



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

RELATED CORRESPONDENCE

August 30, 1984

Alan S. Rosenthal, Chairman  
Atomic Safety and Licensing Appeal Board  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Thomas S. Moore  
Atomic Safety and Licensing Appeal Board  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Howard A. Wilber  
Atomic Safety and Licensing Appeal Board  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

In the Matter of  
DUKE POWER COMPANY, ET AL.  
(Catawba Nuclear Station, Units 1 and 2)  
Docket Nos. 50-413 and 50-414 *OK*

FILE OF RECORDS  
SECTION

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DOCKETED  
USNR

Dear Members of the Appeal Board:

Since the close of the hearing on safety issues in the Catawba proceeding, Staff counsel has kept the Licensing Board which heard those issues informed of notices of violation issued to Applicants on matters relevant to hearing issues--specifically in the quality assurance area. Where pertinent to such notices of violation, Applicants' responses and Significant Deficiency Reports have also been sent to the Board.

With the issuance of the June 22, 1984 Partial Initial Decision (PID) of the Licensing Board and Intervenor's filing of a notice of appeal with regard thereto, jurisdiction over the matters decided in the PID, with certain specified exceptions, has passed to the Appeal Board. Accordingly, the Staff will forward notices of violation and other materials relevant to issues decided in the PID to the Appeal Board for information as appropriate.

You will find enclosed Applicants'/Licensees' response relating to Violation No. 413/84-49-01, 414/84-23-01, on inspections of concrete for honeycomb. The subject violation and inspection report are included as well. These documents are relevant to matters considered by the Licensing Board in its resolution of quality assurance issues.

Sincerely,

George E. Johnson  
Counsel for NRC Staff

Enclosures: As stated

cc w/ enclosures: Service list

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JUL 6 1984

Duke Power Company  
ATTN: Mr. H. B. Tucker, Vice President  
Nuclear Production Department  
422 South Church Street  
Charlotte, NC 28242

Gentlemen:

SUBJECT: REPORT NOS. 50-413/84-49 AND 50-414/84-23

Thank you for your response of June 22, 1984, to our Notice of Violation issued on May 24, 1984, concerning activities conducted at your Catawba facility. We have evaluated your response and found that it meets the requirements of 10 CFR 2.201. We will examine the implementation of your corrective actions during future inspections.

We appreciate your cooperation in this matter.

Sincerely,

*D Verrelli for*

Richard C. Lewis, Director  
Division of Reactor Projects

cc: R. L. Dick, Vice President - Construction  
J. W. Hampton, Station Manager

bcc: NRC Resident Inspector  
G. Johnson, E.I.D.  
Document Control Desk  
State of North Carolina

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DUKE POWER COMPANY

P.O. BOX 33189  
CHARLOTTE, N.C. 28242

HAL B. TUCKER  
VICE PRESIDENT  
NUCLEAR PRODUCTION

TELEPHONE  
(704) 373-4531

June 22, 1984

Mr. James P. O'Reilly, Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, NW, Suite 2900  
Atlanta, Georgia 30303

Re: RII:JRH  
50-413/84-49  
50-413/84-23

Dear Mr. O'Reilly:

Please find attached a response to violation No. 413/84-49-01, 414/84-23-01 as identified in the above referenced inspection report. Duke Power Company does not consider any information contained in this inspection report to be proprietary.

Very truly yours,

*Hal B Tucker*

Hal B. Tucker

*BY HBT*

LTP/rhs

Attachment

cc: NRC Resident Inspector  
Catawba Nuclear Station

Mr. Robert Guild, Esq.  
Attorney-at-Law  
P. O. Box 12097  
Charleston, South Carolina 29412

Palmetto Alliance  
2135½ Devine Street  
Columbia, South Carolina 29205

Mr. Jesse L. Riley  
Carolina Environmental Study Group  
854 Henley Place  
Charlotte, North Carolina 28207

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Duke Power Company  
Catawba Nuclear Station  
Violation 413/84-49-01, 414/84-23-01

Response

1. Duke Power admits the Violation.

2. Cause of Violation

QA Procedure M-2, "Inspection of Design Concrete", was not properly interpreted by site personnel to require honeycomb inspections in a timely manner after concrete form removal. Construction did not always remove forms on pours immediately after the required curing period for certain construction reasons. Due to irregularity of form removal and lack of specified controls to require Construction to remove forms at scheduled times, inspections were not effectively scheduled for the many different areas of concrete placement where forms were removed at Construction's discretion after the required curing period. There was communication between Builder Craft and Civil Inspectors when forms were being removed, especially at times when Construction was interested in removing forms upon completion of required curing periods to continue further concrete placement in the area. If forms remained in place for extended periods longer than a month, communication between craft and inspectors of when forms were being removed may not have been as definite as when removed early after curing period to facilitate further construction.

3. Action

A complete walkdown of all Unit 1 QA Condition concrete structures has been made by QA Civil Inspectors for any honeycomb concrete. All areas requiring repairs have been identified and corrected.

Furthermore, prior to structure turnover to Nuclear Production as related to concrete (ref: QAP S-5), a final walk through will be made by Construction and a separate inspection by QA Civil inspectors for completeness and any surface imperfections.

4. Corrective Action to Avoid Further Violations

Major concrete work at Catawba Units 1 and 2 is complete; however, QA Procedure M-2 will be revised to clearly state requirements for future work.

5. Status

Full compliance for Unit 1 has been achieved as a complete walkdown has been conducted.

Full compliance for Unit 2 will be accomplished by November 30, 1984.

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MAY 24 1984

Duke Power Company  
ATTN: Mr. H. B. Tucker, Vice President  
Nuclear Production Department  
422 South Church Street  
Charlotte, NC 28242

Gentlemen:

SUBJECT: REPORT NOS. 50-413/84-49 AND 50-414/84-23

On May 1-4, 1984, NRC inspected activities authorized by NRC Construction Permit Nos. CPPR-116 and CPPR-117 for your Catawba facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed inspection report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

The inspection findings indicate that certain activities violated NRC requirements. The violations, references to pertinent requirements, and elements to be included in your response are presented in the enclosed Notice of Violation.

In accordance with 10 CFR 2.790(a), a copy of this letter, its enclosures, and your reply will be placed in NRC's Public Document Room upon completion of our evaluation of the reply. If you wish to withhold information contained therein, please notify this office by telephone and include a written application to withhold information in your response. Such application must be consistent with the requirements of 2.790(b)(1).

The responses directed by this letter and the enclosures are not subject to the clearance procedures of the Office of Management and Budget issued under the Paperwork Reduction Act of 1980, PL 96-511.

Should you have any questions concerning this letter, please contact us.

Sincerely,

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Richard C. Lewis, Director  
Division of Reactor Projects

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Enclosures:

1. Notice of Violation
2. Inspection Report Nos. 50-413/84-49  
and 50-414/84-23

cc w/encls:

R. L. Dick, Vice President - Construction  
J. W. Hampton, Station Manager

bcc w/encls:  
(See page 2)

MAY 24 1984

Duke Power Company

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bcc w/encs:  
NRC Resident Inspector  
G. Johnson, ELD  
Document Control Desk  
State of South Carolina

RII *[Signature]*  
JHarris:jw  
5/18/84

RII *[Signature]*  
TConlon  
5/18/84

RII *[Signature]*  
AHerd  
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RII  
JOlshinski  
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HDance  
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RII *[Signature]*  
RCLewis  
5/23/84

ENCLOSURE 1

NOTICE OF VIOLATION

Duke Power Company  
Catawba

Docket Nos. 50-413 and 50-414  
License Nos. CPPR-116 and CPPR-117

The following violation was identified during an inspection conducted on May 1-4, 1984. The Severity Level was assigned in accordance with the NRC Enforcement Policy (10 CFR Part 2, Appendix C).

10 CFR 50, Appendix B, Criteria V as implemented by QA Topical Report (Duke-1A) Section 17.1.5.2 requires that activities affecting quality be accomplished in accordance with prescribed instructions, procedures, or drawings. Procedure M-2, Revision 8, Inspection of Design Concrete, specifies that honeycomb shall be identified after concrete forms are removed.

Contrary to the above, discussions with responsible engineers and examination of documentation showed that numerous honeycomb defects were not identified at the time of form removal in concrete pours made prior to 1979.

This is a Severity Level IV violation (Supplement II).

Pursuant to 10 CFR 2.201, you are required to submit to this office within 30 days of the date of this Notice, a written statement or explanation in reply, including: (1) admission or denial of the alleged violation; (2) the reasons for the violation if admitted; (3) the corrective steps which have been taken and the results achieved; (4) corrective steps which will be taken to avoid further violations; and (5) the date when full compliance will be achieved.

Security or safeguards information should be submitted as an enclosure to facilitate withholding it from public disclosure as required by 10 CFR 2.790(d) or 10 CFR 73.21.

Date:           MAY 24 1984          

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

Report Nos.: 50-413/84-49 and 50-414/84-23

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

Docket Nos.: 50-413 and 50-414

License Nos.: CPPR-116 and CPPR-117

Facility Name: Catawba 1 and 2

Inspection at Catawba site near Rock Hill, South Carolina

Inspector: *T. E. Conlon for* 5/16/84  
 J. R. Harris Date Signed

Approved by: *T. E. Conlon* 5/16/84  
 T. E. Conlon, Section Chief Date Signed  
 Engineering Branch  
 Division of Reactor Safety

SUMMARY

Inspection on May 1 - 4, 1984

Areas Inspected:

This routine, unannounced inspection involved 26 inspector-hours onsite in the areas of structural concrete, an unresolved item and a previously identified licensee item.

Results:

Of the three areas inspected, no violations or deviations were identified in two areas; one apparent violation was found in one area (Failure to Identify Concrete Honeycomb - paragraph 3).

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*R. L. Dick, Construction Vice President
- \*E. M. Couch, Project Administrator
- \*L. R. Davidson, Project QA Manager
- \*R. W. Ballard, Chief, Construction Technical Support
- \*T. H. Robertson, Civil Construction Technical Support Supervisor
- \*R. A. Morgan, Senior QA Engineer
- \*K. W. Schmidt, QA Engineer
- \*D. V. Ethington, Assistant QA Engineer
- \*D. P. Hensley, QA Technician
- J. Warren, QC Engineer Civil
- C. Arnold, Civil Field Engineer
- D. Allison, Civil QC Inspector

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on May 4, 1984, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspection findings. The following item was opened:

Violation 413/84-49-01, 414/84-23-01, Failure to Identify Concrete Honeycomb.

### 3. Licensee Action on Previous Enforcement Matters

(Closed) Unresolved Item (414/80-33-01) Identification of Concrete Honeycomb. The inspector observed several honeycomb areas in concrete pour numbers 2W72 and 2W74 made on August 25, 1977, which had not been repaired and which did not appear to have been identified, as required by procedure M-2 Revision 8, Inspection of Design Concrete. Procedure M-2 Revision 8, requires the structural inspector to document honeycomb and void areas after the forms are removed. Review of documentation for wall pours 2W72 and 2W74 in the Unit 2 Containment and for several wall pours in the Unit 1 containment showed that honeycomb was not being documented by structural inspectors at the time of form removal. This unresolved item is closed and is upgraded to a violation. The violation was identified to the licensee as violation 413/84-49-01, 414/84-23-01, Failure to Identify Concrete Honeycomb.

In response to the unresolved item the licensee has been performing a 100 percent reinspection of concrete surfaces on all structures in Unit 1 and Unit 2 and is repairing all identified defects. Work on Unit 1 is scheduled to be completed by June 1, 1984. Work on Unit 2 is scheduled to be completed by November 1984. During this inspection, the NRC inspector examined documentation on the repairs and did a walkdown inspection of

honeycomb repairs made on all structures in the Unit 1 powerblock and the annulus of the Unit 2 containment building. Examination of repairs and documentation showed that honeycomb is now being identified and repaired in accordance with procedures.

4. Unresolved Item

Unresolved items were not identified during this inspection.

5. Independent Inspection

The inspector examined ongoing work activities in the concrete and soils testing laboratory, calibration controls on testing equipment and preparation for a concrete placement around the Unit 2 pressurizer.

6. Licensee Identified Items (92700)

(Closed) Item CDR 413-414/82-23, Abandoned Drill Hole Repairs. This item was reported to NRC on November 8, 1982. The licensee submitted an interim report on December 8, 1982, a final report on May 6, 1983 and an amended final report on April 18, 1984.

During drilling of a hole for an anchor in the Auxiliary Building it was necessary to partially drill into an abandoned drill hole which had been repaired with SikaTop 122. The repair material was found to be weak and could not support torquing of the anchor to the required load. QA personnel investigated this problem and found that construction craft personnel were not following the approved construction procedure for mixing the two components for SikaTop 122. Anchor capacity could be adversely affected if the anchor is located partially in or near weak repairs made with SikaTop 122.

Investigations showed that craft personnel were mixing and placing the SikaTop 122 at a "dry pack" consistency instead of the wet mortar or grout consistency obtained when following the manufacturers mixing directions. The licensee performed tests in which SikaTop 122 was mixed to a "dry pack" consistency and then used to repair 5/8 inch, 1 inch, and 2 inch diameter holes drilled in a test slab. After curing, 5/8 inch diameter holes were drilled at locations from completely within a repair to tangent to a repair. Expansion anchors were then installed into the repairs and axially loaded to failure. Test results showed that the anchor capacities in the dry pack were equivalent to capacities of anchors set in sound concrete. The licensee also made test cube specimens with the dry pack and the specified wet grout mix and made compressive strength tests on the test cubes after the specified curing time. Test results showed that the SikaTop 122 will have an acceptable strength when properly mixed as both a dry pack and as a wet grout mix. However, the investigation also showed that in mixing SikaTop 122 to a dry pack consistency, the material tended to dry quickly once mixed. The dried material would have been weak and would not have allowed torquing of the anchor. Thus additional tests were initiated to

determine the likelihood of other weak repairs that could affect anchor performance.

A list of hangers whose anchors were installed during the affected time frame was compiled. A statistical sampling approach using random numbers was used to determine a 95% confidence level that less than 5% of anchors installed could be significantly affected by a repair made with the SikaTop 122. Anchors from the selected sample were loaded to 125 percent of their design capacity. A total of 119 anchors on 74 hangers were tested and found to hold the imposed load. In addition to the above, Swiss hammer tests were made on 125 repair areas in walls and 78 repair areas located in ceilings that were judged to be typical of repairs made during the affected time frame. The sample size was made in accordance with guidance in Military Standard 105D. The Swiss hammer was calibrated to the SikaTop 122 material for horizontal and overhead hammer positions and all Swiss hammer tests were performed by a single operator using one hammer. Analysis of the Swiss hammer data showed that there is a 99% probability that the repairs will exceed 3300 psi and an 82% probability that the repair will exceed 5000 psi. The capacity values for anchors found in Specification CNS-1206.00-04-0001, "Design Specification for Nuclear Safety-Related Pipe Supports" are based on 3000 psi concrete strength.

Based on the above investigations and testing the following conclusions were drawn:

- a. When SikaTop 122 is properly blended and placed as a dry pack, the repair will have acceptable strength and will not affect the ultimate capacity of anchors.
- b. The root cause of the weak repair that was discovered was either the use of dry material which was not sufficiently combined with the liquid component or the use of mixed material which was allowed to dry out before using.
- c. The weak repair which initiated concerns was an isolated case. The probable occurrence of poor repairs is low.
- d. Tests on in-place anchors indicate to a 95% confidence level that anchors are properly installed into sound material and that design requirements will be met.
- e. Test of field repairs indicate a 96% probability that repairs are sufficiently sound such that no reduction in pullout capacity will take place.

A new procedure had been developed with guidance for use of SikaTop materials for concrete repairs. Craft personnel have been retrained in the proper method for mixing and placing SikaTop materials. This item is closed.