

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT
Richard C. DeYoung, Director

In the Matter of)	
)	
DUKE POWER COMPANY)	Docket Nos. 50-413
(Catawba Nuclear Station,)	50-414
Units 1 and 2))	(10 CFR 2.206)

DIRECTOR'S DECISION UNDER 10 CFR 2.206

I. INTRODUCTION

On behalf of the Palmetto Alliance, Ms. Billie Pirner Garde of the Institute for Policy Studies' Government Accountability Project (GAP) requested in a letter dated September 14, 1983, that the Commission initiate various "independent" reviews of the construction, design, and management of Duke Power Company's Catawba Nuclear Station. The petitioner asks that the Commission modify the construction permits so as to require "a mandatory review by an independent contractor" of:

- ° the actual as-built condition of the Catawba facility through a 100% reinspection of the safety-related areas of the plant,
- ° "the design deficiencies and the breakdown in the design change control systems which render the design, as approved in the Final Safety Analysis Report [FSAR], inaccurate and incomplete", and
- ° the quality assurance and quality control program "which has existed with major weaknesses at the Catawba facility since the beginning of construction."

Petition at 1. In addition, the petitioner asks that the Commission order "a management audit of the Catawba upper and mid-level managers responsible for both design and implementation of the Catawba quality control/quality assurance program." Id. The petitioner contends such relief is warranted because the available evidence demonstrates a continuing and pervasive break-down in the quality assurance program for design and construction of Catawba.

The petitioner also asks that the Commission's Office of Investigations investigate harassment and intimidation of Catawba workers and that the Office of Inspector and Auditor's pending internal investigation include alleged improprieties by NRC Region II personnel in maintaining the confidentiality of NRC informants and in executing the Commission's regulatory program.

In accordance with usual Commission practice, the petitioner's request was referred to the staff for consideration under 10 CFR 2.206. See Lorion v. NRC, 712 F.2d 1472, 1474 (D.C. Cir. 1983), cert. granted on other grounds Sub nom. Florida Power & Light Co. v. Lorion, 52 U.S.L.W. 3701 (U.S. 1984). The Director of the Office of Inspection and Enforcement acknowledged receipt of the petition in a letter dated October 14, 1983. In this letter, the Director also denied the petitioner's request for immediate implementation of the proposed relief, because no imminent danger to public health and safety warranted such action, nor was such action required to ensure adequate consideration of the petition. A notice was published in the Federal Register that the petition was under consideration. 48 Fed. Reg. 48882 (Oct. 21, 1983).

In deciding this petition, the staff has considered the petition and its various attachments as well as other relevant information. GAP responded by letter dated December 2, 1983, to staff questions concerning the § 2.206 petition. Duke Power Company (DPC) submitted a response to the petition on

January 5, 1984. ^{1/} The results of the NRC inspection program at Catawba were also reviewed in reaching this decision. The pertinent inspection reports containing those findings are referenced in this decision and provide greater detail regarding the basis for this decision.

Additionally, the staff has reviewed the record developed before the Atomic Safety and Licensing Board in the operating license proceeding for the Catawba Nuclear Station. Among other issues, the Licensing Board has held hearings on the adequacy of the quality assurance and quality control program at Catawba.^{2/} As noted in several instances in this decision, the petitioner has advanced before the Licensing Board much of the evidence on which it relies in its request under §2.206. While this §2.206 decision was in final preparation, the Licensing Board issued its "Partial Initial Decision," ASLBP No. 81-463-06 OL (June 22, 1984), in the operating license proceeding. Subject to certain stated conditions, the Licensing Board authorized issuance of a low-power license for Catawba Unit 1. Partial Initial Decision at 271-72. The Licensing Board's decision is generally consistent with the staff's view of the facts concerning the common issues regarding quality assurance which were raised in both the operating license proceeding and the §2.206 petition.

^{1/} Letter to Richard C. DeYoung from W. H. Owen, Executive Vice President for Engineering and Construction, DPC (Jan. 5, 1984) (hereinafter "DPC Response"). Although licensees are not required to respond to §2.206 petitions in the absence of a formal request pursuant to 10 CFR § 50.54(f) or §182 of the Atomic Energy Act, licensees may respond to such petitions at their own volition, as was the case here. See LeBouef, Lamb, Leiby & Mac Rae, 41 Fed. Reg. 3359 (Jan. 22, 1976).

^{2/} The ultimate issue before the Licensing Board is, of course, whether operating licenses for the Catawba units should be issued. The Licensing Board does not have jurisdiction to modify the construction permits as the petitioner requests be done in its §2.206 petition. See Consumers Power Co. (Midland Plant, Units 1 & 2), ALAB-674, 15 NRC 1101, 1102-03 (1982).

The Licensing Board found "no pervasive failure or breakdown" of the quality assurance program for Catawba; to the contrary, the Board found that, "on the whole, the Duke QA program at Catawba worked well." Partial Initial Decision at 21.

Upon the staff's review of information pertaining to the petitioner's request, I have determined that modification of the Catawba construction permits to compel the independent reviews requested by the petitioner is not required to ensure adequate protection of public health and safety. Consequently, for the reasons stated in this decision, the petitioner's request for such action is denied.^{3/}

^{3/} As noted at the outset of this decision, the petitioner also requested investigations by the NRC's Office of Inspector and Auditor (OIA) and the Office of Investigations (OI). A request for an investigation, particularly one for an investigation by OIA of internal NRC personnel matters, does not fall squarely within the class of requests contemplated by 10 CFR 2.206. Section 2.206 contemplates requests to institute enforcement proceedings with respect to any license. In all events, both OI and OIA have initiated investigations related to matters raised in the petition.

OI has initiated an investigation of harassment and intimidation issues raised in the petition and in an April 21, 1983 letter from GAP to Ben B. Hayes, Director of OI, and James P. O'Reilly, Region II Administrator. See Board Notification Memorandum (Nov. 1, 1983) from T. Novak, Office of Nuclear Reactor Regulation. GAP considers its request for an OI investigation to have been granted. Letter from Billie P. Garde to Richard C. DeYoung, at 3 (Dec. 2, 1983).

OIA was provided a copy of the petition for its use in connection with its investigation begun as a result of GAP's April 21st letter to Messrs. Hayes and O'Reilly. As discussed in the latter portion of this decision, the Office of Inspection and Enforcement has reviewed the allegations of misconduct by regional personnel raised in the petition. It does not appear that Region II personnel revealed confidential sources or information in their communications with licensee personnel, or that the region's review of DPC's welding inspector task forces or other aspects of the construction of Catawba was inappropriate.

II. THE NRC INSPECTION PROGRAM

Because of the asserted deficiencies in design and construction of the Catawba plants, the petitioner contends that the NRC's inspection program has been incapable of identifying problems at Catawba and ensuring necessary corrective action. By way of background, the inspection program is described below. Additional details are contained in Appendix A to this decision with respect to the inspection program at Catawba.

The NRC inspection program, as applied to reactor facilities under construction, utilizes sampling inspection techniques to determine whether there is reasonable assurance that the plant is constructed and tested according to the requirements of the construction permit and NRC regulations, and the commitments made by the licensee in its Preliminary and Final Safety Analysis Reports (PSAR and FSAR) and in various correspondence with the NRC. These techniques are also used to establish whether the licensee's quality assurance and quality control (QA/QC) program is effective in inspecting, correcting and documenting activities in a way that assures protection of public health and safety. Furthermore, beyond the construction phase, the NRC inspection program is applied to plants undergoing start-up testing after they are licensed for operation, and for plants already in routine operation, to provide this same assurance.

The NRC inspection program is designed as a preventive program and is applied to structures, systems, components, and activities that are important to safety. This preventive objective is achieved by examination of management controls, quality assurance and quality control manuals, procedures and records, and observation of work in progress. Work in progress is inspected by experienced

engineers in various technical disciplines for quality of workmanship, conformance to codes and standards and the licensee's established QA/QC program requirements. Records are examined to verify that purchased equipment meets quality standards and that quality control inspections are implemented throughout the construction and preoperational test phases. Enforcement action is taken for violations of NRC requirements in accordance with the Commission's enforcement policy.

As described in this decision, the overall NRC inspection and enforcement program has been identifying problems in the Catawba plant and requiring corrective action. More fundamentally, the petitioner has not demonstrated why its concerns cannot be adequately addressed through implementation of the NRC inspection program. In short, no adequate justification for the proposed extraordinary independent review efforts has been shown.

III. CONSIDERATION OF PETITIONER'S BASES FOR RELIEF

The thrust of the petition is that the quality assurance program for Catawba has broken down in a pervasive way. The petitioner asserts that this breakdown is reflected in these major respects:

1. Failure to assure that the "as-built" condition of the plant reflects the final version of an acceptable design,
2. Failure to maintain an adequate quality assurance program organization to identify and correct construction deficiencies,
3. Failure to maintain adequate controls to process and respond to nonconforming conditions,
4. Failure to maintain adequate material traceability to identify and document the history of all material, parts, components, and special processes, and
5. Failure to maintain an adequate quality assurance program for vendors.

Each of these alleged failures is addressed in turn below. Additional supporting details are discussed in the decision's appendices.

Before turning to the petitioner's arguments regarding the sufficiency of DPC's quality assurance program, it is important to note that the petitioner has not provided substantial new information in support of its request. The petitioner relies primarily on the findings of DPC's Self-Initiated Evaluation (SIE) conducted for Catawba and on allegations related to welding inspectors' concerns and DPC's treatment of those concerns. These issues as well as other aspects of design and construction of the Catawba plant have been reviewed by the staff as part of the NRC's inspection program and, as noted above, many of these issues have been aired in the Catawba operating license proceeding.

The Commission recognizes that deficiencies will be found as a result of its inspections. Corrective action is required for every violation of NRC requirements. See 10 CFR 2.201. Inevitably, in any project approaching the magnitude and complexity of a nuclear power plant, some construction defects will occur and, therefore, it would be unreasonable to expect error-free construction. See Union Electric Co. (Callaway Plant, Unit 1), ALAB-740, 18 NRC 343, 346 (1983). Neither the Atomic Energy Act nor the Commission's regulations mandate such a result. What is required is a finding of reasonable assurance that the facility, as built, can be operated without undue risk to public health and safety. See Citizens for Safe Power, Inc. v. NRC, 524 F.2d 1291, 1297 (D.C. Cir 1975); Petition for Shutdown of Certain Reactors, CLI-73-31, 6 AEC 1069, 1070 (1973), aff'd sub nom. Nader v. NRC, 513 F.2d 1045 (D.C. Cir. 1975). The best alternative to error-free construction is an effective quality assurance system that detects problems, evaluates them and verifies that appropriate corrective action has been implemented to handle them.

In the staff's view, DPC's quality assurance program for Catawba is adequate to provide the requisite assurance under the Commission's requirements.

1. Assurance that the As-built Condition of the Plant Reflects the Final Version of an Acceptable Design

The petitioner contends that design control is lacking at Catawba because design documentation does not reflect the plant as designed and may not reflect the as-built condition of the plant. The petitioner points to the findings and observations of the Self-Initiated Evaluation (SIE), and DPC's alleged lack of an appropriate response to the recommendations which emerged from SIE, as the "best argument" in support of the petitioner's request for an independent design and construction verification program. The petitioner further contends that DPC's use of "Variation Notices" for controlling field variations between the specific design and as-built construction does not comply with 10 CFR Part 50, Appendix B, Criterion III.

The SIE uses methodology developed by the Institute of Nuclear Power Operations (INPO). The SIE evaluations conducted at Catawba and other plants are designed to examine and evaluate site activities in order to make an overall determination of plant safety, to evaluate management systems and controls, and to identify areas needing improvement. The goal of the program evaluation is to assist the utility in achieving the highest standards of excellence. The recommendations in each area are based on best practices, rather than minimum acceptable standards or requirements. Accordingly, areas where improvements are recommended by the SIE team are not necessarily indicative of unsatisfactory performance. A detailed discussion of the SIE methodology and

the NRC's review and evaluation of the SIE findings for Catawba is contained in Appendix B to this decision.^{4/}

The Catawba SIE was conducted from September 27 through October 14, 1982. The staff was kept informed of the outcome of this evaluation. In Region II, a team composed of the Catawba Resident Inspector and experienced regional management personnel was established to perform the onsite SIE review. Team members and other regional specialists performed a comprehensive review of the SIE report and selected items for further review and followup with the licensee. The team performed a comprehensive onsite review of the DPC status report on corrective actions and comparison with the SIE report.

The review team concluded that the licensee's proposed actions and schedules were appropriate for the nature and safety significance of the issues. The team concluded that the SIE findings were appropriately evaluated for reportability in accordance with 10 CFR 50.55(e) and Part 21. Several items in the design control area noted in the petition are among those that the review team identified for further evaluation. NRC has completed its review of the completion and timeliness of the licensee's actions in response to the SIE report. The staff findings do not identify any practice which would have led to poor quality construction or unsafe operation of the plant.

^{4/} The SIE report is entitled Construction Project Evaluation for Catawba Nuclear Station Unit 1-2 and is attached to both the petition (Attachment 1) and DPC's Response (Attachment 6). As a result of a request by Palmetto Alliance, the petitioner here, to reopen discovery based on findings in the SIE report, the Licensing Board determined that a number of the authors of that report should appear before the Board in order for the Board to determine if there were sufficient bases for the motion. The SIE witnesses were questioned by the Board and parties. Transcript at 10053-276 (DPC Response, attachment 1). Based upon the testimony the Board decided not to reopen discovery. In Camera Transcript at 948-954 (DPC Response, attachment 2).

Based on NRC inspections and review of the SIE findings and recommendations, including those which the petitioner identified as examples supporting its concerns, the staff believes that the recommended improvements would enhance the licensee's QA program, but the SIE findings regarding design control are not indicative of a failure by DPC to meet NRC requirements, much less a significant quality assurance breakdown.^{5/} Inasmuch as DPC's actions in response to the SIE constitute improvements to its program and are not required to ensure minimal compliance with NRC requirements, there is no basis to the petitioner's charge that DPC's response to the SIE has been inadequate or tardy.

Beyond its review of the SIE, NRC Region II inspections of DPC design activities indicate that there is reasonable assurance that Catawba's design meets regulatory requirements.

The petitioner, as noted earlier, presents several concerns relative to the Variation Notice (VN) system used by DPC at Catawba. Utilities, architect/engineers and construction organizations throughout the nuclear industry commonly utilize various systems to assure that field variations are approved by the proper organizational element and that the proper changes appear as revisions to the design drawings, specifications, or other documentation as required by Criterion III of 10 CFR Part 50, Appendix B. This criterion requires control of design changes commensurate with those controls applied to original design activities. At DPC, one form of such a field change request is called a "Variation Notice."

^{5/} The SIE team members who testified before the Licensing Board on the petitioner's motion to reopen discovery did not believe that their findings indicated a significant quality assurance breakdown at Catawba. See Transcript at 10153-55 (attachment 1 to DPC Response).

The detailed staff review of the petitioner's concerns relative to the handling of field-initiated design changes is contained in Appendix B to this decision. The staff concludes that DPC has developed a system which controls design and meets regulatory requirements. The inspections of this area during the construction of Catawba included review of the Variation Notice procedures and their implementation by DPC. Those inspections show that the Variation Notices have been controlled within the DPC design control system as required by 10 CFR Part 50, Appendix B, Criterion III.^{6/}

In addition, it should be noted that prior to full power licensing of McGuire Unit 2, a comprehensive DPC self-audit was performed of activities related to seismic design at the Catawba and McGuire units within the DPC Design Engineering Department. NRC Region II reviewed the subject report, examined some of the audit findings to verify performance of corrective actions, and found the activity to be acceptable. Region II's review of DPC's seismic design audit is documented in NRC Inspection Report No. 50-370/83-18. Furthermore, due to DPC's broad nuclear design and construction experience, and demonstration of adequate performance at Oconee, the staff concluded that an independent design verification program was not needed for McGuire Unit 2.

^{6/} The concerns of Mr. Ronald McAfee, referenced by the petitioner with respect to alleged design control deficiencies, were included in the review by the staff in reaching the above conclusions on design control. Mr. McAfee was a witness in the Catawba licensing proceeding where his concerns with respect to the correct use of procedures involving documentation of deficiencies and design changes were presented. In the staff's view, Mr. McAfee's testimony does not raise substantial doubt as to the effectiveness of the licensee's quality assurance program or the adequacy of the Catawba plant. See generally NRC Staff's Proposed Findings of Fact and Conclusions of Law in the Form of a Partial Initial Decision, at 15-26, 41-46 (March 8, 1984); see also Partial Initial Decision at 182-96.

Since Catawba's design is practically identical to that of McGuire, the staff has concluded that an independent design verification was also not warranted for Catawba.

In summary, based on the inspection findings to date and the staff's review contained in Appendix B, it is concluded that the design control system at Catawba is acceptable, the Variation Notice system has not been abused, the findings of the SIE were appropriately handled within the DPC management control systems, and the findings were properly reviewed for reportability to the NRC.

2. Maintenance of an Adequate Quality Assurance Program to Identify and Correct Construction Deficiencies

The petitioner alleges that the DPC organizational structure and Quality Assurance Program do not meet the independence and organizational freedom requirements of 10 CFR Part 50, Appendix B, Criteria I and II. The petitioner charges that the DPC Construction Quality Assurance Program is not and has never been independent of construction, thereby restricting the quality control inspectors' ability to determine the quality of construction, to implement approved QA procedures, or to identify and correct construction deficiencies.

NRC and its predecessor, the Atomic Energy Commission, have reviewed the Catawba QA program and organization routinely since DPC applied for construction permits for Catawba on July 24, 1972. Appendix C to this decision contains a chronology of the development and NRC's review of the DPC quality assurance and quality control (QA/QC) program at Catawba from 1973 to 1983. The NRC staff found that the DPC organization for QA and QC met the requirements of 10 CFR Part 50, Appendix B, in 1973, about two years before the construction

permits were issued for Catawba. The initial acceptability of the DPC QA program in 1973 was predicated on DPC's commitment to fill the position of Corporate QA Manager by July 1974. This commitment was met in February 1974. The overall QA program and QA organization for design and procurement were inspected by the NRC Region II staff during 1973, 1974, and 1975 prior to the issuance of the construction permits.^{7/}

Before the construction permits were issued the Design Engineering Department (DED) "Design Engineering QA Plan," the DED procedures (including procedures for engineering calculations, engineering drawings, SAR commitment control, variation notices, nonconforming item reports, specifications and procurement), the divisional QA procedures for the internal audits of civil, electrical, and mechanical-nuclear design work, and various appendices were examined to determine the state of readiness for start of construction.

The Catawba construction permits were issued in August 1975. In authorizing issuance of the permits, the Atomic Safety and Licensing Board found that DPC's quality assurance program met the Commission's requirements. Duke Power Co. (Catawba Nuclear Station, Units 1 and 2), I.BP-75-34, 1 NRC 626, 650 (1975), aff'd, ALAB-355, 4 NRC 397 (1976).

Since issuance of the construction permits in 1975, NRC inspection findings have confirmed that DPC has developed and implemented an acceptable QA/QC organizational and functional alignment. No violations or deviations have been identified related to the organizational freedom and authority aspect of the DPC QA/QC organizations as approved by the NRC. Thus, DPC realignment

^{7/} See NRC Inspection Reports 50-413/73-01, 73-02, 73-03, 73-04, 74-01, 74-02, 74-03, 75-01, 75-02, 75-03, 75-04, 75-05, and 75-06.

of QC administrative functions in 1981 was not designed to "cure" any prior noncompliance. Contrary to the petitioner's suggestion, the SIE did not find a lack of independence in DPC's QA/QC program. Rather, the SIE report states, "Quality Assurance and Quality Control functions were performed adequately and independently to support and control the quality of the facility." SIE Report at 2a. The allegations in the petition that the DPC Quality Assurance Program is not, and never has been, independent of construction have not been substantiated. Compare Partial Initial Decision at 62-66.

On pages 16-18 the petition cites complaints expressed by welding inspectors as evidence of pressure from construction. In addition to the routine inspections, the Region II inspection staff started in 1979 to conduct special inspections designed to detect whether undue pressure, harrassment, or intimidation was present that could be detrimental to quality of work at Catawba. These inspections and the inspection results are described in Appendix A, pages 4-7, to this decision. In addition to these special inspections the NRC Region II staff monitored the DPC Task Force efforts and conducted an assessment of the concerns which included interviewing the involved welding inspectors, review of the task force reports, and other documentation. The Region II inspection efforts regarding the welding inspector's complaints are described in Appendix D, pages 10-12 to this decision. As further detailed in staff testimony in the operating license proceeding, NRC review of the welding inspector's concerns and DPC Task Force response to those concerns did not reveal any programmatic breakdown or harrassment of welding inspectors which adversely affected the overall operation of the QA program.^{8/} The problems seemed to have stemmed primarily from poor

^{8/} NRC Staff Testimony of P. K. VanDoorn on Palmetto Alliance Contention 6 Regarding Welding Inspector Concerns, received into evidence in the Catawba operating license proceeding as Staff Exhibit 7, Transcript at 9206 (December 2, 1983). See also Partial Initial Decision at 135-36, 177-81.

communication between site supervision and the welding inspectors. None of the welding inspectors acknowledged knowing of any poor work that had not been found by QC and properly corrected. It was unlikely that harassment detrimental to quality developed under the conditions observed. The Licensing Board has reached similar conclusions. While finding that harassment of welding inspectors by craft workers and foremen occurred on occasion, the Board concluded that the incidents did not deter the inspectors from performing their job nor was the freedom of the QA program restricted. Partial Initial Decision at 179-80. The Licensing Board did find, however, that DPC's policy against harassment could be improved, and the Board has directed that the policy be revised. Id. at 181, 271.

3. Maintenance of Adequate Controls to Process and Respond to Non-Conforming Conditions

The petitioner identifies a number of concerns regarding this subject. Details concerning DPC's Nonconforming Item (NCI) system, NRC's review of that system, and a discussion of the petitioner's specific concerns about the system are contained in Appendix D. The alleged deficiencies at the Catawba site regarding DPC's management control system for identifying, documenting and correcting a broad spectrum of construction related problems, appear to be based primarily on the petitioner's review of the SIE and comments provided to GAP by several present and former DPC employees.

A review of the information pertinent to concerns noted in the petition leads to the conclusion that DPC has developed and implemented an adequate control system for identifying, documenting, and correcting a broad spectrum of problems. Each revision of the DPC system for controlling, dispositioning and correcting nonconforming conditions (NCIs) has been reviewed by the NRC Region

II inspection staff. In the staff's view, the control and evaluation of NCIs have been improved with each revision of that system and its implementing procedures. The NCI system, and NCIs related to defects in specific components and systems, have been routinely inspected as part of the NRC inspection program. DPC has implemented needed corrective actions to the NCI system that have been identified by NRC inspection findings, by the licensee's QA audit program, and by the SIE. The deficiencies to which the petitioner refers do not, in the staff's view, suggest a significant, "decade-long" breakdown in the entire QA program. The allegations made by the petitioner do not provide a basis for technical concern for safety of the plant.^{9/}

The petitioner alleges that Catawba's nonconformance procedure ("Q-1") violates 10 CFR Part 50, Appendix B, Criterion X for the following reasons:

- ° The procedure bears a striking similarity to a situation at Midland Nuclear Plant that resulted in a Severity Level III violation.
- ° Catawba QC inspectors by procedure were shackled to the Senior Engineer in that they no longer had authority to write NCIs without first getting approval.
- ° It was improper for Document Control to issue sequential serial numbers only for approved NCIs.

^{9/} It should be noted that during the Catawba licensing hearings, the DPC QC inspectors consistently stated that the hardware problems they identified were always corrected. Their stated concerns were disagreements with handling of the resolution of nonconformances. See generally NRC Staff's Proposed Findings of Fact and Conclusions of Law in the Form of a Partial Initial Decision, at 46-51, 74-76 (March 8, 1984); compare Partial Initial Decision at 124-25, 178.

NRC staff testimony presented at the Catawba licensing hearing on Contention 6 regarding welding inspector concerns shows that DPC recognized these problems, made a proper investigation into these concerns, and implemented appropriate corrective action to handle these concerns and any programmatic or hardware problem so identified that needed attention. See NRC Staff Testimony of Peter K. Van Doorn, *supra* note 8, at 42-50; Transcript at 9679-81, 9875-76, 9897-98. See also NRC Staff's Proposed Findings, *supra*, at 68-77; compare Partial Initial Decision at 115-25, 135-36, 268-69.

The comparison between Catawba and Midland regarding the handling of in-process inspections at Midland is not valid. At Midland, QC inspectors stopped their inspection activities when an excessive number of deficiencies became apparent. When this occurred, the system being inspected was returned to the crafts for rework. The crafts corrected only the reported deficiencies, and upon reinspection by QC, only the reported deficiencies were reinspected. In some cases at Midland, this practice led to a situation where complete system inspections were not performed, and some systems contained deficiencies even though final QA inspection and acceptance had been indicated. At Catawba, however, work on nonconforming work activities was stopped and documented while QC inspections continued for those work activities which were allowed to proceed.

The petition quotes the following from Catawba's "Control of Nonconforming Items," Procedure Q-1, Rev. 9, dated June 11, 1976 (Petition attachment 14), and contends that it allows for suspended inspections and, consequently, the undesirable consequences at Midland could also occur at Catawba:

"If a nonconformance is identified on material, equipment, or activities in the course of installation or construction, the nonconforming activities or activities which affect the resolution of the nonconformance shall be stopped and not resumed until the resolution of the nonconformance is identified. Activities involving the material, equipment, or item which do not affect the resolution of the nonconformance may continue. The Project QA Staff shall be responsible for determining which activities may proceed. Where necessary, these activities shall be described in the statement of the nonconformance."

However, this mode of construction nonconformance control is in accordance with NRC requirements. Section 16 of ANSI N45.2, accepted by NRC in Regulatory Guide 1.28, states that "measures which control further processing, delivery, or installation of a nonconformance or defective item pending a decision on its

disposition shall be established and maintained." The petitioner implies that Catawba QC inspectors performed limited inspection of items after an NCI was issued but provided no examples to substantiate its claim. The NRC believes, based on inspections and investigations into employee concerns to date, that adequate inspections were performed. This procedure, as written, does not violate 10 CFR Part 50, Appendix B, Criterion X.

There is no meaningful basis on which to evaluate the petitioner's claim that violations of Criteria X and XVI increased after 1978. NRC experience indicates that as more construction work disciplines become involved, or as each discipline approaches peak activity, more construction problems may occur. Such problems do not pose a safety problem as long as adequate measures exist to identify and correct problems. Adequate measures exist at Catawba.

The petitioner believes that the procedure for controlling NCIs has been deficient in other respects. See Petition at 21. The petitioner contends that Revision 12 to Procedure Q-1 "completely shackled" QC inspectors to the Senior Engineer. Additionally, the petitioner implies that obtaining serial numbers only for approved (valid) NCIs is improper.

NRC inspection findings do not indicate that the DPC inspector's freedom and independence to identify quality problems, and verify corrective action, was denied. The corrective action system described by Revision 12 to Procedure Q-1 met NRC requirements. Subsequent revisions of this procedure have helped to remove any real or perceived uncertainties by a QC inspector as to their freedom and independence. In addition to the routine NRC inspections at Catawba, the NRC staff conducted two special inspections, specifically focused on interviewing DPC employees, to determine the extent of cooperation between work groups, management support, and whether pressures, harassment or intimidation

were present at Catawba that could be detrimental to performance of their functions. The details of these inspections are described in Appendix A.

The NRC inspection staff has found no problem with the licensee issuing serial numbers only for valid NCIs. As discussed more fully in Appendix D, not every construction deficiency requires handling as an NCI under Catawba's program for controlling deficiencies. Deficiencies declared to be nonvalid NCIs were corrected on another type QA record certifying their acceptability in accordance with existing QA procedures. There is no NRC requirement to keep record copies of nonvalid NCIs, but the NRC staff encourages licensees to keep any documentation that the licensee feels may help verify the quality of its plant.

NRC testimony relative to Palmetto Alliance Contention 6 in the Catawba operating license proceeding provides the staff's position concerning alleged misuse of the Catawba NCI system.^{10/} That testimony addresses each specific allegation for merit and safety significance and clarifies the NRC requirements concerning corrective action systems. Based on the staff's review, the NCI system and its implementation at Catawba generally have met regulatory requirements. To be sure, the NRC staff has not found the corrective action system and its implementation at Catawba to have been consistently effective; however, no major QA breakdown has occurred in this area as alleged by the petitioner. The Licensing Board has reached similar conclusions regarding the NCI system. See generally Partial Initial Decision at 27-28, 31-33, 67-136. Violations in

^{10/} See NRC Staff Testimony of Peter K. Van Doorn, supra note 8; testimony of Messrs. Bryant, Maxwell, and Van Doorn, Transcript at 9197-10002, passim (December 2, 5 and 6, 1983). See also NRC Staff's Proposed Findings, supra note 6, at 68-111.

this area have been identified by the NRC. DPC has recognized those problems and has been cooperative in making appropriate evaluations and taking proper corrective actions. The evaluations and actions by DPC have been reviewed by NRC. The licensee has been responsive to the need for improvements in the NCI system identified by the NRC. The licensee's internal audit program has focused on this area from time-to-time; corrective measures were taken in response to the audit findings. Therefore, no additional enforcement measures appear warranted at this time based on findings to date.

The petitioner also raises concerns relative to the handling of DPC's R-2A system. The concerns raised by the petitioner are:

- ° The R-2A system being used to report inspection deficiencies at Catawba is deficient (inferior) when compared to the NCI (Form Q-1A) system used.
- ° The SIE report identified areas of weakness with the R-2A construction corrective actions.
- ° In the past Catawba has been criticized by NRC for having "too many NCIs".
- ° Workers have reported to GAP that the R-2As are used liberally by both QA and construction to legitimize construction that pushes ahead of QA/QC inspection.
- ° The R-2A (Inspection Discrepancy Report) governed by the R-2 procedure is used on the bulk of nonconformance items.
- ° R-2As remain under the control of construction, corrective actions were not required to be documented and an indeterminate number of non-conforming conditions may have been corrected without trending of appropriate reviews.

The R-2A, "Inspection Discrepancy Report," is a quality control mechanism utilized to document and correct identified deficiencies that do not rise to the level of significance of a nonconforming item. 10 CFR Part 50, Appendix B, Criterion XVI requires that conditions adverse to quality be promptly identified and corrected. Catawba's Procedure R-2 was written to meet a selected element of this requirement. Form R-2A, which is a part of Procedure R-2, is utilized at Catawba to document the identification and correction of

minor deficiencies found by the QC inspectors as a result of preplanned inspections which are thought to be readily correctable and require no additional engineering design evaluation. Other, more serious deficiencies, that qualify as significant conditions adverse to quality, are required by Criterion XVI of Appendix B to be documented, to be given an extensive review to determine the cause, identify appropriate corrective actions to prevent recurrence and to be reported to the appropriate levels of management. Catawba's Procedure Q-1 was specifically developed to document NCIs, the more serious type of deficiency. Forms R-2A and Q-1A (NCI) are two of the mechanisms utilized by Catawba to report deficiencies and, when implemented properly, these procedures meet NRC requirements. The petitioner's assertion that the R-2A system is "inferior" to the NCI system reflects a misunderstanding of the corrective action system and has no real bearing on the acceptability of Catawba's corrective action program. A detailed discussion of the weaknesses the petitioner perceives in the R-2A system is contained in Appendix D. As noted above, NRC staff testimony summarizes inspection findings concerning alleged misuse of the Catawba corrective action system.^{11/}

NRC routinely addresses deficiencies as they are identified by or to NRC inspectors. Deficiencies are classified according to safety significance, and priorities and remedial actions are guided by that classification. As noted above, at Catawba the more significant type deficiencies are classified as NCIs. The NRC inspection findings show that construction deficiencies at Catawba have been generally classified appropriately. The ratio of NCIs to

^{11/} Id.

R-2A-type deficiencies at Catawba has been small. Although there were examples identified in the SIE where R-2A type deficiencies were improperly dispositioned, these were few in number and represented a small percentage of the thousands of R-2As recorded at Catawba. In the past, some NRC inspectors have been critical of Catawba QC inspectors for writing too many NCIs for problems which could rightfully have been resolved as minor deficiencies under other QA procedures. In NRC Inspection Report 50-413/81-02, it was noted that an apparently large volume of NCIs had been generated at the site, averaging nearly 300 per month over a seven month period. The subjects covered by these NCIs ranged from relatively minor documentation problems to major problems with safety-related hardware. The processing of such a wide range of problems in the same manner was brought to DPC's attention as a possible contributor to generic items or trends apparently going unnoticed. Several NCIs were cited as an example of the condition, and the licensee was cited for a violation for generic items or trends being neither recognized nor forwarded to management. The DPC corrective actions on this matter were evaluated and found to be acceptable by Region II staff. Followup by the staff verified implementation of the corrective actions.

The SIE findings, in light of the results of NRC inspections, show that the DPC system for control of construction deficiencies has functioned adequately with a few minor exceptions. Therefore, it is the NRC staff's view that the DPC QA/QC program is continuing to function adequately in the area of nonconformance and corrective action in that:

- ° The NCI system is the appropriate system to be utilized for significant deficiencies; however, the R-2A system is not inferior to it because its intended function is also accomplished. Catawba's corrective action system satisfies 10 CFR Part 50, Appendix B, Criterion XVI requirements.

- The SIE correctly identified two minor weaknesses in construction trending but in general QA trending overlapped these deficient areas. One R-2A appears to have been inappropriately closed out but had no safety significance nor was any hardware affected. Considering that 20,456 R-2As have been written at Catawba as of October 7, 1983, these findings do not indicate a programmatic breakdown.
- Some Region II inspectors, after examining Catawba's NCIs for adequacy informed the licensee that some DPC QC inspectors were being overly conservative and were writing too many NCIs which could have been appropriately handled by other approved QA mechanisms such as R-2As, M-4s or M-51Cs.^{12/} Proper utilization and trending of these other QA mechanisms does not violate NRC requirements.
- Proper utilization and implementation of the R-2A system would not permit construction to push ahead of QA/QC inspections. Alleged misuse of the R-2A system has been investigated and problems identified were found to have no safety significance.^{13/}

In summary, DPC has developed and implemented an adequate corrective action system (which includes the NCI and the R-2A system) that meets NRC requirements,

^{12/} Inspection Report No. 50-413/81-02.

^{13/} As stated by NRC staff witnesses P. K. Van Doorn, J. C. Bryant and G. F. Maxwell during the Catawba hearings, the DPC quality assurance program included various methods of reporting deficiencies, including R-2As and there was no evidence that DPC was not generally following the appropriate procedures. Transcript at 9776-78 and 9806. Compare Partial Initial Decision at 135-36.

and one which has been appropriately revised, updated and improved over the years. The reviews conducted by the NRC staff provide sufficient assurance that there has not been, nor is there now, a breakdown in the QA program at Catawba as alleged by the petitioner.

4. Measures Established to Provide Adequate Material Traceability

The petitioner contends that DPC failed to maintain adequate material traceability to identify and document the history of all materials, parts, components, and special processes as required by 10 CFR Part 50, Appendix B, Criteria VIII and IX. See Petition at 26-27. The petitioner relies on findings from the SIE as the basis for lack of traceability. These specific items are discussed in Appendix E to this decision.

NRC inspections have revealed relatively few violations or deviations in this general area of concern or the specific areas discussed in the SIE report. The SIE findings do not reflect a severe breakdown in DPC's quality assurance and control program for material traceability at Catawba.

5. Measures Established to Maintain an Adequate Quality Assurance Program for Vendors

The petitioner alleges that DPC has failed to maintain an adequate quality assurance program for vendors. To illustrate this concern, the petitioner repeats the observations and recommendations of the SIE report to show alleged weaknesses in the heating, ventilation and air conditioning (HVAC) contractor's welding program. The specific items and the NRC evaluation are discussed in Appendix F.

NRC inspection findings relative to the alleged weaknesses in the HVAC contractor's onsite welding program do not support the contention that serious weaknesses exist in the contractor's program. NRC inspections indicate that the site contractor has fabricated, inspected, and erected the HVAC system consistent with applicable codes, specifications, and NRC requirements. Although deficiencies have been identified in the areas of QC inspections and QA/QC records, these were, in the staff's view, isolated cases. NRC inspections of onsite welding activities revealed no evidence of unqualified welders performing safety-related welds, or examples of flawed welding procedures being used to perform this work.

6. Summary

As shown in the foregoing discussion and the supporting appendices, the design and construction of the Catawba plant has not suffered the severe quality assurance breakdown that the petitioner believes has occurred. To the contrary, the licensee's quality assurance and quality control program has generally satisfied the Commission's requirements with respect to the structure and implementation of the program. The results of NRC inspections do not provide a basis for concluding such a substantial breakdown has occurred, and the petitioner's reliance on the SIÉ's findings is misplaced. The welding inspectors' concerns and the related DPC task forces have been examined extensively by the staff through the inspection program and in the operating license hearings for Catawba. While DPC's performance at Catawba has not been perfect, the design and construction of the plant has been adequate to provide reasonable assurance that operation of the plant will not pose an undue risk to public health and safety.

IV. ADEQUACY OF REGION II'S PERFORMANCE

The foregoing analysis of the alleged quality assurance breakdown is the best answer to the petitioner's charge that NRC Region II and its management have failed to detect serious problems at Catawba and to ensure the licensee's adherence to the Commission's requirements. As indicated at numerous points in this decision, Region II has examined, through the inspection program, DPC's organization and implementation of its systems to control design and construction of Catawba. The regional office has also followed such matters as DPC's handling of the welding inspectors' concerns and the findings of the SIE to ensure the licensee satisfied the Commission's requirements and took appropriate corrective actions. Region II and other responsible staff offices continue to initiate appropriate action to deal with new issues that may arise bearing on the adequacy of the plant.

As noted in Appendix A to this decision, the region has identified a number of violations at Catawba, but on balance DPC's program for design and construction of Catawba has been adequate. Nonetheless, the petitioner suggests on the one hand that enforcement action has been lacking at Catawba, but the petitioner notes on the other that a "large number" of Notices of Violation at low severity levels have been issued to Catawba. A Notice of Violation is, however, the primary enforcement tool used by NRC to document noncompliance and to ensure corrective action and compliance with regulatory requirements. See General Policy and Procedure for NRC Enforcement Actions, 10 CFR Part 2, Appendix C, Section IV (1983), as revised, 49 Fed. Reg. 8583 (March 8, 1984). Far from indicating weak enforcement, identification of a large number of low level violations may well indicate an enforcement program that vigorously

ensures compliance and identifies problems at an incipient stage. In view of the general sufficiency of DPC's construction activities, the extent of enforcement action to date seems appropriate at Catawba. Civil penalties and orders for construction-related violations often indicate longstanding problems which have remained undetected or which have grown more significant by virtue of inadequate corrective actions. Although the petitioner criticizes Region II for not issuing Notices of Violation for welding deficiencies identified in the SIE, the Commission does not generally issue Notices of Violation in such instances involving lower level violations which the licensee has identified and has corrected or will correct. See 10 CFR Part 2, Appendix C, Section IV (1983), as revised, 49 Fed. Reg. 8583 (March 8, 1984). The NRC follows this policy to encourage self-inspection activities such as the SIE and correction of deficiencies identified through such programs.

In sum, Region II's inspection and enforcement activities appear adequate and, thus, do not indicate a failure to come to grips with alleged safety problems at Catawba.^{14/} Along these lines, the Licensing Board remarked, "Suffice it to say that while we may not agree with everything the Region II personnel did at Catawba, we believe them to be conscientious and men of integrity. On the whole, we think they did a good job." Partial Initial Decision at 127 n.19.

^{14/} Although these questions are subject to inquiry by the NRC's Office of Inspector and Auditor, it does not appear that regional personnel revealed the identity of confidential sources or violated NRC staff policy concerning release of draft inspection reports. See Petition at 29-33, 44. While NRC will protect the identity of confidential informants to the extent permitted by law and NRC prohibits release of draft agency reports, the NRC will bring safety information promptly to the attention of licensees to ensure appropriate actions are taken to cure noncompliance and abate any hazard to public health and safety.

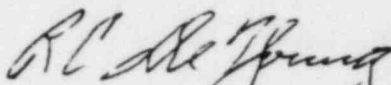
V. CONCLUSION

For the reasons stated in this decision, the petitioner has not demonstrated that Duke Power Company's quality assurance and quality control program for the Catawba Nuclear Station has suffered a serious breakdown. From the staff's review, it appears that the program has been adequate to ensure acceptable design and construction of the facility. See Union Electric Co., supra, ALAB-740, 18 NRC at 346. In view of these findings, the petitioner has not demonstrated a substantial safety issue that warrants initiation of enforcement proceedings to mandate the extraordinary "independent" reviews requested by the petitioner. See Consolidated Edison Co. (Indian Point Units 1-3), CLI-75-8, 2 NRC 173, 176 (1975). Accordingly, the petitioner's request is denied.

This decision is made without prejudice to the Licensing Board's Partial Initial Decision and any appeal of that decision. The staff will, of course, followup the items identified by the Licensing Board as conditions of its authorization of a low power license and the staff will pursue the resolution of other safety issues that may come to the staff's attention during the course of its inspections and further licensing review of Catawba. The staff will take appropriate action on the results of the Office of Investigations' examination of alleged harassment and intimidation. At this juncture, however, the available evidence - including earlier inquiries by Region II on this issue

(see Appendix A) and the record in the licensing proceeding - do not suggest a need for the extraordinary remedies that the petitioner request.^{15/}

A copy of this decision will be filed with the Secretary of the Commission for the Commission's review in accordance with 10 CFR 2.206(c). As provided in 10 CFR 2.206(c), this decision will become the final action of the agency 25 days after issuance, unless the Commission determines to review the decision within that time.



Richard C. DeYoung, Director
Office of Inspection and Enforcement

Dated at Bethesda, Maryland
this 6th day of July 1984.

^{15/} See "NRC Staff Testimony of P. K. Van Doorn", supra note 8; NRC Staff's Proposed Findings of Fact and Conclusions of Law in the Form of a Partial Initial Decision, at 35-147; see also Partial Initial Decision at 160-61, 177-81, 205-07. To correct any misunderstanding on this point, it should be noted that, contrary to the petitioner's impression, 10 CFR Part 19 is not the regulatory basis for NRC actions to prevent harassment and discrimination against workers at nuclear reactor construction sites. See Union Electric Co. (Callaway Plant, Units 1 & 2), ALAB-527, 9 NRC 126, 136-37 (1979). Currently, such wrongful conduct may be reached under 10 CFR 50.7 or 10 CFR Part 50, Appendix B, Criterion I. Section 210 of the Energy Reorganization Act provides workers a direct remedy against discrimination for engaging in the "protected activities" defined by the statute.

APPENDIX A
NRC INSPECTION AND ENFORCEMENT PROGRAM
FOR PLANTS UNDER CONSTRUCTION

General

The purpose of the NRC inspection and enforcement program is to ensure that facilities and materials under NRC jurisdiction are constructed, operated, and used in a manner which protects the public health and safety and the environment, and to take prompt and vigorous enforcement action against licensees who do not comply with NRC requirements.

Implementation of the NRC inspection program is generally conducted under two basic formats: (1) scheduled inspections designed to evaluate the licensee's routine activities, recognizing that the licensee has primary responsibility for protection of the public health and safety; and (2) unscheduled, reactive inspections to assure the adequacy of licensee response to incidents and accidents or to assess licensee compliance with special NRC requirements.

NRC resident inspectors provide a substantial increase in verification of licensee performance through direct observation and independent measurements. Region-based inspections consist of in-depth, specialized technical inspections and follow-up activities relative to allegations.

Inspections at Catawba

Region II inspections at Catawba began in February 1973, before the NRC granted the limited work authorizations for both units on May 16, 1974 (Construction permits for Catawba Units 1 and 2 were issued on August 7, 1975). Inspections were conducted in accordance with the Commission's inspection program. Inspections covered design, procurement, construction and vendor QA programs.

Subsequent to the issuance of a construction permit, inspection activities are accomplished in accordance with the inspection program applicable to the construction and pre-operational phase. The quality assurance and quality control (QA/QC) programs for the DPC Engineering and Construction Departments, and portions of the QA/QC program were inspected during each inspection at the construction site. Ongoing construction inspections included detailed examination and inspection of licensee and contractor safety-related activities and the associated QA/QC procedures, work in progress, and records. The following functional areas have been inspected during the construction and pre-operational testing phases at Catawba:

- QA Program
- Design Control
- Procurement
- Receipt inspection, storage and handling of material and equipment
- Site excavation and foundations
- Structures and supports
- Concrete operations
- Containment erection
- Piping systems installation
- Electrical/Instrumentation and control systems installation
- QA/QC documentation and records
- Operational staffing and training
- Comparison of as-built plant to FSAR description
- Preoperational test program, implementation and verification
- Operating, maintenance and emergency procedures
- Fuel receipt and storage
- Fire prevention/protection
- Technical Specification Review
- Environmental Protection
- Emergency Plan
- Radiation Protection
- Radioactive waste systems

NRC Enforcement Program

Enforcement is jointly carried out by IE Headquarters and the Regions (a) to ensure compliance with NRC regulations and license conditions; (b) to obtain prompt correction of noncompliance; (c) to deter further noncompliance; and

(d) to encourage improvement of licensee performance. The enforcement program employs a series of sanctions that escalate according to the seriousness of the noncompliance and the past history of licensee performance. Sanctions available to the NRC include notices of violation, civil monetary penalties, orders to cease and desist, and orders to suspend, modify or revoke construction permits or licenses.

NRC Construction Permit Nos. CPPR-116 and CPPR-117 were issued on August 7, 1975, for the Catawba facility. Since that time, NRC enforcement actions have been taken in accordance with the NRC enforcement policy in effect at the time. Between August 1975 and October 1980, the effective policy was the one issued on December 31, 1974 and implemented through the Office of Inspection and Enforcement Manual Chapter 0800 (Enforcement Actions). Between October 1980 and March 1982, a revised Interim Enforcement Policy was in effect. 45 Fed. Reg. 66754 (October 7, 1980). Since March 1982, the General Policy and Procedure for NRC Enforcement Actions (10 CFR Part 2, Appendix C) has been in effect. Revisions to this policy were issued on March 2, 1984. 49 Fed. Reg. 8583 (March 8, 1984). Review of the enforcement history of Catawba reveals that through April 1984, 108 violations were identified at Unit 1 and 76 violations were identified at Unit 2. Sixty-seven violations, already included above, were common to both units. The majority of these violations were of minor significance and, in all cases, the licensee addressed the violation with corrective actions acceptable to the NRC.

Specialized Inspections at Catawba

In addition to routine NRC inspections, NRC has conducted special inspections at Catawba where particular emphasis was placed on interviewing QA/QC, craft, engineering, support, and management personnel to determine the extent of cooperation between work groups; management support, supervisory and

technical assistance to the craft and QA/QC; and whether pressures, harassment or intimidation were present that could be detrimental to quality work.

The first of these special inspections was conducted in 1979, in response to a suggestion by the General Accounting Office. This special inspection was conducted as part of a plan to conduct one special inspection at one construction site in each of the five NRC Regions. The purpose of these inspections was to privately interview craftsmen and craft foremen involved in safety-related work to determine if they were aware of any nuclear safety-related problems at the site that should be brought to the attention of the NRC. Confidentiality of the participants was maintained by several methods. Interviewees were randomly selected, and the interviews were held where they could not be overheard. A minimum of three persons was chosen from each craft and each interviewed separately. None of the information received was identified with any person interviewed. Management was informed that no discriminatory or personnel action was to be taken against those interviewed should management become aware of an individual's identity.

This inspection ^{1/} was performed at Catawba on November 13-16, 1979. The two primary reasons for the choice of Catawba was that the site was in the mid-construction phase at that time, and DPC was its own architect/engineer and constructor. Questions asked of the interviewees included:

- ° "Do you have any outstanding concerns about the quality of construction?"
- ° "Are you aware of any instances where construction did not meet prescribed specifications, codes, standards, or other requirements, and corrective actions were not taken?"
- ° "Are you aware of any day-to-day problems or irregularities affecting quality that you believe the NRC should know about?"

^{1/} Reported in Inspection Report No. 50-413,-414/79-21.

Twenty-eight persons were selected for interviews. After DPC management announced the purpose of the inspection to the work force, an additional twenty-nine persons expressed interest and were interviewed also. No specific allegations of wrong-doing were received from the interviewees.^{2/}

None of those interviewed expressed negative opinions about DPC's intent or ability to build a safe plant. Most said they felt free to express opinions to foremen and some said they felt sure management would listen to them.

Another special inspection^{3/} was conducted about two years later on January 26 - February 6, 1981. This special inspection was one of a series conducted by the Regions to test inspection methods and procedures which eventually resulted in the NRC Construction Assessment Team (CAT) inspection program. The inspection involved 45 man-days of direct inspection activity at the site. During this inspection at Catawba, in addition to DPC management, the NRC inspectors held discussions with 25 engineers, construction supervisors, and foremen; 47 construction craftsmen; 38 technicians (QC); and 16 office personnel.

^{2/} The following characterizes the type of findings which received followup inspection efforts by the NRC staff.

Several persons said that concrete placement was rushed, objects such as soft drink cans and pieces of wood were left in the forms, and vibration was not good. All of them stated that problems found were always corrected thoroughly. NRC inspectors looked at one void identified by an interviewee and agreed there was more voiding than normal. All void areas examined during the inspection were marked by QC, cleaned, and repaired. This matter was discussed with site management and was subsequently reinspected by NRC. Report No. 50-413, -414/79-21.

One employee questioned vendor torquing (and other) procedures and wanted to know more about requirements. He was recontacted the week of November 19, 1979. Several persons were concerned about the attitude of personnel safety inspections. This information was passed on to DPC project management in a general way which protected the identity of the individual.

^{3/} Reported in Inspection Report 50-413, -414/81-02.

Objectives of the inspection were:

- An evaluation of implementation of the DPC/QA program for control of construction activities.
- An evaluation of methods used by management to ensure that a quality product is produced, and an evaluation of the degree of management and supervisory staff participation in the handling of site problems.
- An evaluation of the competence of craftsmen and QC inspectors and their perception of the DPC commitment to quality; availability of technical assistance; relationship between work groups; accessibility of management; freedom to express opinions; and protection from harassment.

Inspections were performed in the areas listed below both at the Catawba site and at DPC corporate offices. The objectives identified above were pursued in each of the following areas:

- Site QA program implementation
- Site project management and control
- Site procurement, receiving, and storage
- Electrical equipment and installation
- Instrumentation and control
- Pipe support and restraint system
- Mechanical equipment
- Nonconforming item report evaluation
- 10 CFR 50.55(e) and 10 CFR Part 21 reporting

Five violations of regulatory requirements were identified. See NRC Inspection Report 50-413/81-02. These violations were primarily related to procedural problems and were not significant.

The inspection findings and conclusions resulted in a complete review by DPC of their handling of approximately 10,000 nonconforming item reports (NCI) with respect to description of the problem, evaluation, corrective actions, generic issues, reportability, and programmatic improvement. Subsequent to this special inspection and special NCI review by DPC, the NRC Resident Inspector has received all NCIs.

The Resident Inspector has reviewed all NCIs generated during the two years subsequent to this special inspection. The review of the NCIs was to ensure proper description of the problem, appropriate evaluation, and adequate corrective actions by DPC. The Resident also reviewed the NCIs for generic concerns, verification of corrective actions, and appropriate programmatic changes to minimize future occurrences. The Resident has identified several minor violations during the first year of his reviews. Since DPC instituted an NCI review task group in September 1982, no violations have been identified.

Generally, the NRC inspection findings at Catawba reflect that the QA program is working; site management is informed and involved; and technical assistance is readily available in problem areas. The inspectors believe that there is good cooperation between work groups; that management and supervision are available to employees at a low threshold; and that it is unlikely that harassment detrimental to quality has developed under the conditions observed.

Inspections Related To Allegations

Procedures are in place in the NRC Regional offices to process allegations, complaints, or other concerns which come to the attention of the staff. This function is centrally coordinated and controlled within each Regional office. Allegations are evaluated by appropriate technical staff including any necessary site inspection activities. Where appropriate, allegations are referred to the NRC's Office of Investigations. Allegations pertaining to licensed activities have been received by telephone, letter, news media reports, and direct contact. NRC employees who receive allegations are aware that it is essential to protect the identity of allegeders.

The NRC draws a distinction between providing information about safety problems, which require prompt resolution to assure public health and safety, and the source of that information. Safety problems will be brought to the attention of the proper licensee organization which can correct those problems and, as such, the disclosure of this information does not constitute a breach of confidentiality. NRC procedures are designed to protect the identities of information sources rather than the information itself.

Inspection Resources Expended at Catawba

Inspections performed at the Catawba site April 30, 1984 are documented in 475 NRC inspection reports (Unit 1-257, Unit 2-218). These reports document approximately 17,683 hours of direct inspection by 49 inspectors.

APPENDIX B

ASSURANCE THAT THE AS-BUILT CONDITION OF THE PLANT REFLECTS THE FINAL VERSION OF AN ACCEPTABLE DESIGN

Petitioner's Allegation

The petitioner alleges that there is a lack of design control at the Catawba site, that design documentation does not reflect the plant as designed, and that it is unclear whether that documentation reflects the as-built condition of the plant. The petitioner further contends that the findings and observations of the Self-Initiated Evaluation (SIE), and DPC's lack of appropriate response to the recommendations which emerged from the SIE, form the best argument in support of the petitioner's request for an independent design and construction verification program. The petitioner alleges that the system of Variation Notices used for controlling variations between the specific design of a system or structure and its actual construction in the field does not comply with 10 CFR Part 50, Appendix B, Criterion III.

Utility Self-Initiated Evaluation (SIE)

General

The petitioner cites recommendations and findings from the SIE as the major basis to support its assertion regarding a lack of design control at the Catawba site. Petition at 6-8.

By way of background, the SIE methodology was specifically developed by the Institute of Nuclear Power Operations (INPO) for nuclear power plants under construction. The SIE evaluations are performed and managed by licensees. The evaluations are designed to examine and evaluate site construction activities in order to make an overall determination of plant safety, to evaluate management systems and controls, and to identify areas needing improvement. As a basis for the evaluation, the programs used performance objectives and criteria relative to each of the areas examined. These are applied and evaluated in light of the experience of the team members, members' observations, and industry practices. The expressed goal of the SIEs was to assist the affected utilities in achieving the highest standards of excellence. The recommendations in each area are based on best practices, rather than minimum acceptable standards or regulatory requirements. Accordingly, areas where improvements are recommended are not necessarily indicative of unsatisfactory performance. The SIE program was carried out during 1982 at all nuclear power plants under construction. The Office of Inspection and Enforcement issued special instructions to ensure an orderly and thorough review process by the regional and headquarters' staffs.^{1/}

Catawba SIE

The Catawba SIE was conducted from September 27 through October 14, 1982. Personnel conducting the Catawba evaluation were employed by Duke Power Company and the Tennessee Valley Authority. The team leader for the SIE was a

^{1/} Temporary Instruction 2510/10 "Review and Followup of Utility Self Evaluation (Using INPO Criteria) at Nuclear Facilities Under Construction" (April 21, 1983).

representative from INPO. The SIE team members were selected on the basis of their experience in design, construction, and quality assurance. TVA personnel assumed lead responsibilities for the review and evaluation of DPC activities. The team members from DPC had limited direct responsibilities for ongoing construction and design activities at the Catawba site. The areas to which they were assigned to review were those for which they had no direct involvement in ongoing activities. To prepare the team members for the evaluation, INPO trained key team members in the methodology of the SIE review. These key members then trained the other team members. The evaluation consisted of field observations, interviews, and review of supporting documentation. The licensee submitted the final SIE report to INPO for review and evaluation; the NRC has complete access to the SIE findings.

NRC was kept informed of the outcome of the evaluation performed at Catawba. The NRC Resident Inspector was fully aware of the SIE activities and was briefed regarding the results.^{2/} A Region II based inspector was also briefed on the SIE findings during a design engineering inspection on January 24-28, 1983.^{3/} On March 1, 1983, DPC briefed Region II management relative to the findings and recommendations of the Catawba SIE. On March 11, 1983, INPO briefed the Commission on the results of the SIEs conducted at various plants.

A Region II team, composed of the resident inspector and experienced management personnel, was established to perform the onsite review of the SIE at Catawba. Region II Inspection Report Nos. 50-413/83-20 and 50-414/83-18 dated August 16, 1983, addressed the first special inspection of the Catawba

^{2/} See Inspection Report Nos. 50-413/82-30 and 50-414/82-28.

^{3/} See Inspection Report No. 50-413,-414/83-02.

SIE. The review team, following a comprehensive examination of the licensee's status report on corrective action in comparison with the SIE report, obtained further clarification and confirmation from DPC of the status of numerous selected items. In particular, the team stressed to licensee personnel the necessity for timeliness in completing the corrective actions, QA monitoring, and management review of the effectiveness of actions that were implemented. A number of specific items were identified to the licensee for followup by the review team.^{4/} NRC Region II review team inspection followup activities have been completed. The team findings do not identify any systematic breakdown in the QA program at Catawba nor do the findings point to any practice which would have led to poor quality of construction or unsafe operation of the plant.

The Region II review team concluded that proposed actions and schedules were appropriate for the nature and safety significance of the issues and that the SIE findings were evaluated appropriately for reportability in accordance with 10 CFR §50.55(e) and Part 21. Several items in the design control area, that were identified in the petition as problem areas, were among those identified for inspector follow-up.

Review of Specific Petition Concerns

The petitioner relies on a number of recommendations and findings from the SIE report pertaining to design in support of the petition. See Petition at

^{4/} See NRC Inspection Report Nos. 50-413/83-20 and 50-414/83-18. These items from the SIE report for Catawba were selected for follow-up action by Region II: DC.1-1, DC.1-3, DC.1-5, DC.4-2, CC.1-1, CC.3-1, CC.3-1, CC.3-5, DD.3-6, CC.4-1, CC.5-1, CC.5-3, CC.7-1, QP.4-1, TC.1-2, TC.2-3, and TN.1-1.

Subsequent Region II reports that address follow-up of specific SIE identified design and construction items are 50-413/83-19, 83-35, 83-37, 84-23 and 50-414/83-17, 83-30, 83-32 and 84-14.

6-8. These findings concerned primarily such issues as tracking PSAR commitments, defining responsibilities for providing design input, control of design information, maintenance and use of current, accurate system descriptions and diagrams, and correct application of seismic response spectra. DPC's evaluations and corrective actions applicable to the SIE recommendations and findings are contained in the SIE report, which is attached both to the petition and the DPC Response to the petition. The DPC Response (at 5-18) also contains a summary of DPC's position and actions regarding the SIE findings cited by the petitioner.

As noted above, Region II reviewed the SIE recommendations and findings, including those specifically referenced in the petition. In sum, the staff's review confirms the initial inspection findings that the SIE recommended improvements would enhance the licensee's QA program but were not indicative of any failure to meet NRC requirements. The following information was established during NRC inspections of the SIE and highlights the staff's views on the items identified by the petitioner in support of its request.

With respect to tracking PSAR commitments (SIE finding DC.1-1), DPC had been informally tracking SAR commitments prior to the SIE. DPC has since developed and formalized a program for tracking all PSAR/FSAR and other regulatory commitments. A sampling of quarterly SAR commitments listings issued by the licensee's design division licensing staff was inspected and confirmed the informal tracking of SAR commitments. A computerized listing of all regulatory commitments has been developed. In the staff's view that there is reasonable assurance that licensee commitments have been and are being complied with. The NRC agrees that formalization of a tracking system for DPC Design Division commitments would enhance the DPC QA program for design control.

The petitioner also cited SIE findings (DC.1-2 and DC.1-3) related to responsibilities for control of design information. During inspections in 1983

related to the Design Engineering Department staff performance, Design Engineering Department personnel were found to be knowledgeable regarding their responsibilities for providing input information to other Design Division departments. Similarly, they were also aware of the appropriate source of input information needed for their respective tasks. DPC Design Engineering Department document "Responsibility Statements" defines organizational responsibilities including design input responsibilities. The Design Engineering Manual contains design input and interface responsibilities. The Design Engineering Department QA Manual contains procedures for controlling design information and transmittal of data. These procedures have been further enhanced, subsequent to the SIE, to further strengthen the controls.

A number of the SIE findings (e.g., DC.1-4, DC.2-1, DC.3-3, DC.4-3, DC.5-1) concern the currency of system descriptions. An inspection of design calculations and design documents in 1983 did not identify the use of out-of-date system description information. During the inspection, it was determined that the licensee had verified the accuracy of 32 system descriptions and was in the process of verifying of the remaining 8. To ensure that design calculations are not based on system descriptions, the licensee is instructing all mechanical system description holders not to use it as a design basis. In addition, the licensee surveyed various Design Division organizations to ascertain that out-of-date system descriptions were not used as a primary design document. The staff concludes that there is reasonable assurance that out-of-date system descriptions were not used as primary design documents.

With respect to proper application of seismic response spectra (SIE finding D.1-5), NRC inspections included verification of correct application of seismic

response spectra.^{5/} In addition, the licensee's activities regarding SIE corrective action in the seismic design area was inspected and results documented. DPC originally had several procedures for various application of the seismic response spectra. Subsequent to the SIE, the licensee compiled all the spectra and all the procedures into one design specification. An inspection of the licensee's Catawba structural design specification and specification for the response spectra and seismic displacement for Category 1 structures confirmed the compilation of various existing design information and documents into a comprehensive specification. It should be noted that this compiled specification was issued concurrent with the end of the SIE onsite efforts which indicates that the revision to the specification had been initiated independent of the SIE findings. It is the staff's view that the licensee previously had reasonably acceptable documented procedures and has further enhanced its program by compiling them into one design specification. Verification of the correct use of the seismic response spectra is required by the independent design document verification requirements of the DPC Design Department QA Manual. Further verification is provided by the supervisor during the design approval process.

Summary of NRC Findings Regarding SIE

Region II inspections of DPC design activities provide reasonable assurance that Catawba's design meets the applicable regulatory requirements. Where violations have been identified by NRC Region II or the licensee, NRC inspections have provided assurance of corrective action. The SIE findings related to the Design Engineering Department resulted in enhancement of several DPC Design Engineering Department procedures and programs. The SIE did not identify any

^{5/} Inspection Reports, 50-413/83-02, 83-22, 83-35 and 83-51.

violations or deviations from regulatory requirements. The licensee's Design Division management, including the Vice President for Engineering, has exhibited an understanding of the SIE items and have been involved in the enhancement programs. The DPC Vice President for Engineering has monitored the progress on these continuing actions.

The NRC inspection of the licensee's design activities is a continuing effort. NRC audits of DPC's design activities will be conducted, as it has in the past, on a periodic basis in accordance with the NRC inspection procedures. The adequacy of selected aspects of the Catawba design will be further verified during pre-operational testing. The Catawba pre-operational test program is being monitored by the NRC. Lastly, certain other specific inspections of design related activities, such as those for IE Bulletins 79-02 and 79-14, are continuing. Appropriate completion of these Bulletin commitments is required prior to fuel load. Based on the above reviews, inspections and evaluations, the NRC staff concludes that the findings from the SIE, relied on by the petitioner, do not justify the actions requested.

Variation Notices

The petitioner alleges that Variation Notices (VNs) have been improperly used from the beginning of construction as the method of controlling field variations from Design Engineering drawings and specifications. The petitioner further alleges that no meaningful QA/QC review of design changes evidently occurred until May 1, 1974, when the Project Senior Quality Assurance Engineer became responsible for approving the QA aspects of variation notices; that design control procedures remained inadequate throughout the decade; and that Variation Notices did not comply with 10 CFR Part 50, Appendix B for design changes.

By way of background, various utilities, architect-engineers, and construction organizations throughout the nuclear industry utilize a "Field Change Request" type of document as one of the methods to assure that field variations are approved by the proper organizational element and that the approved changes appear as revisions to the design drawings, specifications, and appropriate other documentation. NRC experience shows that there is no uniform organizational and functional alignment throughout the industry that accomplishes this field change review, approval, and document change control process. Design changes must be controlled as required by Criterion III of 10 CFR Part 50, Appendix B. Many types of documents, by name or function, company organization or contractual arrangements, are utilized to accomplish the required control of design changes. The NRC monitors the process frequently to ensure an adequate understanding of the process and its effectiveness.

NRC Review of DPC Variation Notice System

At DPC one form of a "Field Change Request" is called a "Variation Notice" (VN). DPC Construction Department QA Procedure R-3, "Design Drawing and Specification Variation," establishes the method for ensuring that field variations are evaluated and approved or reworked and that they appear as revisions to the design drawing, specification, or other documentation. Form R-3A, "Variation Notice," is the form that is used to document the problem, control distribution, document the action to be taken, document completed action inspection, and assure engineering document update. The Project Manager, or his designee, is responsible for approving the technical portion of the VN for field use and assuring that the use of the VN requirements in the approval chain include reaching agreement with appropriate Design Engineering Department personnel and identifying the name of the design engineer giving this approval on the VN form.

The petitioner's apparent objection (Petition at 11) that "all the paperwork from engineering to QA could be done in the convenience of office..." fails to recognize that "in the office" is where the specifications, drawings, and records of design criteria, design changes and, possibly other VNs are available to the "design engineering contact" and the "responsible construction engineer" (terms used in the VN). The DPC Construction Engineer is responsible for initiation of VNs involving problems under his or her purview. The Construction Department is responsible for distribution and logging of VNs. The Design Engineering Department is responsible for assuring that all design changes meet design requirements and for properly making all required revisions to specifications, drawings, or calculations.

DPC Construction QA procedure Q-1 "Control of Nonconforming Items", referenced in Procedure R-3, establishes the method to report work which has been completed and is in violation of the approved design drawing or specification effective at the time. Previously completed work which varies in some respect from later revisions to design drawings or specifications may be reported on a VN in accordance with Procedure R-3. The DPC procedure clearly distinguishes a VN from a Nonconformance Item Report (NCI). The licensee procedures in this area have been reviewed routinely during NRC inspections and found generally acceptable.

NRC inspections^{6/} have confirmed that VNs have been controlled within the design control system by DPC. Prior to establishing the office of the Corporate

^{6/} The following NRC Inspection Reports, for Catawba only, reflect Region II review of design, NCI and variation notice control procedures and implementation: 50-413 and/or 414, Report Nos. 73-01, 76-5, 78-4, 78-12, 80-09, 80-10, 80-12, 80-14, 80-25, 81-01, 81-02, 81-03, 81-06, 81-11, 81-14, 81-15, 81-17, 81-22, 81-25, 81-28, 82-03, 82-06, 82-07, 82-09, 82-10, 82-12, 82-13, 82-24, 82-25, 82-26, 82-27, 82-29, 82-31, 83-02, 83-02, 83-04, 83-17, 83-18, 83-19, 83-20, 83-22, 83-24, 83-30, 83-32, 83-35, 83-37.

QA Manager on February 1, 1974, DPC had QA managers within the Mechanical-Nuclear Division, the Civil-Environmental Division, the Electrical Division, Purchasing Department, Steam Production Department, Construction Department, and QA Division. The QA review of design changes was conducted within the appropriate design divisions and audited by the QA department. The overall QA program and QA organization for design and procurement have been regularly monitored and inspected by NRC for the Catawba project since 1973. The implementation and control of VNs, with respect to drawings and specifications, have not been found to be a significant problem during NRC inspections.

The change from having the "Project Engineer" (or others) responsible for controlling VNs (or several other functions), as stated in Revision 7 to Procedure R-3 (April 21, 1975), to the "Project Manager or his designee in writing" as stated in Revision 9 (September 17, 1976) was acceptable to NRC based on the designee being responsible and qualified. A review of revisions to Procedure R-3 and the frequency of revisions indicates that the project was responsive to a need for maintaining quality control and did not restrict the Project Engineer.

Copies of VNs have been sent to Design Engineering Department or the Vice President, Engineering, per paragraph 4.4 of each issue of R-3 referenced in the petition (Revisions 5, 7, 8, 9, 13, 17). The NRC staff has no objection to DPC assigning the responsibility to the Design Engineering Department to evaluate problems for reportability as required by 10 CFR Part 21 and 50.55(e) or performing trend analysis of VNs. The deletion of the requirement for reportability review by the DPC Construction Department by Revision 17 of Procedure R-3 is acceptable to the staff because R-3 is a Construction Department QA Program procedure and is not applicable to the Design Engineering Department. Design Engineering Department procedure PR-290 and QA procedure QA-121 control

the items to be reviewed for reportability to NRC. Thus, the petitioner's contention that DPC procedures did not adequately cover reportable items is not well taken.

The NRC is continuing to review the effectiveness of the DPC implementation of their procedural controls over VNs, NCIs, review and reportability of 10 CFR Part 21 and 50.55(e) items, QA approval of VNs, and design control activities. During the ongoing review of these items since 1973, the NRC has concluded that adequate measures have been established and implemented to control these aspects of their program.^{7/}

Staff Conclusions

Based on the results of the implementation of the NRC inspection program, the staff concludes that the design control system at Catawba is an acceptable system, and the Variation Notice system meets regulatory requirements and has not been abused. Applicable findings of the SIE were appropriately handled by DPC management. The SIE findings were properly reviewed for reportability to the NRC. The SIE findings and the results of the NRC inspection program do not indicate that there has been a design control or QA breakdown at Catawba.

^{7/} Id.

APPENDIX C

CHRONOLOGY OF SIGNIFICANT EVENTS

QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC) ORGANIZATION DEVELOPMENT FOR CATAWBA NUCLEAR POWER PLANT

The following is a chronology of significant events regarding NRC's review of the Quality Assurance and Quality Control Organizations of the Duke Power Company.

Chronology of Events

- February 1973 The initial NRC pre-construction QA inspection for Catawba resulted in a finding that the Construction Department QA manager is not sufficiently independent of construction costs and schedules as required by 10 CFR 50, Appendix B, Criterion 1. 1/
- May 29, 1973 NRC meeting with Duke Power Company (DPC) to discuss the DPC QA program which shows QA personnel reporting administratively to a line organization and functionally to the QA organization. It was also noted at this time that the Senior VP of Engineering and Construction was the acting Corporate QA Manager.
- July 1973 NRC completed evaluation of the DPC QA program for Catawba. NRC received a commitment by DPC to fill the position of Corporate QA manager no later than July 1974. With this commitment, the NRC found the DPC QA program acceptable.
- October 12, 1973 The Safety Evaluation Report was issued by NRC. Section 17 discusses DPC's QA program and its organization to meet the program objectives. It recognizes the combination of Senior VP of Engineering and Construction and the Corporate QA Manager into one position. It discusses the distinction between the administrative and functional reporting relationships of DPC's QA managers. Pertinent conclusions are that:
- (1) "The DPC organizational structure ... complies with the requirements of Criterion I of Appendix B to 10 CFR 50 and is acceptable." (Page 17-13)

- (2) "A QA staff has been provided with adequate authority and guidance for the implementation of the DPC QA program." (Page 17-13)

Additionally, the Safety Evaluation Report discusses DPC's QC organization and states: "In the area of construction, we have reviewed the independence, responsibilities, authorities, and specific duties of the QC inspectors in the electrical, mechanical, welding, and civil disciplines. Figure 17.6 shows additional details of the Construction Department QC organization. DPC has stated that these inspectors perform objective acceptance inspections and are full time inspectors who are independent from the construction and production craftsmen and foremen. DPC states that these inspectors have clear stop-work authority and the responsibility to refer problems to their supervision." (Pages 17-10, 17-12)

The NRC staff concluded that DPC's organizational structure was acceptable. The NRC inspection program monitors and verifies that these commitments have been implemented.

February 1, 1974

The roles of Senior Vice President of Engineering and Construction and Corporate QA Manager separated with the Corporate QA Manager reporting to the Senior VP of Engineering and Construction.

April 2, 1974

DPC reported restructuring of its QA organization planned for May 1974, with the QA organization reporting directly to the Corporate QA Manager.

October 1, 1974

DPC Topical Report DUKE-1 on QA reflects the QA organization established on April 2, 1974, with the QA organization reporting to the Corporate QA Manager and the Corporate QA Manager reporting to the Senior VP of Engineering and Construction.

That DPC Topical Report on QA indicates that the QA organization reviews and approves QC inspection procedures and records. The pertinent organization chart shows the site QC staff reporting directly to a Senior QC Engineer who is shown with a "functional" reporting relationship to the Project Senior QA Engineer within the DPC QA organization.

February 14, 1975

DPC Topical Report on QA adds the commitment that QC inspector certification procedures and certifications are approved by QA.

- April 17, 1975 NRC affirms acceptability of DPC Topical Report on QA - Amendment 2 dated February 14, 1975 - which continues to show the QA organization reporting to the Corporate QA Manager who continues to report to the Senior VP of Engineering and Construction.
- August 7, 1975 Construction Permits issued for the Catawba facility.
- With respect to DPC's QA Program, the Atomic Safety and Licensing Board states:
- "After a careful consideration of the written and oral testimony and the replies to the Board's own questions in this record, the Board finds that the QA program of the Applicant meets the requirements established by the Commission and that the full record shows that the Applicant is technically qualified to design and construct the Catawba facility." Duke Power Company (Catawba Nuclear Station, Units 1 & 2) LBP-75-34, 1 NRC 625, 650 (1975).
- February 9, 1981 DPC informed the NRC that the site QC staff was being brought into the QA organization for both functional and administrative controls.
- July 14, 1981 NRC staff, by letter of July 14, 1981, reports acceptability of having DPC construction QC included in the DPC QA organization.
- February 3, 1983 NRC, in a letter responding to DPC's Amendment 6 to the QA Topical Report, continues to affirm acceptability of DPC organization which continues to show QA organization reporting to the Corporate QA Manager who continues to report to the Senior VP of Engineering and Construction.

APPENDIX D

EVALUATION OF CONTROLS TO PROCESS AND RESPOND TO NON-CONFORMING CONDITIONS

Background

This Appendix discusses the staff's review of the Duke Power Company's (DPC) management control systems used at the Catawba site to identify and control deficiencies detected during the construction process. Before proceeding, it is important to understand the distinction drawn by the NRC between "deficiencies" and "significant deficiencies." Appendix B to 10 CFR Part 50 does not require the same level of consideration for all deficiencies that are identified by a licensee. Criterion XVI of Appendix B requires the determination and documentation of the cause, corrective action, and management attention given to those deficiencies only in the case where there are significant conditions adverse to quality. Criterion XVI requires that other conditions adverse to quality [note the omission of the term "significant"] are promptly identified and corrected.

Also, because the petition raises issues specifically related to nonconforming items, and to better understand NRC actions with respect to the measures established to control and respond to nonconforming conditions, the American National Standards Institute (ANSI) Standard N45.2.10 definition of a "Nonconformance" should be understood. The ANSI definition describes a nonconformance as a deficiency in characteristic, documentation, or procedure which renders the quality of an item unacceptable or indeterminate. This does not mean that all identified problems are nonconformances or reportable to NRC. If the identified problem is of such a nature that it is judged to be correctable through the use of the licensee's established QA program for corrective measures to bring the item back into specification, the item is not considered unacceptable or indeterminate. Under these circumstances, minor problems may be documented and

corrected via an alternative mechanism as opposed to declaring the item nonconforming. NRI has accepted this definition and approach to problem resolution. See Regulatory Guide 1.74, "Quality Assurance Terms and Definitions".

Typically, licensees constructing nuclear power plants establish several management control and record systems to report, monitor, and achieve correction of conditions adverse to quality, including significant conditions. These control systems usually are multiple level systems and can originate in several construction-related organizations depending on the origin, nature and significance of the identified problem. In many cases, licensees use terms such as "Nonconformance Report" or "Nonconforming Item Report" to describe that system which is used to manage the identification and correction of significant conditions adverse to quality.

QA procedure Q-1, "Control of Nonconforming Items (NCI)," establishes the DPC mechanism for documenting, controlling, evaluating, correcting and inspecting identified NCIs. NCI reports are a part of the QA record files. The site records vault is under the management and control of the QA Department. Procedure Q-1 is one of approximately 166 QA procedures that implement the DPC QA program described in the DPC Topical QA Report, DUKE-1. The Construction Department has 91 QA procedures, the Design Engineering Department has 32 QA procedures, and the QA Department has 43 QA procedures. Procedures similar to Q-1 are also used to document deficiencies for specific work areas and related corrective action programs for construction, design, and QA work. The NCI system is one of the mechanisms that has been used by DPC to document field-initiated design changes since before the Catawba construction permits were issued in August 1975.

For deficiencies that qualify as significant conditions adverse to quality, Criterion XVI of Appendix B requires that they be documented, a review be performed to determine the cause of the condition, corrective action be taken which prevents recurrence and that the issue be reported to appropriate levels of management. Catawba's Procedure Q-1 (Form Q-1A or NCI) was specifically developed to deal with this type of significant deficiency.

As noted previously, 10 CFR Part 50, Appendix B, Criterion XVI requires that conditions adverse to quality be promptly identified and corrected. Catawba's Procedure R-2 was written to meet the above requirement. Form R-2A (Inspection Discrepancy Report) from Procedure R-2 is utilized at Catawba to document the identification and correction of minor deficiencies which are readily correctable, require no additional engineering design evaluation, and are found by the QC inspectors as a result of preplanned inspections.

The licensee through its QA program conducts planned and documented audits of all aspects of the Catawba QA program, including the several deficiencies control systems, to verify compliance with its program.

NRC Review of DPC's Deficiency Control Systems

Forms R-2A and Q-1A are only two of the mechanisms utilized by Catawba to report deficiencies. When implemented properly, these mechanisms meet NRC requirements. The fact that the petitioner contends that the R-2A system is inferior to the NCI system has little, if any, bearing on the acceptability of Catawba's corrective action program. The R-2A system meets the requirements of Criterion XVI and the staff is satisfied that the Appendix B requirements are being met.

NRC inspections at Catawba began^{1/} with a review of the QA programs for Design, Construction, and QA. Activities related to design control, design changes, QA organization and independence, QA manuals and procedures, quality of construction, vendors, document control, records, audits, corrective action systems, and other 10 CFR Part 50, Appendix B criteria have been routinely inspected since 1973. The DPC QA Topical Report, DUKE-1, was reviewed and approved by NRC as applicable to Catawba Project prior to issuance of the construction permit. This has been discussed in detail elsewhere in this response.^{2/} NRC has also reviewed and accepted six revisions to DUKE-1 over the years it has been in use.

The NCI system and the NCIs related to defects in specific components and systems have been routinely examined as part of the NRC inspections implemented during the construction phase. The licensee has upgraded procedure Q-1 at least 14 times as of November 1, 1983. Each revision has been reviewed by the NRC, and the control and evaluation of NCIs by DPC have been observed to improve in some respect due to the revision of Q-1. DPC has made improvements to the NCI system based on findings by the NRC, by DPC's own QA audit program, and by the Self-Initiated Evaluation (SIE).

In addition to determining whether the licensee's procedures are adequate, NRC inspectors routinely review nonconformance or deficiency reports to determine whether the subject records are complete, legible, retrievable, and properly closed out. In conjunction with the routine inspection program, a special

^{1/} See NRC Inspection Report 50-413, -414/73-1.

^{2/} See supra Appendix C.

regional construction assessment team inspection was conducted at the Catawba facility on January 26 - February 6, 1981. This inspection is described in detail in Appendix A to this decision. The purpose and findings of this special inspection are also applicable to the concerns being addressed here.

NRC inspectors are sensitive to licensee activities to ensure that QA functions are kept separate from line responsibilities of the Construction Department. These inspections indicate that the Construction Department at Catawba generally performs the function of correcting the deficiencies in the field. The Design Department evaluates and approves the corrective action when corrective actions go beyond Construction's authority and capability. The DPC QA Organization approves the adequacy of the description of the deficiencies, the corrective action program, and the implementation of the corrective program, including the DPC reinspection program. Trend analysis is performed by Construction, Design, and QA, each to meet their own responsibilities. The logging of NCIs and maintaining the status of Construction NCI's is a function of the Construction Department. QA audits Construction's work, deficiency corrective actions, documentation, and trending.

QA/QC verifies the corrective action taken by Construction. Verification by the QA inspector usually involves a hardware inspection. NRC inspectors have verified the adequacy of the files of completed and incomplete NCIs and inspected to assure that the NCI system has been adequately maintained. These inspections indicate that the review and approval role of QA over the NCI system has been maintained.

Staff Review of Petitioner's Concerns Relative to NCIs

The petitioner's view that QA violations were identified on "more informal substitute forms such as R-2As, M-4s, M-51s, VNs, and frequently mere interoffice

memoranda..." is unfounded and inaccurate. The staff has found that the use of each of these forms (R-2As, M4s, M-51s, VNs) is controlled by a DPC procedure and the necessary corrective actions are documented through a controlled system. NRC review indicates that it is a practice at Catawba for interoffice memoranda, prepared by responsible engineers, to be attached to the above forms to supply or refer to supplementary information. The above forms are not viewed as "informal substitute forms," since they are part of the management system to correct deficiencies. As stated above, the DPC system meets Appendix B criteria.

The petitioner believes that use of NCI trending lists (probably a reference to status printouts) for "CONST [Construction] Engineers to expedite the completion of their responsibilities for resolving the nonconformance," provides a "chilling insight" into construction practices at Catawba. Based on NRC staff inspection findings, use of such lists has not been found to be detrimental to the adequacy of the corrective action work, the inspection of the work, or the documentation of the NCIs.

The specific concerns identified on page 22 of the petition regarding various heat numbers on pipe material and the apparent misunderstanding, or lack of communication, between the inspector and management have been reviewed by NRC inspectors. The NRC staff has reviewed the relevant QA records at Catawba and has found that the material was correct for the application. It should be noted that the pipe involved was a non-ASME Code piping system, and thus did not require heat number traceability. This matter was properly documented and corrected by DPC and the QC inspectors retrained. It was found to be an unfortunate circumstance that the two parties involved did not have a common understanding of the problem and resolution. This lack of common understanding resulted in further discussions that led to the comment "that the resolutions on NCIs were no concern

of mine." The NRC staff has determined that the problem with heat numbers on the pipe was evaluated and resolved appropriately and there was no effect on the plant hardware. See NRC Inspection Report Nos. 50-413/82-21, 82-32, 82-33, and 50-414/82-19, 82-30, 82-31.

The petitioner suggests, erroneously, that Revision 17 of procedure Q-1 contains "the first requirement for a 10 CFR Part 50, Appendix B, Criteria [sic] XVI evaluation of each NCI." See Petition at 22. The requirement to document nonconformances under Criterion XVI, so that they are properly identified, evaluated and corrected, and receive review for significance for 10 CFR 50.55(e) reportability, has been in the DPC QA program procedures for Design and QA since 1974. This requirement and its implementation has been verified by NRC on a regular basis. The Catawba site QA engineer is trained to review NCIs and route potentially reportable items to Design if the NCI was not routinely marked to be routed to Design. Also, an NRC inspector has verified that procedures appropriate for 10 CFR Part 21 reporting requirements were in the QA manuals for the Design Engineering Department, the Construction Department, and the QA Department and that appropriate training of the DPC staff was to be conducted with the annual training for the requirements of 10 CFR 50.55(e).^{3/} DPC implementation of NRC evaluation and reporting requirements have been periodically reviewed by NRC Region II inspectors during the course of normal inspection efforts.

The petitioner alleges that DPC technical supervisors took authority from the QC inspectors when the Q-1 procedure was revised from Revision 11 (approved July 18, 1977 - Petition attachment 14) to Revision 12 (approved June 27, 1978 - Petition attachment 15). See Petition at 21, 42. Revision 12 is more definitive in its general and specific instructions; however, the responsibilities for

^{3/} See NRC Inspection Report 50-413/414/78-1 (January 24, 1978.)

technical duties by QC technicians is unchanged. Although the petitioner contends that the QC inspector was unrightfully "shackled to the Senior Engineer," NRC inspection findings do not indicate that the inspector's freedom and independence to identify quality problems and verify corrective action to those problems, was denied. The QC inspector is, however, required to use the proper procedural reporting mechanism. The corrective action system as described by Revision 12 to Procedure Q-1 is acceptable under NRC requirements. In the staff's view, technical supervisors did not take authority from the QC inspectors.

With respect to petitioner's concerns (Petition at 21, 43) about QC inspectors being told what "not to write up" as a NCI and what to "sign off," it should be noted that the supervisor's normal responsibilities include instructing and training QC technicians to provide a uniform, corporate interpretation of specifications and commitments being inspected against. The concerns relative to NCIs not being written up, as described in the petition, illustrate the occasional problem that occurs when QC inspectors provide their own individual interpretations of specifications, drawings, and procedures. Occasionally, the supervisors may find it necessary to provide uniform interpretation of design, construction and QA requirements when such problems are encountered.

NRC requirements and industry standards do not require QC inspectors to have the qualifications of graduate engineers, and the staff's experience shows they seldom possess a strong technical design background. Quite often the technical significance of deficiencies found during their inspections may not be clearly established without engineering assistance whereby the appropriate identification and documentation method is selected (i.e., NCI systems for significant conditions adverse to quality as opposed to M-51C, M-4A, R-2A, etc., for other conditions). In the staff's experience, QC inspectors are conscientious

individuals who generally err on the side of conservatism (and are encouraged to do so). Consequently, they may occasionally write NCIs for deficiencies of lesser significance which do not need to have a design evaluation and should have been classified as a minor deficiency, i.e., one that is readily correctable with no additional engineering evaluation needed. To provide better control of these unwarranted NCIs^{4/}, DPC implemented Revision 12 to Procedure Q-1 that required a Senior Engineer review all NCIs to determine if the reported deficiencies were valid for reporting under the NCI format or if they were problems of lesser significance that could be handled by other existing in-process QA inspection procedures. As required by procedure Revision 12, the first review was initiated by the Senior Engineer (Supervisor or site QC) and, if he determined the NCI to be invalid, the reason for that determination was noted on the NCI form. This method of screening NCIs to reduce unwarranted NCIs and control the resolution of identified problems through other mechanisms has been reviewed by the NRC and found acceptable.

In NRC inspections, the staff found that the DPC QC inspectors at times were uncertain if their findings merited an NCI report and sought guidance from the Senior Engineer. If, after discussion, the QC inspectors could accept the Senior Engineer's rationale, the QC inspectors would often withdraw their written NCI

^{4/} Massive number of unnecessary NCIs can mask important items, as was pointed out in Inspection Report No. 50-413,-414/81-02. Whether as a direct result of this comment or for some other reason, the licensee began to use R-2A's more frequently for deficiencies not requiring engineering review.

and redocument the finding by other appropriate QA mechanisms.^{5/} By procedure, the valid or nonvalid NCI report was then forwarded to the Senior QA Engineer for his review. If the report was determined to be invalid, it was filed with no further action taken. Valid NCIs were signed and dated, then sent to the document controllers for assignment of a sequential serial number.

The petitioner implies that it is improper for Document Control to issue sequential serial numbers only for approved NCIs. The staff finds no problem with the licensee issuing serial numbers for only valid NCIs since those minor deficiencies initially reported as NCIs but later declared to be nonvalid will be corrected through other QA procedures. There is no NRC regulation requirement to keep record copies of nonvalid NCIs.

Additionally, the licensee's QA program requires the conduct of planned and documented audits of all aspects of the Catawba QA program, including nonconformance control to verify compliance with the QA program. The NRC has determined that DPC has conducted trend analysis on NCIs in accordance with DPC procedures QA-150, QA-304, and CDA-9. DPC has not identified to NRC any reportable items as a result of this program.

Several task forces were created by DPC in 1981 and 1982, to review the concerns expressed by DPC welding inspectors to which the petitioner refers. The Region II staff and management monitored the task force efforts and conducted an independent assessment of the concerns which included interviewing the welding inspectors, review of the task force reports, and reporting documenta-

^{5/} The NRC acknowledges there was testimony presented at the hearings that concerned some invalid welding NCIs which were not formally documented by other appropriate QA mechanisms. Testimony also revealed that a DPC task force (accepted and monitored by NRC) thoroughly evaluated all such concerns that were specific in nature for technical adequacy and whether specific criteria were violated. Although procedural violations were identified, no technical inadequacies were found that affected the safety of the plant.

tion. A more detailed description of the review process and findings are contained in the "NRC Staff Testimony of Peter K. Van Doorn on Palmetto Alliance Contention 6 Regarding Welding Inspector Concerns," which was filed in the Catawba operating license proceeding. See also NRC Staff's Proposed Findings of Fact and Conclusions of Law in the Form of a Partial Initial Decision, at 46-147 (March 8, 1984).

With respect to DPC's task forces, the petitioner suggests that it was inappropriate for NRC to allow DPC to address the issues raised by the welding inspectors through the task forces. In the first instance, the concerns of the welding inspectors were first brought by the inspectors to DPC management which, appropriately, instituted the welding task forces and retained the services of an outside consultant to enhance the objectivity of the review. The NRC expects licensees to identify and correct problems and to responsibly address any others brought to their attention. Indeed, the various regulations involving reporting requirements make licensee identification and evaluation of problems mandatory in many instances. See, e.g., 10 CFR 50.55(e). Further, the NRC enforcement policy encourages licensee identification and correction of problems. For example, the policy provides for reduction of civil penalties for unusually prompt and extensive corrective action and the Commission will not cite a licensee for self-identified and corrected violations of lesser severity. See 10 CFR Part 2, Appendix C, §§ IV.A, IV.B.1. & 2. Consistent with this regulatory practice, there is nothing inappropriate about allowing a licensee to conduct its own investigations into matters of concern and to develop and implement corrective actions on issues it has identified.

In connection with the above concerns, NRC inspection activities during the period referenced above included determining whether workers at Catawba knew of QA problems which had not been corrected. This inspection is described in detail in Appendix A. Workers were asked if they had any concerns relative to the

quality of construction at Catawba; if they were aware of any instances when construction did not meet specifications, codes, or standards and corrective actions were not taken; or if they were aware of any day-to-day irregularities affecting quality that NRC should know about. Several of those interviewed mentioned occasions where extra work was required to repair poor work caused by haste or improper planning. None of those questioned indicated they had knowledge of any poor work that had not been found by QC and properly corrected. Two areas of concern were developed, however, neither dealt with welding problems as implied in the petition. Both were subsequently inspected and resolved by the licensee and verified by the NRC.

It has been made known to DPC employees, during numerous NRC inspections conducted since 1978 and via bulletin board postings, that NRC inspectors were available to discuss problems either onsite or offsite. The Region II telephone number has been permanently posted to facilitate reporting safety concerns or allegations. The first NRC Resident Inspector was assigned to the Catawba site in February 1981, and has been available to receive concerns or allegations from DPC and contractor personnel.

Staff Review of Petitioner's Concerns Relative to the R-2 Systems

The petitioner raises specific concerns relative to the use and handling of R-2As. These concerns are:

- ° The R-2A system being used to report inspection deficiencies at Catawba^{6/} is deficient (inferior) when compared to the NCI (Form Q-1A) system.

^{6/} Although the petitioner calls the R-2A system (Procedure R-2) inferior to the NCI system (Procedure Q-1) for handling nonconforming conditions, the petitioner appears to accept as satisfactory the measures provided by Procedure R-2. On Page 26 the petition states, "The legitimacy of the R-2A as a substitute for NCI's depends not so much on its procedural flaws, but on its implementation."

- ° The SIE report found areas of weakness with the R-2A construction corrective actions.
- ° In the past Catawba has been criticized for having "too many NCIs" by the NRC.
- ° Workers have reported to GAP that the R-2As are used liberally by both QA and construction to legitimize construction that pushes ahead of QA/QC inspection.
- ° The R-2A (Inspection Discrepancy Reports) governed by the R-2 procedure is used on the bulk of nonconformance items.
- ° R-2As remain under the control of Construction, corrective actions were not required to be documented and an indeterminate number of non-conforming conditions may have been corrected without trending or appropriate reviews.

The following discussion should clarify the areas of the R-2A process that the petitioner alleges are deficient when compared to the NCI system. The areas in which the petitioner contends that the R-2A is deficient compared to NCIs are listed below with the staff's response.

- ° NCIs identify the cause of the problem.
10 CFR Part 50, Appendix B, Criterion XVI requires that the cause of the problem be identified for significant conditions adverse to quality. However, R-2A type problems, which do not rise to the level of significance described by Procedure Q-1, do not necessarily require cause determination and documentation. R-2As are reviewed to determine if they should be elevated to NCI status.
- ° NCIs cannot be closed with an informal undocumented design change.
By procedure R-2, any deficiency that requires design evaluation, other than interpretation, classification or editorial changes, must be elevated to an NCI. Therefore, an R-2A should not be written for any

deficiency requiring a design evaluation. The NRC inspection findings have not identified an abuse of the R-2A system in this respect.

- NCIs give inspectors the ability to stop work on a nonconforming item that needs to be isolated.

This statement is true, and the practice is necessary because, by definition, an NCI may be an unacceptable or indeterminate item requiring design resolution which generally takes some time to resolve. An R-2A, however, is to be used for minor deficiencies (which are, by definition, readily correctable) that are found during in-process inspections and that can be brought back into conformance with codes and specifications by existing site QA procedures. If a stop work action should be necessary for an R-2A deficiency, the R-2A item should have been elevated to a NCI.

- NCIs are sent to the NCI (sic) for review.

The petitioner contends that the R-2A is deficient from NCIs in that NCIs are sent to the "NCI" for review. We presume that the petitioner intended to say "NRC" instead of "NCI." It must be clearly understood that NCIs are not required to be sent to the NRC. This was a special arrangement that the NRC Senior Resident Inspector requested and to which DPC agreed. The requirement is that DPC have a nonconformance control program, implement that program and that the program be available for NRC review. Special arrangements for the R-2As were not requested. NRC inspection program findings reflect that DPC has satisfactorily implemented the R-2A program.

° NCIs are trended in QA.

R-2As were trended in accordance with Procedure QA-304 from September 12, 1977 to December 8, 1982. Construction was given the responsibility to trend R-2As (Procedure R-2, Revision 8) on June 22, 1982, and is now trending them. DPC QA audits Construction's trending activities.

° NCIs have control numbers (once issued).

R-2As have had control numbers (serial numbers) since November 25, 1974 to the present.

° NCIs require written resolution.

Any documented R-2A condition also requires written resolution; it is true, however, that any minor R-2A type deficiency identified during an inspection, that is immediately corrected when pointed out and corrected in the presence of a QC inspector, need not be documented on Form R-2A. "Undocumented" R-2As which are immediately correctable by existing site procedures, are documented to the extent in that the final signed QC inspection record indicates acceptance of the item in question.

The petitioner quotes from page 43 of the SIE report which identifies five areas of weakness with respect to the R-2A system. See Petition at 23. These areas are listed below along with applicable clarifying comments.

° Construction has not performed any trend analysis during the period June 1, 1982 through August 23, 1982 for R-2As.

This was a valid finding of the SIE. The responsibility for performing certain trend analyses changed from QA to the Construction Department in June 1982. The Construction Department took time to develop a satisfactory implementing procedure (CDA-9 Trend Analysis Procedure) to conduct its trending. Construction now trends NCIs (Q-1As), inspection deficiencies (R-2As), component support information records (M-51Cs) and other items deemed necessary by management. These deficiencies are analyzed to detect generic problems and the results are forwarded to the Catawba Project Manager. NRC inspections show that DPC QA continues to trend NCIs and they did trend R-2As up until December 8, 1982. There is some trending overlap in these areas.

° Construction has not performed any trend analysis of QA surveillance reports.

The licensee's QA program requires that the QA surveillance group report their problems as either NCIs, R-2As or as a problem area requiring further evaluation. As mentioned above both R-2As and NCIs are trended by Construction. The third category of problems either gets resolved with further evaluation as not being a problem or eventually ends up being trended by Construction as an R-2A or NCI problem. In effect, Construction does trend QA Surveillance Reports. Additionally, although not formally identified as a trending mechanism, the DPC Surveillance Supervisor has been preparing monthly Surveillance Summary Reports since February 1982, which are distributed to the Project QA Manager, the Senior QA Engineer, and the Inspection Superintendent. These reports, some of which have been reviewed by NRC

inspection personnel, summarize the findings of one month's accumulation of surveillance activities, highlighting problem areas, discrepancies noted, and followup action required as needed. Additionally, the reports list the status of previous monthly surveillance open items that required followup action.

° Construction has not performed any trend analyses on nonconforming items reports.

While Construction did not perform NCI trend analysis during the period of change in responsibility, the DPC QA department continued to perform this function and still does for NCIs, independent of Construction trending. It is the NRC staff's view that the licensee had adequate control and access to trend behavior during the transition period.

° Statement of action on R-2A No. 5677 does not address all areas of concern. Piping system was pressurized prior to release to hydro group. R-2A did not address procedure violation nor safety implications.

DPC Construction Procedure CP 201, "Transfer of System to the Systems Group for Cleaning, Pressure Testing and Control of Work" was not complied with in this case. The subject R-2A concerns work which was performed on a non-safety related section of a fire protection system. Even though the system was not safety-related, if QC finds any requirements not being followed they will write it up as they did in this case. CP 201 required various construction checks to be performed and documented as acceptable by the crafts (primarily for personnel safety) prior to the system being turned over to the Systems Group for pressure testing. QA/QC does not inspect pressure testing of non-safety fire protection systems; however, QC does perform a general configuration

verification of such systems. Apparently, while performing the configuration system inspection, the QC inspector discovered the system had already been pressure tested by the System Group without obtaining a CP 201 release for the system. This is a violation of a DPC internal construction procedure, but it is not otherwise a violation of any code or NRC regulatory requirement.

° Action required on R-2A No. M5350, although cleared by QA, has not been completed.

In this case, an auxiliary feedwater flow diagram (which is the basis for design but not for construction of a system) and the pertinent design isometric (the basis for construction of the system) disagreed as to the position of piping taps for instrument connections. When the construction technical support staff contacted Design for a clarification as to which drawing was correct, Design stated that they had already discovered the subject flow diagram was in error and had issued a change order to revise the flow diagram drawing. As it turned out, the system had been constructed properly but, based on the telephone conversation, QA had inappropriately closed this R-2A without verifying that the subject flow drawing corrections had indeed been incorporated on the drawing.

° The R-2A system allowed construction to push ahead of construction QA/QC inspections.

If properly implemented the R-2A system would not permit construction to push ahead of QA/QC inspections. The R-2A form requires initials and dates for the individual who specifies the corrective action, the person who completes the corrective action, the QC inspector who reinspects the

corrective action. The system also requires final review, approval, signature, and date by project QA staff. Without these authentications (initials, signatures and dates) being completed, any construction that pushed ahead of documented R-2A findings would be discovered and elevated to an NCI condition. (This discrepancy would represent a bypassed inspection hold point.) For a nondocumented minor R-2A type discrepancy the correction action must be completed immediately under the observation of the QC inspector. Therefore, unless the crafts and/or QC knowingly circumvents the R-2 procedure, construction should not push ahead of QA/QC inspection. The NRC inspection program findings do not substantiate that there have been significant violations of the R-2 system.

The SIE findings on the R-2A system are, in the staff's view, of minor importance. The findings and recommendations of the SIE were appropriately handled by DPC and the matters identified have not had an impact on plant hardware.

The petitioner also alleges that the R-2A (inspection deficiency reports) governed by the R-2 procedures is used on the bulk of nonconforming items. Until the implementation of Revision 12 to the Q-1 Procedure (June 22, 1978) and its required review of NCIs for validity, the vast majority of discrepancies (minor and major) were reported, evaluated and processed under the NCI format. Just prior to implementation of Revision 12, there were reportedly 3287 NCIs issued versus 52 R-2As, or a 63:1 ratio. In February 1981 (NRC Inspection Report No. 50-413, 414/81-02), NRC inspectors noted that a large volume of NCIs had been generated as of that date even though the NCI to R-2A ratio had been reduced to approximately 8:1. This ratio was observed by the NRC to further declined to about 0.3:1 during the period between February 1981 and October 7, 1983. While the petitioner claims correctly that R-2As were used on the bulk of deficiencies

identified during the February 1981 to October 1983 timeframe, a ratio of 3 minor deficiencies (R-2As) to one major deficiency (NCI) is not inappropriate in light of NRC experience with other facilities under construction.

It is true that, in the past, some NRC inspectors have been critical of Catawba for writing "too many NCIs" for problems which could have been resolved as minor deficiencies under other existing DPC site QA procedures. In NRC Inspection Report 50-413-414/81-02, NRC inspectors noted that an apparently large volume of NCIs had been generated at the site, averaging nearly 300 per month over a past seven month timeframe from July 1980 to February 1981. The subjects covered by these NCIs ranged from relatively minor documentation problems to major problems with safety-related hardware. This large volume of all types of problems being handled in the same manner was pointed out to DPC management by the NRC as a possible contributor to the reason why some generic items and/or trends were apparently going unnoticed. Several NCIs were cited as an example of the condition, and DPC was issued a Notice of Violation for generic items (trends) being neither recognized nor forwarded to management. In response, DPC performed an extensive review of past NCIs to check for missed trends, proper definition, and appropriate corrective actions. NRC finds the DPC corrective action on this matter to be adequate.

Generally, the vast majority of deficiencies recorded by licensees and those observed by NRC inspectors are of minor safety significance. Deficiencies are usually correctly classified according to safety significance and priorities, and remedial actions are generally guided by the classifications of the deficiencies. The staff concludes that construction deficiencies at Catawba are generally classified appropriately. Although there were examples identified in the SIE where R-2A type discrepancies were improperly disposed, these were few in number,

representing a small percentage of the total R-2As recorded at Catawba through mid-1983. The NRC staff has found, with few exceptions, that the DPC system for control of construction deficiencies has functioned adequately. NRC inspections of construction activities will continue throughout the remainder of the construction period; where appropriate, the required evaluations will be made and, if necessary, enforcement actions will be taken to ensure compliance with NRC requirements.

Staff Review of Petitioner's Comparison of Catawba to Midland

On page 20 of the petition, the petitioner asserts that the nonconformance procedure (Q-1) for Catawba, Revision 9, dated June 11, 1976, bears a striking similarity to the situation discovered at Midland. NRC staff review of this matter has determined that there is no parallel in the handling of nonconformances at Midland Nuclear Plant and the Catawba facility. At Midland, QC stopped inspection activities while permitting work to continue, whereas under Catawba's Procedure Q-1, work on nonconforming activities was stopped and documented while QC inspection continued for those activities allowed to proceed.

In October 1982, the NRC Region III issued Consumers Power Company a Severity Level III violation for QC inspectors not documenting as nonconformances all deficiencies which they observed at the Midland Nuclear Plant based on information developed by NRC inspectors and investigators. In this case, Midland QC supervisors instructed their QC inspectors to suspend an inspection if an excessive number of deficiencies were observed. Consequently, measures were not implemented at Midland to prevent the continued installation or the use of these nonconforming items. Moreover, when an inspection was suspended before its completion, there was no assurance that a subsequent complete QC inspection was

ever performed on the defective item, component, or structure involved. NRC inspections at Midland indicate that reexamination of suspended Midland inspections disclosed that for a period of time some of these QC inspections received final QC acceptance and closure based only on reinspection and acceptance of those limited deficiencies identified prior to suspending the inspection.

The petition quotes the following section taken from Procedure Q-1, Revision 9, dated June 11, 1976 (Petition attachment 14):

"If a nonconformance is identified on material, equipment, or activities in the course of installation or construction, the nonconforming activities or activities which affect the resolution of the nonconformance shall be stopped and not resumed until the resolution of the nonconformance is identified. Activities involving the material, equipment, or item which do not affect the resolution of the nonconformance may continue. The Project QA Staff shall be responsible for determining which activities may proceed. Where necessary, these activities shall be described in the statement of the nonconformance."

The petitioner states that the procedure allows suspended inspections and that the undesirable consequences that happened at Midland could also occur at Catawba. The NRC staff has reviewed this procedure and finds it to be an acceptable mode of construction nonconformance control and is in accordance with NRC requirements. Further, Section 16 of ANSI N45.2, applicable to Catawba, states "measures which control further processing, delivery, or installation of a nonconformance or defective item pending a decision on its disposition shall be established and maintained." The petitioner contends that Catawba QC inspectors have performed limited inspection of items after an NCI was issued but has provided no examples to substantiate the contention. NRC does not believe, based on inspections and investigations into employee concerns to date, that inadequate inspections (similar to Midland) were performed. At Catawba, work on nonconforming work activities was stopped and documented while QC inspection continued for those work activities which were allowed to proceed.

APPENDIX E

ANALYSIS OF MEASURES ESTABLISHED TO PROVIDE ADEQUATE MATERIAL TRACEABILITY TO IDENTIFY AND DOCUMENT THE HISTORY OF ALL MATERIAL, PARTS, COMPONENTS, AND SPECIAL PROCESSES

General

Relying on findings from the Self-Initiated Evaluation (SIE), the petitioner alleges that Duke Power Company (DPC) failed to maintain adequate material traceability to identify and document the history of materials, parts, components, and special processes as required by 10 CFR Part 50, Appendix B, Criteria VIII and IX. Petition at 26-27.

At Catawba, procurement, receiving and storage, identification and control of special processes, and QA records have been periodically inspected in accordance with the NRC inspection program by the NRC Region II inspection staff since the beginning of NRC inspection of construction activities.^{1/} These routine inspections covered verification of DPC's QA program for control of the above areas as required by 10 CFR Part 50, Appendix B, Criteria VIII and IX. The NRC inspections covered, in addition to verification of the QA program, the implementation of the control program through work observation and review of completed records. The NRC inspections encompassed the major site activities of the licensee and other site contractors. The NRC staff has also reviewed and evaluated the complete SIE report for Catawba, including those items specifically identified by the petitioner.

^{1/} See NRC Inspection Reports 50-413, 414/75-6, 50-413, 414/76-7, 50-413, 414/76-5, 50-413, 414/76-4, 50-413, 414/77-15, 50-413, 414/77-11, 50-413, 414/77-10, 50-413/78-11, and 50-414/78-10, 50-413, 414/78-05, 50-413, 414/79-08, 50-413, 414/79-12, 50-413, 414/79-16, 50-413, 414/80-13, 50-413, 414/81-02, 50-413, 414/81-23, 50-413/82-18 and 50-414/82-16.

NRC Staff Review of Specific Concerns by Petitioner

The petitioner points to six findings and one questionable area from the SIE report.^{2/} The following is a summary of the staff's review of the significance of each SIE finding referenced by the petitioner. The corrective actions proposed by DPC relative to each SIE finding are contained in the SIE report appended to the petition.

- ° "Site receipt inspection does not ensure that material and equipment received on site are evaluated against the requirements of the procurement specifications. Examples of the problem may potentially result in delays, waste of materials, additional time spent on disposition of deviations from procured materials and work stoppage." (Finding CC.3-1)

The petitioner infers from this and other SIE findings that materials traceability has broken down "on a massive scale". Petition at 26. This particular SIE finding reflects matters of primarily economic concern; i.e., the efficiency with which DPC handles receipt of materials. The SIE finding does not indicate that substandard material has been used or installed at the plant, and NRC inspectors have not developed information that DPC's material receiving practices have led to problems that would affect hardware quality, personnel safety, or safe operation of the plant.

- ° "A consistent method for material identification was not in effect in the warehouse. Several instances were noted where I.D. tags had fallen off; equipment was marked with ink; and when material was being sectionalized to start fabrication, a means for maintaining the identification was not being done." (Finding CC.3-2)

^{2/} The referenced SIE findings are numbered CC.3-1, CC.3-2, CC.3-3, CC.3-4, CC.3-5, CC.3-6, and may be found in the SIE report at page 30 and the questionable area may be found at page 32, item 5.

Safety-related equipment is marked in accordance with Manufacturers Standardization Society Practice-25 (MSSSP25), American Society of Testing and Material (ASTM), or American Society of Mechanical Engineers (ASME) requirements. The paper tags which had fallen off of electrical equipment were not being used for material traceability. Also, as identified in the SIE, the galvanized angle material being sectionalized by the fabricator contained the proper ASTM Color-Code. 10 CFR Part 50, Appendix B, Criterion VIII, allows identification of the item either on the item or on records traceable to the item. NRC staff evaluation found that no material had lost its traceability. Therefore, no violation or deviation occurred in the incident cited.

- ° "Proper protective measures were not taking place for environmentally sensitive equipment that was 'robbed' for spare parts. Some parts were being stored in an open door instrument cabinet." (Finding CC.3-3)

The particular item of concern identified by the SIE inspection team was a 24 kV circuit breaker. The circuit breaker was not a safety-related item and had been ordered as a spare circuit breaker for the McGuire facility. This circuit breaker was later transferred to Catawba and disassembled by the Transmission Department and the parts placed in their warehouse. These breaker parts were not intended for use at Catawba. The NRC has verified adequate warehouse and in-place storage facilities throughout the Catawba construction period for equipment important to safety. The NRC has also verified that effective measures have been established and implemented to environmentally protect equipment in the warehouse and power block.^{3/} No violations or deficiencies were identified in this area during these inspections.

^{3/} See NRC Inspection Reports 50-413/82-18 and 50-414/82-16, 50-413/81-23 and 50-414/81-23.

- ° "Procedure QFP-8.002 CNS, Rev. 1A, does not indicate the disposition of unused filler material. Confusion appears to exist regarding handling of unused filler material and adherence to AWS code requirements could not be determined." (Finding CC.3-4)

NRC has reviewed Bahnson procedure QFP-8.002 CNS, Rev. 1A, which controls the issue of welding material in the HVAC fabrication shop. Almost all welding in the fabrication shop is performed by the Metal Inert Gas (MIG) process. This type welding filler material does not contain a low hydrogen coating and therefore, rebake requirements are not applicable. The NRC review of procurement, receipt inspection, review of certified material test reports, issue, and control of welding filler material has verified compliance with DPC approved procedures.^{4/} Correction of the SIE identified weakness observed in the referenced procedure and appropriate instructions to DPC personnel have been accomplished by DPC.

- ° "Materials are not being maintained or stored effectively at work site locations. Several examples were noted which reflected improper control." (Finding CC.3-5)

This concern, involving in-place storage, was identified during the SIE. It dealt with a single piece of 4-inch stainless steel pipe in contact with rusty carbon steel rollers and end caps missing from pipe spool CT-SM-73 in the Catawba turbine building. Also, during a walkdown of the turbine building, it was observed that three valves were welded up on one side and left uncapped on the other. The example of end caps missing from pipe spool CT-SM-73 is normally outside the purview of the NRC in that the turbine building piping is not required to comply with 10 CFR Part 50, Appendix B, because it is not a safety-

^{4/} See NRC Inspection Report 50-413/83-36 and 50-414/83-31.

related structure. The staff has concluded that the other examples discussed in the SIE report are isolated instances. This view is based on a lack of similar problems being discovered during NRC inspections in the same area outside of the SIE followup effort. In view of the inspection findings^{5/} which indicate a relatively small number of violations or deficiencies in this area, there has not been a massive breakdown in this area.

- ° "Scheduled preventive maintenance activities on installed equipment are not always assured throughout the entire period of Construction Department control. Equipment was identified for which preventive maintenance has been cancelled up to 21 months ago, and there was not evidence that compensatory requirements had been established."
(Finding CC.3-6)

NRC inspectors have reviewed the Catawba storage and preventive maintenance activities.^{6/} These inspections indicate that an adequate maintenance program has been established to prevent equipment deterioration. The NRC believes the examples identified during the SIE are isolated cases and are not of sufficient dimension to raise serious doubts as to the overall integrity of safety-related structures and components. DPC has performed a review of its preventive maintenance program in view of the SIE findings to ensure that plant equipment is adequately maintained during construction. Additionally, a comprehensive pre-operational test is conducted on safety systems prior to plant operation to help verify that components have not experienced unacceptable deterioration during the construction phase.

^{5/} See supra note 1.

^{6/} Id.

- ° "During a review of No. 10 Cadweld operation in the Auxiliary Building, it was learned that the Cadweld sleeves and powder had not been received by QC Receiving. These items were received from another site as non-quality items, and the QC inspector was not aware of the 16 51144 sleeves until notified by his supervisor. The work was stopped." (SIE at 32, item 5)

NRC inspections^{7/} confirm that written procedures were placed into effect and measures established to control material transfers from other DPC sites. In addition to receipt inspection, other measures were established to control the acceptance of material used in Cadweld splices. Catawba procedure M-14, "Cadweld Splice Inspection Testing," Revision 6, covers control of materials received from another DPC site by virtue of its requiring QC to verify that qualified materials were used subsequent to the fabrication of the Cadweld splice. The QC inspector is required to compare the Cadweld sleeve type, size, and the powder batch type with the release log information developed for the specific type of Cadweld. The NRC inspections do not indicate that there has been a massive breakdown in the Cadweld operation at Catawba.

Based on a review of the NRC inspection program findings, the examples presented in the petition and discussed above do not indicate a massive breakdown in QA relative to materials traceability at Catawba.

^{7/} See NRC Inspection Reports 50-413/80-13 and 50-414/80-13, 50-413/83-37 and 50-414/83-12.

APPENDIX F

ADEQUACY OF QUALITY ASSURANCE PROGRAM FOR VENDORS

The petitioner alleges that DPC has failed to maintain an adequate quality assurance program for vendors. To support this position, the petitioner references findings and recommendations included in the DPC Self-Initiated Evaluation (SIE) report. These findings and recommendations are given as examples to illustrate serious weaknesses in the vendor program.

Background

The licensee contracted with Bahnson Service Company (Bahnson) to provide the heating, ventilating, and air conditioning system (HVAC) for the Catawba auxiliary building, reactor building and other facilities on site. DPC provides for the general arrangement; i.e., location elevation, of the equipment and duct work, installs the major equipment, performs the seismic analysis of the Bahnson-designed duct work and supports, approves the final design, and provides QA surveillance of Bahnson's work. Bahnson provides project management, shop and field drawings, fabricated duct work and supports, and QA/QC for the fabrication and installation work. The contractor will also conduct the startup, testing and balancing of the installed HVAC system.

The controlling document of the HVAC contract is DPC Specification No. CNS-1211.00-05, "Heating Ventilating and Air Conditioning for Catawba Nuclear Station." Quality assurance requirements for this contract are implemented through policies delineated in Bahnson's QA Manual. Quality control is implemented through procedures contained in the Bahnson's Quality Field Procedures (QAF) Manual.

The American Welding Society Structural Steel Code(s) D1.1 and D1.3 are applicable to fabrication and inspection of HVAC duct work and supports. Welders are qualified in accordance with Section IX of the ASME Code. Other related commitments applicable by reference include Appendix B to 10 CFR Part 50 and ANSI N45.2-1971, "Quality Assurance Program Requirements of Nuclear Power Plants." Surveillance of Bahnsen is conducted by DPC-HQ Vendors Division. Prior to August 1981, surveillances were performed by the DPC site QA organization.

The Catawba HVAC system has been inspected at various times by Region II inspectors. These inspections have involved system hardware, interviews with contractor personnel, observation of work in progress and other areas such as purchase orders, QA/QC program implementation, QA surveillance, record review and evaluation.^{1/} Three violations, involving record discrepancies and inadequate QC procedures were identified. The resolution of two violations identified in Inspection Report 50-413/83-36 is still pending. These violations are considered to have minor safety significance. The licensee has submitted and the staff has reviewed the proposed actions for correcting and preventing the recurrence of the violations. Preliminarily, the proposed actions appear to be technically sound and appropriate. While the NRC staff has not yet performed the necessary follow-up inspection required to closeout these items, inspections are scheduled and will be completed in accordance with programmatic requirements.

^{1/} Details of these inspections are documented in NRC Inspection Reports Nos. 50-413/80-06, 50-413/80-13, 50-413/82-13, 50-413/82-18, 50-413/82-21, and 50-413/83-36.

Review of Specific SIE Concerns Identified in the Petition

The following discussion addresses these SIE findings cited by the petitioner:

- "No welder knew the weld procedure under which he was working."
(CC.4-5A)
- "All welders knew required weld size and location, but did not know how they acquired that information." (CC.4-5B)
- "No process control was available to specify the welding procedure for plenum erection (from Drawing CN-1684-VA-000H, Rev. 0)." (CC.4-5C)
- "Welder was making welds without removing galvanizing material."
(CC.4-5D)
- "HVAC support 2-H-VC-4999 had undercut in excess of that allowed by AWS D1.1 code." (CC.4-5E)

DPC's evaluations and corrective actions associated with the recommended improvements associated with the above SIE findings are contained in the SIE report appended to the petition. NRC inspection findings regarding DPC's evaluations and corrective actions are summarized in the following paragraphs.

NRC inspection activities at Catawba have included the review of performance qualification records of welders. Performance qualification records of welders, selected at random for review in accordance with NRC inspection procedures, were found to comply with applicable code requirements. The staff believes there is reasonable assurance that the welding on the HVAC system at Catawba was performed by qualified welders. This finding is consistent with the findings of the SIE report, Appendix A, page 167, section III.A.

The NRC has reviewed the finding that no welder knew the weld procedure under which he was working and that all welders knew the required weld size and

location, but did not know how they acquired that information. This finding may be true and to some extent understandable when the nature of the fabrication of the HVAC system is taken into consideration. For the most part, the HVAC duct work is fabricated in the fabrication shop from 16 gauge, galvanized sheet steel. The material is formed into the desired shape and subsequently welded, inspected and then taken to the plant for installation. The above process is controlled by approved design drawings, specifications and procedures, consistent with applicable code requirements. This uniformity of material type, size and the repetitiveness of the product-shape is almost identical to production line type welding where a single repetitive, routine welding process is used and the difficulty of joint fabrication is minimal. Under these circumstances it is not uncommon for a welder who is qualified to that single process, and uses it regularly, to not be fully informed about the procedure reference information. It is recognized that, ideally, each welder should be fully knowledgeable about the weld procedures he or she is working to help ensure that procedure process parameters are maintained.

The NRC staff has also reviewed the finding that a "welder was making welds without removing galvanizing material." This action did not conform to applicable specification requirements, but in the staff's view, it did not constitute a violation of applicable welding code requirements. On this latter point, section 4 of AWS D1.3 permits welding without the galvanize being removed; however, it is recognized that removal of galvanizing material is the preferred process. Inspections performed by Region II staff found no evidence of welding being performed under the stated conditions. The staff believes that the SIE observation was an isolated case rather than a routine practice.

The NRC reviewed the concern that weld undercut in excess of that allowed by AWS D1.1 Code was found on HVAC support 2-H-VC-4997. This concern may be

correct. DPC's evaluation of the concern for undercut shows that undercut is primarily related to fatigue considerations applicable to components and structures under high stress. Fatigue is not a concern in the HVAC duct support systems and stresses for all loading conditions, other than seismic, are relatively low in the HVAC system. DPC's evaluation on this concern was issued by memorandum dated October 29, 1982, by the DPC Chief Engineer of Mechanical/Nuclear Division. Accordingly, the contractor has revised the applicable welding specification for the HVAC supports to take into account the above information and remove overly restrictive undercut requirements.

The petitioner also cites the following SIE findings.

- "There is no traceability of weld procedures to the finished weld." (QP-1)
- "Procedures did not meet code requirements." (QP-1)
- "Welder/supervisor picks welding procedure from all available welding procedures. Supervisor indicates welding procedure(s) used on a support after the support is complete." (CC.4-5F)

The NRC has reviewed the finding that "welder/supervisor picks welding procedure(s) from all available welding procedures and indicates procedure(s) used on a support after welding is completed." The weld foreman maintains up-to-date lists of qualified welders which is used to assign welders to work. Assignment of weld procedures for duct work fabrication is controlled by instructions on Bahnson Drawing No. 2682-8-20 "Typical Duct Details" and for seismic support/hanger fabrication by procedure AFP-CNS-5.001, Revision 5. Most of the material used on safety-related duct work is on the order of 16 gauge or .0635"-thick, galvanized sheet steel. The material used on seismic hangers/supports is also limited in thickness range, i.e., $\frac{1}{4}$ " to $\frac{1}{2}$ " thick, ASTM, A36 or A500 GrB mild steel. Most of the duct work is welded in sections in the

site fabrication shop with the gas metal arc process while the seismic supports are welded in the field with the shielded metal arc process. Having this information the foreman selects one or several welders qualified to fabricate the required welds, and communicates to them the information necessary to perform their assignment.

The requirement and responsibility for preparing and maintaining records subsequent to work completion is established by applicable code requirements and standards. Also, regarding the matter of no traceability of weld procedures to the finished weld of HVAC supports and duct work, the applicable code, AWS D1.1-77, does not require such information to be retained after weld completion and/or weld acceptance. Hence, the contractor's practice is consistent with code requirements.

Beyond the issue raised in the petition, the staff has been pursuing concerns with Bahnson supplied equipment at a number of nuclear plants, including Catawba. NRC Region II was informed of Bahnson equipment problems through the NRC vendor inspection program. See Inspection Reports 99900791/82-01 and 50-400/84-05. From these inspections, it was determined that Bahnson manufactured two safety related HVAC air handling units that were supplied to the Catawba plant. A special Region II inspection was performed on these two units. See Inspection Reports 50-413/84-28 and 50-414/84-16. Bahnson was performing a reinspection, at the plant, of these air handling units at the time of the NRC special inspection. Welding discrepancies, similar to those identified in previous NRC vendor inspections, were identified on the Catawba units by both Bahnson and Region II inspectors. DPC has since reported that the identified weld deficiencies have been evaluated and represent no safety problem. DPC has determined that the units are to be used in the "as-is" condition. Region II identified one violation involving failure to

establish adequate procurement controls. The resolution of the violation identified in inspection report 50-413/84-28 and 50-414/84-16 is still pending. The licensee has submitted and the Region II staff has reviewed the proposed actions for correcting and preventing the recurrence of this violation. The submittal appears to be technically sound and appropriate. While the Regional staff has not yet performed the necessary followup inspection required to close this item, those inspections are scheduled and will be completed in accordance with programmatic requirements.

Conclusions

The results of Region II inspections indicate that there is no substantial evidence to support the contention of an inadequate quality assurance program for vendors which could preclude the system from performing its intended function and thus compromise plant safety.

The results of NRC inspections performed between the years 1980 and 1983 show that the HVAC contractor is fabricating, inspecting and erecting the HVAC system consistent with applicable code and specification requirements and NRC commitments. Although certain deficiencies have been identified in the area of QC inspections and QA/QC records, these appeared to be isolated cases. These inspections found no evidence of unqualified welders fabricating safety-related welds or flawed welding procedures being used to perform this work. The staff finds no basis for requiring additional measures other than those planned during implementation of the routine NRC inspection program.

Based on review of the NRC staff inspection program findings, review of the SIE report and subsequent review of the petitioner's identified SIE findings, the staff concludes that DPC has developed and implemented an acceptable vendor control program.