UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

Report Nos. 50-413/81-02 and 50-414/81-02

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

Facility Name: Catawba 1 and 2

Docket Nos. 50-413 and 50-414

License Nos. CPPR-116 and CPPR-117

Inspection at Catawba site near Rock Hill, South Carolina and Duke Power Company (DPC) Corporate Offices, Charlotte, North Carolina

Inspectors: J. C. Bryant — Date Signed 3/24/81

V. L. Brownlee — Date Signed 3/24/81

J. J. Blake — Date Signed 3/24/81

C. R. McFarland — Date Signed 3/24/81

M. D. Hunt — Date Signed 3/24/81

Approved by: J. C. Bryant, Section Chief, Division of Resident and Reactor Project Inspection — Date Signed 3/24/81

SUMMARY

Inspection on January 26 - February 6, 1981

Areas Inspected

This special, announced inspection involved 345 inspector-hours on site and 15 hours at the Corporate office in the areas of quality assurance, on site design controls, site management, site procurement, construction controls and activities, handling of nonconformances and reportable item evaluation. Construction activities inspected included electrical components and systems, instrumentation, safety-related pipe support and restraint system, and mechanical equipment installation.

Results

Of the areas inspected, two violations were found concerning evaluation and reporting of Part 21 and 50.55(e) items (Inadequate evaluation - paragraph 8.c and inadequate training - paragraph 13.d); two violations were found in the area of nonconforming items processing (Inadequate evaluation for generic issues - paragraph 12.b and 12.c and Inadequate documentation - paragraph 12.c); one violation was found in mechanical installation (Inadequate procedures - paragraph 11.e.(2), (3)).

DETAILS

1. Persons Contacted

Licensee Employees

*R. S. Alexander, Personnel Manager
*L. R. Barnes, Manager, Supports/Restraints
*D. G. Beam, Project Manager, Catawba
L. R. Davison, QA Manager, Construction
*S. W. Dressler, Senior Construction Engineer
*W. J. Foley, Principal Engineer, Electrical Division
*D. L. Freeze, Manager, Construction Services
*G. W. Grier, Planning Manager
*W. O. Henry, QA Manager, Technical Services
*R. A. Morgan, Project QA Engineer
*E. C. Wall, General Superintendent
J. R. Wells, Corporate QA Manager

Other licensee employees contacted included 25 engineers and construction supervisors and foremen, 47 construction craftsmen, 38 technicians, and 16 office personnel.

Other Organizations

T. Davis, Project Manager, MCC Powers
W. Rochester, QA Engineer, MCC Powers
NRC Resident Inspector

*P. K. VanDoorn

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on February 6, 1981, with those persons indicated in Paragraph 1 above. The violations were discussed in detail.

On February 26, 1981, L. C. Dail, DPC Vice President Design Engineering and J. R. Wells, Corporate QA Manager met with the Region II staff in the Region II office to discuss inspection findings.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or

deviations. New unresolved items identified during this inspection are discussed in paragraph 7.d.

5. Site QA and Construction QA Program Implementation

a. General

The purpose of this portion of the inspection was to complete an overall review of implementation of the DPC program for control of site QA and construction activities.

DPC Topical Report - Quality Assurance, Duke 1-A, Rev. 4, was accepted by the Quality Assurance Branch, Division of Project Management, NRR, by letter dated June 29, 1978. The Duke QA program commits to applicable regulatory requirements such as 10 CFR 50, Appendix B and to approved industry standards such as ANSI N45.2-1971 and corresponding daughter standards, or to equivalent alternatives. The QA program commits to the regulatory position of the NRC Regulatory Guides listed in table 17.0-1 of Duke-1-A with the exception of the clarifications, modifications and alternatives stated in the table.

b. Documents Examined

(1) DPC Topical Report on Quality Assurance, Duke 1-A, Amendment 4
(2) Corporate QA Manual
(3) Design Department QA Manual
(4) QA Department QA Manual
(5) Construction Department QA Manual
(6) Catawba Nuclear Station Construction Procedures Manual
(7) Catawba Nuclear Station Organization Chart

c. QA Program Review

The inspector reviewed the documents listed in paragraph 5.b and held discussions with responsible corporate and site management, QA, QC, technical support and craft personnel, and concluded that the DPC QA program and supporting manuals contain the following:

(1) A policy statement from upper management supporting the QA program and objectives.

(2) Adequate definition in the program for control of contractor and subcontractor activities.

(3) Provisions in departmental QA manuals for interface control between Engineering Design, QA, Construction, Consultants, Contractors, and Procurement.

(4) A listing of commitments to regulatory requirements.

(5) Provision for management audits to determine QA effectiveness.

(6) Clear cut organization charts and responsibility matrices.

(7) Independence of the QA organization from design and construction.

(8) QA Department direct access to management.

(9) Complete departmental QA manuals with procedures to implement the scope of work and provide interface control with other departments.

(10) Departmental QA manuals which are controlled documents and which contain procedures for change control.

(11) Stop work requirements established in the Topical Report and implemented by departmental procedures.

d. Program Implementation

By observation of ongoing activities, review of reports and discussions with personnel at all levels, the inspector concluded that the DPC QA program, supporting manuals and organizational/functional alignment are consistent with project status and adequate to monitor project activities in an effective manner. Personnel were knowledgeable of the QA program and procedural requirements. The inspector identified one area, lack of knowledge and understanding of NRC evaluation and reporting requirements, for which a violation was issued. This is discussed in paragraph 13.d.

e. Audits

There is a comprehensive system of audit and surveillance activities which spans corporate, departmental and site activities. DPC belongs to a joint Utility Management Organization which includes seven utilities. This organization performs the corporate audit on an annual basis. The inspector reviewed the corporate audit report for the October 6-10, 1980 audit.

Departmental audits are performed by the QA Department Internal Audits Group. The inspector reviewed C-80-7, Catawba Nuclear Station (10/13-20/80), and C-80-8, McGuire Nuclear Station (11/3-7/80) audits.

Site surveillance activities are performed by site QA personnel.

The inspector found that the audit system provides effective interfacing. Audit plans are tailored to a function and are not superficial checklists.

f. Reorganization

On February 1, 1981, all Quality Control personnel were transferred from the Construction Department to the QA Department. The Topical Report does not reflect this organization. The inspector discussed the change with NRR QA Branch, and with the DPC Corporate QA Manager. It was agreed that DPC will submit a letter immediately to NRR describing the new organization and will revise the Topical Report by March 31, 1981. Neither NRR nor IE objects to the reorganization and the inspectors have no further questions on the subject.

As a result of this inspection, the inspector finds that the interface activities between Design, QA and Construction is adequate. Management involvement at the work site is quite good. It appears that management supports the program.

6. Project Management - Site

Portions of this inspection were directed toward methods used by site management to determine that a quality product is produced and toward participation of management and supervisory staff in handling of site problems. Also, it was directed toward craftsmen and inspectors to determine their competence and their perception of the following: work quality; availability of technical assistance; accessibility of management; freedom to express opinions; and protection from harassment.

a. Organization

(1) There are no major contractors at the Catawba site other than the NSSS, Westinghouse. Except for a few small contractors, all personnel on site, from the project manager through craftsmen and laborers, are employees of Duke Power Company (Duke). Many employees are second or third generation Duke employees and many are working on their third Duke nuclear power site.

Probably as a result of this Duke "family" relationship, the organization is less formally structured than at some other utility sites.

Organization charts are of current date; however, they do not reflect exactly how the organization is functioning in some minor aspects. This presented no problem, since everyone involved knew the actual functions. Also, there is a major change of function in progress to Corporate Quality Assurance rather than to the site project manager. This change is discussed in greater detail in paragraph 5.f of this report.

(2) Position Descriptions

The site has Position Analyses for most jobs in the top two or three levels, project manager excluded. These analyses are

generic to the company and are not totally accurate relative to Catawba. They do not match the organization chart completely. These analyses give the broad scope of authority and responsi- ties of the positions. However, QA procedures place specific responsibilities on positions in handling safety-related matters.

Position descriptions do not provide for assumption of authority in the absence of superiors. Assignments to acting positions are made, if needed, by superiors. There are certain signoffs which are not delegated but are designated to be signed by a specific rank.

(3) Communications

The program specifies only three types of reports to go to the project manager. These are site stop work orders, variation notices (departure from design), and nonconforming items reportable to the Nuclear Regulatory Commission. Internally, numerous other reports are sent to him, such as trending reports, personnel actions and others.

Communications within the organization are not formally structured but are handled by managers as they see fit with only the most serious requiring notification of receipt back to the originator. On safety matters, the QA Manual describes required communications in each procedure. These appear to be clearly understood.

(4) Change Controls

Change controls are mostly originated in corporate offices and notices are disseminated from there. Design changes originated on site are handled by variation notices which receive corporate approval before implementation.

In summary, site organization interface and communications is relatively informal. Written memos are not used when direct contact will serve, except as required in the QA manual. Due to the nature of the Duke "family" organization, this system appears to be working. No noncompliances or safety concerns were found that could be attributed to the organization.

b. Trending: Nonconformances and Rework

(1) Nonconformances

Site personnel reported that trends of Nonconforming Items (NCI) reports are prepared annually in corporate offices. These were not examined by the inspectors. Unofficial trends of NCI's are developed quarterly on site by the senior QA engineer. NCI's are placed in the computer and trends are developed. At least quarterly, these are reported to the site manager and actions are taken as indicated.

This system, while it apparently is of value in some respects, is quite limited in other respects. Items are entered in the computer by a non-technical person and are assigned a key designation based on wording of the NCI's. NCI's of identical items and failures were found by the inspectors to have received different key designations, thus they would not appear on the printout as repeat items.

Also, trending is based on changes in relatively large numbers (50 or more) and thus would not detect five failures, for example, of a critical item.

(2) Rework

Extensive trending is done of all rework. Trending reports are developed for time periods throughout site history, by discipline, by system, by crew, and by cause. Cause is generally defined as repair or design, with a very low percentage due to repair. Design may mean any change from original intent, from a regulatory change to rerouting due to interference found in layout provided in the field.

These trending reports are prepared for the planning manager and are received by the site manager and others monthly. They are used extensively in planning and evaluation.

The NCI trending described above is not a requirement by NRC or Duke, but is provided for information. Though weaknesses are described in the system, no noncompliance with regulation was found. Weaknesses in the NCI system are described elsewhere in this report.

c. Management Accessibility to Employees

(1) Availability of Technical Assistance

Discussions were held with craftsmen, inspectors and engineers by all of the NRC inspectors during conduct of this inspection. As described in other sections of this report, the site engineering staff works very closely with construction forces. Problems are approached together in the field and resolutions determined. Construction personnel and inspectors stated that assistance was always available.

(2) Freedom to Express Opinions

Duke procedure Q-1 states that all employees are required to report conditions adverse to quality. There was evidence that employees are encouraged to take any problem to their supervision and to higher supervision, if they feel the need. Employee

Relations has documented 255 cases in 1980 of employees going to higher supervision and believes there may be many cases undocumented.

(3) Employee Relations

There is an employee relations office on site located in the work area. Employees are encouraged to use these services for any problem. On all terminations for cause, Employees .Relations conducts an investigation independent of other company investigations.

(4) Grievance Procedure

The site has a Construction Department Employee Recourse Procedure which expresses the belief that employee concerns should be addressed promptly and should receive thorough consideration without recrimination. The procedure directs Employee Relations to assist in preparation of grievances as desired by employees; it also details steps and required response times.

An informal procedure is described which provides for oral discussions through four steps to the project manager. A formal written procedure is described with steps up through the president of Duke Power Company.

(5) Harassment

The company has a procedure which is posted on site forbidding harassment of any employee for any reason by anyone and describing penalties up through termination.

NRC inspectors discussed with QC inspectors and craftsmen the possibility that they might be pressured or harassed about rejecting work or into performing poor quality work. Some of those interviewed were amused at the thought of such pressure. None of those talked to felt that such a situation might develop.

(6) Management Contact

In January 1981, the company instituted an Employee Forum program. This provides for meetings with 20-30 employees, without their supervision, by management. The first meetings were held in January and were attended by craftsmen and the project manager, the general superintendent, and the personnel manager. Meetings were described as totally open to any subject, completely confidential, and followed up by answers, if the answer could not be provided at the time.

The Employee Forum announcement is posted in the general work area. The project manager stated that he hopes to reach 2000 employees in 1981. The personnel manager described the meetings as very open.

The inspector has observed the project manager in the work areas and noted that he was well known by the workers. He was frequently greeted by his first name.

In summary, it is the inspectors' opinion from interviews, observations, and review of site and company policies that top management and supervision are available to employees at a very low threshold. It is unlikely that harrassment detrimental to quality work could develop under these conditions.

7. Site Procurement, Receiving and Storage

a. General

The bulk of equipment or materials received at the site are either NSSS supplied or DPC Engineer procured. Site requisitioned items are primarily consumables, standard stock items and transfers.

b. Documents Examined

(1) Requisition 8337-00578S
P. O. No. F 6216-13

(2) Requisition 8337-00607S
P.O. No. E-98052-13

(3) Requisition 8337-00957S
P.O. No. F-33825

(4) Requisition 8337-02195D-3
P.O. No. F-34676

(5) Design Engineering Department QA Program -
Section 300 - Procurement

(6) Construction Department QA Program - Procedure E-3,
Field Procurement of Items and Construction Services

(7) QA Manual for ASME Code Work - Section E

c. Program Implementation

The inspector examined the above noted requisitions, purchase orders, and controlling procedures; held discussions with site QA personnel,

Technical Support personnel, Warehouse QC personnel, and Warehouse personnel; and performed an inspection of warehouse and storage facilities.

The inspector concluded that:

(1) The procurement documents examined included the applicable technical, QA,Codes, standards and Part 21 requirements.

(2) The materials were ordered from suppliers which are on the approved vendors list.

(3) The procurement documents specify packaging, handling storage and documentation requirements.

(4) The receiving QC technicians have access to the procurement documents at the warehouse.

(5) Site personnel were knowledgeable of site procurement, receiving and storage policies, procedures and activities.

(6) The site receiving, inspection, nonconforming, tagging, storage, records and transfer activities are being handled in a controlled manner.

(7) Class A, B, C and D storage facilities have been established.

d. Weld Filler Material

During a review of purchasing/receiving records on February 4, 1981, the inspectors noted that Purchase Order No. E98052-13 for type E110-18 electrodes ordered to ASME B&PV Code requirements only required typical certifications rather than the actual certifications by heat and lot required for ASME B&PV work. The inspectors were informed that the material was ordered for a specific Non-ASME application and was not used in ASME applications even though the material appears on the site list of approved ASME materials. The inspectors informed the licensee that this would be considered to be an unresolved item (50-413/414/81-02-01 "Control of Weld Filler Material"), while the licensee attempts to verify the following:

(1) The material was not used in any ASME application.

(2) No other material has been purchased in the same manner and used in ASME applications.

(3) The system for control of filler material assures that material with only typical certifications does not get used in ASME applications.

In the areas inspected, no violations were identified.

8. Electrical (Components and Systems I) - Observation of Work and Work Activities

a. Emergency Diesel Generators Auxiliary Equipment

The inspector examined the inplace storage conditions of Diesel Generators 1A and 1B and associated local control panels. Each diesel engine and generator is enclosed in temporary enclosures to reduce the accumulation of dust and dirt resulting from construction activities in the immediate area. Heaters are installed at the base of the generators for protection from moisture. Weekly inspections are made to insure that the heaters are functioning properly and recorded on inspection Form 41-B. Megger readings are taken every 3 months to ensure that the protection is adequate for the generator windings.

The control panels and sequencing panels are covered with wooden doors to prevent damage to the control switches and meters. These panels are inspected periodically for cleanliness and damage.

b. 4160 Volt Switchgear

The inspector reviewed the installed 4160V switchgear 2ETA with the QC inspectors to ascertain the depth of the QC installation inspection. Records and discussions revealed that verifications of proper handling methods, of correct location, and of proper orientation of the base and equipment were made during the installation of the switchgear. Inspection for damage is made at this time.

The electrical QC inspectors verify the correct torque values when anchor bolts are used, but welding inspectors inspect and approve welded equipment to base installations. The inspection is conducted in accordance with Supplemental Inspection Instruction, Serial No. 4, Electrical Equipment Installation.

c. 600V Switchgear and Motor Control Centers

During this inspection, it was found that thirteen 600V circuit breakers had been nonconformed for broken contact blocks. These breakers had been found defective during calibration and adjustment by the Transmission Department and nonconformed in accordance with Procedure Q-1, Control of Nonconforming Items, on Nonconforming Item Report Nos. 9755, 10665, 10684, 10721, 10745, 10752, 10818 and 10852.

As of the beginning of the inspection, no request had been made for an evaluation to determine the reportability of the breaker deficiencies. The fact that breakers had been found defective during 6 successive working days did not trigger any administrative mechanism that required further evaluation for reportability.

Approximately 3 days into the inspection, a request for evaluation of the breaker deficiencies was made by site personnel to corporate offices. Shortly before the end of the inspection, the inspectors were advised that evaluation had determined that the breaker deficiencies were not reportable.

The inspector, however, identified the compartments in which the breakers were to be used and found that 4 of the breakers served either as the normal feeder or alternate feeder breaker for the 600V Essential Auxiliary Power System 600V Load Centers 2ELXB and 2ELXD.

Failure of these breakers would result in the loss of one train of 600V motor control centers, which supply power for letdown heat exchanger cooling water supply and suction valves; auxiliary feedwater to steam generator 2B isolation valve; auxiliary feedwater pump 2B suction valve from nuclear service water; and the pressurizer power operated relief valve isolation valve.

It was further determined that one of the breakers identified as deficient was to be installed as a feeder breaker in 600V Essential Auxiliary Power System 2ELXA which is identified as the redundant power train. It would appear that were these breakers, as designated by approved engineering drawings CN-2703-01.01 and CN-2703-01.01, to fail, the capability to obtain and maintain safe shutdown conditions would be greatly decreased.

Since the same model breakers are used throughout the other power train, the possibility exists that the same deficiency exists in them. The failure to adequately evaluate the breaker deficiencies appears to be a violation and is identified as 414/81-02-02, Inadequate Evaluation of Generic Deficiencies for Reportability.

d. Electrical Penetration Installation

The inspector observed partial installation of electrical penetration, Serial No. 2629F, internals. Cleanliness during the installation was closely controlled. All seals were installed and the torquing sequence was in accordance with Procedure CNS-1390.01-00-0073, Mechanical Installation Procedure for Electrical Penetration Types B, C, D, F, G, H, J, K, L, & M. Discussions with the craftsmen and QC inspector revealed that these personnel were knowledgeable of the installation procedures as well as the requirements of installation of equipment which required periodic calibration.

e. Transmission Department

This department performs all circuit breaker tests, calibration and inspections for the construction and operating departments. In addition, all adjustable relay calibrations are accomplished by this department. The Transmission Department also performs the high

potential testing of high voltage cables after installation by the construction forces.

All work is performed in accordance with the construction QA program or the operating plant QA program. During construction activities, surveillance activities are performed and documented by the electrical QC group.

Discussion with transmission department supervision revealed that the existing department QA manual is being revised to define more clearly the responsibilities of the department.

f. Cable Installation and Terminations

No safety-related cable installations were made during this inspection. Cable terminations were in progress in several areas but verification by the QC inspectors is performed just prior to system turnover.

Discussions with the QC inspectors performing this task indicated that they have an understanding of the procedure requirements. They further advised the inspector that there was no difficulty in getting corrections made when required.

g. Electrical Motor Storage

Examination was made of electrical motor storage conditions while in the warehouse or after being set in place. Inspections are made and documented in accordance with approved QA/QC procedures. The motors are manually rotated quarterly and meggered monthly. Motors requiring heat when not in operation have temporary power applied to the heaters until the permanent power wiring is installed. When this is completed, the permanent breaker is closed and tagged so that power is applied to the motor heaters.

h. Electrical Equipment Qualification

The inspectors met with a Duke Power Company task force that had been assigned the duty of qualifying electrical and instrumentation equipment to meet the conditions of IEB 79-01B. The group had just been organized and had not had time to develop a complete program. Discussions with the inspectors indicated that the group was well informed and understood the task before them.

i. Personnel Interviews

The inspector conducted interviews with several craftsmen, QC inspectors, engineering technical support and supervisory personnel. All discussions indicated that safety concerns could be carried to the highest level necessary to obtain satisfactory answers or resolutions. No resentment was observed between the craftsmen and the inspection personnel. The craftsmen were aware of the requirements to do the work

properly. Most were aware of the separation criteria and power train requirements for separation. All had access to procedures and drawings and indicated that they used them frequently.

The QC inspectors appeared to be well versed in the inspection procedure to which they were inspecting.

Throughout the organization, no problems appeared that would indicate that there was not cooperation between all parties involved.

9. Instrumentation and Control

a. General

DPC, being its own AE/Constructor, is responsible for final design and layout of plant; plant systems; purchasing of balance of plant equipment; site receiving, storage issue installation and associated QA/QC activities. NSSS supplied equipment is received on site, stored and installed by DPC Construction Department.

The only contractor on site that has responsibility for installation and checkout of safety-related instrumentation is for HVAC, Bahnsen Service Co. (Bahnsen) contractor. Bahnsen has subcontracted to MCC Powers (Powers) the instrumentation and control portion of the contract. Powers does application engineering only.

Contractor work packages for system installation, which include description of work, applicable drawing, equipment to be purchased, etc. are submitted to DPC Design Engineering Department for review and approval prior to start of work or purchase of equipment. DPC has reviewed and accepted Bahnson's QA/QC program. Bahnsen has reviewed and accepted Powers QA/QC program. DPC performs vendor audits and site surveillance checks on Bahnsen and Powers activities.

b. Documents Examined

(1) Catawba Organizational Chart

(2) Equipment location drawing CN-1499.01.11

(3) Equipment location drawing CN-1499.01.10

(4) Instrumentation Surveillance Checklist, dated 1/28/81

(5) DPC Specification No. CNS-1210.04-00-0011, June 27, 1978, Rev. 1, December 5, 1978

(6) Instrument Standards Installation Field Practices, Drawing Nos. 1CS-A-20, 20.1, 20.2, 20.3, 20.3, 20.4, 20.5, 20.6, 20.7, 20.8, 20.9 and 20.10.

(7) Instrument Field Installation Detailed Drawings CN-1499-KC-30, KC29, KC24.

(8) Specification No. CNS-1354.02.00.0001, 10/19/77, Multi Conductor Control Cable

(9) Specification No. CNS-1354-03-00-0001, 11/18/77, Shield Pair Instrument Cable

c. Systems Installation

To verify systems installations, the inspector performed the following:

(1) Held discussions with DPC Design Engineering engineers, site technical support personnel, warehouse receiving and inspector personnel, site QA/QC personnel, craft personnel and craft foremen, and Bahnsen and MCC Powers Contractor personnel.

(2) Reviewed the documents identified in paragraph 9.b above.

(3) Examined the field installation of the following instruments to verify that installation is in accordance with the plans and specifications:

-- 1KCFT 5990
-- 1KCFS 5990
-- 1KCFS 5950
-- 1KCFT 5950
-- 1KCFS 6060
-- 1FCFT 6060
-- 1KCFS 5960
-- 1KCFT 5960
-- 1KCPG 5660
-- 1RNPT 5020
-- 2KCFE 6520

(4) Verified that selected drawings and variation notices were current and at the proper locations.

(5) Witnessed QC personnel performing acceptance inspections.

(6) Witnessed QA personnel performing Surveillance Checklists on QC personnel performing acceptance inspections.

d. Findings

The inspector concluded the following:

(1) There appears to be good interface between Design Engineering and site Instrument Technical Support personnel.

(2) Site Instrument Technical Support personnel are providing the needed guidance to the crafts, QA and QC.

(3) Electrical/Instrumentation QC personnel are knowledgeable of QA program and engineering document requirements.

(4) Craft foremen and craft personnel interviewed were knowledgeable of engineering and QA requirements.

(5) The inspector could detect no cases where hostilities or harrassment existed between craft, QC, technical support and Design Engineering personnel.

(6) Instrumentation and control equipment that was being received, inspected, stored, installed and inspected for installation was being handled in accordance with program requirements.

No violations or deviations were identified.

10. Safety-Related Pipe Support and Restraint Systems (Unit 1)

a. Program

The applicable code for safety-related support and restraint installations is the ASME B&PV Code, 1974 Edition with Summer 1975 Addenda.

The inspectors reviewed selected procedures; interviewed technical, quality control and craft supervisors; observed work activities; and inspected installed supports and restraints to determine if the licensee's program was adequate to ensure that installed supports and restraints met the design requirements imposed by the applicable code.

Procedures reviewed included the following:

(1) CP-115 Installation of Concrete Expansion Anchors

(2) CP-385 Support/Restraint Erection Tolerances

(3) CP-432 Welding of Hangers, Supports and Seismic Controls

b. Personnel

The supervisors were interviewed to determine the working relationship between the various groups involved with fabrication and installation of the supports and restraints. It was noted that the technical and craft organizations have personnel assigned to specific areas of support and restraint work (i.e., Reactor Building, Auxiliary Building and Turbine Building) and that the technical people in a specific area work closely with the craft personnel assigned to the same area.

The licensee's hanger group also includes a design liaison team assigned to the site for the purpose of solving minor problems with hanger and support installation and also to perform verification inspections when a problem is of the type that requires reanalysis of the support systems.

This design group appears to have established a good working relationship with the construction technical and craft personnel and the design response to problems is obviously facilitated by the problems being translated into design terminology at the site level.

The inspectors noted that there appeared to be an obvious cooperative attitude in the interaction between the construction technical, craft and design liaison personnel.

c. Work Observation

Work observed included the following activities:

(1) Observation of a pre-check team (one technical representative and one craft representative) sighting locations of proposed hangers and supports to see if they could be installed as designed.

The pre-check included verification by actual measurement and establishing the location site with appropriate markings to provide guidance to the installation crew. The completion of the pre-check exercise was either a release for fabrication or a design deviation or change request initiated by the technical member of the team.

(2) Observation of support and restraint fabrication welding and inspection activities in the Auxiliary Building.

(3) Observation of support and restraint installation activities in the Auxiliary and Reactor Buildings.

During the observation of work activities, the inspector questioned the personnel involved to determine their knowledge of job requirements. The personnel contacted during this inspection appeared to be well trained in that welders, fitters, and QC inspectors all seemed to understand the welding symbols used on the design drawings, and installation mechanics all seemed to be aware that if the drawing being worked did not provide tolerances that CP-385 would provide the necessary information.

The installed supports and restraint systems inspected included the following:

-- 1AN1-4136
-- 1RN1-1486

-- 1RN1-1487
-- 1RN1-1399
-- 1RKC- 392

The inspector also examined the following mechanical type snubbers which were a part of restraints being assembled in the Auxiliary Building:

--	1RN1-1350	1500# Snubber
--	1RNV-1472	1500# Snubber
--	1RCF-1529	6000# Snubber
--	1RNV-1741	650# Snubber
--	1RNV-1738	1500# Snubber
--	1RCA- 079	1500# Snubber
--	1ANV-3249	1500# Snubber
--	1ANV-3286	650# Snubber

These snubbers were inspected for evidence of damage or mishandling.

The result of this inspection was that the inspector gained the impression that licensee management is endeavoring to establish a team environment in the area of hanger fabrication and installation.

There were no violations or deviations in this area of the inspection.

11. Mechanical Equipment

a. Scope

This portion of the inspection concerned on site design work and installation relative to mechanical equipment. The inspector examined completed work and work in progress relative to heat exchangers, tanks and fuel racks.

b. Organization

The mechanical equipment for the nuclear steam supply system (NSSS) procured from Westinghouse Electric Corporation (Westinghouse) is installed under the supervision of the mechanical construction engineers. Mechanical equipment for the balance of plant is installed under supervision of the civil engineers. The only documentation of the civil engineers' evaluations is QA/QC documentation of acceptance or rejection of work. Power house mechanics (millwrights) perform the work of installation of all safety-related mechanical equipment.

QC engineers and technicians inspect work performance while QA engineers and technicians perform surveillance of QC and craft work and documentation of the work.

The inspector held discussions with personnel from each of the groups listed above. All of those contacted demonstrated sufficient knowledge of their assignments, the interface with the other groups and of the QA/QC requirements to perform the work satisfactorily.

c. Design Functions

The applicable specifications and drawings are prepared by the corporate design engineering department and are readily available on site as controlled documents.

Variation Notices (VN's) are processed for design changes deemed necessary by on site construction engineers and on site design, and result in revisions to design drawings. Minor changes may be worked out by telephone between the two design groups but these are followed up by drawing changes from corporate. The design groups meet regularly either in the field or in corporate, usually weekly, to assure proper understanding of problems.

d. Document Review

The inspector reviewed the following VN's as representative of work in progress and work completed: 1844, 1882, 6045, 7622, 7970, 8468, 10287, 12243, and 12992. VN's are controlled by the requirements of QA procedure R-3, Design Drawing and Specification Variation, documented on Form R-3A and the status of VN's is logged on Form R-3B.

The inspector found that the task for each organization on site is clearly planned, implemented and documented. Complete work packages were prepared for each task by the engineering section.

Prior to and during the inspection the inspector reviewed the PSAR and QA procedures relative to mechanical design engineering and construction.

No violations were found in this area.

e. Safety-Related Components - Observation of Work and Work Areas

(1) Upper and Lower Lateral Restraints, Steam Generators and Pressurizers, Units 1 and 2. The inspector reviewed specifications for the support framing of the pressurizer, steam generators and reactor coolant pumps, CNS-114.05-3, and upper lateral restraints of the steam generators, CNS-1144.05-00-0012. He also reviewed drawings CN1070-11, CN1070-14 and CN1070-30 and related details and construction procedures CP399 and 475. The inspector also reviewed QA procedures L-80, M-4, 9, 15, 18, 19, 21 and 51; QA procedures Q1 and R3; the QA surveillance checklist for mechanical equipment installation and alignment, MWN-2; and the monthly QA surveillance reports for inspection of installation of mechanical equipment for June 1980 through January 1981.

Discussions with construction engineers and craft foremen revealed a reasonable knowledge of the above documents and related work.

The lower laterals are installed for the Units 1 & 2 steam generators (SG). Upper laterals for Unit 1 SG's are about 25 percent complete. No field work has begun on upper laterals for Unit 2 SG's. Upper and lower supports are installed for the Unit 1 pressurizer. The Unit 2 pressurizer lower supports erection is about 75% complete; the upper supports are on site, but no field work has been initiated.

The inspector examined the completed work. No field erection was in progress.

(2) Pressurizer Relief Tanks - Units 1 and 2

Pressurizer relief tanks for Units 1 and 2 were inspected for proper installation. The inspector reviewed drawings CNM1201.-4-100, CP360A and QA procedure for reference. The tanks are stored in place. The sliding supports for each tank are set on embeds with two inch bolts. The elongated bolt holes in the base of the sliding supports are designed to be 2.75 inches long to allow for thermal expansion of the tank and movement of the sliding supports. Embeds for the sliding supports are not grouted; the work is not complete.

Inspection of the elongated bolt holes is limited by washers and nuts. By reaching under the sliding support plates, the inspector was able to determine that the support plates apparently are improperly positioned relative to the embed bolts. There was clearance for about ¼ inch of expansion on the Unit 1 tank and ½ inch on the Unit 2 tank; whereas, the design provides 3/4 inch. Neither the equipment specification nor the installation procedure provide acceptance criteria for this dimension. Acceptance criteria are related only to tank nozzles and piping.

Failure to provide acceptance criteria is contrary to Criterion V of Appendix B as implemented by Duke Topical Report paragraph 17.1.5.2. This is a violation identified as 413/414/81-02-03, Inadequate Procedure.

(3) Containment Spray Heat Exchangers Supports - Units 1 and 2

Supports for the containment spray heat exchangers are being fabricated by welding I beams and cross braces in the site metal fab shop and are being installed according to CP360A. Approximately ½ of the required thickness of each weld (approximately 200 welds per support) is being applied in the fab shop. The supports are then transported to the Auxiliary Building and are completed in place with the weight of the heat exchangers on them.

Welds are not completed in the fab shop and existing procedures, drawings and instructions fail to define the status of work completed in the fab shop. Thus, in the field, the supports must be examined according to drawings and each of the ¼ inch welds increased to 3/8 to ½ inch. Also, the welds are completed with the weight of the heat exchangers on them; whereas, design intent apparently was to have them welded in the shop without this load.

Failure to define the status of work completed prior to releasing the equipment to another area is contrary to Criterion V of Appendix B, as implemented by Duke Topical Report paragraph 17.1.5.2. This is considered to be another example of the violation identified as 413/414/81-02-03, Inadequate Procedures.

(4) Spent Fuel Racks - Units 1 and 2

The inspector reviewed the following drawings related to the spent fuel racks: CN1210-5, CN1210-13, CN1210-14, CN1210-20 and Westinghouse drawing 875-7051, sheet 20. He also reviewed draft procedure CP384 for the drag load test of fuel storage and fuel handling equipment, and Westinghouse fuel assembly interface specification, F-8, relative to new and spent fuel racks.

The inspector examined welding related work and inspected spent fuel racks in the spent fuel pools for alignment and configuration. Discussions with engineers, welders and inspectors revealed that they were adequately knowledgeable of requirements and their duties.

Except as noted in paragraphs 11.e(2),(3) above, no violations were identified.

12. Nonconforming Item Report Evaluation

a. Scope

The licensee's handling of the broken circuit breaker contact problem (discussed in paragraph 8.c.) as a series of isolated nonconformances, without any apparent consideration of generic implications raised questions about the nonconformance review and evaluation process at the site.

The inspectors reviewed the licensee's procedure for reporting and evaluating nonconforming items. This procedure, QAP Procedure Q-1, Control of Nonconforming Items, provides step-by-step instructions for the initiation and processing of nonconforming items on NCI Report Form Q-1A.

The inspectors next conducted a two part review of NCI Reports. The first part involved the review of recently initiated NCI's (those listed in the past 3 to 4 months) to see if any trends or generic type

of nonconformances could be identified. The second part involved a review of completed NCI Reports in the QA records vault to determine if corrective actions and documentation appeared to be appropriate for the nonconformances described.

b. Active NCI's

The first part of the review started with a review of the NCI Log Book, followed by a review of the record copy of the NCI Reports for those that were still being worked. The inspectors immediately noted the apparently large volume of NCI's being generated at the site - (The Log indicated that NCI Number 9000 had been issued in July 1980 and number 10900 was issued during early February 1981 - This is nearly 300 NCI Reports per month). The subjects covered by these NCI's ranged from relatively minor documentation problems through major problems with safety-related hardware. This large volume of all types of problems being handled in the same manner was pointed out to licensee management as a possible contributor to the reason why generic items and/or trends were apparently going unnoticed.

During the review of the active NCI's, the inspectors noted one NCI (Number 10479 which described a linear indication the full length of the outside surface of a piece of stainless steel pipe) on which the originator had added a note to the effect that this was the same heat of material as was reported on NCI 10311. The inspector found that NCI 10311 had been closed after the corrective action "These sections of pipe shall be replaced and discarded" was accomplished, but that when the pipe; identified in NCI 10479 was inspected in the pipe fabrication shop, two other piping assemblies with the same problem were noted. These assemplies had also been nonconformed (NCI's 10637 and 10638) with the NCI containing a note to the effect that this was the same heat of material as reported on NCI 10311 and 10479.

The only acknowledgement of generic implications was that NCI's 10311 and 10479 were assigned to construction for evaluation while 10637 and 10638 had been assigned to design.

The inspector's evaluation of the indications reported by these NCI's was that they were a lack of fusion indication caused by improper welding of this seamed stainless steel pipe. NCI's 10637 and 10638 were initiated on January 9, 1981, and forwarded to design for evaluation on January 13, 1981.

At the time of the exit interview for this inspection on February 6, 1981, an evaluation from design had not been received and there had been no hold put on the remaining material of the same heat which remained in stock in the licensee's pipe storage area.

The handling of these NCI's was cited as one example of violation No. 414/81-02-04, Apparent Generic Items or Trends Not Recognized nor Forwarded to Management.

During this review of NCI's, the inspectors noted a number of NCI's which reported that the inside surface or root face of a weld or welds did not meet ASME B&PV Code acceptance criteria even though the weld had already been accepted by QC. These NCI's included one (NCI 9902) which reported unacceptable root condition on a weld joint which the weld history records showed had been repaired as the correction to NCI 9295, which reported unacceptable root condition on a previously accepted weld.

Another significant NCI was number 10786 listing a number of welds, accessible for internal visual inspection, which did not meet acceptance criteria even though the welds had been accepted by QC visual inspection. This NCI also referenced the Authorized Nuclear Inspectors Report of January 30, 1981, which listed other welds with the same unacceptable root conditions.

All of the NCI's which reported these weld ID surface problems had three things in common: Disposition was to repair as necessary; Report to management was checked "NO"; and not one of the NCI's reviewed by the inspectors questioned how the inspection of the root surface was missed originally and what action would prevent recurrence.

This situation was particularly surprising for NCI No. 10786 which was initiated by the QA group because of the apparent significance of the problem, but when construction decided not to report to management, QA approved this decision.

This problem with the apparent inadequate visual inspection of the internal surfaces of piping welds was cited as another example of Apparent Generic Items or Trends Not Recognized nor Forwarded to Management (Violation No. 413/81-02-02)

c. Completed NCI's

During the second part of the NCI review, the inspector selected NCI's numbered 9900 through 10000 which had been completed and filed in the QA record vault. During this review, the following NCI's were identified as problems to the licensee's QA personnel

NCI 9926 reported that a wear collar ring for a penetration was 5/16-inch thick and the plan required a thickness of 0.5312 to 0.5938-inch. The NCI was dispositioned by the same person that originated it with the statement that the material was right and the plan was right.

Discussion with the originator showed that the plan required dimensions were obtained by subtracting diameters and should have been divided by two to find the actual requirement, therefore, there was no need for the NCI.

NCI 9933 reported that a piping flow section did not meet smoothness requirements. This NCI had been dispositioned on November 17, 1980, as unacceptable, requiring refabrication. This disposition had been lined out on December 17, 1980, and a new disposition "Acceptable as is" added. This change in disposition was done without any recorded justification.

These two NCI's were cited as examples of violation No. 413/81-02-04, Incomplete QA Documentation.

In this same group of NCI's, NCI 9959 was written concerning the fact that an 8" class A weld (Weld No. INI-32-1) was welded with excessive weld weave. The disposition required removal of improperly welded material and reinstruction of the welder(s).

The inspector noted that the disposition did not require verification of metal removal nor did it specify how much to remove. The question of what other welds had been done by the welder(s) was not asked. A review of the weld history record for this weld shows that the NCI number was written on the weld joint record but there is no record of any metal removal.

NCI 9984 was also noteworthy: it reported that an RHR pump unit had apparently been fabricated improperly because when the seal water flanges were unbolted, the piping moved out of alignment indicating that when the unit was fabricated by Ingersoll-Rand for Westinghouse, the piping was assembled with residual stresses caused by cold spring.

The documentation for this case showed that the corrective action was to bend the piping to the proper configuration under the guidance of the Westinghouse site representative. The NCI documentation did not report how much movement was involved nor was there any provision for control and documentation of the bending operation. As a result, there was no evaluation to determine what effect, if any, the uncorrected cold spring could have had on safe plant operation.

These two NCI's were considered to be additional examples of the licensee's apparent lack of comprehensive evaluation of potentially serious nonconformance situations. These will be considered a part of Violation 413/81-02-02, Apparent Generic Items or Trends Not Recognized nor Forwarded to Management.

13. Reporting of Deficiencies, Defects and Noncompliances (10 CFR 50.55(e) and 10 CFR Part 21)

a. General

The purpose of this inspection was to ascertain whether DPC, and appropriate responsible officers, established and implemented procedures and other instructions as required to ensure compliance with 10 CFR Part 21, and 10 CFR 50.55(e) requirements relative to the

evaluation and reporting of deficiencies, defects and noncompliances. Inspector determinations are based on the requirements of 10 CFR Part 21 as c.assified by staff positions in NUREG-302, Revision 1 and additional IE guidance relative to 10 CFR 50.55(e).

b. Documents Examined

(1) Procedure QA-121, Rev. 2, June 1980, Nuclear Regulatory Commission Reporting Requirements

(2) Procedure PR-202, Rev. 0, November 1980, Design Nonconformance

(3) Procedure PR-220, Rev. 7, August 1980, Nonconforming Item Reports

(4) Procedure PR-290, Rev. 4, June 1980, Nuclear Regulatory Commission Reporting Requirements

(5) Procedure Q-1, Rev. 13, May 1980, Control of Nonconforming Items

(6) Procedure R-5, Rev. 2, June 1980, Nuclear Regulatory Commission Reporting Requirements

c. Program Review

The inspector reviewed the above controlling procedures and verified that procedures have been established to assure that the following requirements of 10 CFR 21 will be met; the posting (21.6), evaluating deviations (21.21(a)(1)), informing the director (21.21(b)), and to assure that procurement documents specify that provisions of 10 CFR Part 21 will apply when applicable (21.31), maintenance of records (21.51(a)), and disposition of records (21.51(b)). The inspector also verified that procedures have been established to assure that 10 CFR 50.55(e) identification, evaluation, and reporting requirements will be met.

The inspector concluded that the procedures, if implemented by properly trained personnel, could provide the necessary controls to implement the evaluation and reporting requirements of 10 CFR 50.55(e) and 10 CFR Part 21.

The lack of properly trained personnel is discussed below.

d. Program Implementation

The inspector held discussions with management, QA technical support, QC and craft personnel relative to NRC requirements, NRC guidance, and DPC controlling procedures for the evaluation and reporting of deficiencies, defects and nonconformances. The inspector concluded that the personnel did not have sufficient knowledge and understanding of NRC evaluation and reporting reqirements and NRC guidance.

Therefore, the procedures were not being properly implemented. This lack of knowledge and understanding of the requirements is evidenced by the following:

(1) Personnel do not understand when a basic component is considered to be delivered.

(2) Personnel do not understand when Duke becomes the responsible evaluating agent.

(3) Personnel do not know how responsible individuals are informed of possibly reportable matters when the concerned individual is not assigned as the evaluator.

(4) Review of site training records and discussions with site personnel reflect that training sessions, 10 CFR 50.55(e) - given by site QA to site QA on 10/22/79, and 10 CFR 50.55(e) and Part 21 - given by DPC management to site QA and Construction on 11/27/79, consisted of presentations of only the direct words of regulations with no reference to NUREG 0302. There was no handout guidance. No additional training was in evidence at the site even though a complete revision of procedures, as noted in paragraph "b" above was completed in mid 1980.

It was evident that evaluating personnel were not questioning, if a basic componenet was involved; where the component was used, if the component performed a safety-related function, what were the consequences, and if the items were generic.

10 CFR 50, Appendix B, Criterion II requires that the program shall provide for training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained. The lack of adequate training relative to NRC evaluation and reporting requirements for deficiencies, defects and nonconformances is identified as a violation (413/81-02-05 and 414/81-02-05).