation symbols prescribed by 10 CFR Part 20 to be implemented using the conventional radiation caution colors (magenta or purple on yellow background).

10 CFR 20.203(e) requires each area in which licensed material is used or stored and which contains any radioactive material in an amount exceeding ten times the quantity of such material specified in Appendix C of this part to be posted with a sign or signs bearing the radiation caution symbol and the words: "Caution, Radioactive Material(s)." 10 CFR 20.203 (f) requires, in part, each container of licensed material with greater than Appendix C quantities to bear a durable, clearly visible label identifying the radioactive contents. The label is to bear the radiation caution symbol and the words "Caution, Radioactive Material," and also provide sufficient information to permit individuals handling or using the containers, or working in the vicinity thereof, to take precautions to avoid or minimize exposures.

The inspector reviewed radioactive material storage areas associated with radioactive waste processing and storage and verified that all areas were posted appropriately and that, if accessible, all containers were labeled properly. Further, from limited discussions with workers in the area, the inspector noted that workers were aware of the appropriate area posting and container labeling requirements.

No violations or deviations were identified.

8. Violation Followup (92701)

a. (Closed) 50-413,-414/91-18-01 VIO: Failure to follow or to have adequate respiratory protection procedures (1) for developing RWP/SWRP respiratory protective equipment criteria for RP personnel involved with initial surveys of contaminated areas, systems, or equipment, and (2) for completing breathing air and SCBA compressors quarterly Grade D air quality surveillances.

The inspector reviewed and verified implementation of corrective actions stated in Duke Power Company's (DPC's) response dated December 12, 1991.

The inspector informed licensee representatives that based on review of procedural revisions, and subsequent implementation as documented in Paragraph 4.b, this item would be considered closed.

b. (Closed) 50-413,-414/91-18-03 VIO: Failure to conduct adequate skin dose assessment for personnel exposed to elevated concentrations of Xe-133. Violation of 10 CFR 20.201(b) requirements.

The inspector reviewed and verified implementation of corrective actions stated in DPC's response dated December 12, 1991.

The inspector informed licensee representatives that based on review of procedural revisions, and results of the licensee evaluation of previous inadequate skin dose measurements as documented in Paragraph 5.b, this item would be considered closed.

9. Followup Items (92701)

The inspector reviewed the following Information Notices (INs) with licensee representatives and verified that they would be obtained, subsequently reviewed for applicability, distributed to appropriate personnel, and that action was taken or would be scheduled, as appropriate:

- IN 88-63, Supplement 2: High Radiation Hazards from Irradiated Incore Detectors and Cables
- IN 91-60: False Alarms of Alarm Ratemeters Because of Radiofrequency Interference
- IN 91-65: Emergency Access to Low-level Radioactive Waste Disposal Facilities
- IN 91-76: 10 CFR Parts 21 and 50.55(e) Final Rules
- IN 91-77: Shift Staffing at Nuclear Power Plants

10. Exit Interview (65051, 83750, 92701)

The inspection scope and results were summarized on March 19, 1992, with those persons indicated in Paragraph 1 above. The general program areas reviewed and the NCVs identified during this inspection and listed below were discussed in detail.

The inspector informed licensee representatives that although proprietary information was reviewed during this inspection, such material would not be included in the report.

During a April 16, 1992 teleconference, the current status and the timeliness of licensee corrective actions regarding integration of body burden and RIIA analysis procedures were reviewed. Licensee actions regarding corrective actions were determined to be appropriate.

Item Number	Description and Reference
50-413,-414/92-06-01	NCV: Failure to post 10 CFR Part 21 documents properly (Paragraph 3.c). N of 10 CFR Part 21.6 requirements with corrective actions initiated prior to completion of the onsite inspection.
50-413,-414/92-06-02	NCV: Failure to have adequate procedures to evaluate and subsequently to assess and assign proper internal exposure data for positive body burden analysis results (Paragraph 4.a). Violation of TS 6.11.1 with licensee corrective actions to be completed by May 29, 1992.
50-413,-414/92-06-03	NCV: Failure to follow procedures for completing post ALARA job reviews for selected maintenance activities Paragraph 6). Violation of TS 6.11.1 with licensee committing to complete corrective actions by June 30 1992.