

HIC- ACQUISITION NO <b>N/A</b>		VLT <b>WESTINGHOUSE</b>		VIS VIOLATED <b>A-52</b> <b>11/17/83</b>		FORM G-14 DUR CONSTRUCTION PROJECT - <b>SBA</b> <b>RECORD COPY</b> NONCONFORMING ITEM REPORT USE BALL POINT PEN ONLY	
MPS PG NO <b>N/A</b>		MECH/ELEC SYSTEM <b>RN</b>				<b>3866</b>	
YES [ ] NO [ ]		IDENTIFICATION METHOD [ ] OTHER					
LOCATOR OF ITEM		UNSE.#1					
DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM							
<p>Re: RN PUMP MOTOR: NUCLEAR SER. WATER PUMP MOTOR.</p> <p>1. SPACE HEATER NAMEPLATE MOUNTED AT T/C CONNECTION BOX ON OPPOSITE SIDE OF MOTOR FROM SPACE HEATER CONNECTION BOX.</p> <p>2. LOWER BEARING T/C IS BROKEN.</p> <p>3. COOLING WATER FLANGE OPENINGS (4) NOT COVERED.</p>							
EVALUATION/DISPOSITION RESPONSIBILITY <b>C.A. Cole</b> <b>9-8-78</b>				DATE REVIEWED <b>J.R. Danner</b> <b>9-13-78</b>			
DISPOSITION <b>See Below</b>				MTR. SER # <b>15-78-74F18634</b>			
EVALUATION/JUSTIFICATION 1. REMOVE space heater nameplate from T/C connection box and attach to space heater connection box. 2. COVER COOLING WATER FLANGE OPENINGS. 3. LOWER bearing T/c will be replaced by Westinghouse serviceman. Westinghouse is advised of the problem in the attached letter of September 12, 1978.							
BY <b>also enclosing</b>		DATE <b>10/27/78</b>		TO <b>T.C. Roberts</b>		DATE <b>11-6-78</b>	
ACT OR EFFECT REQUIRED				AS ASSIGNED TO		DATE	
Relocate space heater nameplate to space heater connection box				Elect Craft		(29) Mar 12-12-78	
Cover cooling water flange openings				Elect Craft		(29) Mar 12-12-78	
Coordinate the replacement of Lower Bearing T/c with Westinghouse Serviceman.				Tech Support		(03) SEE BELOW	
B405240516 B31117 PDR ADOCK 05000413 G							
DATE <b>11/27/78</b>				DATE <b>11/28/78</b>			
ACTION/TITLE <b>SEE UCI 5767 WHICH CREATES THIS UCI</b>				DATE <b>11/13/79</b>			
DISTRIBUTION 2				1			
2				1			
2				1			

P. O. BOX 33189

DUKE POWER COMPANY  
GENERAL OFFICES  
422 SOUTH CHURCH STREET  
CHARLOTTE, N. C. 28212

TELEPHONE AREA 704  
373-4011

September 12, 1978

G-1A

3865

Mr. C. K. Moore  
Westinghouse Electric  
P. O. Box 32817  
Charlotte, N. C. 28232

SUBJECT: Catawba Nuclear Station  
Nuclear Service Water Pump Motor  
FILE: CN-1318.20  
H.P.S. Co. Order No. A-71135  
Westinghouse CH-18020-L7

Dear Chester:

During Alex Ehrenburg's visit to Catawba Nuclear Station for NSW pump motor inspection we found lower bearing thermocouple leads broken near the place the T.C. is attached to the bearing. Please advise when Westinghouse will make the necessary repairs.

Sincerely yours,

C. J. Wylie, Chief Engineer  
Electrical Division

BY: Alex Ehrenburg

CJW/AIE/JPV/kkm

APPROVED:

J. P. Vogler

NO ATTACH

DUKE POWER COMPANY

CONSTRUCTION DEPARTMENT  
CATAWBA NUCLEAR 1 & 2  
CLOVER, S. C. 29710

P. O. BOX 223

TELEPHONE AREA 803  
831-1812

March 29, 1979

MEMO TO FILE

Catawba 1-2  
Nuclear Service Water Pump Motor

One of the nuclear service water pump motors presently located in the No. 1 Warehouse is nonconformed and is covered by NCI #3865. The nature of the NCI will not affect the moving of the motor so it can be installed on the pump. Action is currently being done in accordance with the NCI, but minor problems are holding up its immediate completion.

*J W Beam*  
J W Beam

Technical Support-Electrical

JWB/lwl

*R. M. Hargis*  
\_\_\_\_\_  
QA Approval

*A. J. Hargis*  
\_\_\_\_\_  
QA Approval

FORM

0-1A

SION

3

1. DRAWING NO. N/A	2. VENDOR/LOCATION N/A	3. MOUNTING METHOD H-5
4. WPS NO. N/A	5. WELD/ELEC SYSTEM EOA	6. CP-23 CP-23B
7. IDENTIFICATION METHOD <input type="checkbox"/> 0-1B <input type="checkbox"/> ONLY TAPE <input type="checkbox"/> OTHER		

DUKE COMPANY  
CONSTRUCTION DEPARTMENT  
PROJECT CATAWBA

RECORD COPY

NONCONFORMING ITEM REPORT  
USE BLACK BALL POINT PEN ONLY

8. LOCATION OF ITEM CONTROL ROOM 594'EL. 16. SERIAL NO. 4386

10. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM BOLTS, (1/2") SUPPLIED BY VENDER FOR MOUNTING MAIN CONTROL BOARDS TO BASE CHANNEL, WERE TOO SHORT. BOLTS (1/2" X 1 1/4") ISSUED BY WAREHOUSE AND INSTALLED IN CONTROL BOARD BASES ARE NOT IDENTIFIED AS SAFETY RELATED BOLTING MATERIAL.

REASON FOR NOT IDENTIFYING WAREHOUSE NO. 1: THERE ARE APPROX. 150 BOLTS THROUGHOUT CONTROL ROOM.

14. EVALUATION/DISPOSITION RESPONSIBILITY ☐ CORN ☒ DESIGN ☐ QA ☐ WSSS ☐ OVERSIGHT

11. ORIGINATOR T. Hammy DATE 11/30/78 12. REVIEW DATE 11-30-78 13. CA REVIEW DATE 11-1-78

17. DISPOSITION Acceptable - pending approval of test results. 18. REPORT TO MGMT ☐ YES ☒ NO

EVALUATION/JUSTIFICATION

ALL 1/2" DESIGN ORDERED BOLTS (CATAWBA) ARE OR ARE EQUAL TO ASTM 307 AND ARE SUITABLE FOR USE ON SAFETY SYSTEMS.

ALL REQUESTIONS FOR 1/2" BOLTS THAT WOULD BE FOUND WERE RESEARCHED AND FOUND TO BE AS ABOVE.

(SEE ATTACHED SHEET)

19. BY R. G. Hammy DATE 4/25/79 20. TECHNICAL APPROVAL DATE 4/25/79 21. U.S. APPROVAL DATE 2-12-79

22. ACTION/INSPECTION REQUIRED

23. ASSIGNED TO	24. PERFORMED BY	DATE
CECY		
QCME		
1) Perform test in accordance with Attachment	SRG	2/11/81
2) Test results of NCIS 4495 and 4496 have been accepted by Design Elect. on 4/25/79 for all bolts received of the types tested Jul 11-18-79	CEEL	8/14/81
3) Test results were found to be unacceptable. See NCIS No. on 4/25/79	CEEL	NA.

25. ACTION/INSPECTION EXCEPTIONS OR RETIERS

26. U.S. APPROVAL DATE 4-25-79

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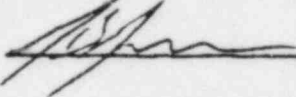
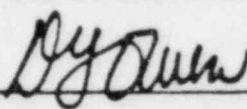
28. DATE 4/27/79



NCI 4386

17. The 1/2 X 1 1/4" bolts used by Construction for mounting the Main Control Boards are to be equivalent in strength to ASTM A-307 bolts.

These bolts should be included in the sample program of 1/2" bolts being tested under the resolutions of NCI 4495 and NCI 4496 to verify their acceptability for this safety-related application.

19. By:  Date: 4/18/79
20. Technical Approval:  Date: 4/18/79
21. QA Approval: TC Roberts Date: 4-19-79

DISTRIBUTION	PROCESSED PAGE	SERIALS	COMMENTS	DATE OF ACQUISITION	DATE OF ANALYSIS	ANALYST
NUMBER OF COPIES	2	1	1	1	1	
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FORM

Q-1A

EVSIO

9

ON NO.

3. VEN

KATION

4. DOCUMENTS VIOLATED

1A

1A

CNS-1390

01-00-0017

PART-4

(STORAGE)

DUKE POWER CO. BY  
CONSTRUCTION OF  
PROJECT CATANBARECORD COPY  
NONCONFORMING ITEM REPORT  
USE BLACK BALL POINT PEN ONLY

5. MPS NO NO

1A

6. WOOD / ELEC SYSTEM

EOA

8. IDENTIFICATION METHOD

0-183 3 ONCE TAPE

OTHER

NOT PRACTICAL

7. LOCATION OF ITEM CONTROL ROOM - ELEV. 594

16 SERIAL NO

UNIT I AND II

10. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM  
DURING ROUTINE  
INSPECTION, IT HAS BEEN NOTED THAT  
ALL WIRING AND COMPONENTS INSTALLED IN  
MAIN CONTROL BOARD PANELS HAVE BEEN  
SUBJECTED TO SEVERE MOISTURE  
CONDITIONS (APPARENTLY CONDENSATION)

14. EVALUATION/DISPOSITION RESPONSIBILITY

X CORIST

DESIGN

QA

N555

QV HAT

08

11. ORIGINATED

DATE

12. REVIEW

DATE

13. QA REVIEW

DATE

R. H. Amey

12-4-78

R. H. Amey

12-4-78

R. H. Amey

12-4-78

17. DISPOSITION

Check circuits, dry component

18. REPORT TO MGMT.

YES X NO

EVALUATION/JUSTIFICATION

Randomly check the operation of a sufficient  
number of circuits to assure proper component  
operation. Replace any components that are found  
to be inoperable. All components will  
be checked for operation prior to transfer to steam  
production. Assure that wiring and components  
have been dried. Remove tags.

19. BY

DATE

20. TECHNICAL APPROVAL

DATE

21. QA APPROVAL

DATE

J. W. Rowell

12-12-78

J. W. Rowell

12-12-78

R. H. Amey

12-13-78

22

ACTION/INSPECTION REQUIRED

23. ASSIGNED TO

PERFORMED BY

DATE

1. Randomly check circuits  
2. Assure dryness - Remove tags

Crost (29)

B. H. Amey

12-19-78

G. C. (14)

B. H. Amey

12-19-78

J. W. Rowell

DATE 12-12-78

26. QA APPROVAL

R. H. Amey

DATE 12-13-78

28. ACTION/INSPECTION EXCEPTIONS OR REMARKS

DISTRIBUTION

PROJECT

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REQUESTION NO. <div style="border: 1px solid black; padding: 2px; display: inline-block;">N/A</div>		1. VENDOR/LOCATION <div style="border: 1px solid black; padding: 2px; display: inline-block;">N/A</div>		4. DOCUMENTS VIOLATED <div style="border: 1px solid black; padding: 2px; display: inline-block;">M-52 Rev. 1</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">CP-115 Rev. 4</div>		DUKE POWER COMPANY CONSTRUCTION DEPARTMENT PROJECT <u>CATAWBA</u>	
2. MPS, PO NO <div style="border: 1px solid black; padding: 2px; display: inline-block;">N/A</div>		3. MECH/ELEC SYSTEM <div style="border: 1px solid black; padding: 2px; display: inline-block;">N/A</div>		RECORD COPY NONCONFORMING ITEM REPORT USE BLACK BALL POINT PEN ONLY			
7. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> <div style="border: 1px solid black; padding: 2px; display: inline-block;">1/11/79</div>		8. 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FORM 0-1A		REVISION 9	
DUKE UNIVERSITY CONSTRUCTION DEPARTMENT PROJECT <u>Catawba</u>		RECORD COPY	
NONCONFORMING ITEM REPORT			
USE BLACK BALL POINT PEN ONLY			
1. REQUISITION NO. <u>N/A</u>	3. VENDOR LOCATION <u>N/A</u>	DOCUMENTS VIOLATED <u>M-52 Rev. 1</u> <u>CP-115 Rev. 4</u>	
2. MPS PO NO. <u>N/A</u>	4. MECH/ELEC SYSTEM <u>N/A</u>		
5. IDENTIFICATION METHOD <input checked="" type="checkbox"/> Q-115 <input type="checkbox"/> Q-116 <input type="checkbox"/> Q-117 <input type="checkbox"/> Q-118 <input type="checkbox"/> Q-119 <input type="checkbox"/> Q-120 <input type="checkbox"/> Q-121 <input type="checkbox"/> Q-122 <input type="checkbox"/> Q-123 <input type="checkbox"/> Q-124 <input type="checkbox"/> Q-125 <input type="checkbox"/> Q-126 <input type="checkbox"/> Q-127 <input type="checkbox"/> Q-128 <input type="checkbox"/> Q-129 <input type="checkbox"/> Q-130 <input type="checkbox"/> Q-131 <input type="checkbox"/> Q-132 <input type="checkbox"/> Q-133 <input type="checkbox"/> Q-134 <input type="checkbox"/> Q-135 <input type="checkbox"/> Q-136 <input type="checkbox"/> Q-137 <input type="checkbox"/> Q-138 <input type="checkbox"/> Q-139 <input type="checkbox"/> Q-140 <input type="checkbox"/> Q-141 <input type="checkbox"/> Q-142 <input type="checkbox"/> Q-143 <input type="checkbox"/> Q-144 <input type="checkbox"/> Q-145 <input 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10-30-75

DISTRIBUTION	No.	SUBJECT	ELECT	MAT	HAB
NATIONAL INSTITUTE OF EDUCATION	2		1	1	1
OF EDUCATION	2		1	1	1



DUKE POWER COMPANY  
CONSTRUCTION DEPARTMENT  
PROJECT CATAWBA 1RECORD COPY  
NONCONFORMING ITEM REPORT  
USE BLACK BALL POINT PEN ONLY

1. REQUISITION NO. N/A	3. VENDOR / LOCATION N/A	4. DOCUMENTS VIOLATED CN 1214-3 Rev 5
5. MPS PO NO N/A	6. MECH / ELEC SYSTEM N/A	
7. MISC. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> PAC 11/1/79	8. IDENTIFICATION METHOD <input checked="" type="checkbox"/> NO. 185 <input type="checkbox"/> I <input type="checkbox"/> TAP <input type="checkbox"/> OTHER <input type="checkbox"/> NOT PRACTICAL	

9. LOCATION OF ITEM Auxiliary Building EL 560' SERIAL NO 4316  
Coke 57' MM

10. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM

45-KVA Lighting Transformer 1KAB  
Not seismic mounted by detail on CN 1214-3 Rev 5  
Mounted with four 3/4 Anchors, Print calls for  
six 1/2 Anchors

14. EVALUATION / DISPOSITION RESPONSIBILITY ☐ CONST ☒ DESIGN ☐ QA ☐ N555 DIV CIVIL 3211. ORIGINATED DATE 11-20-78 13. REVIEWER REVIEW DATE 11-20-78 15. QA REVIEW DATE 11-21-78  
Ray Hamline S. Duvon Harry17. DISPOSITION CN 1214-3 OK as is 18. REPORT TO MGMT ☐ YES ☒ NO

EVALUATION / JUSTIFICATION

Lighting transformer 1KAB mounted using 4-3/4"  $\phi$   
steel anchors is acceptable. Drawing CN 1214-3  
I will detail the required changes

19. BY Michael Duran 1-3-79 20. TECHNICAL APPROVAL MC Shuen 1-3-79 21. QA APPROVAL IC Roberts 1-12-79

22. ACTION / INSPECTION REQUIRED 23. ASSIGNED TO GC 27. PERFORMED BY R. Hamline 1-23-79

Remove MCI tape & tag when Drawing  
CN 1214-3 is revised to show the  
transformer mounting detail

24. ACTION / INSPECTION / EXCEPTIONS OR REMARKS  
Michael E. Rose DATE 1/18/79 25. QA APPROVAL R. Hamline DATE 1-19-79

26. ACTION / INSPECTION / EXCEPTIONS OR REMARKS

DISTRIBUTION  
1. PROJECT 2. SITE 3. FILE 4. ELEC 5. MECH 6. QA 7. CIVIL 8. CONSTRUCTION 9. RECORDS 10. OTHER

NUMBER OF COPIES 2 1 1 1 1 1 1 1 1 1



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FORM

Q-1A

VISION

9

2 REQUISITION NO.

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4 DOCUMENTS VIOLATED

DUKE POWER CO  
CONSTRUCTION DEPT. MENT  
PROJECT Catawba

RECORD COPY

NONCONFORMING ITEM REPORT

USE BLACK BALL POINT PEN ONLY

1 REQUISITION NO.

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4 DOCUMENTS VIOLATED

DUKE POWER CO  
CONSTRUCTION DEPT. MENT  
PROJECT Catawba

RECORD COPY

NONCONFORMING ITEM REPORT

USE BLACK BALL POINT PEN ONLY

5 MPS PO NO

6 MECH/ELEC SYSTEM

7 NO YES NO

8 IDENTIFICATION METHOD  
☒ 0-183 ☐ ONCT TAPE  
☐ OTHER  
☐ NOT PRACTICAL

9 LOCATION OF ITEM

Warehouse # 1

Electrical Fab Shop

10 SERIAL NO

4372

10 DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM

LEATC-11 Center of C Channel bowed out 3/4" at Air in  
Light Door bowed out 2 1/2". Panel Damaged During  
Routine Handling.

14 EVALUATION/DISPOSITION RESPONSIBILITY

☒ CORIST☐ DESIGN☐ QA☐ NSSS

DIV ELEC 0.9

11 ORIGINATED

DATE

13 SERIAL NO REVIEW

DATE

15 QA REVIEW

DATE

17 DISPOSITION

Repair Cabinet

18 REPORT TO MGMT

☐ YES ☒ NO

EVALUATION/JUSTIFICATION

Repair cabinet and ~~inspect~~ by straightening Bow in door and  
panel. Reinspect cabinet after repair remove tape and tag

19 BY J. W. Powell

DATE

12-12-78

20 TECHNICAL APPROVAL

DATE

12-12-78

21 QA APPROVAL

DATE

12-12-78

22 ACTION/INSPECTION REQUIRED

23 ASSIGNED TO

24 PERFORMED BY

DATE

1. Repair cabinet

2. Inspect cabinet remove tape &amp; tag

Craft 29 ~~Sumner~~ 12-31-78

GC 16 J. Coleman 12-29-78

25 BY J. W. Powell

DATE

12-12-78

26 QA APPROVAL

DATE

12-12-78

28 ACTION/INSPECTION EXCEPTIONS OR REMARKS

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FORM 0-1A		REVISION 9	
3. VENDOR/LOCATION N/A		DOCUMENTS VIOLATED H-5 CP-23 CP-27B EN-1903-01	
4. MISC/ELEC SYSTEM ENC		5. IDENTIFICATION METHOD CIRCUITS OTHER NOT PRACTICAL	
6. LOCATION OF ITEM AUXILIARY BLDG. UNIT I+II		7. SERIAL NO 4495	
8. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM ALL ELEV'S 1/2" BOLTS USED THROUGHOUT AUX. BLDG. CABLE TRAY SUPPORT SYSTEM ARE NOT IDENTIFIED AS "UNISTRUT" (DESIGNATED AS SUCH ON DESIGN DRAWINGS IE. EN-1903-01) NEITHER ARE THEY IDENTIFIED AS SAFETY RELATED STOCK BOLTING MATERIAL PER CP-23 (CP-27B) THE USE OF THESE BOLTS MAY CONTINUE UNTIL THIS PROBLEM IS RESOLVED. NOT IDENTIFIED WITH QIB TAG - AREA TOO EXTENSIVE			
9. EVALUATION/PROPOSITION RESPONSE LIT CONST <input type="checkbox"/> DESIGN <input checked="" type="checkbox"/> QA <input type="checkbox"/> NISS <input type="checkbox"/> DATE 4-0			
10. ORIGINATOR T. Hamay 12/13/78		11. DATE 12/13-78	
12. DISPOSITION Acceptable - pending approval of test results		13. REPORT TO MGMT NO	
EVALUATION/JUSTIFICATION Based on the attached letter by RG Maloney dated Feb 2 1979 and the attached certifications from Sure-loc and Southeastern Bolt and screw, it has been established that all bolting material (ie) was either ASTM A307 or SAE 429 Grade 2 which is equivalent to A307. Design drawings designating bolting material have been revised to indicate that all bolts used on cable tray hanger connections shall be ASTM A307 or equivalent. (SEE ATTACHED SHEET)			
14. BY W. E. Thomas 2-26-79		15. DATE 2-26-79	
16. ACTION/INSPECTION REQUIRED		17. G. A. APPROVAL T. C. Roberts 2-28-79	
18. 1) Perform test in accordance w/ Attachment 4/1 Attachment 2) When results of testing program have been accepted by Design Elect, attach to this NCI. 4/25/79 3) Test results found acceptable by Design Elect - 4/25/79 for all bolts received of the types tested. 10-15-79 4) Test results found to be unacceptable by Design Elect. See NCI No. 4/25/79		19. 20. G. A. APPROVAL T. C. Roberts 2-28-79	
21. T. H. Robertson 12/10/80		22. DATE 4-25-79	
23. ACTION/INSPECTION EXCEPTIONS OR REMARKS * IF BOLTS PROVE UNSAT THEY SHALL BE REMOVED.			
24. DISTRIBUTION PROJECT 2			

- ~~17. The 1/2" diameter bolts used in the nuclear safety related cable tray support systems are to be equivalent in strength to ASTM A-307 bolts. All appropriate design drawings have been revised to indicate this.~~

~~To verify that all 1/2" diameter bolts used meet this strength requirement, a random sample of each bolt size shall be secured by Construction from those bolts which are not indentified by appropriate markings. The sample sizes shall be in accordance with B W Logan's attached letter of 3/29/79. These samples shall then be tested in accordance with C L Ray's attached test procedure of 3/20/79.~~

~~The results of this testing program shall be sent to Design Engineering/ Electrical Division for determination of acceptability.~~

19. By: *[Signature]* Date: 4/18/79

20. Technical Approval: *Dyomew* Date: 4/18/79

QA Approval: *TC Roberts* Date: 4-19-79

(SEE REVISION 2 - ATTACHED)



17. The  $\frac{1}{2}$ " diameter bolts used in the nuclear safety related cable tray support systems are to be equivalent in strength to ASTM A-307 bolts. All appropriate design drawings have been revised to indicate this.

To verify that all  $\frac{1}{2}$ " diameter bolts used meet this strength requirement, a random sample of each bolt size shall be secured by Construction from those bolts which are not identified by appropriate markings. The sample sizes shall be in accordance with B W Logan's attached letter of 3/29/79. These samples shall then be sent to a qualified outside testing laboratory by the Construction Department, to be tested in accordance with ASTM A-307 requirements. The results of this testing program shall be sent to the Design Engineering Electrical Division for determination of acceptability.

In order to prevent reoccurrence of this problem, several changes have been implemented. First, all appropriate design documents have been revised to specifically state the material/grade requirements for bolting materials. Second, the Purchase Requisitions for all bolting materials are checked for the inclusion of applicable material/grade requirements. Third, Mill Power Supply has committed that no vendor or material substitutions will be made without the prior approval of responsible Design Engineering personnel.

19. By: *[Signature]* Date: *11/24/80*
20. Technical Approval: *BY Owen* Date: *11/26/80*
21. QA Approval: *TC Rabuts* Date: *12-3-80*

*see attached addendum, dated 3-16-81*

March 29, 1979

D G Owen

Subject: Determination of Sample Size for Catawba  
Electrical Bolting Material Problem  
File: CN-1388.00

The testing of sample bolts to make an inference about the ability of an entire lot to meet tensile strength criteria is a two part statistical problem. The first part involves the determination of an appropriate sample size, and the second part is concerned with the acceptance or rejection of the lot based upon the results of the tests.

The following procedure is proposed to 1) determine an appropriate sample size for each of the bolt lots in question, and 2) establish a criteria for accepting or rejecting the lot based upon the test results. In order to establish the procedure, the following assumptions must be made:

- 1) Since the number of bolt manufacturers represented in the questioned lots cannot be determined, each lot shall be approached as an unknown quantity.
- 2) The bolts used at Catawba Nuclear Station are not significantly different from those used at McGuire Nuclear Station. This allows the use of McGuire test results to estimate physical parameters which are needed to determine sample sizes. The Catawba test results will indicate the validity of this assumption.
- 3) The accuracy of torque wrenches used to tighten bolts is  $\pm 5\%$  of the set value. This is used to determine the allowable error in measuring tensile strength. The test should not expect accuracy better than that of the wrenches used to tighten the bolts.
- 4) An acceptable confidence factor is 99% or roughly three standard deviations ( $3\sigma$ ) from the mean value.

Based upon these assumptions the following expression\* should be used to determine sample sizes

$$n = \left[ \frac{3\sigma}{E} \right]^2$$

where  $n$  is the number of samples,  $\sigma$  is one standard deviation from the mean tensile strength calculated from McGuire test results, and  $E$  is the allowable error in the tensile strength measurement and is based on McGuire data. This expression means that if  $n$  samples are tested, there is better than a 99% chance the estimated tensile strength for the lot will lie within the allowable error limit.

D G Owen  
March 29, 1979  
Page 2

When a tested bolt size from McGuire closely corresponds to a questioned bolt size from Catawba, the McGuire test data\* for that bolt size shall be used in calculating the Catawba sample size. When a Catawba bolt size does not correspond to a tested McGuire bolt size, the McGuire values which give the most conservative estimate of sample size, i.e., the largest observed standard deviation and the smallest allowable error bound, shall be used in the sample size determination.

The following table will summarize the suggested sample sizes\*\* for each of the questioned bolt sizes:

Bolt Size	Quantity Issued	Suggested Sample Size Confidence	
		95%	99%
1/2" X 15/16"	107,500	-	58
1/2" X 1 3/16"	15,000	-	8
1/2" X 1 1/2"	51,000	-	45
1/2" X 1 3/4"	1,600	26	(56)
1/2" X 2"	1,000	25	(55)
1/2" X 2 1/4"	500	25	(52)
1/2" X 2 1/2"	10,000	<u>26</u>	<u>58</u>
		245	312

For the 1 3/4, 2 and 2 1/4 inch bolts, a 95% confidence level is suggested to reduce the number of samples to a more realistic value. Also, the reason only eight samples were required of the 1 3/16 inch bolts is that the McGuire data for the 1 1/4 inch bolts displayed a fairly small standard deviation.

After testing the bolts from Catawba, a mean value for tensile strength and a standard deviation about the mean should be calculated for each bolt size. ASTM Standard A 307-76b sets the minimum acceptable tensile strength for Class A bolts at 8500 lbf. Acceptance or rejection of a bolt size lot should be determined by the following procedure:

- 1) Calculate a mean and a standard deviation from test data
- 2) Subtract 8500 from the mean value
- 3) Divide the result (from 2) by the calculated standard deviation
- 4) If this quotient is greater than 2, accept the lot. This gives 95% confidence that the bolts in the lot have tensile strengths greater than the mean less  $2\sigma$ .
- 5) If the quotient is less than 2
  - a) reject the lot or,
  - b) repeat the test using the same sample size or,
  - c) find the true percentage from a standard normal distribution table and determine if it is acceptable. For instance, 1.645 give 90% confidence.

\* McGuire NCI Report No. 4444

\*\* Calculations are attached.

4495

D G Owen  
March 29, 1979  
Page 3

If you have questions or comments on the above procedures, please notify me.

*Bruce W. Logan*

B W Logan  
Assistant Design Engineer

BWL/lge

attachments

cc: L E Suther  
B Garman  
C J Hager



## CALCULATIONS

For 99% confidence

Bolt size	$\sigma$	E	$n = \left[ \frac{3\sigma}{E} \right]^2$	N	$n_L = n \left[ \frac{N}{N+n} \right]^*$
1/2 X 15/16	1214	480	58	107,500	-
1/2 X 1 3/16	455	480	8	15,000	-
1/2 X 1 1/2	1214	545	45	51,000	-
1/2 X 1 3/4	1214	480	58	1,600	56
1/2 X 2	1214	480	58	1,000	55
1/2 X 2 1/4	1214	480	58	500	52
1/2 X 2 1/2	1214	480	58	10,000	-

For 95% confidence

Bolt Size	$\sigma$	E	$n = \left[ \frac{2\sigma}{E} \right]^2$	N	$n_L = n \left[ \frac{N}{N+n} \right]^*$
1/2 X 1 3/4	1214	480	26	1,600	-
1/2 X 2	1214	480	26	1,000	25
1/2 X 2 1/4	1214	480	26	500	25

\*ASTM Standard E 122-72, Section 5, p 1045

## REFERENCES

1. ASTM Standard A 307-76b, "Standard Specification for Carbon Steel Externally and Internally Threaded Standard Fasteners."
2. ASTM Standard E 122-72, "Standard Recommended Practice for Choice of Sample Size to Estimate the Average Quality of a Lot or Process."
3. William Mendenhall, Introduction to Probability and Statistics, Duxbury Press, 1971.
4. McGuire NCI Report No. 4444.

17. EVALUATION OF TEST RESULTS

In order to complete the statistical process of determining whether or not the sample bolts meet the mechanical strength criteria of ASTM A-307 bolts, the attached test results for each of the samples must be evaluated according to the established acceptance procedure (See B W Logan's attached letter dated 3/29/79).

The evaluation of the test results for the 1/2" bolts is summarized in Tables I and II. For the lot of 1/2" x 15/16" bolts, a Rockwell "B" hardness test determines whether the bolts conform to the mechanical requirements. As shown in Table I, the results indicate that the mean value is greater than two standard deviations from both the upper and lower limits of the hardness requirements. Therefore the respective sample of 1/2" x 15/16" bolts is acceptable to the standards of ASTM A-307 bolts. The remaining samples were tested in regards to their conformance to the mechanical tensile strength requirements. The evaluation of their test results is summarized in Table II and indicates that the respective samples are also acceptable. In conclusion, the test results have determined that the subject bolts meet the mechanical requirements for ASTM A-307 bolts with a 95% confidence level.

19. By: Douglas W Vass / [Signature] Date: 3/16/81
20. Technical Approval [Signature] Date: 3/17/81
21. QA Approval TC Roberts Date: 3-23-81

BOLT SIZE	SAMPLE SIZE	MEAN (1)	STANDARD DEVIATION (2)	REQUIRED RANGE		$\frac{(1)-(3)}{(2)}$	$\frac{(4)-(1)}{(2)}$	ACCEPTABLE LOT?
				MIN (3)	MAX (4)			
1/2" x 15/16"	58	92.95	2.62	69	100	9.14	2.69	YES

TABLE I  
EVALUATION OF HARDNESS TEST RESULTS  
FOR 1/2" BOLTS

BOLT SIZE	SAMPLE SIZE	MEAN (1)	STANDARD DEVIATION (2)	MIN TENSILE STRENGTH (LBS) (3)	$\frac{(1)-(3)}{(2)}$	ACCEPTABLE LOT ?
1/2" x 1-3/16"	8	10825.00	738.24	8500.	3.15	YES
1/2" x 1-1/2"	45	12415.55	232.04	8500.	16.87	YES
1/2" x 1-3/4"	26	11723.07	505.61	8500.	6.37	YES
1/2" x 2"	25	11612.00	172.17	8500.	18.08	YES
1/2" x 2-1/4"	25	13436.00	392.51	8500.	12.58	YES
1/2" x 2-1/2"	58	12484.48	111.29	8500.	35.80	YES

TABLE II  
EVALUATION OF TENSILE STRENGTH TEST RESULTS  
FOR 1/2" BOLTS



# LAW ENGINEERING TESTING COMPANY

geotechnical, environmental & construction materials consultants

501 MINUET LANE  
P.O. BOX 11297 • CHARLOTTE, NORTH CAROLINA 28220  
(704) 523-2022



## REPORT OF ROCKWELL "B" HARDNESS INSPECTION

Client: Duke Power Company  
Project: Catawba Nuclear Station  
Newport, South Carolina

Office: Charlotte Metals  
Date: February 4, 1981  
Lab. No. CHS 81-016

Client's P. O. No.: G 2494-41

Material: Reported as Carbon Steel Externally Threaded Standard  
Fastener ASTM A307 (See Below) Grade A

Heat No.: Unknown

Date Tested: 2/2/81

Procedure: In accordance with ASTM A307-78 and ASTM E18-79

### EQUIPMENT CALIBRATION

<u>Readings</u>	<u>Average Reading</u>	<u>Calibration Standard</u>	<u>Reading Correction, %</u>
--	84.1	81.6	97.0
--	87.3	81.6	93.5

### ROCKWELL "B" HARDNESS RESULTS

<u>LETCo. Piece No.</u>	<u>Bolt Size (In)</u>	<u>Average Reading</u>	<u>Corrected Reading</u>	<u>Comments</u>
1-23-81-1	1/2" x 15/16"	92.0	89	--
1-23-81-2	1/2" x 15/16"	97.1	94	--
1-23-81-3	1/2" x 15/16"	92.2	89	--
1-23-81-4	1/2" x 15/16"	95.6	93	--
1-23-81-5	1/2" x 15/16"	98.3	95	--
1-23-81-6	1/2" x 15/16"	98.0	95	--
1-23-81-7	1/2" x 15/16"	97.3	94	--
1-23-81-8	1/2" x 15/16"	97.5	95	--
1-23-81-9	1/2" x 15/16"	99.2	96	--
1-23-81-10	1/2" x 15/16"	98.0	95	--
1-23-81-11	1/2" x 15/16"	99.0	95	--
1-23-81-12	1/2" x 15/16"	98.3	94	--
1-23-81-13	1/2" x 15/16"	99.3	95	--
1-23-81-14	1/2" x 15/16"	96.5	92	--

Duke Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 2 of 3

ROCKWELL "B" HARDNESS RESULTS  
 Continued

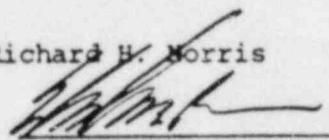
<u>LETCo. Piece No.</u>	<u>Bolt Size (In)</u>	<u>Average Reading</u>	<u>Corrected Reading</u>	<u>Comments</u>
1-23-81-15	1/2" x 15/16"	97.8	93	--
1-23-81-16	1/2" x 15/16"	96.6	92	--
1-23-81-17	1/2" x 15/16"	95.6	91	--
1-23-81-18	1/2" x 15/16"	100.0	96	--
1-23-81-19	1/2" x 15/16"	99.8	95	--
1-23-81-20	1/2" x 15/16"	98.7	94	--
1-23-81-21	1/2" x 15/16"	100.6	95	--
1-23-81-22	1/2" x 15/16"	95.7	90	--
1-23-81-23	1/2" x 15/16"	99.3	94	--
1-23-81-24	1/2" x 15/16"	97.5	92	--
1-23-81-25	1/2" x 15/16"	100.7	95	--
1-23-81-26	1/2" x 15/16"	99.0	94	--
1-23-81-27	1/2" x 15/16"	98.8	93	--
1-23-81-28	1/2" x 15/16"	100.2	95	--
1-23-81-29	1/2" x 15/16"	99.7	94	--
1-23-81-30	1/2" x 15/16"	100.0	95	--
1-23-81-31	1/2" x 15/16"	98.2	93	--
1-23-81-32	1/2" x 15/16"	102.8	97	--
1-23-81-33	1/2" x 15/16"	99.7	94	--
1-23-81-34	1/2" x 15/16"	96.3	91	--
1-23-81-35	1/2" x 15/16"	100.3	95	--
1-23-81-36	1/2" x 15/16"	97.2	92	--
1-23-81-37	1/2" x 15/16"	98.5	93	--
1-23-81-38	1/2" x 15/16"	95.3	90	--
1-23-81-39	1/2" x 15/16"	99.3	94	--
1-23-81-40	1/2" x 15/16"	99.8	94	--
1-23-81-41	1/2" x 15/16"	98.2	91	--
1-23-81-42	1/2" x 15/16"	99.2	92	--
1-23-81-43	1/2" x 15/16"	99.2	92	--
1-23-81-44	1/2" x 15/16"	101.2	94	--
1-23-81-45	1/2" x 15/16"	96.8	90	--
1-23-81-46	1/2" x 15/16"	98.0	91	--
1-23-81-47	1/2" x 15/16"	98.0	91	--
1-23-81-48	1/2" x 15/16"	97.0	90	--
1-23-81-49	1/2" x 15/16"	100.2	93	--

Duke Power Company  
Catawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 3 of 3

ROCKWELL "B" HARDNESS RESULTS  
Continued

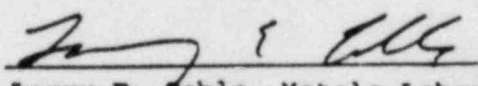
LETCo. Piece No.	Bolt Size (In)	Average Reading	Corrected Reading	Comments
1-23-81-50	1/2" x 15/16"	100.0	93	--
1-23-81-51	1/2" x 15/16"	89.7	83	--
1-23-81-52	1/2" x 15/16"	98.3	91	--
1-23-81-53	1/2" x 15/16"	100.8	94	--
1-23-81-54	1/2" x 15/16"	102.2	95	--
1-23-81-55	1/2" x 15/16"	90.8	84	--
1-23-81-56	1/2" x 15/16"	102.7	96	--
1-23-81-57	1/2" x 15/16"	101.0	94	--
1-23-81-58	1/2" x 15/16"	102.5	95	--
Required Range.....				69 thru 100.....

Inspector: Richard H. Morris

Reviewed by: 

Edward M. Beck, P. E.  
Metals Department Manager

Respectfully submitted,  
LAW ENGINEERING TESTING COMPANY

  
Larry B. Coble, Metals Laboratory Supervisor

# LAW ENGINEERING TESTING COMPANY

geotechnical, environmental & construction materials consultants

501 MINUET LANE  
P.O. BOX 11297 • CHARLOTTE, NORTH CAROLINA 28220  
(704) 523-2022



## REPORT OF MECHANICAL TENSION TEST

Client: Duke Power Company  
Project: Catawba Nuclear Station  
Newport, South Carolina

Office: Charlotte Metals  
Date: February 4, 1981  
Lab. No. CHS 81-016

Client P. O. No.: G 2494-41

Material: Reported as Carbon Steel Externally Threaded Standard  
Fastener ASTM A307 (See Below) Grade A

Heat No.: Unknown

Date Tested: 2/3/81

Procedure: In accordance with ASTM A307-78 and ASTM A370-77

### TEST RESULTS

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	1/2" x 1-3/16"	13	0.1419	10,500
1-23-81-2	1/2" x 1-3/16"	13	0.1419	10,550
1-23-81-3	1/2" x 1-3/16"	13	0.1419	10,400
1-23-81-4	1/2" x 1-3/16"	13	0.1419	12,400
1-23-81-5	1/2" x 1-3/16"	13	0.1419	10,050
1-23-81-6	1/2" x 1-3/16"	13	0.1419	10,250
1-23-81-7	1/2" x 1-3/16"	13	0.1419	10,850
1-23-81-8	1/2" x 1-3/16"	13	0.1419	11,200
Minimum				8,500
1-23-81-1	1/2" x 1-1/2"	13	0.1419	12,500
1-23-81-2	1/2" x 1-1/2"	13	0.1419	12,250
1-23-81-3	1/2" x 1-1/2"	13	0.1419	12,300
1-23-81-4	1/2" x 1-1/2"	13	0.1419	12,150
1-23-81-5	1/2" x 1-1/2"	13	0.1419	12,500
1-23-81-6	1/2" x 1-1/2"	13	0.1419	12,250
1-23-81-7	1/2" x 1-1/2"	13	0.1419	12,100
1-23-81-8	1/2" x 1-1/2"	13	0.1419	12,000
1-23-81-9	1/2" x 1-1/2"	13	0.1419	12,500
1-23-81-10	1/2" x 1-1/2"	13	0.1419	12,650
1-23-81-11	1/2" x 1-1/2"	13	0.1419	12,150
1-23-81-12	1/2" x 1-1/2"	13	0.1419	12,300



Duke Power Company  
Catawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 2 of 11

MECHANICAL TENSION TEST  
Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-13	1/2" x 1-1/2"	13	0.1419	12,700
1-23-81-14	1/2" x 1-1/2"	13	0.1419	12,400
1-23-81-15	1/2" x 1-1/2"	13	0.1419	12,650
1-23-81-16	1/2" x 1-1/2"	13	0.1419	12,450
1-23-81-17	1/2" x 1-1/2"	13	0.1419	12,400
1-23-81-18	1/2" x 1-1/2"	13	0.1419	12,500
1-23-81-19	1/2" x 1-1/2"	13	0.1419	12,750
1-23-81-20	1/2" x 1-1/2"	13	0.1419	12,600
1-23-81-21	1/2" x 1-1/2"	13	0.1419	12,200
1-23-81-22	1/2" x 1-1/2"	13	0.1419	12,200
1-23-81-23	1/2" x 1-1/2"	13	0.1419	12,350
1-23-81-24	1/2" x 1-1/2"	13	0.1419	12,800
1-23-81-25	1/2" x 1-1/2"	13	0.1419	12,350
1-23-81-26	1/2" x 1-1/2"	13	0.1419	12,300
1-23-81-27	1/2" x 1-1/2"	13	0.1419	12,450
1-23-81-28	1/2" x 1-1/2"	13	0.1419	12,650
1-23-81-29	1/2" x 1-1/2"	13	0.1419	12,800
1-23-81-30	1/2" x 1-1/2"	13	0.1419	12,150
1-23-81-31	1/2" x 1-1/2"	13	0.1419	12,850
1-23-81-32	1/2" x 1-1/2"	13	0.1419	12,550
1-23-81-33	1/2" x 1-1/2"	13	0.1419	12,600
1-23-81-34	1/2" x 1-1/2"	13	0.1419	12,100
1-23-81-35	1/2" x 1-1/2"	13	0.1419	12,550
1-23-81-36	1/2" x 1-1/2"	13	0.1419	12,450
1-23-81-37	1/2" x 1-1/2"	13	0.1419	12,200
1-23-81-38	1/2" x 1-1/2"	13	0.1419	12,150
1-23-81-39	1/2" x 1-1/2"	13	0.1419	12,750
1-23-81-40	1/2" x 1-1/2"	13	0.1419	12,100
1-23-81-41	1/2" x 1-1/2"	13	0.1419	12,650
1-23-81-42	1/2" x 1-1/2"	13	0.1419	12,400
1-23-81-43	1/2" x 1-1/2"	13	0.1419	12,700
1-23-81-44	1/2" x 1-1/2"	13	0.1419	12,100
1-23-81-45	1/2" x 1-1/2"	13	0.1419	12,200
Minimum				8,500

NCR 4498

Duke Power Company  
Catawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 3 of 11

MECHANICAL TENSION TEST  
Continued

<u>LETCo.</u> <u>Piece No.</u>	<u>Bolt Size</u> <u>(In)</u>	<u>Threads</u> <u>Per Inch</u>	<u>Area</u> <u>(In<sup>2</sup>)</u>	<u>Ultimate</u> <u>Load</u> <u>(Lbs)</u>
1-23-81-1	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-2	1/2" x 1-3/4"	13	0.1419	12,050
1-23-81-3	1/2" x 1-3/4"	13	0.1419	12,300
1-23-81-4	1/2" x 1-3/4"	13	0.1419	12,100
1-23-81-5	1/2" x 1-3/4"	13	0.1419	11,750
1-23-81-6	1/2" x 1-3/4"	13	0.1419	11,650
1-23-81-7	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-8	1/2" x 1-3/4"	13	0.1419	12,300
1-23-81-9	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-10	1/2" x 1-3/4"	13	0.1419	12,250
1-23-81-11	1/2" x 1-3/4"	13	0.1419	12,200
1-23-81-12	1/2" x 1-3/4"	13	0.1419	11,550
1-23-81-13	1/2" x 1-3/4"	13	0.1419	12,300
1-23-81-14	1/2" x 1-3/4"	13	0.1419	12,100
1-23-81-15	1/2" x 1-3/4"	13	0.1419	10,400
1-23-81-16	1/2" x 1-3/4"	13	0.1419	11,650
1-23-81-17	1/2" x 1-3/4"	13	0.1419	11,550
1-23-81-18	1/2" x 1-3/4"	13	0.1419	10,550
1-23-81-19	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-20	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-21	1/2" x 1-3/4"	13	0.1419	12,200
1-23-81-22	1/2" x 1-3/4"	13	0.1419	11,750
1-23-81-23	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-24	1/2" x 1-3/4"	13	0.1419	11,650
1-23-81-25	1/2" x 1-3/4"	13	0.1419	11,600
1-23-81-26	1/2" x 1-3/4"	13	0.1419	10,700
Minimum				8,500

Duke Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 4 of 11

MECHANICAL TENSION TEST  
 Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	1/2" x 2"	13	0.1419	11,950
1-23-81-2	1/2" x 2"	13	0.1419	11,200
1-23-81-3	1/2" x 2"	13	0.1419	11,650
1-23-81-4	1/2" x 2"	13	0.1419	11,600
1-23-81-5	1/2" x 2"	13	0.1419	11,800
1-23-81-6	1/2" x 2"	13	0.1419	11,450
1-23-81-7	1/2" x 2"	13	0.1419	11,600
1-23-81-8	1/2" x 2"	13	0.1419	11,600
1-23-81-9	1/2" x 2"	13	0.1419	11,700
1-23-81-10	1/2" x 2"	13	0.1419	11,650
1-23-81-11	1/2" x 2"	13	0.1419	11,550
1-23-81-12	1/2" x 2"	13	0.1419	11,750
1-23-81-13	1/2" x 2"	13	0.1419	11,750
1-23-81-14	1/2" x 2"	13	0.1419	11,550
1-23-81-15	1/2" x 2"	13	0.1419	11,700
1-23-81-16	1/2" x 2"	13	0.1419	11,650
1-23-81-17	1/2" x 2"	13	0.1419	11,750
1-23-81-18	1/2" x 2"	13	0.1419	11,600
1-23-81-19	1/2" x 2"	13	0.1419	11,450
1-23-81-20	1/2" x 2"	13	0.1419	11,150
1-23-81-21	1/2" x 2"	13	0.1419	11,650
1-23-81-22	1/2" x 2"	13	0.1419	11,750
1-23-81-23	1/2" x 2"	13	0.1419	11,600
1-23-81-24	1/2" x 2"	13	0.1419	11,500
1-23-81-25	1/2" x 2"	13	0.1419	11,700
Minumum				8,500

Power Company  
 Shawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 5 of 11

MECHANICAL TENSION TEST  
 Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	1/2" x 2-1/4"	13	0.1419	13,600
1-23-81-2	1/2" x 2-1/4"	13	0.1419	12,000
1-23-81-3	1/2" x 2-1/4"	13	0.1419	13,500
1-23-81-4	1/2" x 2-1/4"	13	0.1419	13,400
1-23-81-5	1/2" x 2-1/4"	13	0.1419	13,650
1-23-81-6	1/2" x 2-1/4"	13	0.1419	12,850
1-23-81-7	1/2" x 2-1/4"	13	0.1419	13,650
1-23-81-8	1/2" x 2-1/4"	13	0.1419	13,450
1-23-81-9	1/2" x 2-1/4"	13	0.1419	13,450
1-23-81-10	1/2" x 2-1/4"	13	0.1419	12,950
1-23-81-11	1/2" x 2-1/4"	13	0.1419	13,700
1-23-81-12	1/2" x 2-1/4"	13	0.1419	14,000
1-23-81-13	1/2" x 2-1/4"	13	0.1419	13,750
1-23-81-14	1/2" x 2-1/4"	13	0.1419	13,400
1-23-81-15	1/2" x 2-1/4"	13	0.1419	13,600
1-23-81-16	1/2" x 2-1/4"	13	0.1419	13,450
1-23-81-17	1/2" x 2-1/4"	13	0.1419	13,500
1-23-81-18	1/2" x 2-1/4"	13	0.1419	13,450
1-23-81-19	1/2" x 2-1/4"	13	0.1419	13,200
1-23-81-20	1/2" x 2-1/4"	13	0.1419	13,950
1-23-81-21	1/2" x 2-1/4"	13	0.1419	13,250
1-23-81-22	1/2" x 2-1/4"	13	0.1419	13,600
1-23-81-23	1/2" x 2-1/4"	13	0.1419	13,600
1-23-81-24	1/2" x 2-1/4"	13	0.1419	13,500
1-23-81-25	1/2" x 2-1/4"	13	0.1419	13,450
Minimum				8,500



Duke Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 6 of 11

MECHANICAL TENSION TEST  
 Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-2	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-3	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-4	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-5	1/2" x 2-1/2"	13	0.1419	12,400
1-23-81-6	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-7	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-8	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-9	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-10	1/2" x 2-1/2"	13	0.1419	12,700
1-23-81-11	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-12	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-13	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-14	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-15	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-16	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-17	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-18	1/2" x 2-1/2"	13	0.1419	12,350
1-23-81-19	1/2" x 2-1/2"	13	0.1419	12,350
1-23-81-20	1/2" x 2-1/2"	13	0.1419	12,650
1-23-81-21	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-22	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-23	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-24	1/2" x 2-1/2"	13	0.1419	12,700
1-23-81-25	1/2" x 2-1/2"	13	0.1419	12,650
1-23-81-26	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-27	1/2" x 2-1/2"	13	0.1419	12,300
1-23-81-28	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-29	1/2" x 2-1/2"	13	0.1419	12,350
1-23-81-30	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-31	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-32	1/2" x 2-1/2"	13	0.1419	12,400
1-23-81-33	1/2" x 2-1/2"	13	0.1419	12,350
1-23-81-34	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-35	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-36	1/2" x 2-1/2"	13	0.1419	12,350
1-23-81-37	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-38	1/2" x 2-1/2"	13	0.1419	12,350

Duke Power Company  
Catawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 7 of 11

MECHANICAL TENSION TEST  
Continued

<u>LETCo.</u> <u>Piece No.</u>	<u>Bolt Size</u> <u>(In)</u>	<u>Threads</u> <u>Per Inch</u>	<u>Area</u> <u>(In<sup>2</sup>)</u>	<u>Ultimate</u> <u>Load</u> <u>(Lbs)</u>
1-23-81-39	1/2" x 2-1/2"	13	0.1419	12,300
1-23-81-40	1/2" x 2-1/2"	13	0.1419	12,250
1-23-81-41	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-42	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-43	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-44	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-45	1/2" x 2-1/2"	13	0.1419	12,300
1-23-81-46	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-47	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-48	1/2" x 2-1/2"	13	0.1419	12,400
1-23-81-49	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-50	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-51	1/2" x 2-1/2"	13	0.1419	12,200
1-23-81-52	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-53	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-54	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-55	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-56	1/2" x 2-1/2"	13	0.1419	12,650
1-23-81-57	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-58	1/2" x 2-1/2"	13	0.1419	12,500
Minimum				8,500

Duke Power Company  
Catawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 8 of 11

MECHANICAL TENSION TEST  
Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	3/8" x 1"	16	0.0775	5,650
1-23-81-2	3/8" x 1"	16	0.0775	5,700
1-23-81-3	3/8" x 1"	16	0.0775	5,500
1-23-81-4	3/8" x 1"	16	0.0775	5,500
1-23-81-5	3/8" x 1"	16	0.0775	5,550
1-23-81-6	3/8" x 1"	16	0.0775	5,600
1-23-81-7	3/8" x 1"	16	0.0775	5,400
1-23-81-8	3/8" x 1"	16	0.0775	5,500
1-23-81-9	3/8" x 1"	16	0.0775	5,650
1-23-81-10	3/8" x 1"	16	0.0775	5,250
1-23-81-11	3/8" x 1"	16	0.0775	5,700
1-23-81-12	3/8" x 1"	16	0.0775	5,700
1-23-81-13	3/8" x 1"	16	0.0775	5,500
1-23-81-14	3/8" x 1"	16	0.0775	5,650
1-23-81-15	3/8" x 1"	16	0.0775	5,600
1-23-81-16	3/8" x 1"	16	0.0775	5,750
1-23-81-17	3/8" x 1"	16	0.0775	5,600
1-23-81-18	3/8" x 1"	16	0.0775	5,550
1-23-81-19	3/8" x 1"	16	0.0775	5,700
1-23-81-20	3/8" x 1"	16	0.0775	5,450
1-23-81-21	3/8" x 1"	16	0.0775	5,650
1-23-81-22	3/8" x 1"	16	0.0775	5,750
1-23-81-23	3/8" x 1"	16	0.0775	5,600
1-23-81-24	3/8" x 1"	16	0.0775	5,650
1-23-81-25	3/8" x 1"	16	0.0775	5,550
1-23-81-26	3/8" x 1"	16	0.0775	5,550
1-23-81-27	3/8" x 1"	16	0.0775	5,650
1-23-81-28	3/8" x 1"	16	0.0775	5,650
1-23-81-29	3/8" x 1"	16	0.0775	5,550
1-23-81-30	3/8" x 1"	16	0.0775	5,750
1-23-81-31	3/8" x 1"	16	0.0775	5,400
1-23-81-32	3/8" x 1"	16	0.0775	5,600
Minimum				4,650

Duke Power Company  
Catawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 9 of 11

MECHANICAL TENSION TEST  
Continued

<u>LETCo.</u> <u>Piece No.</u>	<u>Bolt Size</u> <u>(In)</u>	<u>Threads</u> <u>Per Inch</u>	<u>Area</u> <u>(In<sup>2</sup>)</u>	<u>Ultimate</u> <u>Load</u> <u>(Lbs)</u>
1-23-81-1	3/8" x 1-1/4"	16	0.0775	7,600
1-23-81-2	3/8" x 1-1/4"	16	0.0775	7,400
1-23-81-3	3/8" x 1-1/4"	16	0.0775	7,350
1-23-81-4	3/8" x 1-1/4"	16	0.0775	7,600
1-23-81-5	3/8" x 1-1/4"	16	0.0775	7,300
1-23-81-6	3/8" x 1-1/4"	16	0.0775	7,350
1-23-81-7	3/8" x 1-1/4"	16	0.0775	7,750
1-23-81-8	3/8" x 1-1/4"	16	0.0775	7,650
1-23-81-9	3/8" x 1-1/4"	16	0.0775	7,250
1-23-81-10	3/8" x 1-1/4"	16	0.0775	7,350
1-23-81-11	3/8" x 1-1/4"	16	0.0775	7,650
1-23-81-12	3/8" x 1-1/4"	16	0.0775	7,650
1-23-81-13	3/8" x 1-1/4"	16	0.0775	7,750
1-23-81-14	3/8" x 1-1/4"	16	0.0775	7,750
1-23-81-15	3/8" x 1-1/4"	16	0.0775	7,300
1-23-81-16	3/8" x 1-1/4"	16	0.0775	7,650
1-23-81-17	3/8" x 1-1/4"	16	0.0775	7,550
1-23-81-18	3/8" x 1-1/4"	16	0.0775	7,650
1-23-81-19	3/8" x 1-1/4"	16	0.0775	7,250
1-23-81-20	3/8" x 1-1/4"	16	0.0775	7,200
1-23-81-21	3/8" x 1-1/4"	16	0.0775	7,100
1-23-81-22	3/8" x 1-1/4"	16	0.0775	7,750
1-23-81-23	3/8" x 1-1/4"	16	0.0775	7,350
1-23-81-24	3/8" x 1-1/4"	16	0.0775	7,400
1-23-81-25	3/8" x 1-1/4"	16	0.0775	7,750
1-23-81-26	3/8" x 1-1/4"	16	0.0775	7,700
1-23-81-27	3/8" x 1-1/4"	16	0.0775	7,300
1-23-81-28	3/8" x 1-1/4"	16	0.0775	7,250
1-23-81-29	3/8" x 1-1/4"	16	0.0775	7,250
1-23-81-30	3/8" x 1-1/4"	16	0.0775	7,300
1-23-81-31	3/8" x 1-1/4"	16	0.0775	7,500
1-23-81-32	3/8" x 1-1/4"	16	0.0775	7,600
Minimum				4,650



Duke Power Company  
Catawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 10 of 11

MECHANICAL TENSION TEST  
Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	3/8" x 1-1/2"	16	0.0775	5,750
1-23-81-2	3/8" x 1-1/2"	16	0.0775	6,100
1-23-81-3	3/8" x 1-1/2"	16	0.0775	5,900
1-23-81-4	3/8" x 1-1/2"	16	0.0775	5,700
1-23-81-5	3/8" x 1-1/2"	16	0.0775	6,300
1-23-81-6	3/8" x 1-1/2"	16	0.0775	6,350
1-23-81-7	3/8" x 1-1/2"	16	0.0775	6,450
1-23-81-8	3/8" x 1-1/2"	16	0.0775	6,050
1-23-81-9	3/8" x 1-1/2"	16	0.0775	6,100
1-23-81-10	3/8" x 1-1/2"	16	0.0775	5,850
1-23-81-11	3/8" x 1-1/2"	16	0.0775	5,800
1-23-81-12	3/8" x 1-1/2"	16	0.0775	6,300
1-23-81-13	3/8" x 1-1/2"	16	0.0775	5,800
1-23-81-14	3/8" x 1-1/2"	16	0.0775	5,900
1-23-81-15	3/8" x 1-1/2"	16	0.0775	6,000
1-23-81-16	3/8" x 1-1/2"	16	0.0775	6,300
1-23-81-17	3/8" x 1-1/2"	16	0.0775	6,300
1-23-81-18	3/8" x 1-1/2"	16	0.0775	5,850
1-23-81-19	3/8" x 1-1/2"	16	0.0775	5,800
1-23-81-20	3/8" x 1-1/2"	16	0.0775	6,000
1-23-81-21	3/8" x 1-1/2"	16	0.0775	5,900
1-23-81-22	3/8" x 1-1/2"	16	0.0775	6,250
1-23-81-23	3/8" x 1-1/2"	16	0.0775	5,950
1-23-81-24	3/8" x 1-1/2"	16	0.0775	6,350
1-23-81-25	3/8" x 1-1/2"	16	0.0775	6,000
1-23-81-26	3/8" x 1-1/2"	16	0.0775	6,100
1-23-81-27	3/8" x 1-1/2"	16	0.0775	5,900
1-23-81-28	3/8" x 1-1/2"	16	0.0775	5,800
1-23-81-29	3/8" x 1-1/2"	16	0.0775	6,650
1-23-81-30	3/8" x 1-1/2"	16	0.0775	5,950
1-23-81-31	3/8" x 1-1/2"	16	0.0775	6,300
1-23-81-32	3/8" x 1-1/2"	16	0.0775	6,000
Minimum				4,650

Duke Power Company  
Catawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 11 of 11

MECHANICAL TENSION TEST  
Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	3/8" x 2-1/2"	16		
1-23-81-2	3/8" x 2-1/2"	16	0.0775	7,100
1-23-81-3	3/8" x 2-1/2"	16	0.0775	6,900
1-23-81-4	3/8" x 2-1/2"	16	0.0775	7,100
1-23-81-5	3/8" x 2-1/2"	16	0.0775	7,750
1-23-81-6	3/8" x 2-1/2"	16	0.0775	7,600
1-23-81-7	3/8" x 2-1/2"	16	0.0775	7,500
1-23-81-8	3/8" x 2-1/2"	16	0.0775	7,500
1-23-81-9	3/8" x 2-1/2"	16	0.0775	7,500
1-23-81-10	3/8" x 2-1/2"	16	0.0775	7,100
1-23-81-11	3/8" x 2-1/2"	16	0.0775	7,600
1-23-81-12	3/8" x 2-1/2"	16	0.0775	7,050
1-23-81-13	3/8" x 2-1/2"	16	0.0775	7,500
1-23-81-14	3/8" x 2-1/2"	16	0.0775	7,100
1-23-81-15	3/8" x 2-1/2"	16	0.0775	6,900
1-23-81-16	3/8" x 2-1/2"	16	0.0775	7,600
1-23-81-17	3/8" x 2-1/2"	16	0.0775	7,250
1-23-81-18	3/8" x 2-1/2"	16	0.0775	6,800
1-23-81-19	3/8" x 2-1/2"	16	0.0775	7,100
1-23-81-20	3/8" x 2-1/2"	16	0.0775	7,500
1-23-81-21	3/8" x 2-1/2"	16	0.0775	7,490
1-23-81-22	3/8" x 2-1/2"	16	0.0775	7,350
1-23-81-23	3/8" x 2-1/2"	16	0.0775	7,000
1-23-81-24	3/8" x 2-1/2"	16	0.0775	6,800
1-23-81-25	3/8" x 2-1/2"	16	0.0775	7,550
1-23-81-26	3/8" x 2-1/2"	16	0.0775	7,450
1-23-81-27	3/8" x 2-1/2"	16	0.0775	7,450
1-23-81-28	3/8" x 2-1/2"	16	0.0775	6,850
1-23-81-29	3/8" x 2-1/2"	16	0.0775	7,250
1-23-81-30	3/8" x 2-1/2"	16	0.0775	7,600
1-23-81-31	3/8" x 2-1/2"	16	0.0775	7,450
1-23-81-32	3/8" x 2-1/2"	16	0.0775	7,450
Minimum			0.0775	7,350
				4,650

Inspector(s):

Larry E. Coble  
Mark Westall

Reviewed by:

Edward M. Beck, P.E.  
Metals Department Manager

Respectfully submitted,  
LAW ENGINEERING TESTING COMPANY

*[Signature]*  
Larry E. Coble, Metals Laboratory Supervisor

LAW ENGINEERING TESTING COMPANY

# LAW ENGINEERING TESTING COMPANY

geotechnical, environmental & construction materials consultants

501 MINUET LANE  
P.O. BOX 11297 • CHARLOTTE, NORTH CAROLINA 28220  
(704) 523-2022



## REPORT OF CHEMICAL ANALYSIS

Client: DUKE POWER COMPANY  
Project: CATAWBA NUCLEAR STATION  
Newport, South Carolina

Office: Charlotte Metals  
Date: February 9, 1981  
Lab. No. CHS 81-016

Client P. O. No.: G2494-41

Material: Reported as Carbon Steel Externally Threaded Standard Fastener  
ASTM A-307 (See Below) Grade A

Heat No.: Unknown

Date Tested: 2/9/81

Procedure: In accordance with ASTM A-307-78, ASTM A-36-77, and ASTM E-30-77

### TEST RESULTS

LET Co. Piece No.	Elements					Size	
	Carbon	Manganese	Phosphorus	Sulfur	Silicon		
1-81-59	0.13	0.40	0.02	0.02	0.18	1/2" x	15/16"
1-81-9	0.15	0.51	0.01	0.01	0.16	1/2" x	1-3/16"
1-23-81-46	0.15	0.49	0.02	0.02	0.24	1/2" x	1-1/2"
1-23-81-27	0.16	0.50	0.02	0.02	0.15	1/2" x	1-3/4"
1-23-81-26	0.19	0.33	0.02	0.02	0.15	1/2" x	2"
1-23-81-26	0.15	0.48	0.01	0.02	0.15	1/2" x	2-1/4"
1-23-81-58	0.16	0.37	0.01	0.01	0.15	1/2" x	2-1/2"
1-23-81-32	0.12	0.29	0.01	0.01	0.13	3/8" x	3/4"
1-23-81-33	0.18	0.38	0.02	0.02	0.22	3/8" x	1"
1-23-81-33	0.21	0.84	0.02	0.02	0.44	3/8" x	1-1/4"
1-23-81-33	0.18	0.36	0.02	0.02	0.12	3/8" x	1-1/2"
1-23-81-33	0.16	0.36	0.02	0.01	0.14	3/8" x	2-1/2"
Required A-307	—	—	0.06	0.15	—		
Required A-36	0.26	—	0.04	0.05	0.15 to 0.30		

Note: The single values are the maximum allowed in the required section.

Item 1-23-81-33, 3/8" x 1-1/4" exceeds the maximum of silicon per basic material specification.

Inspector(s): Larry E. Coble  
J. Sidney Rice, Jr.

Reviewed by:

Edward M. Beck, P. E.  
Corporate Consultant/Metals

Respectfully submitted,  
LAW ENGINEERING TESTING COMPANY

Larry E. Coble, Metals Laboratory Supervisor

12.06-00-0001  
312.06-00-0002  
MPS PL NO  
WJ  
EPE  
IDENTIFICATION METHOD  
EQUIP +2  
OTHER  
NOT PRACTICAL

RECORD COPY  
NONCONFORMING ITEM REPORT  
USE BLACK BALL POINT PEN ONLY

LOCATION OF ITEM: AUXILIARY BUILDING UNIT 1 ELEVATION 577'0"  
COLUMN LINES AA&BB 45&46 - 46&47  
DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM:  
TRANSFORMER 1ETXC HAS LOW GAS PRESSURE IN VIOLATION TO P3A E-15. REQUIREMENTS  
PRESSURE IS 1.70 LBS LOW. P3A STATES PLUS OR MINUS 1 AT 19.02 READING CALCULATED  
AT 17.32  
TRANSFORMER 1ETXE ALSO HAS LOW GAS PRESSURE IN VIOLATION TO P3A E-155. READING  
CALCULATED AT 17.84 P3A STATES PLUS OR MINUS 1 @ 19.35 PRESSURE IS 2.31 LBS LOW

EVALUATION/DISPOSITION RESPONSIBILITY: ☒ CONST ☐ DESIGN ☐ QA ☐ NSSS DIV. FLE  
11. ORIGINATED: J. M. Rudisill DATE: 9-18-78  
13. SPECIAL ENG. REVIEW: J. M. Rudisill DATE: 9-18-78  
15. QA REVIEW: R. May DATE: 9-18-78  
17. DISPOSITION: ACCEPTABLE - SEE BELOW EVALUATION  
18. REPORT TO MGMT: ☐ YES ☒ NO

EVALUATION/JUSTIFICATION:  
THE TRANSFORMERS SHALL BE REFILLED WITH GAS AND  
CHECKED FOR LEAKS IN ACCORDANCE WITH CNM-1312.06-40.  
SUBSTITUTIONS IN THE PROCEDURE FOR REFILLING AND CHECKING  
OF LEAKS SHALL BE MADE AT THE DISCRETION OF THE  
RESPONSIBLE FIELD ENGINEER. CONSTRUCTION ENGINEER - ELECT. SHALL  
BE RESPONSIBLE FOR COORDINATING REPAIR WITH TRANSMISSION DEPT. AND  
FOR ASSURING THAT CONST. DEPT. QA PROCEDURES ARE FOLLOWED.  
QC TO RETUSPRT AND ~~REMOVE~~ REMOVE TAPE & TAGS.

19. BY: J. M. Beam DATE: 10-16-78  
20. TECHNICAL APPROVAL: J. M. Beam DATE: 10-16-78  
21. QA APPROVAL: R. May DATE: 10/16/78  
22. ACTION/INSPECTION REQUIRED:  
1) FILLING WITH GAS, LEAK TESTING  
2) COORDINATING REPAIR AND ASSURING THAT CONST. DEPT. QA PROCEDURES ARE FOLLOWED.  
3) FINAL INSPECTION AND REMOVAL OF TAPE & TAGS  
23. ASSIGNED TO: TRANS. DEPT. 08  
24. PERFORMED BY: JMB  
25. DATE: 5-9-79  
26. QC: ELECT. 08  
27. DATE: 5-9-79  
28. QC: 15  
29. DATE: 5-9-79  
1ETXE TRANSFORMER HAS DEVELOPED ANOTHER  
LEAK - SEE NCI 5587 J. M. Beam 5-9-79

30. BY: J. M. Beam DATE: 10-16-78  
31. QA APPROVAL: R. May DATE: 10-16-78  
32. INSPECTION EXCEPTIONS OR REMARKS: TRANSFORMER HAS A WELD LEAK AND HAS BEEN  
DOCUMENTED ON NCI 5587 LEI, RUDISILL 5-9-79  
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[illegible]

DUKE POWER COMPANY  
CONSTRUCTION DEPARTMENT  
PROJECT CATAWBA

RECORD COPY

NONCONFORMING ITEM REPORT

Serial no. 3581

INITIAL DISTRIBUTION

1. DESCRIPTION OF NONCONFORMANCE  
Requirements not met, how and when discovered.

ITEM NO.

VENDOR NO.

MPS NO.

VENDOR

2. Document(s) Violated

136100-1

N/A

N/A

DG. O'BRIEN

P3A-ES01

DG. O'BRIEN PENETRATION, SERIAL NUMBER 2228D HAS LOW GAS PRESSURE. PRESSURE READING ON GAGE IS 14 LBS. AT 81° F. CORRECTED TO 72°, USING A CORRECTION FACTOR OF .055, PRESSURE IS 13.50. P3A E-501 GIVES A TOLERANCE OF 15 LBS PLUS OR MINUS 1 AT 72° F.

3. LOCATION OF NONCONFORMANCE WARE HOUSE #1

4. METHOD USED TO MARK 1 (ONE) Q1B TAG

5. ORIGINATED

☐ CONST.

6. SENIOR ENGINEER REVIEW

☐ CONST.

By James L. Rudick Date 7/26/78

☒ Q.C.  
☐ Q.A.

By RL Davis (13) Date 7-26-78

☒ Q.C.  
☐ Q.A.

7. RESOLUTION; RESPONSIBLE FOR RESOLUTION: ☒ CONST. ☐ DESIGN ☐ Q.A. ☐ DIV. Elec

Partial Resolution

① THE GAS PRESSURE OF THIS PENETRATION WILL BE MONITORED EVERY 2 WEEKS FOR A THREE MONTH PERIOD. THE DATA WILL BE RECORDED ON THE ATTACHED FORM 78170 AND ON P3A-ES01. ACTION TO BE TAKEN WILL BE STATED AFTER EVALUATION OF 3 MONTH DATA.

② Design Engineering ELECTRICAL HAS CHANGED STORAGE REQUIREMENTS TO 15 lbs @ 72° F +1, -2 lbs. THEREFORE THE PENETRATION (#2228D) IS WITHIN Requirements. Remove TAG & TAP.

Nuclear Safety Related ☒ Yes ☐ No Safety Class N/A

Resolution by ② J. B. Ebert Date 10/23/78

8. APPROVAL ① DL Frey 10-25-78

① DL Frey 7-28-78

② J. B. Ebert (Const) Date

① RAMANA 8-1-78  
② RAMANA 10-26-78  
Quality Assurance Date

9. ACTION TAKEN PER RESOLUTION:

15

① THIS PENETRATION WAS MONITORED EVERY 2 WEEKS FOR 3 MONTHS AS IN ① ABOVE

② TAG AND TAG REMOVED ACCORDING TO EVALUATION BY DESIGN ENGINEERING AND J. BRENT EBERT

ACTION PERFORMED BY ② James L. Rudick DATE 11-3-78 ACTION INSPECTED BY ① James L. Rudick DATE 10-26-78

DISTRIBUTION

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PROJECT ENGINEER

SENIOR ENGINEER

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DUKE POWER COMPANY  
CONSTRUCTION DEPARTMENT  
PROJECT CATAWBA

Q-1A 3581

DATE 7/28/78

## ELECTRICAL PENETRATION STORAGE LOG

TYPE B 43ACCEPTANCE — PSI AT — °FSERIAL NO. 2228 D+ — PSI

YEAR	<div style="display: flex; justify-content: space-between;"> <div>8-11-78</div> <div>8-24-78</div> <div>9-8-78</div> <div>9-22-78</div> <div>10-6-78</div> <div>10-20-78</div> <div>PRESSURE TEMPERATURE INITIALS</div> </div>											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1978	14.21	14.90	13.98	14.42	14.17	13.94	—	—	—	—	—	—
	79°	82°	84°	78°	78°	73°	—	—	—	—	—	—
	LER	LER	LER	LER	LER	LER	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—
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	—	—	—	—	—	—	—	—	—	—	—	—

REMARKS

FOR USE AS EVALUATION DATA FOR NCI 3581

7/28/78



DUKE POWER COMPANY  
CONSTRUCTION DEPARTMENT  
PROJECT CATAWBA

RECORD COPY

NONCONFORMING ITEM REPORT

Serial no. 3785

INITIAL DISTRIBUTION

1. DESCRIPTION OF NONCONFORMANCE <small>Reference to the NCR, not the NCR description</small>	ITEM NO.	VENDOR NO.	MPS NO.	VENDOR	2. Document(s) Violated
THESE FOUR (4) ELECTRICAL PENETRATIONS HAD LOW GAS PRESSURE AT P3A INSPECTION TIME ON 8-24-78. SERIAL NUMBERS ARE AS FOLLOWS: 2230D, ON P3A E-503; 2211D ON P3A E-505; 2213D ON P3A E-507; P3A E-508 - 2214D. SPECIFIED TEMPERATURE IS 15 LBS AT 22°F. LOWEST RECORDED PRESSURE WAS 13 LBS AT 82°F.	1361-00-102	06-000001	N/A	DA, DB, DC, DD	P3A-E-503 P3A-E-505 P3A-E-507 P3A-E-508

3. LOCATION OF NONCONFORMANCE WAREHOUSE #1

4. METHOD USED TO MARK FOUR (4) Q1 B TAGS

5. ORIGINATED	<input type="checkbox"/> CONST.	6. SENIOR ENGINEER REVIEW	<input type="checkbox"/> CONST.
By <u>James L. Rudolph</u> 8-30-78	<input checked="" type="checkbox"/> Q.C.	By <u>ALM</u> (1-)	<input checked="" type="checkbox"/> Q.C.
	<input type="checkbox"/> Q.A.	Date <u>8-30-78</u>	<input type="checkbox"/> Q.A.

7. RESOLUTION: RESPONSIBLE FOR RESOLUTION: ☐ CONST. ☒ DESIGN ☐ Q.A. ☐ DIV Electrical

Depressure these penetrations to 15 psig using commercial grade, safety related SF<sub>6</sub> gas using the gauge on the penetrations. After 15 minutes record 1) penetration flange temperature, 2) barometric pressure, and 3) gauge pressure of the penetration. Wait a minimum of two weeks and record the same readings. Compensate the second gauge reading for changes in barometric pressure and temperature from the first to the second reading. If the corrected second reading differs from the first reading by 1.55 then 1 psig the penetration is acceptable. If the corrected second reading differs from the first reading by more than 1 psig then notify Design for disposition.

8. Nuclear Safety Related ☒ Yes ☐ No Safety Class 1E Resolution by Paul M. B. 1008 9/15/79

9. APPROVAL ALM 9/19/79 TC Kalkreuth 9-25-78  
Date Date  
Quality Assurance

9. ACTION TAKEN PER RESOLUTION: 25, 15

Action Performed As Per Resolution  
PENETRATIONS ON P3A SERIALS E-503 PER/NO 2214D E-507 ~~PENETRATIONS~~ 2213D, E-505, PENE. SN 2211D ARE NOW ACCEPTABLE PER RESOLUTION THIS NCI. PENETRATION ON P3A E-503 SN 2230D STILL HAS LOW PRESSURE AFTER RESOLUTION PER THIS NCI. NCI 5446 HAS BEEN WRITTEN TO DOCUMENT DISCREPANCIES 1ER-4-20-79

ACTION PERFORMED BY J. E. Potts DATE 4-10-79 ACTION INSPECTED BY James L. Rudolph DATE 4-20-79

10. DISTRIBUTION	PROJECT MANAGER	PROJECT ENGINEER	SENIOR QC ENGR	SENIOR CONST ENGR	QC SUPV	CONST ENGR	SENIOR SUPV	QA DIV VENDOR	DESIGN ENGINEERING SERVICES	QA DIV ENGR. HQ	SENIOR QA ENGR	AUTH INSP
NUMBER OF COPIES	INITIAL											
ACTION / INSPECTION ASSIGNMENT												

QA FINAL REVIEW ALM DATE 5-9-79

FINAL DISTRIBUTION

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NCT 3785

4-6-79

RLH

LER 4-30-79

SHEET 1 OF 2

	PENET. NO.	BP.	PENET. G. PRESS	TEMP. °F
E-508	2214D	29.43	15	66°
E-507	2213D	29.43	15	66°
E-505	2211D	29.43	15	66°
E-503	2230D	29.43	15	66°

3A NO	PENET. NO.	TEMP DIFF	CORRECTION FACTOR	PENET GAGE PRESSURE	CORRECTED BAROMETRIC PRESSURE	ABSOLUTE PRESSURE
E-508	2214D	$72^{\circ} - 66 = 6$	$\times .055 = .33$	$+ 15$	$+ 14.45$	$= 29.78$
E-507	2213D	$72^{\circ} - 66 = 6$	$\times .055 = .33$	$+ 15$	$+ 14.45$	$= 29.78$
E-505	2211D	$72^{\circ} - 66 = 6$	$\times .055 = .33$	$+ 15$	$+ 14.45$	$= 29.78$
E-503	2230D	$72^{\circ} - 66 = 6$	$\times .055 = .33$	$+ 15$	$+ 14.45$	$= 29.78$

NCI: 3785

4-20-79 LER

# REPRESSURIZED CALCULATIONS

SHEET 2- OF 2

	PENET. NO	B.P.	PENET. G. PRESS.	TEMP. °F
E-508	2214D	29.59	15	72
E-507	2213D	29.59	15	72
E-505	2211D	29.59	15	72
E-503	2230D	29.59	15	72

3A NO	PENET. NO.	TEMP. DIFF	CORRECT. FACTOR	PENET. GAGE PRESSURE	CORRECTED BAROMETRIC PRESSURE	ABSOLUTE PRESSURE
E-508	2214D	$72^{\circ} - 72^{\circ} = 0$	$0 \times .055 = 0$	15	+ 14.52	= 29.52
E-507	2213D	$72^{\circ} - 72^{\circ} = 0$	$0 \times .055 = 0$	15	+ 14.52	= 29.52
E-505	2211D	$72^{\circ} - 72^{\circ} = 0$	$0 \times .055 = 0$	15	+ 14.52	= 29.52
E-503	2230D	$72^{\circ} - 72^{\circ} = 0$	$0 \times .055 = 0$	9	+ 14.52	= 23.52

Initial Gas Pressure as compared to  
Gas Pressure 2 weeks later

Gas Pressure	Absolute
4-6-79	4-20-79

# 2214D	29.78	29.52
2213D	29.78	29.52
2211D	29.78	29.52
2230D	29.78	23.52

New NCI written

#5424

1. RESUBMIT NO. N/A	2. VENDOR/LOCATION N/A	4. DOCUMENTS VIOLATED M-41A sub 9 R-0 M-41D Rev 5 CNS-1390-01-00-0022 Rev 0
5. MPS PD NO N/A	6. MECH/ELEC SYSTEM RN both UNITS	7. IDENTIFICATION METHOD <input checked="" type="checkbox"/> OTHERS 4 <input type="checkbox"/> ONLY TAPE <input type="checkbox"/> OTHER <input type="checkbox"/> NOT PRACTICAL
8. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		

DUKE POWER COMPANY  
CONSTRUCTION DEPARTMENT  
PROJECT C-1000A

# RECORD COPY NONCONFORMING ITEM REPORT USE BLACK BALL POINT PEN ONLY

9. LOCATION OF ITEM Nuclear Service Water Pump House	10. SERIAL NO. 5125
---	------------------------

11. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM

During a routine inspection, it was observed that the following Cables in Nuclear Safety Related Channel A have become damaged due to Construction Activities. Broken Armor is the only apparent damage. The Electrical Cables Affected are 1\*RN515, 1\*RN519, 1\*RN521, 1\*RN523

12. EVALUATION AND DISPOSITION RESPONSIBILITY <input checked="" type="checkbox"/> CORRECT <input checked="" type="checkbox"/> DESIGNATION <input type="checkbox"/> QA <input type="checkbox"/> NSSS	13. DATE 3-13-79	14. REVIEW 3-13-79	15. QA REVIEW 3-13-79
--	---------------------	-----------------------	--------------------------

16. DISPOSITION UNACCEPTABLE (SEE BELOW)	17. REPORT TO MGMT C.Y. 10
---	-------------------------------

EVALUATION/JUSTIFICATION RECALL CABLES AS SHOWN ON ATTACHED COPIES OF CABLE CARDS. WHEN DAMAGED CABLES ARE TAKEN OUT, TERMINATION CARDS SHALL BE RETURNED TO QA VAULT.

18. BY J.W. Bean	DATE 3-19-79	19. TECHNICAL APPROVAL D. J. Jurek	DATE 3-19-79	20. QA APPROVAL H.D. Mason	DATE 3/20/79
---------------------	-----------------	---------------------------------------	-----------------	-------------------------------	-----------------

21. ACTION/INSPECTION REQUIRED RECALL CABLES, SCRAP DAMAGED CABLES, TURN OLD TERMINATION CARDS IN TO QA.	22. ASSIGNED TO CEST	23. PERFORMED BY ERM	DATE 3-26-79
RE-INSPECT CABLES	22. ASSIGNED TO SYTE	23. PERFORMED BY LER	DATE 3-26-79

24. BY J.W. Bean	DATE 3-19-79	25. QA APPROVAL H.D. Mason	DATE 3/20/79
---------------------	-----------------	-------------------------------	-----------------

26. NON-INSPECTION RECEIPTS OR REMARKS									
DISTRIBUTION	PROJECT	CEN	5. CORP	6. SUP	7. GC	8. H&M	9. QA	10. E&C	11. E&C
NUMBER	12. 1	13. 2	14. 3	15. 4	16. 5	17. 6	18. 7	19. 8	20. 9
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27. QA REVIEW M. Thompson	DATE 3-26-79
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INITIAL DISTRIBUTION

FINAL DISTRIBUTION

# CABLE INSTALLATION D. A

Acct. No. 09074

DATE - 3-16-79

CABLE NUMBER - 14 RN 515  
TYPE/COLOR - 3X10G2 RED

SYSTEM -  
COMPUTED LENGTH - 24.0

ORIGINATOR - JRG  
RES. CODE - 2

FROM - IEMXQ MOTOR CONTROL CENTER (600 VAC ESS AUX PWR SYS)

DRAWING NUMBER - CNWT-1752-01.13

TO - 1RN011A PH BLDG 612+06

DRAWING NUMBER - CN-1760-01.01

COMMENTS

ROUTING SEQUENCE - 9508 9575 9504

CERTIFIED CORRECT:

FOREMAN -

INSPECTOR -

DATE -

DATE -

LENGTH ACT -  
MANHOURS  
FROM REEL # -

RES CODE 2 Acct No-09074  
CABLE NUMBER 14 RN 515  
TYPE - 3X10G2 RED SYS -  
FROM - IEMXQ MOTOR CONTROL CENTER  
(600 VAC ESS AUX PWR SYS)  
DRAWING NUMBER - CNWT-1752-01.13  
TO - 1RN011A  
PH BLDG 612+06  
DRAWING NUMBER - CN-1760-01.01

TERMINATOR -

DATE -

INSPECTOR -

DATE -

RES CODE 2 Acct. No-09074  
CABLE NUMBER - 14 RN 515  
TYPE - 3X10G2 RED SYS -  
FROM - IEMXQ MOTOR CONTROL CENTER  
(600 VAC ESS AUX PWR SYS)  
DRAWING NUMBER - CNWT-1752-01.13  
TO - 1RN011A  
PH BLDG 612+06  
DRAWING NUMBER - CN-1760-01.01

TERMINATOR -

DATE -

INSPECTOR -

DATE -

CABLE NUMBER - 14 RN 515  
RES CODE 2

CABLE NUMBER - 14 RN 515  
RES CODE 2



# CABLE INSTALLATION DATA

ACCT # - 09074  
DATE - 3-16-79

CABLE NUMBER - 1# RN 519      SYSTEM -      ORIGINATOR - JRG  
TYPE/COLOR - 3X10GZ RED      COMPUTED LENGTH - 26.0      RES. CODE - 2

FROM - 1EMXQ MOTOR CONTROL CENTER (600VAC ESS AUX PWR SYS)

DRAWING NUMBER - CNWT-1752-01.13

TO - 1RN028A PH BLDG 602+11

DRAWING NUMBER - CN-1760-01.01

COMMENTS

ROUTING SEQUENCE - 9508 9575 9504

CERTIFIED CORRECT:

FOREMAN -  
INSPECTOR -

DATE -  
DATE -

LENGTH ACT -  
MANHOURS -  
FROM REEL # -

RES. CODE 2      ACCT No 09074  
CABLE NUMBER 1# RN 519  
TYPE - 3X10GZ RED      SYS. -  
FROM - 1EMXQ MOTOR CONTROL CENTER  
(600VAC ESS AUX PWR SYS)  
DRAWING NUMBER - CNWT-1752-01.13  
TO - 1RN028A  
PH BLDG 602+11  
DRAWING NUMBER - CN-1760-01.01

TERMINATOR -      DATE -  
INSPECTOR -      DATE -

RES. CODE 2      ACCT No 09074  
CABLE NUMBER - 1# RN 519  
TYPE - 3X10GZ RED      SYS. -  
FROM - 1EMXQ MOTOR CONTROL CENTER  
(600VAC ESS AUX PWR SYS)  
DRAWING NUMBER - CNWT-1752-01.13  
TO - 1RN028A  
PH BLDG 602+11  
DRAWING NUMBER - CN-1760-01.01

TERMINATOR -      DATE -  
INSPECTOR -      DATE -

CABLE NUMBER - 1# RN 519  
RES CODE 2

CABLE NUMBER - 1# RN 519  
RES CODE 2

# CABLE INSTALLATION D. 1A

ACCT #09074  
DATE - 3-16-79

CABLE NUMBER - 1\* RN 521  
TYPE/COLOR - 3X10G2 RED

SYSTEM -  
COMPUTED LENGTH - 26.0

ORIGINATOR - JRG  
RES. CODE - 2

FROM - 1EMYQ MOTOR CONTROL CENTER (600VAC ESS. AUX. PWR SYS)

DRAWING NUMBER - CNWT-1752-01.13

TO - 1RN 030A PH BLDG 602+11

DRAWING NUMBER - CN-1760-01.01

COMMENTS

ROUTING SEQUENCE - 9508 9575 9504

CERTIFIED CORRECT:

FOREMAN -  
INSPECTOR -

DATE -  
DATE -

LENGTH ACT -  
MANHOOURS -  
FROM REEL # -

RES. CODE 2 ACCT # 09074  
CABLE NUMBER 1\* RN 521  
TYPE - 3X10G2 RED SYS. -  
FROM - 1EMYQ MOTOR CONTROL CENTER  
(600 VAC ESS. AUX. PWR SYS)  
DRAWING NUMBER - CNWT-1752-01.13  
TO - 1RN 030A PH BLDG 602+11

DRAWING NUMBER - CN-1760-01.01

TERMINATOR -

DATE -

INSPECTOR -

DATE -

RES. CODE 2 ACCT # 09074  
CABLE NUMBER - 1\* RN 521  
TYPE - 3X10G2 RED SYS. -  
FROM - 1EMYQ MOTOR CONTROL CENTER  
(600 VAC ESS. AUX. PWR. SYS)  
DRAWING NUMBER - CNWT-1752-01.13  
TO - 1RN 030A PH BLDG 602+11

DRAWING NUMBER - CN-1760-01.01

TERMINATOR -

DATE -

INSPECTOR -

DATE -

CABLE NUMBER - 1\* RN 521

RES. CODE - 2

CABLE NUMBER - 1\* RN 521

RES. CODE - 2

# CABLE INSTALLATION L..TA

ACCT. No. - 09074

DATE - 3-16-79

CABLE NUMBER - 1# RN 523  
TYPE/COLOR - 3X10G2 RED

SYSTEM -  
COMPUTED LENGTH - 40.0

ORIGINATOR - JRG  
RES. CODE - 2

FROM - 1EMXO MOTOR CONTROL CENTER (600 VAC ESS. AUX PWR SYS)

DRAWING NUMBER - CNWT-1752-01.12

TO - 1RN036A PH BLDG 608+03

DRAWING NUMBER - CN-1760-01.01

COMMENTS

ROUTING SEQUENCE - 9509 9508 9575 9504 9503

CERTIFIED CORRECT:

FOREMAN -  
INSPECTOR -

DATE -  
DATE -

LENGTH ACT -  
MANHOURS -  
FROM REEL # -

RES. CODE - 2 ACCT. No. 09074  
CABLE NUMBER 1# RN523  
TYPE - 3X10G2 RED SYS. -  
FROM - 1EMXO MOTOR CONTROL CENTER  
(600 VAC ESS. PWR. SYS)  
DRAWING NUMBER - CNWT-1752-01.12  
TO - 1RN036A  
PH BLDG. 608+03  
DRAWING NUMBER - CN-1760-01.01

TERMINATOR - DATE -  
INSPECTOR - DATE -

RES. CODE - 2 ACCT. No. 09074  
CABLE NUMBER - 1# RN 523  
TYPE - 3X10G2 RED SYS. -  
FROM - 1EMXO MOTOR CONTROL CENTER  
(600 VAC ESS. PWR. SYS)  
DRAWING NUMBER - CNWT-1752-01.12  
TO - 1RN036A  
PH BLDG 608+03  
DRAWING NUMBER - CN-1760-01.01

TERMINATOR - DATE -  
INSPECTOR - DATE -

CABLE NUMBER - 1# RN523  
RES. CODE - 2

CABLE NUMBER - 1# RN523  
RES. CODE - 2

INITIAL DISTRIBUTION

CESN

FINAL DISTRIBUTION

1. AS-TCR NO. <b>NA</b>		2. VENDOR/LOCATION <b>NA</b>		3. DOCUMENTS VIOLATED <b>M-40 Rev. 5</b> <b>M-41B #9 Rev. 0</b> <b>CNS 1390.01-</b> <b>00-0022 Rev. 0</b>		FORM <b>Q-1A</b> REVISION <b>9</b>	
4. MPS PO NO <b>NA</b>		5. /ELEC SYSTEM <b>RN</b>		6. IDENTIFICATION METHOD <input checked="" type="checkbox"/> OTHER <b>3</b> <input type="checkbox"/> ONLY TAPE <input type="checkbox"/> NOT PRACTICAL		DUKE POWER COMPANY CONSTRUCTION DEPARTMENT PROJECT <b>CATAWBA</b> <b>RECORD COPY</b> NONCONFORMING ITEM REPORT USE BLACK BALL POINT PEN ONLY	
7. LOCATION OF ITEM <b>Nuclear Service Water Pump House</b>		8. SERIAL NO. <b>5124</b>					
9. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM <b>During a routine inspection it was observed that the following electrical cables in Nuclear Safety Related Channel B have become damaged due to construction activities. The electrical cables affected are 1*RN 517, 1*RN 525, 1*RN 527. Broken armor is the only apparent damage.</b>							
10. EVALUATION/DISPOSITION RESPONSIBILITY <input checked="" type="checkbox"/> CORRECT <input type="checkbox"/> DESIGN <input type="checkbox"/> QA <input type="checkbox"/> ISSS <input type="checkbox"/> BY <b>CEEL</b>							
11. DESIGNATED <b>Don McAlister</b> DATE <b>3-13-79</b> 12. SENIOR PAGE REVIEW <b>Don McAlister</b> DATE <b>3-13-79</b> 13. QA REVIEW <b>Don McAlister</b> DATE <b>3-13-79</b>							
14. DISPOSITION <b>UNACCEPTABLE (SEE BELOW)</b> 15. REPORT TO MGMT <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO							
EVALUATION/JUSTIFICATION <b>RECALL CABLES AS SHOWN ON ATTACHED COPIES OF CABLE CARDS. WHEN DAMAGED CABLES ARE TAKEN OUT, TERMINATION CARDS SHALL BE RETURNED TO QA VAULT.</b>							
16. BY <b>J. W. Brown</b> DATE <b>3-19-79</b> 17. TECHNICAL APPROVAL <b>TX Jueg</b> DATE <b>3-19-79</b> 18. QA APPROVAL <b>Don McAlister</b> DATE <b>3/20/79</b>							
19. ACTION/INSPECTION REQUIRED						20. ASSIGNED TO	
<b>RECALL CABLES, SCRAP DAMAGED CABLES</b>						<b>CEST ELM 3-26-79</b>	
<b>TURN OLD TERMINATION CARDS IN TO QA</b>						<b>SVTE LER 3-26-79</b>	
<b>RE-INSPECT CABLES</b>							
21. BY <b>J. W. Brown</b> DATE <b>3-19-79</b> 22. QA APPROVAL <b>Don McAlister</b> DATE <b>3/21/79</b>							
23. NONCONFORMING EXCEPTIONS OR REMARKS							
DISTRIBUTION PROJECT: <b>CNS</b> 1. <b>Comp</b> 2. <b>Spec</b> 3. <b>GC</b> 4. <b>QA</b> 5. <b>QA</b> 6. <b>QA</b> 7. <b>QA</b> 8. <b>QA</b> 9. <b>QA</b> 10. <b>QA</b> 11. <b>QA</b> 12. <b>QA</b> 13. <b>QA</b> 14. <b>QA</b> 15. <b>QA</b> 16. <b>QA</b> 17. <b>QA</b> 18. <b>QA</b> 19. <b>QA</b> 20. <b>QA</b> 21. <b>QA</b> 22. <b>QA</b> 23. <b>QA</b> 24. <b>QA</b> 25. <b>QA</b> 26. <b>QA</b> 27. <b>QA</b> 28. <b>QA</b> 29. <b>QA</b> 30. <b>QA</b> 31. <b>QA</b> 32. <b>QA</b> 33. <b>QA</b> 34. <b>QA</b> 35. <b>QA</b> 36. <b>QA</b> 37. <b>QA</b> 38. <b>QA</b> 39. <b>QA</b> 40. <b>QA</b> 41. <b>QA</b> 42. <b>QA</b> 43. <b>QA</b> 44. <b>QA</b> 45. <b>QA</b> 46. <b>QA</b> 47. <b>QA</b> 48. <b>QA</b> 49. <b>QA</b> 50. <b>QA</b> 51. <b>QA</b> 52. <b>QA</b> 53. <b>QA</b> 54. <b>QA</b> 55. <b>QA</b> 56. <b>QA</b> 57. <b>QA</b> 58. <b>QA</b> 59. <b>QA</b> 60. <b>QA</b> 61. <b>QA</b> 62. <b>QA</b> 63. <b>QA</b> 64. <b>QA</b> 65. <b>QA</b> 66. <b>QA</b> 67. <b>QA</b> 68. <b>QA</b> 69. <b>QA</b> 70. 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804. <b>QA</b> 805. <b>QA</b> 806. <b>QA</b> 807. <b>QA</b> 808. <b>QA</b> 809. <b>QA</b> 810. <b>QA</b> 811. <b>QA</b> 812. <b>QA</b> 813. <b>QA</b> 814. <b>QA</b> 815. <b>QA</b> 816. <b>QA</b> 817. <b>QA</b> 818. <b>QA</b> 819. <b>QA</b> 820. <b>QA</b> 821. <b>QA</b> 822. <b>QA</b> 823. <b>QA</b> 824. <b>QA</b> 825. <b>QA</b> 826. <b>QA</b> 827. <b>QA</b> 828. <b>QA</b> 829. <b>QA</b> 830. <b>QA</b> 831. <b>QA</b> 832. <b>QA</b> 833. <b>QA</b> 834. <b>QA</b> 835. <b>QA</b> 836. <b>QA</b> 837. <b>QA</b> 838. <b>QA</b> 839. <b>QA</b> 840. <b>QA</b> 841. <b>QA</b> 842. <b>QA</b> 843. <b>QA</b> 844. <b>QA</b> 845. <b>QA</b> 846. <b>QA</b> 847. <b>QA</b> 848. <b>QA</b> 849. <b>QA</b> 850. <b>QA</b> 851. <b>QA</b> 852. <b>QA</b> 853. <b>QA</b> 854. <b>QA</b> 855. <b>QA</b> 856. <b>QA</b> 857. <b>QA</b> 858. <b>QA</b> 859. <b>QA</b> 860. <b>QA</b> 861. <b>QA</b> 862. <b>QA</b> 863. <b>QA</b> 864. <b>QA</b> 865. <b>QA</b> 866. <b>QA</b> 867. <b>QA</b> 868. <b>QA</b> 869. <b>QA</b> 870. <b>QA</b> 871. <b>QA</b> 872. <b>QA</b> 873. <b>QA</b> 874. <b>QA</b> 875. <b>QA</b> 876. <b>QA</b> 877. <b>QA</b> 878. <b>QA</b> 879. <b>QA</b> 880. <b>QA</b> 881. <b>QA</b> 882. <b>QA</b> 883. <b>QA</b> 884. <b>QA</b> 885. <b>QA</b> 886. <b>QA</b> 887. <b>QA</b> 888. <b>QA</b> 889. <b>QA</b> 890. <b>QA</b> 891. <b>QA</b> 892. <b>QA</b> 893. <b>QA</b> 894. <b>QA</b> 895. <b>QA</b> 896. <b>QA</b> 897. <b>QA</b> 898. <b>QA</b> 899. <b>QA</b> 900. <b>QA</b> 901. <b>QA</b> 902. <b>QA</b> 903. <b>QA</b> 904. <b>QA</b> 905. <b>QA</b> 906. <b>QA</b> 907. <b>QA</b> 908. <b>QA</b> 909. <b>QA</b> 910. <b>QA</b> 911. <b>QA</b> 912. <b>QA</b> 913. <b>QA</b> 914. <b>QA</b> 915. <b>QA</b> 916. <b>QA</b> 917. <b>QA</b> 918. <b>QA</b> 919. <b>QA</b> 920. <b>QA</b> 921. <b>QA</b> 922. <b>QA</b> 923. <b>QA</b> 924. <b>QA</b> 925. <b>QA</b> 926. <b>QA</b> 927. <b>QA</b> 928. <b>QA</b> 929. <b>QA</b> 930. <b>QA</b> 931. <b>QA</b> 932. <b>QA</b> 933. <b>QA</b> 934. <b>QA</b> 935. <b>QA</b> 936. <b>QA</b> 937							



# CABLE INSTALLATION DATA

Acct. No - 09074

DATE - 3-16-79

CABLE NUMBER - 1\*RN 517  
TYPE/COLOR - 3X10 GZ YEL.

SYSTEM -  
COMPUTED LENGTH - 23.0

ORIGINATOR - JRG  
RES. CODE - 8

FROM - 1EMXR MOTOR CONTROL CENTER (600VAC ESS AUX PWR SYS)

DRAWING NUMBER - CNWT-1752-01.14

TO - 1RN020B PH BLDG. 609+06

DRAWING NUMBER - CN-1760-01.01

COMMENTS

ROUTING SEQUENCE - 9548 9545 9544

CERTIFIED CORRECT:

FOREMAN -

INSPECTOR -

DATE -

DATE -

LENGTH ACT -

MANHOURS -

FROM REEL # -

Acct No 09074

RES. CODE 8

CABLE NUMBER 1\*RN 517

TYPE - 3X10 GZ YEL SYS. -

FROM - 1EMXR MOTOR CONTROL CENTER  
(600VAC ESS AUX PWR SYS)

DRAWING NUMBER - CNWT-1752-01-14

TO - 1RN020B

PH BLDG 609+06

DRAWING NUMBER - CN-1760-01.01

TERMINATOR -

DATE -

INSPECTOR -

DATE -

RES. CODE 8

Acct No 09074

CABLE NUMBER - 1\*RN 517

TYPE - 3X10 GZ YEL. SYS. -

FROM - 1EMXR MOTOR CONTROL CENTER  
(600VAC ESS AUX PWR SYS)

DRAWING NUMBER - CNWT-1752-01-14

TO - 1RN020B

PH BLDG 609+06

DRAWING NUMBER - CN-1760-01.01

TERMINATOR -

DATE -

INSPECTOR -

DATE -

CABLE NUMBER - 1\*RN 517

RES. CODE 8

CABLE NUMBER - 1\*RN 517

RES. CODE 8

# CABLE INSTALLATION F 1TA

ACCT # 09074  
DATE - 3-16-79

CABLE NUMBER - 1\* RN 525  
TYPE/COLOR - 3X10G2 YEL

SYSTEM -  
COMPUTED LENGTH - 18.0

ORIGINATOR - JRG  
RES. CODE - 8

FROM - ZEMXP MOTOR CONTROL CENTER  
DRAWING NUMBER - CNWT-2752-01.12  
TO - 1RN037B PH BLDG 608+03  
DRAWING NUMBER - CN-1760-01.01

## COMMENTS

ROUTING SEQUENCE - 9549 9548 9545 9546

## CERTIFIED CORRECT:

FOREMAN -  
INSPECTOR -

DATE -  
DATE -

LENGTH ACT -  
MANHOURS -  
FROM REEL # -

ACCT # 09074 RES. CODE 8  
CABLE NUMBER 1\* RN 525  
TYPE - 3X10G2 YEL SYS. -  
FROM - ZEMXP MOTOR CONTROL CENTER

DRAWING NUMBER - CNWT-2752-01.12  
TO - 1RN037B PH BLDG 608+03

DRAWING NUMBER - CN-1760-01.01

TERMINATOR - DATE -

INSPECTOR - DATE -

RES. CODE 8 ACCT. # 09074  
CABLE NUMBER - 1\* RN 525  
TYPE - 3X10G2 YEL SYS. -  
FROM - ZEMXP MOTOR CONTROL CENTER

DRAWING NUMBER - CNWT-2752-01.12  
TO - 1RN037B PH BLDG 608+03

DRAWING NUMBER - CN-1760-01.01

TERMINATOR - DATE -

INSPECTOR - DATE -

CABLE NUMBER - 1\* RN 525  
RES. CODE 8

CABLE NUMBER - 1\* RN 525  
RES. CODE 8

# CABLE INSTALLATION DATA

ACCT # 09074  
DATE - 3-16-79

CABLE NUMBER - 1\*RN 527  
TYPE/COLOR - 3X10G2 YEL

SYSTEM -  
COMPUTED LENGTH - 30.0

ORIGINATOR - JRG  
RES. CODE - 8

FROM - IEMXR MOTOR CONTROL CENTER (600VAC ESS AUX PWR SYS)

DRAWING NUMBER - CNWT-1752-01.14

TO - 1RN038B PH BLDG 602+11

DRAWING NUMBER - CN-1760-01.02

COMMENTS

ROUTING SEQUENCE - 9548 9545 9544 9543

CERTIFIED CORRECT:

FOREMAN -  
INSPECTOR -

DATE -  
DATE -

LENGTH ACT -  
MANHOURS -  
FROM REEL # -

RES CODE 8 ACCT # 09074  
CABLE NUMBER 1\*RN 527  
TYPE - 3X10G2 YEL SYS -  
FROM - IEMXR MOTOR CONTROL CENTER  
(ESS AUX PWR SYS - 600VAC)  
DRAWING NUMBER - CNWT-1752-01.14  
TO - 1RN038B PH BLDG 602+11

DRAWING NUMBER - CN-1760-01.02

TERMINATOR -

DATE -

INSPECTOR -

DATE -

RES CODE 8 ACCT # 09074  
CABLE NUMBER - 1\*RN 527  
TYPE - 3X10G2 YEL SYS -  
FROM - IEMXR MOTOR CONTROL CENTER  
(600VAC ESS AUX PWR SYS)  
DRAWING NUMBER - CNWT-1752-01.14  
TO - 1RN038B PH BLDG 602+11

DRAWING NUMBER - CN-1760-01.02

TERMINATOR -

DATE -

INSPECTOR -

DATE -

CABLE NUMBER - 1\*RN 527

RES. CODE 8

CABLE NUMBER - 1\*RN 527

RES. CODE 8



PP	GROUP	NUMBER	DATE	CONTRACT	NO.	CL	NO.	LA	WATER	ANNO	East	ANI			
		2		1	1	1		1		1					
		2		1	1	1		1		1					

CL Drizzle 3-11-80





DUKE POWER COMPANY  
CONSTRUCTION DEPARTMENT  
PROJECT Catawba

# QUALITY ASSURANCE TRAINING RECORD

THIS IS TO CERTIFY THAT THE QUALITY ASSURANCE TRAINING WAS HELD ON 1.21.5179  
NO. DAY YR.

THE FOLLOWING TOPICS AND REFERENCES WERE  
DISCUSSED: QA PROCEDURE R-3

QA  
R-3

ASME

PROCEDURE

COVER SHEET  
REV. 9

DESIGN DRAWING AND SPECIFICATION  
VARIATION

IN REFERENCE TO NCI 5032

INSTRUCTOR L. P. [Signature]

DURATION 1  
HOURS

ATTENDEES:

CREW NO. 1 3 2

ALL ☐  
PART ☒

24.3.7.372.4  
SOCIAL SEC. NO.

Larry M. Minnis  
NAME

SOCIAL SEC. NO.

NAME

245.0.24.425

Bertie Buchanan

244.7.493.56

George F. [Signature]

251-68-1593

Billy Ramsey

245.1931.28

Kevin M. Wiles

2. ALLOCATION NO. <b>N/A</b>		VENDOR / LOCATION <b>N/A</b>		DOCUMENTS VIOLATED <b>CNBM 1717-01.10</b> <b>M-41B SERIAL #8</b>		REVISION BY COMPANY CONSTRUCTION DEPARTMENT PROJECT <b>CATAWBA</b>	
3. APTS PD NO <b>N/A</b>		6. MECH/ELEC SYSTEM <b>ATC</b>		<b>RECORD COPY</b> <b>NONCONFORMING ITEM REPORT</b> <b>USE BLACK BALL POINT PEN ONLY</b>			
7. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		8. IDENTIFICATION METHOD <input checked="" type="checkbox"/> DIMENSIONS <input type="checkbox"/> CHART TAPE <input type="checkbox"/> OTHER _____ <input type="checkbox"/> NOT PRACTICAL					
9. LOCATION OF ITEM <b>Warehouse #1</b>						10. SERIAL NO <b>4957</b>	
11. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM  <b>Cabinet HEATC-10 was sent to Wylie lab for testing.</b> <b>Before going to Wylie lab cabinet was inspected</b> <b>According to M-41B on fabrication and found to be</b> <b>correct. Cabinet was returned with legs missing. This</b> <b>was in violation of CNBM 1717-01.10 which calls</b> <b>for legs. Also a 1/2" hole was burned in bottom of</b> <b>cabinet, which would not make this a NEMA 4</b> <b>enclosure.</b>							
14. EVALUATION/DISPOSITION RESPONSIBILITY <input checked="" type="checkbox"/> CONIST <input type="checkbox"/> DESIGN <input type="checkbox"/> QA <input type="checkbox"/> NSSS <input type="checkbox"/> BY <b>CEEL</b>							
11. ORIGINATED <b>Jerry Calmon</b>		DATE <b>3-22-79</b>		13. SENIOR ENGR REVIEW <b>DL Frieze</b>		DATE <b>3-22-79</b>	
12. DISPOSITION <b>NCT ACCEPTABLE AS IS</b>				15. CA REVIEW <b>NAMay</b>		DATE <b>3-22-79</b>	
17. REPORT TO MGMT <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO							
EVALUATION/ <p>① TL McMinn, Design Eng. WAS NOTIFIED AND WILL CHANGE BILL OF MATERIALS FOR HEATC-10 TO REMOVE LEGS FROM CABINET.</p> <p>Repair 1/2" hole USING ATTACHED CRITERIA.</p>							
15. BY <b>Pelust</b>		DATE <b>3/14/79</b>		16. TECHNICAL APPROVAL <b>DL Frieze</b>		DATE <b>3-14-79</b>	
22. ACTION/INSPECTION REQUIRED				23. ASSIGNED TO <b>SVTW</b>			
① Repair cabinet in accordance with attached procedure.				24. RECEIVED <b>SVTWT</b> DATE <b>3-21-79</b>			
② Visual inspection of welds satisfactory				SVTW <b>D. Calmon</b> DATE <b>3-21-79</b>			
③ Touch-up coatings IAW <b>3/4/79</b> acceptable stds.				CEST <b>J. B. ...</b> DATE <b>3-21-79</b>			
④ Remove NCT tag (1) when repair is satisfactorily completed.				SVTE <b>Roy ...</b> DATE <b>3-22-79</b>			
⑤ Assure that B/m is revised.				SVTE <b>D. Calmon</b> DATE <b>5-30-79</b>			
25. <b>Pelust</b>		DATE <b>3/14/79</b>		26. QA APPROVAL <b>NAMay</b>		DATE <b>3-14-79</b>	
28. INSPECTOR'S EXCEPTIONS OR REMARKS							
DISTRIBUTION PROJECT ENG: <b>ELA</b> INSTRUMENTAL: <b>ELA</b> ELECTRICAL: <b>ELA</b> MECHANICAL: <b>ELA</b> CIVIL: <b>ELA</b> ARCHITECT: <b>ELA</b> OWNER: <b>ELA</b> CONTRACTOR: <b>ELA</b> SUBMITTER: <b>ELA</b> OTHER: <b>ELA</b>							

Dev./Station \_\_\_\_\_

Unit \_\_\_\_\_

File No. \_\_\_\_\_

Subject WELDING CRITERIA FOR NCI # 4957By JSDate 8/14/79

Sheet No. \_\_\_\_\_ of \_\_\_\_\_

Problem No. \_\_\_\_\_

Checked By \_\_\_\_\_

Date \_\_\_\_\_

① Welding shall be in accordance with QA Procedure M-21 and CP-22.

② All material to be A-36.

③ Place backing material over hole on the inside of the cabinet.

④ Add weld metal using FWDs L-250 or L-350.

⑤ Final repair to receive a visual inspection.



1. ITEM NO. 44	2. VENDOR/LOCATION D.G.O'Brien	3. DOCUMENTS VIOLATED P3A E-512	4. DIVISION DU POWER COMPANY CONSTRUCTION DEPARTMENT PROJECT Calamba
5. WPS PD NO N/A	6. MECH/ELEC SYSTEM EZA	7. IDENTIFICATION METHOD <input checked="" type="checkbox"/> P.D. 18.5 <input type="checkbox"/> OTHER <input type="checkbox"/> NOT PRACTICAL	
8. LOCATION OF ITEM Warehouse #1			9. SERIAL NO. 4749

**RECORD COPY**  
 NONCONFORMING ITEM REPORT  
 USE BLACK BALL POINT PEN ONLY

10. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM  
 Electrical penetration 9311E on P3A E-512 has low gas pressure in violation of requirements on P3A. Pressure is 12.53. Specified pressure is 15,  $\pm 2$ ,  $\pm 1$ .

14. EVALUATION/DISPOSITION RESPONSIBILITY <input checked="" type="checkbox"/> CONST <input type="checkbox"/> DESIGN <input type="checkbox"/> QA <input type="checkbox"/> NISS DIV <u>CEEL</u>	11. ORIGINATED BY Ron McHugh	12. DATE 1-26-79	13. REVIEWER J. R. Brown	14. DATE 1-26-79	15. QA REVIEW RAH	16. DATE 1-29-79
17. DISPOSITION NOT ACCEPTABLE AS IS				18. REPORT TO MGMT C YES <input checked="" type="checkbox"/> NO		

EVALUATION/JUSTIFICATION  
 CRAFT & QC To use Installation Spec. CNS 1390.01-00-0068 in determining if penetration is acceptable.

19. BY B. Shurt	20. DATE 4/3/79	21. TECHNICAL APPROVAL DL gauge	22. DATE 4-3-79	23. QA APPROVAL RAH	24. DATE 4-6-79
25. ACTION/INSPECTION REQUIRED				26. ASSIGNED TO	27. COMPLETED BY
① ELECTRICAL CRAFT WORK complete				CEST	4-11-79
② QC Verification that penetration is acceptable & remove tag & stamp QC to document inspection on attached sheet - J.R. Brown 4/5/79				SUTE	4-12-79
③ QA Elect. to review and approve documentation if acceptable				QAEC	5/20/79

28. BY B. Shurt	29. DATE 4/3/79	30. QA APPROVAL RAH	31. DATE 4-6-79
--------------------	--------------------	------------------------	--------------------

32. DISTRIBUTION		33. COPIES		34. REVIEW		35. DATE	
1	1	1	1	1	1	1	1
36. NUMBER OF COPIES		37. REVIEWER		38. DATE		39. REVIEWER	
2		C. L. Duggan		5-24-79			

Penetration Serial No 9311E

By

Date

Sheet No.      of     

Problem No. NCI 4749

Checked By

Date

Note: Initial the blank beside each procedure section as the work is satisfactorily completed. Show "N/A" and initial in blanks for requirements not applicable to this job.

Section:

Limits & Precautions:

6.2 LER

6.3 LER

Procedure:

7.1 LER

7.2 LER

7.3 LER

7.4 N/A

NCI N/A

7.5 N/A

NCI N/A

7.6 N/A

NCI N/A

7.7 N/A

7.8 LER

Comments:

IS NCI report needs to be initiated or is further explanation is needed for clarification; it shall be recorded below or on attached sheets.

NO PROBLEMS ENCOUNTERED FOLLOWING CNS 1390.01-00-0068.

By

Michael R. Bore

Harrison  
Rather

4/5/79  
5/23/79

4/6/79

QA Approval

M. R. Bore

5/23/79

2. POSITION NO. <i>N/A</i>	3. VENDOR/LOCAL <i>D.G. O'Brien</i>	4. DOCUMENTS VIOLATED <i>P3A E-583</i>	DU POWER COMPANY CONSTRUCTION DEPARTMENT PROJECT <i>Catawba</i>
5. MPS NO <i>N/A</i>	6. MECH/ELEC SYSTEM <i>EZA</i>		<b>RECORD COPY</b> <b>NONCONFORMING ITEM REPORT</b> USE BLACK BALL POINT PEN ONLY
7. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> 8. IDENTIFICATION METHOD <input checked="" type="checkbox"/> BY TAGS <input type="checkbox"/> BY TAPE <input type="checkbox"/> OTHER <input type="checkbox"/> NOT PHYSICAL			

9. LOCATION OF ITEM <i>Warehouse #1</i>	10. SERIAL NO <i>4748</i>
--	------------------------------

12. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM

*Electrical penetration 5824 F on P3A E-583 has low gas pressure in violation of requirements on P3A. Pressure is 12.95. Specified pressure is 15, -2, +1.*

14. EVALUATION/DISPOSITION RESPONSIBILITY <input checked="" type="checkbox"/> CONST <input type="checkbox"/> DESIGN <input type="checkbox"/> QA <input type="checkbox"/> MSSS <input checked="" type="checkbox"/> CEEC			
11. ORIGINATED <i>Bon M. Afee</i>	DATE <i>1-26-79</i>	13. SENT FOR REVIEW <i>LL Ransom</i>	DATE <i>1-26-79</i>
17. DISPOSITION <i>NOT ACCEPTABLE AS IS</i>		15. QA REVIEW <i>RA May</i>	
		DATE <i>1-29-79</i>	

18. REPORT TO MGMT ☐ YES ☒ NO

19. EVALUATION/JUSTIFICATION

*CRAFT & QC to use Installation Specification CNS-1390.01-00-0068 in determining if penetration is acceptable.*

20. BY <i>B. Hunt</i>	DATE <i>4/3/79</i>	21. TECHNICAL APPROVAL <i>DL Zuege</i>	DATE <i>4-3-79</i>	22. QA APPROVAL <i>RA May</i>	DATE <i>4-6-79</i>
23. ACTION/INSPECTION REQUIRED			24. ASSIGNED TO		
① ELECTRICAL CRAFT WORK Complete  ② QC Verification that penetration acceptable & remove tags & tape. <i>cc to document inspectors on attached sheet - 7/2/79 4/5/79</i>  ③ QA Eng Elect. to review and approve documentation if acceptable.			25. PERFORMED BY		
			DATE		
			① CEST <i>RA May</i> 4-11-79 ② SITE <i>Pham</i> 5-23-79 ③ QAEC <i>RA May</i> 5-23-79		

26. BY <i>B. Hunt</i>	DATE <i>4/3/79</i>	27. QA APPROVAL <i>RA May</i>	DATE <i>4-6-79</i>												
28. INSPECTION DEFECTS OR REMARKS															
DISTRIBUTION NO. OF COPIES <table style="width:100%; text-align: center;"> <tr> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>2</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> </table>				1	1	1	1	1	1	2	1	1	1	1	1
1	1	1	1	1	1										
2	1	1	1	1	1										
REVIEWED BY <i>C. O'Brien</i> DATE <i>5-24-79</i>															



Station \_\_\_\_\_ Unit \_\_\_\_\_ File No. NCI 4748  
 Subject Penetration serial No. 5824F 5824F  
 Sheet No. \_\_\_\_\_ of \_\_\_\_\_ Problem No. NCI 4748 Checked By \_\_\_\_\_ Date \_\_\_\_\_

Note: Initial the blank beside each procedure section as the work is satisfactorily completed. Show "N/A" and initial in blanks for requirements not applicable to this job.

Section:

Limits & Precautions:

6.2 LER

6.3 LER

Procedure:

7.1 LER

7.2 LER

7.3 LER

7.4 N/A NCI N/A

7.5 N/A NCI N/A

7.6 N/A NCI N/A

7.7 N/A

7.8 LER

Comments:

IF NCI report needs to be initiated or if further explanation is needed for clarification; it shall be recorded below or on attached sheets.

NO PROBLEMS ENCOUNTERED FOLLOWING CNS 1396.1-1-60-006E LER ERCT

By Michael R. Galt 4/6/79  
Homason 4/5/79  
ilam 4/10/79

QA Approval  
37x Galt 5/23/79  
CID



1. ITEM NO. <b>714</b>	2. VENDOR/LOCAL <b>D.G. O'Brien</b>	3. DOCUMENTS VIOLATED <b>P3A E-501</b>	4. POWER COMPANY CONSTRUCTION DEPARTMENT PROJECT <b>Catawba</b>
5. DATE PD NO <b>1/11/79</b>	6. MECH/ELEC SYSTEM <b>EZA</b>	<b>RECORD COPY</b> Pg. 1 of 2 <b>NONCONFORMING ITEM REPORT</b> USE BLACK BALL POINT PEN ONLY	
7. IDENTIFICATION METHOD <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> PHOTO <input type="checkbox"/> TAPE <input type="checkbox"/> OTHER <input type="checkbox"/> NOT PRACTICAL			

8. LOCATION OF ITEM <b>Warehouse #1</b>	9. SERIAL NO. <b>4747</b>
--	------------------------------

10. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM

*Electrical penetration 2228D on P3A E-501 has low gas pressure in violation of requirement on P3A. Pressure is 12.73. Specified pressure is 15, -2, +1.*

11. EVALUATION/DISPOSITION RESPONSIBILITY	<input checked="" type="checkbox"/> CORRECT	<input type="checkbox"/> DESIGN	<input type="checkbox"/> QA	<input type="checkbox"/> N555	BY <b>CEK</b>
12. ORIGINATOR <b>Ron McAlister</b>	DATE <b>1-26-79</b>	13. SERVICE/GR. REVIEW <b>W. J. Lamm</b>	DATE <b>1-26-79</b>	14. QA REVIEW <b>W. J. Lamm</b>	DATE <b>1-29-79</b>
15. DISPOSITION <b>NOT ACCEPTABLE AS IS</b>				16. REPORT TO MGMT. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

EVALUATION/JUSTIFICATION

*Craft & QC to use Installation Spec CNS 1390.01-00-0068 to determine if penetration is acceptable.*

17. BY <b>Blunt</b>	DATE <b>4/3/79</b>	18. TECHNICAL APPROVAL <b>W. J. Lamm</b>	DATE <b>4-3-79</b>	19. QA APPROVAL <b>W. J. Lamm</b>	DATE <b>4-6-79</b>
20. ACTION/INSPECTION REQUIRED				21. ASSIGNED TO	22. PERFORMED BY
① Electrical Craft work complete				<b>CEST</b>	<b>S. J. McKinnis</b>
② QC verification that penetration is acceptable & remove tag & tape QC to document inspection on attached sheet - <b>W. J. Lamm</b> 4/5/79				<b>SVTE</b>	<b>S. J. McKinnis</b>
③ QA Elect. to review and approve documentation if acceptable.				<b>QAEC</b>	<b>W. J. Lamm</b>

23. BY <b>Blunt</b>	DATE <b>4/3/79</b>	24. QA APPROVAL <b>W. J. Lamm</b>	DATE <b>4-6-79</b>
25. INSPECTION PROCEEDING OR RESOLVED			
DISTRIBUTION: <b>Blunt</b> <b>W. J. Lamm</b> <b>W. J. Lamm</b> NUMBER OF COPIES: <b>2</b> <b>1</b> <b>1</b> <b>1</b>			
26. FILED IN OFFICE <b>C-6-C</b> DATE <b>5-24-79</b>			

Note: Initial the blank beside each procedure section as the work is satisfactorily completed. Show "N/A" and initial in blanks for requirements not applicable to this job.

Section:

Limits & Precautions:

6.2 LER

6.3 LER

Procedure:

7.1 LER

7.2 LER

7.3 LER

7.4 N/A NCI N/A

7.5 N/A NCI N/A

7.6 N/A NCI N/A

7.7 N/A

7.8 LER

Comments:

IS NCI report needs to be initiated or is further explanation is needed for clarification; it shall be recorded below or on attached sheets.

NO PROBLEMS FOUND AFTER FOLLOWING PROCEDURE CNS 1390.01-00-000  
LER QC ELECTRICAL INSPECTOR

By

Michael A. Dove  
Thomas  
ILMAY

4/5/79  
5/24/79

4/6/79

QA Approval

M. Dove

5/23/79

1. CN NO. N/A	3. VENDOR/LOCATION N/A	DOCUMENTS VIOLATED N/A 1915-03 R.5
2. MPS PD NO N/A	4. TELE SYSTEM EWC	
5. IDENTIFICATION METHOD <input checked="" type="checkbox"/> 10-18.5 <input type="checkbox"/> TAPE <input type="checkbox"/> OTHER <input type="checkbox"/> NOT PHYSICAL		

DUNN POWER COMPANY  
 CONSTRUCTION DEPARTMENT  
 PROJECT Catawba  
**RECORD COPY**  
 NONCONFORMING ITEM REPORT  
 USE BLACK BALL POINT PEN ONLY

DEY

7. LOCATION OF ITEM Reactor Bldg #1 Annulus Azimuth 356° 349° 342° Elev. 571' ± 11"	16. SERIAL NO. 4717
---	------------------------

10. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM  
 Three HRI-250 cable tray hangers are not properly connected to the wall using connection detail 27, CN 1915-03 R.5. Detail 27 indicates that the tubular steel is to be centered on the 3/8" x 4" x 7" steel plate. The tubular steel member is welded within an inch of the end of the plate. (4" side of the plate)  
 JCA  
 1-26-78

14. EVALUATION/DISPOSITION RESPONSIBILITY <input type="checkbox"/> CORRECT <input checked="" type="checkbox"/> DESIGN <input type="checkbox"/> QA <input type="checkbox"/> MSSS BY <u>DEEL</u>	15. C-1000 REVIEW DATE 1-23-79 <u>Don McAffee</u>	13. SENIOR REVIEW DATE 1-23-79 <u>Don McAffee</u>	15. QA REVIEW DATE 1-29-79 <u>Don McAffee</u>
17. DISPOSITION		18. REPORT TO MGMT <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

EVALUATION/JUSTIFICATION  
 Location of the tube steel on the plate is not critical as long as there is enough clearance to allow the 3/16" fillet weld to be made. Since there is 1" to seat a 3/16" weld this is O.K.  
 See CN-1915-03 Rev 7 for design change. (MST)

15. BY <u>Don McAffee</u> 7/21/79 <u>C.W. Whittick</u> 7-16-79	16. TECHNICAL APPROVAL <u>D. J. O'Brien</u> 7-25-79	17. QA APPROVAL <u>TC White</u> 7-27-79
--	--	--

22. ACTION/INSPECTION REQUIRED	23. ASSIGNED TO	24. PERFORMED BY	DATE
① Craft personnel to be re-instructed in the requirements of QA procedure R-3, emphasis shall be placed on the fact that drawings shall not be deviated from without prior Design Engineering approval. Document Training on QA Form V-1A.	STST	C. Link	8-22-79
② Remove MCI tags & Q-18 tags (3)	SVTE	R.D. Loney	8-23-79

15. BY <u>Michael Bove</u> 8/14/79	17. QA APPROVAL <u>Don McAffee</u> 8-16-79
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2. REVIEW		L. Loney		DATE		9-25-79	



DUKE POTTER COMPANY  
CONSTRUCTION DEPARTMENT  
PROJECT CATANBA

# QUALITY ASSURANCE TRAINING RECORD

THIS IS TO CERTIFY THAT THE QUALITY ASSURANCE TRAINING WAS HELD ON 8/12/79  
NO. DAT TR.

THE FOLLOWING TOPICS AND REFERENCES WERE  
DISCUSSED: PROCEDURE R3

Concerning NCI 4717

QA

ASME

PROCEDURE

COVER SHEET  
REV.

9

INSTRUCTOR

C. R. Cox

DURATION

1

HOURS

ATTENDEES:

CREW NO.

132ALL ☐  
PART ☒

48-02-9987

SOCIAL SEC. NO.

NAME

SOCIAL SEC. NO.

NAME

244-74-9356

Ray F. Gump, Jr.

295024425

Bobby F. Buchanan

251-68-1593

Billy Ramsey

253803223

Kath Queen

243723724

Larry M. Linnis

250080031

Timothy Randall Smith

249922765

Alan Dale Bell

266986422

Michael L. Everson

249264316

Shub A. Porter

249929004

Johnny Thompson

50706107

C. R. Cox



2. REQUEST NO. N/A	3. VENDOR/LOCAL (W)	4. MECH/ELEC SYSTEM NV	5. IDENTIFICATION METHOD TAG-185 2 ONLY TAPE OTHER NOT PRACTICAL	6. COMPANY DEPARTMENT CONSIDER PROJECT TAWBA	7. RECORD COPY NONCONFORMING ITEM REPORT USE BLACK BALL POINT PEN ONLY
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9. LOCATION OF ITEM AB ELEV. 543 055 54 JT UNIT #1

10. SERIAL NO. 7606

11. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM  
CENTRIFUGAL CHARGING PUMP MOTOR IS-76-75E31363 HAS THERMOCOUPLING BROKEN OUT OF HOUSING AT MOTOR BEARING (REAR) LOCATION OF THERMOCOUPLING IN ELECTRICAL SC OFFICE

12. EVALUATION/DISPOSITION RESPONSIBILITY  
☒ CORRECT ☐ DESIGN ☐ CM ☐ N555  
 13. ORIGINATED DATE 1-9-79  
 14. SENT TO (FOR) REVIEW DATE 1-9-79  
 15. G.A. REVIEW DATE 1-9-79  
 16. REPORT TO MGMT. YES ☒ NO ☐

17. DISPOSITION NOT ACCEPTABLE AS IS

18. EVALUATION/JUSTIFICATION  
 TO CORRECT DEFICIENCY WESTINGHOUSE ON SITE REPRESENTATIVE NOTIFIED OF PROBLEM AND REQUESTED TO OBTAIN NEW THERMOCOUPLES. WESTINGHOUSE IS REQUESTED TO REPLACE BEARING UNITS WHEN NEW THERMOCOUPLES RECEIVED ON SITE.

19. BY L.H. Reynolds DATE 3-16-79  
 20. TECHNICAL APPROVAL DL Frazier DATE 3-16-79  
 21. G.A. APPROVAL RMoney DATE 3-29-79

22. ACTION/INSPECTION REQUIRED  
 ORDER NEW THERMOCOUPLES CEMC (W)  
 ED OWENS HAS ORDERED THERMOCOUPLES  
 NOTIFY OF ELECTRICAL PRIOR TO PERFORMING CEMC (W)  
 VERIFY NEW THERMOCOUPLES HAVE BEEN RECEIVED CEMC (W)  
 REMOVE TAGS & TAPE PRIOR TO INSTALLING OF SVTE  
 NEW THERMOCOUPLES  
 INSTALL NEW THERMOCOUPLES CEMC (W)  
 REMOVE TAGS - SCRAP OLD THERMOCOUPLES - NEW THERMOCOUPLES WILL SVTE W. Balthus 3-31-80  
 BE INSTALLED LATER DURING NORMAL CONSTRUCTION WORK.  
 23. DATE 3-28-80  
 24. DATE 3-16-79  
 25. DATE 3-29-79

26. DISTRIBUTION  
 27. APPROVAL  
 28. REVIEW  
 29. DATE 4-8-80

1. REVISION NO.		2. VENDOR / LOCATION		3. COMMENTS VIOLATED		FORM 0-1A		REVISION 9	
N/A		(U)		-3 PROCEEDURES		CONSIST		R COMPANY	
4. MPS PD NO		5. /ELEC SYSTEM		P3A E-4		PROJECT		DEPARTMENT	
N/A		NI				TAWBA			
6. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		7. IDENTIFICATION METHOD		8. ONLY TAPE		RECORD COPY		NONCONFORMING ITEM REPORT	
		9. OTHER		10. NOT PRACTICAL		USE BLACK BALL POINT PEN ONLY			

9. LOCATION OF ITEM		10. SERIAL NO	
ELEVATION 543' A/B COL. LINES GG-HH 53 & 54 UNIT 1		4607	

10. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM

SAFETY INTERLOCK PUMP MOTOR - IS-76-75F47622 HAS THERMOCOUPLES BROKEN OUT OF HOUSING AT REAR MOTOR BEARING LOCATION OF THERMOCOUPLES IN ELECTRICAL QUALITY CONTROL OFFICE

14. EVALUATION / DISPOSITION RESPONSIBILITY		15. G A REVIEW		16. DATE	
11. ORIGINATED		12. REVIEW		13. DATE	
Pearl & Rudick 1-9-79		1-9-79		1-9-79	

17. DISPOSITION

NO - ACCEPTABLE AS IS

EVALUATION / JUSTIFICATION

TO CORRECT DEFICIENCY WESTINGHOUSE ON SITE REPRESENTATIVE NOTIFIED OF PROBLEM AND REQUESTED TO OBTAIN NEW THERMOCOUPLES. WESTINGHOUSE IS REQUESTED TO REPLACE BROKEN UNITS WITH NEW THERMOCOUPLES RECEIVED ON SITE

18. BY		19. DATE		20. TECHNICAL APPROVAL		21. G A APPROVAL		22. DATE	
H. H. Rynders		3-16-79		DL Jure		H. H. Mason		3-20-79	
23. ACTION / INSPECTION REQUIRED		24. ASSIGNED TO		25. PERFORMED BY		26. DATE			
ORDER NEW THERMOCOUPLES		CEMC (P)		Don Mc		4-3-79			
ED OWENS HAS ORDERED THERMOCOUPLES									
NOTIFY QC ELECTRICAL PRIOR TO PERFORMING		CEMC (P)							
VERIFY NEW THERMOCOUPLES HAVE BEEN RECEIVED		CEMC (P)		Don Mc		3-28-80			
REMOVE TAGS & TAPE PRIOR TO INSTALLING		SVTE							
OF NEW THERMOCOUPLES									
INSTALL NEW THERMOCOUPLES		-CEMC (P)							
REMOVE TAGS - SCRAP OLD THERMOCOUPLES - NEW THERMOCOUPLES WILL		SVTE		W. Butts		3-31-80			
BE INSTALLED LATER DURING NORMAL CONSTRUCTION WORK.									
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3-16-79		3-16-79		3-20-79					

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2. REQUISITION NO.		3. VENDOR/LOC		4. JMWTS VIOLATED		5. VISION	
N/A		(W)		P33 PRIORITIZED P3A 2-133		R COMPANY CONSTR. DEPARTMENT PROJECT CATAWABA	
6. MPS PO NO		7. MACH/ELEC SYSTEM		8. IDENTIFICATION METHOD		9. NONCONFORM REPORT	
JA		NV		20-185 3 ONCE TAPE OTHER NOT PRACTICAL		USE BLACK BALL POINT PEN ONLY	

9. LOCATION OF ITEM		10. SERIAL NO	
A/A ELEV 543' JJ-55-54 UNIT #1		4608	
11. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM			
CENTRIFUGAL CHARGING PUMP MOTOR HAS THERMOCOUPLE BROKEN OUT OF MOTOR HOUSING AT FRONT BEARING. MOTOR SERIAL NO. 25-76-74F 31363. LOCATION OF THERMOCOUPLE IN ELECTRICAL QUALITY CONTROL OFFICE.			

12. EVALUATION/DISPOSITION RESPONSIBILITY				13. G A REVIEW			
CONSTR				DESIGN			
14. ORIGINATED		DATE		15. G A REVIEW		DATE	
James L. Robinson		1-9-79		J. H. Hume		1-9-79	
16. DISPOSITION				17. REPORT TO MGR			
LET ACCEPTABLE AS IS				YES NO			

EVALUATION/JUSTIFICATION

TO CORRECT DIFFICIENCY, WESTINGHOUSE ON-SITE REPRESENTATIVE NOTIFIED OF PROBLEM AND REQUESTED TO OBTAIN NEW THERMOCOUPLES. WESTINGHOUSE IS REQUESTED TO REPLACE BROKEN UNITS WITH NEW THERMOCOUPLES WHEN REPLACEMENTS RECEIVED ON SITE.

18. BY		DATE		19. TECHNICAL APPROVAL		DATE		20. G A APPROVAL		DATE	
J. H. Hume		3-16-79		DL Frey		3-16-79		R. H. Hume		3-29-79	
21. ACTION/INSPECTION REQUIRED				22. ASSIGNED TO				23. PERFORMED BY			
ORDER NEW THERMOCOUPLES				CENC (W)				J. H. Hume 9-3-79			
ED OWENS HAS ORDERED THERMOCOUPLES											
ADVISE JC ELECTRICAL PRIOR TO PERFORMING WORK				CENC (W)				J. H. Hume 3-28-80			
VERIFY NEW THERMOCOUPLES HAVE BEEN RECEIVED				REMOVE TAGS & TAPE PRIOR TO INSTALLING				SVTE			
OF NEW THERMOCOUPLES											
INSTALL NEW THERMOCOUPLES				CENC (W)							
REMOVE TAGS - SCRAP OLD THERMOCOUPLES - NEW THERMOCOUPLES WILL BE INSTALLED LATER DURING NORMAL CONSTRUCTION WORK.				SVTE				W. Bottis 3-31-80			
24. BY		DATE		25. G A APPROVAL		DATE		26. BY		DATE	
J. H. Hume		3-28-80		J. H. Hume		3-28-80		J. H. Hume		3-29-79	

27. DISTRIBUTION		28. NUMBER OF COPIES		29. DATE		30. BY	
2		2		4-8-80		C. L. B. Jones	



JCM

FORM

Q-1

REVISION

9

1. ACQUISITION NO.

N/A

3. VENDOR/LOCATION

Frank Elk.

4. DOCUMENTS VIOLATED

Procedure M-41

5. MPS FO NO

N/A

6. MECH/ELEC SYSTEM

EOR

M-418 Serial

#4 Rev #1

7. YES ☒ NO ☐

8. IDENTIFICATION METHOD

☒ Q-18☐ ONCE TAPE☐ OTHER☐ NOT PRACTICALD. POWER COMPANY  
CONSTRUCTION DEPARTMENT  
PROJECT CATAPWARECORD COPY  
NONCONFORMING ITEM REPORT  
USE BLACK BALL POINT PEN ONLY

9. LOCATION OF ITEM

Control Room E. 594' Col. 57 RA

16. SERIAL NO. 4617

10. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM

During routine inspection it was noted that factory welds on MAIN Control Board 2MCI ARC broken.

14. EVALUATION/DISPOSITION RESPONSIBILITY

☐ CONST☒ DESIGN☐ QA☐ NSSSBY Elk 40.

11. ORIGINATED

DATE

Roy J. Hembree 1-9-79

13. SENIOR REVIEW

DATE

R. H. Hembree 1-9-79

15. QA REVIEW

DATE

R. H. Hembree 1-9-79

12. DISPOSITION

REPAIR

18. REPORT TO MGMT

C. YES ☒ NO ☐

EVALUATION/JUSTIFICATION

Grind broken welds off smooth and reweld with 3/16 inch fillet weld all grounds welding to be per AWS-D1.1 Rev 2-1974.

19. BY

DATE

J. Chung 2-5-79

20. TECHNICAL APPROVAL

DATE

T. M. Mahe 2-5-79

21. QA APPROVED

DATE

T. C. Roberts 2-19-79

22. ACTION/INSPECTION REQUIRED

23. ASSIGNED TO

24. PERFORMED BY

DATE

Craft shall do all welding in accordance with EP-22

WEST

Remove Q-18 tag

SVTE

NOTE:

Remove 3/4/79

NCI 5916 Supersedes This NCI

Bogardine 7-2-79

DATE 3-2-79

BY R. H. Hembree

DATE 3-8-79

25. ACTION/INSPECTION REQUIRED OR REMARKS

Q-18 tag removed iaw NCI 5916

Bogardine 7-2-79

DISTRIBUTION

1. PROJECT

2. WORK

3. HAZARD

4. ELEC

5. LOSS

6. MECH

7. QA

R. H. Hembree

7-6-79



INITIAL DISTRIBUTION

CESE

FINAL DISTRIBUTION

1. ITEM NO. N/A		2. VENDOR/LOCATION Frank Elec.		3. DOCUMENTS VIOLATED Proc. M-41 M-41B Serial #4 Rev #1		FORM Q-1		REVISION 9	
4. MFG. PO NO. N/A		5. MECH./ELEC. SYSTEM EOA		6. IDENTIFICATION METHOD <input checked="" type="checkbox"/> Q-1B <input type="checkbox"/> ONLY TAPE <input type="checkbox"/> OTHER <input type="checkbox"/> NOT PRACTICAL		DUKE POWER COMPANY CONSTRUCTION DEPARTMENT PROJECT <u>CATAWBA</u> RECORD ONLY			
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO						NONCONFORMING ITEM REPORT USE BLACK BALL POINT PEN ONLY			

7. LOCATION OF ITEM Control Room Et. 594 Cat. 58 AA

8. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM  
During routine inspection it was noted that factory welds on main control board 2mc5 ARE broken.

9. EVALUATE N/A DISPOSITION RESPONSIBILITY <input type="checkbox"/> CONIST <input checked="" type="checkbox"/> DESIGN <input type="checkbox"/> QA <input type="checkbox"/> NSSS		10. DATE 1-9-79		11. SERVICED BY R. H. Hume		12. DATE 1-9-79		13. QA REVIEW J. H. Hume		14. DATE 1-9-79	
15. DISPOSITION REPAIR						16. REPORT TO MGMT <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					

17. EVALUATION/JUSTIFICATION  
Grind broken welds off smooth and reweld with 3/16 inch fillet weld all around. Welding to be per AWS-D1.1-1977.

18. BY J. H. Hume		19. DATE 2-5-79		20. TECHNICAL APPROVAL T. M. Muth		21. DATE 2/5/79		22. QA APPROVAL T. C. Roberts		23. DATE 2-19-79			
24. ACTION/INSPECTION REQUIRED Craft shall do all welding in accordance with CP-22. Remove Q-1B tag. Rb Room 3/2/79								25. ASSIGNED TO WLST		26. PERFORMED BY J. H. Hume		27. DATE 4-6-79	
								28. ASSIGNED TO SVTE		29. PERFORMED BY R. H. Hume		30. DATE 4-6-79	

31. BY J. H. Hume		32. DATE 3-2-79		33. QA APPROVAL J. H. Hume		34. DATE 3-5-79	
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35. COMMENTS  
Welding to be per AWS-D1.1-1977.

2. REQUESTION NO. <b>NA</b>	3. VENDOR <b>GE</b>	4. LOCATION <b>EL 554</b>	5. DOCUMENTS VIOLATED <b>Procedure M.4</b>	6. DUK VER <b>CONSTRUCTION DE</b>	7. ANY <b>PROJECT CATAWBA</b>
8. MPS PO NO <b>NA</b>	9. MECH/ELEC SYSTEM <b>EPL</b>	10. SERIAL NO <b>Rev. 5</b>	11. SERIAL NO <b>Rev. 0</b>	<b>RECORD COPY</b> <b>NONCONFORMING ITEM REPORT</b> <b>USE BLACK BALL POINT PEN ONLY</b>	
12. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		13. IDENTIFICATION METHOD <input checked="" type="checkbox"/> CHIPS <input type="checkbox"/> TAPE <input type="checkbox"/> OTHER <input type="checkbox"/> NOT PRACTICAL			

14. LOCATION OF ITEM <b>Auxiliary Building EL 554</b>	15. SERIAL NO <b>4666</b>
16. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM	

During routine inspection at Battery Rack 1EBB it was found that the Plastic Cell Strips (Part # 504-106349-003) ARE NOT installed properly. Because of the low temperature the strips ARE NOT Adhering to the racks.

17. EVALUATION/ DISPOSITION RESPONSIBILITY <b>Ray Hemline</b>	DATE <b>1-16-79</b>	18. CONIST <b>Design</b>	DATE <b>1-16-79</b>	19. G A REVIEW <b>Ray</b>	DATE <b>1-17-79</b>
17. DISPOSITION <b>see below</b>			18. REPORT TO MGMA <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

EVALUATION/ JUSTIFICATION

Failure of the plastic cell strips to adhere to the metal racks appears to be due to the stiffness and contorted shape of the plastic strips caused by low temperatures. The low temperatures may also detract from the bonding qualities of the cement.

Raise the temperature of the metal rack and plastic cell strips by heating the Battery Cubicle. Re-install or complete installation of the plastic cell strips.

19. BY <b>L B Mooseh</b>	DATE <b>1-17-79</b>	20. TECHNICAL APPROVAL <b>DC Fuzze</b>	DATE <b>1-17-79</b>	21. G A APPROVAL <b>Ray</b>	DATE <b>1-17-79</b>
22. ACTION/ INSPECTION REQUIRED				23. ASSIGNED TO	
① Remove NGI Tape and Taps				24. BY <b>OC (15)</b>	DATE <b>1-18-79</b>
② Heat Battery Cubicle				24. BY <b>Griff (29)</b>	DATE <b>1-19-79</b>
③ Re-install or complete installation of Plastic Cell Strips				24. BY <b>Griff (29)</b>	DATE <b>1-19-79</b>
④ Inspect Battery Racks				24. BY <b>KPC (15)</b>	DATE <b>1-19-79</b>

25. BY <b>L B Mooseh</b>	DATE <b>1-17-79</b>	26. G A APPROVAL <b>Ray</b>	DATE <b>1-17-79</b>
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DISTRIBUTION	1	2	3	4	5	6	7	8	9	10
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27. G A REVIEW **12 Hemline** DATE **1-24-79**





1. TICKET NO. <b>11A</b>	2. VENDOR/LOCATION <b>NIA</b>	3. DOCUMENTS VIOLATED <b>CN2892-05</b> <b>CN1903-04</b> <b>QA Procedure</b> <b>M-418 Serial 2</b>	4. DU POWER COMPANY CONSTRUCTION DEPARTMENT PROJECT <b>CATAWBA</b>
5. MP/PO NO <b>NIA</b>	6. /ELEC SYSTEM <b>EW C</b>	RECORD COPY NONCONFORMING ITEM REPORT USE BLACK BALL POINT PEN ONLY	
7. YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		8. IDENTIFICATION METHOD <input checked="" type="checkbox"/> 10-105 <input type="checkbox"/> ONLY TAPE <input type="checkbox"/> OTHER <input type="checkbox"/> NOT PRACTICAL	

9. LOCATION OF ITEM <b>560' elevation Auxiliary Building</b> <b>Column Lines H H And 59</b>	10. DRAWING NO <b>NIA 4584</b>
12. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM <b>Hanger 2 HA 33 C WAS modified</b> <b>AND NOW exceeds design drawing widths on both CN2892-</b> <b>05 Revision 2 schedule and CN 1903-04 revision 5 seismic</b> <b>Standard DHS 18 detail.</b>	

14. EVALUATION/DISPOSITION RESPONSIBILITY	<input type="checkbox"/> CONST	<input checked="" type="checkbox"/> DESIGN	<input type="checkbox"/> QA	<input type="checkbox"/> NISS	BY <b>ELC</b>
11. ORIGINATED <b>W M Hadden</b>	DATE <b>11/3/79</b>	13. REVIEWED <b>L. Johnson</b>	DATE <b>1-3-79</b>	15. QA REVIEW <b>R. Morgan</b>	DATE <b>1-4-79</b>
17. DISPOSITION			18. REPORT TO MGMT <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

EVALUATION/JUSTIFICATION

**HANGER IS OK AS SHOWN ON THE ATTACHED SKETCH.**  
**(WHICH IS AS BUILT.)**

**MARK TULLY**  
**4/13/79**

19. BY <b>R.D. Ahmady</b>	DATE <b>8-2-79</b>	20. SPECIAL APPROVAL <b>By Allen</b>	DATE <b>8-6-79</b>	21. QA APPROVAL <b>TC R. R. R.</b>	DATE <b>8-28-79</b>
22. ACTION/INSTRUCTION REQUIRED <b>No further Action Required</b> <b>11/13/79</b>				23. ASSIGNED TO <b>NA</b>	24. REVIEWED BY <b>NA</b>
25. ACTION/INSTRUCTION REQUIRED <b>No action Required</b>				26. ASSIGNED TO <b>NA</b>	27. REVIEWED BY <b>NA</b>

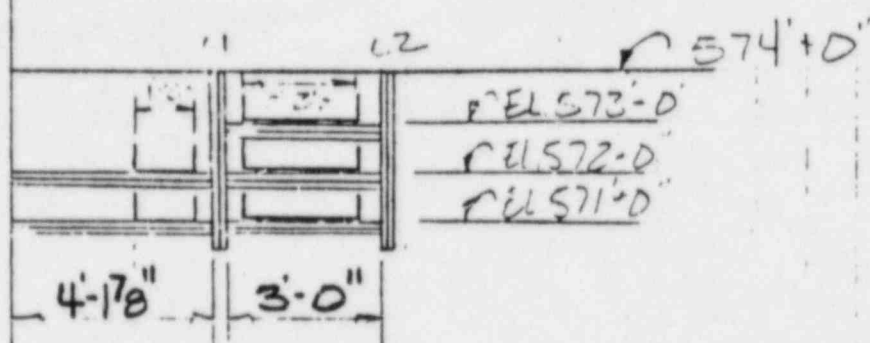
26. QA APPROVAL <b>H. E. Mason</b>	DATE <b>10-15-79</b>
27. ACTION/INSTRUCTION REQUIRED <b>No action Required</b>	
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NCI ~~4884~~  
4584

Checked By

Date 4-4-79  
Date



11 F.L. 1/2 LONGITUDINALLY BRACED

BY	DATE	TECHNICAL APPROVAL	DATE	QA. APPROVAL	DATE
R.D. Dierker	9-25-79	W. J. Owen	10/2/79	TC Roberts	10-8-79

1. REQ. NO. <u>N/A</u>		3. VENDOR/LOCATION <u>DE O'BRIEN</u>		DOCUMENTS VIOLATED <u>P3A E-558</u>		FORM <u>0-1A</u> REVISION <u>9</u>	
2. MPS PO NO. <u>N/A</u>		4. MECH/ELEC SYSTEM <u>EZA</u>				DUNKER COMPANY CONSTRUCTION DEPARTMENT PROJECT <u>CATCHER</u>	
7. YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		8. IDENTIFICATION METHOD <input checked="" type="checkbox"/> OTHER <input type="checkbox"/> NOT IDENTICAL <input type="checkbox"/>		RECORD COPY			
9. LOCATION OF ITEM <u>WAREHOUSE #1</u>				16. SUPPLY NO. <u>4566</u>			
10. DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM <u>ELECTRICAL PENETRATION 4250 F ON P3A EX58 HAS LOW GAS PRESSURE IN VIOLATION TO REQUIREMENTS ON P3A. PRESSURE IS 11.5. P3A STATES A TOLERANCE OF (+) PLUS 1 MINUS (-) 2</u>							
14. EVALUATION/DISPOSITION RESPONSE CITY <u>ALL</u> <input checked="" type="checkbox"/> DESIGN <input checked="" type="checkbox"/> QA <input type="checkbox"/> NISS <input type="checkbox"/> ELEC <input type="checkbox"/>							
11. ORIGINATED <u>James L. Rudisill</u>		DATE <u>12-29-78</u>		12. REVIEWER <u>William D. Ryan</u>		DATE <u>12-29-78</u>	
17. DISPOSITION <u>PERFORM ATTACHED PROCEDURE</u>				18. REPORT TO MGMT. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
EVALUATION/JUSTIFICATION <u>THE ATTACHED PROCEDURE ALLOWS THE FIELD TO DETERMINE IF A PROBLEM EXISTS WHICH CAN BE REPAIRED IN THE FIELD OR IF THE PENETRATION MUST BE RETURNED TO THE MANUFACTURER FOR REPAIR.</u>							
19. APPROVAL <u>Paul M. McBride</u>		DATE <u>3/12/79</u>		20. TECH. APPROVAL <u>TC Ralston</u>		DATE <u>3-19-79</u>	
22. ACTION/INSPECTION REQUIRED				23. ASSIGNED TO		27. PERFORMED BY	
1. Electrical Craft to notify QC Electrical prior to beginning work and to perform the steps outlined in the attached procedure.				CEST		9-11-78	
2. QC Electrical to witness all of the steps outlined in the attached procedure and certify that the steps were performed correctly by initialing the blanks specified on the attached procedure checklist.				SVTE		LER 4-17-79	
3. Review & Approve attached Procedure results				QAEC		4-24-79	
21. APPROVAL <u>Michael S. Bore</u>		DATE <u>4/3/79</u>		26. QA APPROVAL <u>Anthony</u>		DATE <u>4-4-79</u>	
24. INSPECTION EXCEPTIONS OR DEFECTS							
DISTRIBUTION							
29. FINAL QA REVIEW <u>Michael S. Bore</u> DATE <u>4-27-79</u>							

- 1.0 TITLE: Procedure for Corrective Action for Electric Penetrations which have a Marginal or Possibly Unacceptable SF<sub>6</sub> Leak Rate (Types A through M)
- 2.0 PURPOSE: To specify courses of action for Electric Penetrations which have a questionable leak rate due to low SF<sub>6</sub> pressure readings.
- 3.0 SCOPE: This specification applies to Electrical Penetration Types A-M installed at Catawba Nuclear Station.
- 4.0 REFERENCES:
- 4.1 CNM1361.00-6 Sh. 1 (D.G. O'Brien No. R31E5046 Sh. 1) Low Voltage Power Electric Penetration Installation Drawing
- 4.2 CNM1361.00-7 Sh. 1 (D.G. O'Brien No. R31E5047 Sh. 1) Instrumentation and Control Electric Penetration Installation Drawing
- 4.3 CNM1361.00-8 Sh. 1 (D.G. O'Brien No. R31E5048 Sh. 1) Medium Voltage Power Electric Penetrations.
- 5.0 Test Equipment/Tools:
- 5.1 A bottle of commercial grade SF<sub>6</sub> which has been designated for Electrical Penetration use.
- 5.2 Regulator, hoses or piping, and fittings to attach SF<sub>6</sub> bottle to penetration under test.
- 5.3 Wrenches as required for above.
- 5.4 Bottle of soap solution which may be obtained from the NDE office.
- 6.0 LIMITATIONS AND PRECAUTIONS:
- 6.1 Do not over torque the fill valve. It is fully closed when shut finger tight.
- 6.2 To prevent air from being injected into penetration.
- 6.2.1 Loosely connect SF<sub>6</sub> source to the penetration but DO NOT open the penetration fill valve.
- 6.2.2 Crack open SF<sub>6</sub> bottle supply or regulator valve and flush the fill line with SF<sub>6</sub>.
- 6.2.3 Tighten all fill connections and then shut off SF<sub>6</sub> supply or regulator valve.
- 6.3 Do not allow soap solution to get into the ends of the connector modules and clean up all soap solution after using.

TITLE: Procedure for Corrective Action for Electric Penetrations Which have a Marginal or Possibly Unacceptable SF <sub>6</sub> Leak Rate (Types A through M)		Index/Specification No:	
Revision No: 0		CNS-1390.01-00-00	
Date: March 8, 1979		Page 1 of 3	
Pmm			

( ATTACHMENT TO  
NCI # 4566

7.0 PROCEDURE:

- 7.1 Pressurize the penetration assembly to 17 psig with the commercial grade SF<sub>6</sub> specified in Section 5.0 while heeding the precautions in Section 6.
- 7.2 Close the fill valve and remove the source of SF<sub>6</sub>.
- 7.3 Using a soap solution check all fittings and welds on the pressure gauge assembly and tubing. DO NOT ALLOW SOAP SOLUTION TO GET INTO MODULE CONNECTOR ENDS.
- 7.4 If a leak is found at a weld joint then a non-conforming item report should be issued.
- 7.5 If a leak is found at the end of the fill connection then tighten the fill valve.

NOTE

THIS VALVE IS FULLY CLOSED WHEN SHUT FINGER TIGHT.

- 7.5.1 If the leak has stopped:
  - 7.5.1.1 Decrease the pressure to 15 psig; record the pressure, flange temperature and barometric pressure.
  - 7.5.1.2 Wait at least two (2) days minimum [three (3) days maximum] and record the flange temperature and pressure and barometric pressure.
    - a. If there is no indication of pressure loss when corrected for temperature and barometric pressure changes, then the penetration is acceptable for use.
    - b. If there is an indication of pressure loss when corrected for temperature and barometric then a non-conforming item report should be issued.
- 7.5.2 If the leak has not stopped, the valve may be faulty and a non-conforming item report should be issued.
- 7.6 If a leak is found in the valve body or at the valve stem a non-conforming item report should be issued.
- 7.7 If a leak is found where the pressure gauge screws into the mounting assembly.
  - 7.7.1 Decrease pressure to 3 psig, remove pressure gauge, wrap gauge threads with teflon tape, and re-insert gauge.

NOTE

THE PRECEDING STEP MUST BE DONE EXPEDITIOUSLY.

- 7.7.2 Re-pressurize the unit to 17 psig and repeat the bubble check of the gauge connection.

TITLE: Procedure for Corrective Action for Electric Penetrations Which have a Marginal or Possibly Unacceptable SF <sub>6</sub> Leak Rate (Types A through M)		Index/Specification No. CNS-1390.01-00-00	
Revision No	0	Date	March 8, 1979 Pmm
		Page:	2 of 3



ATTACHMENT to  
NCI P4566

77 -

7.7.2. If no further leaks are observed then decrease the pressure to 15 psig, record pressure, flange temperature and barometric pressure and monitor for at least two (2) days.

a. If there is no indication of pressure loss when corrected for temperature and barometric pressure, then the penetration is acceptable for use.

b. If the gauge fitting still leaks repeat 7.7.

7.8 If no leaks are found by bubble check:

7.8.1 Pressurize the penetration to 17 psig with commercial grade SF<sub>6</sub> specified in Section 5.0 while heeding the precautions in Section 6.0.

7.8.2 Decrease the pressure to 15 psig; record pressure, flange temperature and barometric pressure.

7.8.3 Wait two (2) days minimum [three (3) days maximum] and record the flange temperature, pressure and barometric pressure.

7.8.3.1 If there is no indication of pressure loss when corrected for temperature and barometric pressure changes, then the penetration is acceptable for use.

7.8.3.2 If there is still indication of pressure loss when corrected as above, then contact Design Engineering for further instructions or disposition.

TITLE: Procedure for Corrective Action for Electric Penetrations Which have a Marginal or Possibly Unacceptable SF <sub>6</sub> Leak Rate (Types A through M)		Index/Specification No: CNS-1390.01-00-00
Revision No 0	Date: March 8, 1979 Pmm	Page: 3 of 3

# Catawba Nuclear Station Procedure Checklist.

NCI 4566

5 of 5

NCI 4566

B.

Date

Check E

Date

Note: Initial the blank beside each procedure section as the work is satisfactorily completed. Show "N/A" and initial in blanks for requirements not applicable to this job.

## Section:

### Limits & Precautions:

6.2 LER

6.3 LER

### Procedure:

7.1 LER

7.2 LER

7.3 LER

7.4 N/A NCI N/A

7.5 N/A NCI NA

7.6 N/A NCI N/A

7.7 N/A

7.8 LER

### Comments:

IF NCI report needs to be initiated or if further explanation is needed for clarification; it shall be recorded below or on attached sheets.

NO PROBLEMS ENCOUNTERED FOLLOWING CNS 1390.01-00-0068

By

Michael R. Gore

4/13/79

QA Approval

J. J. Gore

4/24/79

[illegible]

2 REQUISITION NO. N/A		3 VENDOR N/A		4 DOCUMENTS VIOLATED Q1 PARA. I R.3 PARA. II		FORM 0-1A / REVISION 9	
5 NO. OF NO. A		6 MECH/ELEC SYSTEM EWC				DUKE POWER CO. NY CONSTRUCTION DEPARTMENT PROJECT CATAWBA I.	
7 NO. YES <input type="checkbox"/> NO <input type="checkbox"/>		8 IDENTIFICATION METHOD <input checked="" type="checkbox"/> TAGS <input type="checkbox"/> TAPE <input type="checkbox"/> OTHER <input type="checkbox"/> NOT PRACTICAL				RECORD COPY NONCONFORMING ITEM REPORT USE BLACK BALL POINT PEN ONLY	
9 LOCATION OF ITEM CMH 4 SOUTHEAST OF REACTOR						16 SERIAL NO. 4497	
10 DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM TWO(2) CABLE SUPPORTS ON THE EAST SIDE HAVE BEEN FABRICATED AND INSTALLED. THERE IS NO DETAIL COVERING THESE CABLE SUPPORTS ON CN-1938-04, REV. 3.							
14 EVALUATION/DISPOSITION RESPONSIBILITY <input checked="" type="checkbox"/> CONIST <input type="checkbox"/> DESIGN <input type="checkbox"/> QA <input type="checkbox"/> NSSS OVERLAP DE							
11 ORIGINATOR M. J. Roberts		DATE 12/14/78		13 SERIAL NO. OF REVIEW R. Johnson		DATE 12-14-78	
17 DISPOSITION ACCEPTABLE AND IS						18 REPORT TO MGMT C YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	
EXPLANATION/JUSTIFICATION							
① DRAWING CN 1938-04 REV 4 HAS BEEN RECEIVED SHOWING THE DETAILS NEEDED FOR THIS INSTALLATION.							
CRAFT PERSONNEL TO BE INSTRUCTED IN QA PROCEDURE R-3.							
15 BY R. Roberts		DATE 1/2/79		20 TECHNICAL APPROVAL R. Johnson		DATE 1-2-79	
22 ACTION/INSPECTION REQUIRED				23 QA APPROVAL			
① VERIFY DRAWING & WORK & REMOVE TAGS & TAPE				23 ASSIGNED TO HANWAY 15			
② INSTRUCT PERSONNEL				23 BY M. J. Roberts			
Attach evidence of instruction to this copy of RCT				DATE 1-13-79			
24 BY R. Roberts		DATE 1/3/79		26 QA APPROVAL R. Marge		DATE 1-3-79	
28 ACTION/INSPECTION FRECTIONS OF REWORK							
DISTRIBUTION							
NUMBER OF COPIES 2							



NAME \_\_\_\_\_

Rich. Green

DUKE POWER COMPANY  
CONSTRUCTION DEPARTMENT  
PROJECT CATANBARECORD COPY  
NONCONFORMING ITEM REPORT  
USE BLACK BALL POINT PEN ONLY

VENDOR/LOCATION

DOCUMENTS VIOLATED

N/A

H-5  
CP-23

ELEC SYSTEM

(CP-23B)

FNC

IDENTIFICATION METHOD

OTHER

NOT IDENTICAL

LOCATION OF ITEM NUCLEAR SERVICE WATER

16 SERIAL NO

4496

Pump House

DESCRIPTION OF ITEM AND STATEMENT OF PROBLEM

1/2" BOLTS USED THROUGHOUT  
NUCLEAR SERVICE WATER PUMP HOUSE CABLE  
TRAY SUPPORT SYSTEM ARE NOT IDENTIFIED  
PER. CP-23 (CP-23B). THE PROBLEM IS  
INCREASED BY THE FACT THAT DESIGN  
DRAWINGS EN-1940-01, 02 DO NOT DESIGNATE  
A TYPE OF BOLT MATERIAL.NOT IDENTIFIED WITH Q-18TAG - AREA TOO EXTENSIVE.

EVALUATION/DISPOSITION RESPONSIBILITY

ELECT

DESIGN

QA

NCS

G. E. E. H. 4.1

ORIGINATED

DATE

12/13/78

DATE

12-13-78

SQA REVIEW

DATE

12-15-78

DISPOSITION Acceptable - Pending approval of test results

REPORT TO MGR

EVALUATION/JUSTIFICATION

Based on the attached letter by RG Mallaney dated Feb 2, 1979 and the attached Certifications from Sureloc and Southeastern Bolt and Screw, it has been established that all bolting material (1/2") was either A 307 or SAE J429 Grade 2 which is equivalent to A 307. Design drawings designating bolting material have been revised to indicate that all bolts used on cable tray hanger connections shall be ASTM A 307 or equivalent.

(SEE ATTACHED SHEET)

W. E. Johnson

DATE

2-26-79

DATE

DATE

2-26-79

21 SQA APPROVAL

DATE

2-28-79

ACTION/INSPECTION REQUIRED

23 ASSIGNED TO

21 PERFORMED BY

DATE

1) Perform test in accordance with Attachments

QCME THE MGR

SQA

CECV

T.H. Roberts

2/7/81

2) When results of testing program have been evaluated by Design Eect., attach to this NCI. Mon 4/25/79

CEEL

J.W. Roberts

3-25-81

3) Test results found to be acceptable by Design Eect. 4/25/79 for all bolts received at the types tested Aug 10-19-79

CEEL

J.W. Roberts

3-25-81

4) Test results found to be unacceptable by Design Eect. See NCI No. 4/25/79

CEEL

N/A

T.H. Robertson

12/10/80

2

H. E. Johnson

12/10/80

W. E. Johnson

DATE

4-25-79

DATE

4-25-79

ACTION/INSPECTION EXCEPTIONS OR REMARKS

DISTRIBUTION

FILE

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~~17. The 1/2" diameter bolts used in the nuclear safety related cable tray support systems are to be equivalent in strength to ASTM A-307 bolts. All appropriate design drawings have been revised to indicate this.~~

~~To verify that all 1/2" diameter bolts used meet this strength requirement, a random sample of each bolt size shall be secured by Construction from those bolts which are not identified by appropriate markings. The sample sizes shall be in accordance with B W Logan's attached letter of 3/29/79. These samples shall then be tested in accordance with C L Ray's attached test procedure of 3/20/79.~~

~~The results of this testing program shall be sent to Design Engineering/ Electrical Division for determination of acceptability.~~

19. By: *[Signature]*

Date: 4/16/79

20. Technical Approval: *Bytown*

Date: 4/18/79

21. QA Approval: *TC Polenta*

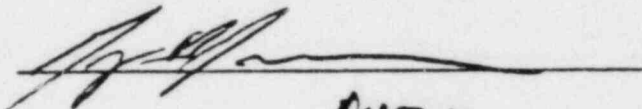
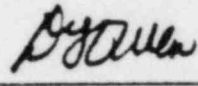
Date: 4-19-79

(SEE REVISION 2 - ATTACHED)

17. The  $\frac{1}{2}$ " diameter bolts used in the nuclear safety related cable tray support systems are to be equivalent in strength to ASTM A-307 bolts. All appropriate design drawings have been revised to indicate this.

To verify that all  $\frac{1}{2}$ " diameter bolts used meet this strength requirement, a random sample of each bolt size shall be secured by Construction from those bolts which are not identified by appropriate markings. The sample sizes shall be in accordance with B W Logan's attached letter of 3/29/79. These samples shall then be sent to a qualified outside testing laboratory by the Construction Department, to be tested in accordance with ASTM A-307 requirements. The results of this testing program shall be sent to the Design Engineering Electrical Division for determination of acceptability.

In order to prevent reoccurrence of this problem, several changes have been implemented. First, all appropriate design documents have been revised to specifically state the material/grade requirements for bolting materials. Second, the Purchase Requisitions for all bolting materials are checked for the inclusion of applicable material/grade requirements. Third, Mill Power Supply has committed that no vendor or material substitutions will be made without the prior approval of responsible Design Engineering personnel.

19. By:  Date: 11/24/80
20. Technical Approval:  Date: 11/26/80
21. QA Approval: TC Roberts Date: 12-3-80

*See attached addendum dated 3-16-81*



March 29, 1979

4496

D G Owen

Subject: Determination of Sample Size for Catawba  
Electrical Bolting Material Problem  
File: CN-1388.00

The testing of sample bolts to make an inference about the ability of an entire lot to meet tensile strength criteria is a two part statistical problem. The first part involves the determination of an appropriate sample size, and the second part is concerned with the acceptance or rejection of the lot based upon the results of the tests.

The following procedure is proposed to 1) determine an appropriate sample size for each of the bolt lots in question, and 2) establish a criteria for accepting or rejecting the lot based upon the test results. In order to establish the procedure, the following assumptions must be made:

- 1) Since the number of bolt manufacturers represented in the questioned lots cannot be determined, each lot shall be approached as an unknown quantity.
- 2) The bolts used at Catawba Nuclear Station are not significantly different from those used at McGuire Nuclear Station. This allows the use of McGuire test results to estimate physical parameters which are needed to determine sample sizes. The Catawba test results will indicate the validity of this assumption.
- 3) The accuracy of torque wrenches used to tighten bolts is  $\pm 5\%$  of the set value. This is used to determine the allowable error in measuring tensile strength. The test should not expect accuracy better than that of the wrenches used to tighten the bolts.
- 4) An acceptable confidence factor is 99% or roughly three standard deviations ( $3\sigma$ ) from the mean value.

Based upon these assumptions the following expression\* should be used to determine sample sizes

$$n = \left[ \frac{3\sigma}{E} \right]^2$$

where n is the number of samples,  $\sigma$  is one standard deviation from the mean tensile strength calculated from McGuire test results, and E is the allowable error in the tensile strength measurement and is based on McGuire data. This expression means that if n samples are tested, there is better than a 99% chance the estimated tensile strength for the lot will lie within the allowable error limit.

\*From Introduction to Probability and Statistics, pp. 182, 197

## REFERENCES

1. ASTM Standard A 307-76b, "Standard Specification for Carbon Steel Externally and Internally Threaded Standard Fasteners."
2. ASTM Standard E 122-72, "Standard Recommended Practice for Choice of Sample Size to Estimate the Average Quality of a Lot or Process."
3. William Mendenhall, Introduction to Probability and Statistics, Duxbury Press, 1971.
4. McGuire NCI Report No. 4444.

## CALCULATIONS

For 99% confidence

Bolt size	$\sigma$	E	$n = \left[ \frac{3\sigma}{E} \right]^2$	N	$n_L = n \left[ \frac{N}{N+n} \right]^*$
1/2 X 15/16	1214	480	58	107,500	-
1/2 X 1 3/16	455	480	8	15,000	-
1/2 X 1 1/2	1214	545	45	51,000	-
1/2 X 1 3/4	1214	480	58	1,600	56
1/2 X 2	1214	480	58	1,000	55
1/2 X 2 1/4	1214	480	58	500	52
1/2 X 2 1/2	1214	480	58	10,000	-

For 95% confidence

Bolt Size	$\sigma$	E	$n = \left[ \frac{2\sigma}{E} \right]^2$	N	$n_L = n \left[ \frac{N}{N+n} \right]^*$
1/2 X 1 3/4	1214	480	26	1,600	-
1/2 X 2	1214	480	26	1,000	25
1/2 X 2 1/4	1214	480	26	500	25

\*ASTM Standard E 122-72, Section 5, p 1045

When a tested bolt size from McGuire closely corresponds to a questioned bolt size from Catawba, the McGuire test data\* for that bolt size shall be used in calculating the Catawba sample size. When a Catawba bolt size does not correspond to a tested McGuire bolt size, the McGuire values which give the most conservative estimate of sample size, i.e., the largest observed standard deviation and the smallest allowable error bound, shall be used in the sample size determination.

The following table will summarize the suggested sample sizes\*\* for each of the questioned bolt sizes:

Bolt Size	Quantity Issued	Suggested Sample Size Confidence	
		95%	99%
1/2" X 15/16"	107,500	-	58
1/2" X 1 3/16"	15,000	-	8
1/2" X 1 1/2"	51,000	-	45
1/2" X 1 3/4"	1,600	26	(56)
1/2" X 2"	1,000	25	(55)
1/2" X 2 1/4"	500	25	(52)
1/2" X 2 1/2"	10,000	<u>245</u>	<u>58</u> 332

For the 1 3/4, 2 and 2 1/4 inch bolts, a 95% confidence level is suggested to reduce the number of samples to a more realistic value. Also, the reason only eight samples were required of the 1 3/16 inch bolts is that the McGuire data for the 1 1/4 inch bolts displayed a fairly small standard deviation.

After testing the bolts from Catawba, a mean value for tensile strength and a standard deviation about the mean should be calculated for each bolt size. ASTM Standard A 307-76b sets the minimum acceptable tensile strength for Class A bolts at 8500 lb<sup>f</sup>. Acceptance or rejection of a bolt size lot should be determined by the following procedure:

- 1) Calculate a mean and a standard deviation from test data
- 2) Subtract 8500 from the mean value
- 3) Divide the result (from 2) by the calculated standard deviation
- 4) If this quotient is greater than 2, accept the lot. This gives 95% confidence that the bolts in the lot have tensile strengths greater than the mean less 2 $\sigma$ .
- 5) If the quotient is less than 2
  - a) reject the lot or,
  - b) repeat the test using the same sample size or,
  - c) find the true percentage from a standard normal distribution table and determine if it is acceptable. For instance, 1.645 $\sigma$  give 90% confidence.

\* McGuire NCI Report No. 4444

\*\* Calculations are attached.



D G Owen  
March 29, 1979  
Page 3

If you have questions or comments on the above procedures, please notify me.

*Bruce W. Logan*

B W Logan  
Assistant Design Engineer

BWL/lge

attachments

cc: L/E Suther  
B Garman  
C J Hager

17. EVALUATION OF TEST RESULTS

In order to complete the statistical process of determining whether or not the sample bolts meet the mechanical strength criteria of ASTM A-307 bolts, the attached test results for each of the samples must be evaluated according to the established acceptance procedure (See B W Logan's attached letter dated 3/29/79).

The evaluation of the test results for the 1/2" bolts is summarized in Tables I and II. For the lot of 1/2" x 15/16" bolts, a Rockwell "B" hardness test determines whether the bolts conform to the mechanical requirements. As shown in Table I, the results indicate that the mean value is greater than two standard deviations from both the upper and lower limits of the hardness requirements. Therefore the respective sample of 1/2" x 15/16" bolts is acceptable to the standards of ASTM A-307 bolts. The remaining samples were tested in regards to their conformance to the mechanical tensile strength requirements. The evaluation of their test results is summarized in Table II and indicates that the respective samples are also acceptable. In conclusion, the test results have determined that the subject bolts meet the mechanical requirements for ASTM A-307 bolts with a 95% confidence level.

19. By: Douglas W Vass / [Signature] Date: 3/16/81
20. Technical Approval [Signature] Date: 3/17/81
21. QA Approval TC Roberts Date: 3-23-81

BOLT SIZE	SAMPLE SIZE	MEAN (1)	STANDARD DEVIATION (2)	REQUIRED RANGE		$\frac{(1)-(3)}{(2)}$	$\frac{(4)-(1)}{(2)}$	ACCEPTABLE LOT?
				MIN (3)	MAX (4)			
1/2" x 15/16"	58	92.95	2.62	69	100	9.14	2.69	YES

TABLE I  
EVALUATION OF HARDNESS TEST RESULTS  
FOR 1/2" BOLTS

BOLT SIZE	SAMPLE SIZE	MEAN (1)	STANDARD DEVIATION (2)	MIN TENSILE STRENGTH (LBS) (3)	$\frac{(1)-(3)}{(2)}$	ACCEPTABLE LOT ?
1/2" x 1-3/16"	8	10825.00	738.24	8500.	3.15	YES
1/2" x 1-1/2"	45	12415.55	232.04	8500.	16.87	YES
1/2" x 1-3/4"	26	11723.07	505.61	8500.	6.37	YES
1/2" x 2"	25	11612.00	172.17	8500.	18.08	YES
1/2" x 2-1/4"	25	13436.00	392.51	8500.	12.58	YES
1/2" x 2-1/2"	58	12484.48	111.29	8500.	35.80	YES

TABLE II  
EVALUATION OF TENSILE STRENGTH TEST RESULTS  
FOR 1/2" BOLTS

# LAW ENGINEERING TESTING COMPANY

GEOTECHNICAL, ENVIRONMENTAL & CONSTRUCTION MATERIALS CONSULTANTS

501 MINUET LANE  
P.O. BOX 11297 • CHARLOTTE NORTH CAROLINA 28220  
(704) 523-2022



## REPORT OF ROCKWELL "B" HARDNESS INSPECTION

Client: Duke Power Company  
Project: Catawba Nuclear Station  
Newport, South Carolina

Office: Charlotte Metals  
Date: February 4, 1981  
Lab. No. CHS 81-016

Client's P. O. No.: G 2494-41

Material: Reported as Carbon Steel Externally Threaded Standard  
Fastener ASTM A307 (See Below) Grade A

Heat No.: Unknown

Date Tested: 2/2/81

Procedure: In accordance with ASTM A307-78 and ASTM E18-79

### EQUIPMENT CALIBRATION

<u>Readings</u>	<u>Average Reading</u>	<u>Calibration Standard</u>	<u>Reading Correction, %</u>
--	84.1	81.6	97.0
--	87.3	81.6	93.5

### ROCKWELL "B" HARDNESS RESULTS

<u>LETCo. Piece No.</u>	<u>Bolt Size (In)</u>	<u>Average Reading</u>	<u>Corrected Reading</u>	<u>Comments</u>
1-23-81-1	1/2" x 15/16"	92.0	89	--
1-23-81-2	1/2" x 15/16"	97.1	94	--
1-23-81-3	1/2" x 15/16"	92.2	89	--
1-23-81-4	1/2" x 15/16"	95.6	93	--
1-23-81-5	1/2" x 15/16"	98.3	95	--
1-23-81-6	1/2" x 15/16"	98.0	95	--
1-23-81-7	1/2" x 15/16"	97.3	94	--
1-23-81-8	1/2" x 15/16"	97.5	95	--
1-23-81-9	1/2" x 15/16"	99.2	96	--
1-23-81-10	1/2" x 15/16"	98.0	95	--
1-23-81-11	1/2" x 15/16"	99.0	95	--
1-23-81-12	1/2" x 15/16"	98.3	94	--
1-23-81-13	1/2" x 15/16"	99.3	95	--
1-23-81-14	1/2" x 15/16"	96.5	92	--



Duke Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 2 of 3

ROCKWELL "B" HARDNESS RESULTS  
Continued

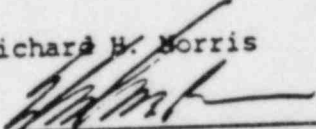
<u>LETCo.</u> <u>Piece No.</u>	<u>Bolt Size</u> <u>(In)</u>	<u>Average</u> <u>Reading</u>	<u>Corrected</u> <u>Reading</u>	<u>Comments</u>
1-23-81-15	1/2" x 15/16"	97.8	93	--
1-23-81-16	1/2" x 15/16"	96.6	92	--
1-23-81-17	1/2" x 15/16"	95.6	91	--
1-23-81-18	1/2" x 15/16"	100.0	96	--
1-23-81-19	1/2" x 15/16"	99.8	95	--
1-23-81-20	1/2" x 15/16"	98.7	94	--
1-23-81-21	1/2" x 15/16"	100.6	95	--
1-23-81-22	1/2" x 15/16"	95.7	90	--
1-23-81-23	1/2" x 15/16"	99.3	94	--
1-23-81-24	1/2" x 15/16"	97.5	92	--
1-23-81-25	1/2" x 15/16"	100.7	95	--
1-23-81-26	1/2" x 15/16"	99.0	94	--
1-23-81-27	1/2" x 15/16"	98.8	93	--
1-23-81-28	1/2" x 15/16"	100.2	95	--
1-23-81-29	1/2" x 15/16"	99.7	94	--
1-23-81-30	1/2" x 15/16"	100.0	95	--
1-23-81-31	1/2" x 15/16"	98.2	93	--
1-23-81-32	1/2" x 15/16"	102.8	97	--
1-23-81-33	1/2" x 15/16"	99.7	94	--
1-23-81-34	1/2" x 15/16"	96.3	91	--
1-23-81-35	1/2" x 15/16"	100.3	95	--
1-23-81-36	1/2" x 15/16"	97.2	92	--
1-23-81-37	1/2" x 15/16"	98.5	93	--
1-23-81-38	1/2" x 15/16"	95.3	90	--
1-23-81-39	1/2" x 15/16"	99.3	94	--
1-23-81-40	1/2" x 15/16"	99.8	94	--
1-23-81-41	1/2" x 15/16"	98.2	91	--
1-23-81-42	1/2" x 15/16"	99.2	92	--
1-23-81-43	1/2" x 15/16"	99.2	92	--
1-23-81-44	1/2" x 15/16"	101.2	94	--
1-23-81-45	1/2" x 15/16"	96.8	90	--
1-23-81-46	1/2" x 15/16"	98.0	91	--
1-23-81-47	1/2" x 15/16"	98.0	91	--
1-23-81-48	1/2" x 15/16"	97.0	90	--
1-23-81-49	1/2" x 15/16"	100.2	93	--

Duke Power Company  
Catawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 3 of 3

ROCKWELL "B" HARDNESS RESULTS  
Continued

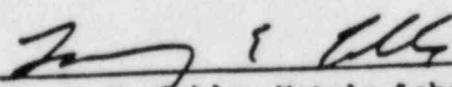
LETCo. Piece No.	Bolt Size (In)	Average Reading	Corrected Reading	Comments
1-23-81-50	1/2" x 15/16"	100.0	93	--
1-23-81-51	1/2" x 15/16"	89.7	83	--
1-23-81-52	1/2" x 15/16"	98.3	91	--
1-23-81-53	1/2" x 15/16"	100.8	94	--
1-23-81-54	1/2" x 15/16"	102.2	95	--
1-23-81-55	1/2" x 15/16"	90.8	84	--
1-23-81-56	1/2" x 15/16"	102.7	96	--
1-23-81-57	1/2" x 15/16"	101.0	94	--
1-23-81-58	1/2" x 15/16"	102.5	95	--
Required Range.....			69 thru 100.....	

Inspector: Richard H. Morris

Reviewed by: 

Edward M. Beck, P. E.  
Metals Department Manager

Respectfully submitted,  
LAW ENGINEERING TESTING COMPANY

  
Larry B. Noble, Metals Laboratory Supervisor

# LAW ENGINEERING TESTING COMPANY

geotechnical, environmental & construction materials consultants

501 MINUET LANE  
P.O. BOX 11297 • CHARLOTTE NORTH CAROLINA 28220  
(704) 523-2022



## REPORT OF MECHANICAL TENSION TEST

Client: Duke Power Company  
Project: Catawba Nuclear Station  
Newport, South Carolina

Office: Charlotte Metals  
Date: February 4, 1981  
Lab. No. CHS 81-016

Client P. O. No.: G 2494-41

Material: Reported as Carbon Steel Externally Threaded Standard  
Fastener ASTM A307 (See Below) Grade A

Heat No.: Unknown

Date Tested: 2/3/81

Procedure: In accordance with ASTM A307-78 and ASTM A370-77

### TEST RESULTS

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	1/2" x 1-3/16"	13	0.1419	10,900
1-23-81-2	1/2" x 1-3/16"	13	0.1419	10,550
1-23-81-3	1/2" x 1-3/16"	13	0.1419	10,400
1-23-81-4	1/2" x 1-3/16"	13	0.1419	12,400
1-23-81-5	1/2" x 1-3/16"	13	0.1419	10,050
1-23-81-6	1/2" x 1-3/16"	13	0.1419	10,250
1-23-81-7	1/2" x 1-3/16"	13	0.1419	10,850
1-23-81-8	1/2" x 1-3/16"	13	0.1419	11,200
Minimum				8,500
1-23-81-1	1/2" x 1-1/2"	13	0.1419	12,500
1-23-81-2	1/2" x 1-1/2"	13	0.1419	12,250
1-23-81-3	1/2" x 1-1/2"	13	0.1419	12,300
1-23-81-4	1/2" x 1-1/2"	13	0.1419	12,150
1-23-81-5	1/2" x 1-1/2"	13	0.1419	12,500
1-23-81-6	1/2" x 1-1/2"	13	0.1419	12,250
1-23-81-7	1/2" x 1-1/2"	13	0.1419	12,100
1-23-81-8	1/2" x 1-1/2"	13	0.1419	12,000
1-23-81-9	1/2" x 1-1/2"	13	0.1419	12,500
1-23-81-10	1/2" x 1-1/2"	13	0.1419	12,650
1-23-81-11	1/2" x 1-1/2"	13	0.1419	12,150
1-23-81-12	1/2" x 1-1/2"	13	0.1419	12,300

Duke Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 2 of 11

MECHANICAL TENSION TEST  
Continued

<u>LETCo.</u> <u>Piece No.</u>	<u>Bolt Size</u> <u>(In)</u>	<u>Threads</u> <u>Per Inch</u>	<u>Area</u> <u>(In<sup>2</sup>)</u>	<u>Ultimate</u> <u>Load</u> <u>(Lbs)</u>
1-23-81-13	1/2" x 1-1/2"	13	0.1419	12,700
1-23-81-14	1/2" x 1-1/2"	13	0.1419	12,400
1-23-81-15	1/2" x 1-1/2"	13	0.1419	12,650
1-23-81-16	1/2" x 1-1/2"	13	0.1419	12,450
1-23-81-17	1/2" x 1-1/2"	13	0.1419	12,400
1-23-81-18	1/2" x 1-1/2"	13	0.1419	12,500
1-23-81-19	1/2" x 1-1/2"	13	0.1419	12,750
1-23-81-20	1/2" x 1-1/2"	13	0.1419	12,600
1-23-81-21	1/2" x 1-1/2"	13	0.1419	12,200
1-23-81-22	1/2" x 1-1/2"	13	0.1419	12,200
1-23-81-23	1/2" x 1-1/2"	13	0.1419	12,350
1-23-81-24	1/2" x 1-1/2"	13	0.1419	12,800
1-23-81-25	1/2" x 1-1/2"	13	0.1419	12,350
1-23-81-26	1/2" x 1-1/2"	13	0.1419	12,300
1-23-81-27	1/2" x 1-1/2"	13	0.1419	12,450
1-23-81-28	1/2" x 1-1/2"	13	0.1419	12,650
1-23-81-29	1/2" x 1-1/2"	13	0.1419	12,800
1-23-81-30	1/2" x 1-1/2"	13	0.1419	12,150
1-23-81-31	1/2" x 1-1/2"	13	0.1419	12,850
1-23-81-32	1/2" x 1-1/2"	13	0.1419	12,550
1-23-81-33	1/2" x 1-1/2"	13	0.1419	12,600
1-23-81-34	1/2" x 1-1/2"	13	0.1419	12,100
1-23-81-35	1/2" x 1-1/2"	13	0.1419	12,550
1-23-81-36	1/2" x 1-1/2"	13	0.1419	12,450
1-23-81-37	1/2" x 1-1/2"	13	0.1419	12,200
1-23-81-38	1/2" x 1-1/2"	13	0.1419	12,150
1-23-81-39	1/2" x 1-1/2"	13	0.1419	12,750
1-23-81-40	1/2" x 1-1/2"	13	0.1419	12,100
1-23-81-41	1/2" x 1-1/2"	13	0.1419	12,650
1-23-81-42	1/2" x 1-1/2"	13	0.1419	12,400
1-23-81-43	1/2" x 1-1/2"	13	0.1419	12,700
1-23-81-44	1/2" x 1-1/2"	13	0.1419	12,100
1-23-81-45	1/2" x 1-1/2"	13	0.1419	12,200
Minimum				8,500



Duke Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 3 of 11

MECHANICAL TENSION TEST  
 Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-2	1/2" x 1-3/4"	13	0.1419	12,050
1-23-81-3	1/2" x 1-3/4"	13	0.1419	12,300
1-23-81-4	1/2" x 1-3/4"	13	0.1419	12,100
1-23-81-5	1/2" x 1-3/4"	13	0.1419	11,750
1-23-81-6	1/2" x 1-3/4"	13	0.1419	11,650
1-23-81-7	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-8	1/2" x 1-3/4"	13	0.1419	12,300
1-23-81-9	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-10	1/2" x 1-3/4"	13	0.1419	12,250
1-23-81-11	1/2" x 1-3/4"	13	0.1419	12,200
1-23-81-12	1/2" x 1-3/4"	13	0.1419	11,550
1-23-81-13	1/2" x 1-3/4"	13	0.1419	12,300
1-23-81-14	1/2" x 1-3/4"	13	0.1419	12,100
1-23-81-15	1/2" x 1-3/4"	13	0.1419	10,400
1-23-81-16	1/2" x 1-3/4"	13	0.1419	11,650
1-23-81-17	1/2" x 1-3/4"	13	0.1419	11,550
1-23-81-18	1/2" x 1-3/4"	13	0.1419	10,550
1-23-81-19	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-20	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-21	1/2" x 1-3/4"	13	0.1419	12,200
1-23-81-22	1/2" x 1-3/4"	13	0.1419	11,750
1-23-81-23	1/2" x 1-3/4"	13	0.1419	11,700
1-23-81-24	1/2" x 1-3/4"	13	0.1419	11,650
1-23-81-25	1/2" x 1-3/4"	13	0.1419	11,600
1-23-81-26	1/2" x 1-3/4"	13	0.1419	10,700
Minimum				8,500

Duke Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 4 of 11

MECHANICAL TENSION TEST  
 Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	1/2" x 2"	13	0.1419	11,950
1-23-81-2	1/2" x 2"	13	0.1419	11,200
1-23-81-3	1/2" x 2"	13	0.1419	11,650
1-23-81-4	1/2" x 2"	13	0.1419	11,600
1-23-81-5	1/2" x 2"	13	0.1419	11,800
1-23-81-6	1/2" x 2"	13	0.1419	11,450
1-23-81-7	1/2" x 2"	13	0.1419	11,600
1-23-81-8	1/2" x 2"	13	0.1419	11,700
1-23-81-9	1/2" x 2"	13	0.1419	11,650
1-23-81-10	1/2" x 2"	13	0.1419	11,550
1-23-81-11	1/2" x 2"	13	0.1419	11,750
1-23-81-12	1/2" x 2"	13	0.1419	11,750
1-23-81-13	1/2" x 2"	13	0.1419	11,550
1-23-81-14	1/2" x 2"	13	0.1419	11,700
1-23-81-15	1/2" x 2"	13	0.1419	11,650
1-23-81-16	1/2" x 2"	13	0.1419	11,750
1-23-81-17	1/2" x 2"	13	0.1419	11,600
1-23-81-18	1/2" x 2"	13	0.1419	11,450
1-23-81-19	1/2" x 2"	13	0.1419	11,150
1-23-81-20	1/2" x 2"	13	0.1419	11,650
1-23-81-21	1/2" x 2"	13	0.1419	11,750
1-23-81-22	1/2" x 2"	13	0.1419	11,600
1-23-81-23	1/2" x 2"	13	0.1419	11,500
1-23-81-24	1/2" x 2"	13	0.1419	11,700
1-23-81-25	1/2" x 2"	13	0.1419	8,500
Minimum				

Duke Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 5 of 11

MECHANICAL TENSION TEST  
 Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	1/2" x 2-1/4"	13	0.1419	13,600
1-23-81-2	1/2" x 2-1/4"	13	0.1419	12,000
1-23-81-3	1/2" x 2-1/4"	13	0.1419	13,500
1-23-81-4	1/2" x 2-1/4"	13	0.1419	13,400
1-23-81-5	1/2" x 2-1/4"	13	0.1419	13,650
1-23-81-6	1/2" x 2-1/4"	13	0.1419	12,850
1-23-81-7	1/2" x 2-1/4"	13	0.1419	13,650
1-23-81-8	1/2" x 2-1/4"	13	0.1419	13,450
1-23-81-9	1/2" x 2-1/4"	13	0.1419	13,450
1-23-81-10	1/2" x 2-1/4"	13	0.1419	12,950
1-23-81-11	1/2" x 2-1/4"	13	0.1419	13,700
1-23-81-12	1/2" x 2-1/4"	13	0.1419	14,000
1-23-81-13	1/2" x 2-1/4"	13	0.1419	13,750
1-23-81-14	1/2" x 2-1/4"	13	0.1419	13,400
1-23-81-15	1/2" x 2-1/4"	13	0.1419	13,600
1-23-81-16	1/2" x 2-1/4"	13	0.1419	13,450
1-23-81-17	1/2" x 2-1/4"	13	0.1419	13,500
1-23-81-18	1/2" x 2-1/4"	13	0.1419	13,450
1-23-81-19	1/2" x 2-1/4"	13	0.1419	13,200
1-23-81-20	1/2" x 2-1/4"	13	0.1419	13,950
1-23-81-21	1/2" x 2-1/4"	13	0.1419	13,250
1-23-81-22	1/2" x 2-1/4"	13	0.1419	13,600
1-23-81-23	1/2" x 2-1/4"	13	0.1419	13,600
1-23-81-24	1/2" x 2-1/4"	13	0.1419	13,500
1-23-81-25	1/2" x 2-1/4"	13	0.1419	13,450
Minimum				8,500

Catawba Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 6 of 11

MECHANICAL TENSION TEST  
 Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-2	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-3	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-4	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-5	1/2" x 2-1/2"	13	0.1419	12,400
1-23-81-6	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-7	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-8	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-9	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-10	1/2" x 2-1/2"	13	0.1419	12,700
1-23-81-11	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-12	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-13	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-14	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-15	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-16	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-17	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-18	1/2" x 2-1/2"	13	0.1419	12,350
1-23-81-19	1/2" x 2-1/2"	13	0.1419	12,350
1-23-81-20	1/2" x 2-1/2"	13	0.1419	12,650
1-23-81-21	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-22	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-23	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-24	1/2" x 2-1/2"	13	0.1419	12,700
1-23-81-25	1/2" x 2-1/2"	13	0.1419	12,650
1-23-81-26	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-27	1/2" x 2-1/2"	13	0.1419	12,300
1-23-81-28	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-29	1/2" x 2-1/2"	13	0.1419	12,350
1-23-81-30	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-31	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-32	1/2" x 2-1/2"	13	0.1419	12,400
1-23-81-33	1/2" x 2-1/2"	13	0.1419	12,350
1-23-81-34	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-35	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-36	1/2" x 2-1/2"	13	0.1419	12,350
1-23-81-37	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-38	1/2" x 2-1/2"	13	0.1419	12,350



Duke Power Company  
Catawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 7 of 11

MECHANICAL TENSION TEST  
Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-39	1/2" x 2-1/2"	13	0.1419	12,300
1-23-81-40	1/2" x 2-1/2"	13	0.1419	12,250
1-23-81-41	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-42	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-43	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-44	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-45	1/2" x 2-1/2"	13	0.1419	12,300
1-23-81-46	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-47	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-48	1/2" x 2-1/2"	13	0.1419	12,400
1-23-81-49	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-50	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-51	1/2" x 2-1/2"	13	0.1419	12,200
1-23-81-52	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-53	1/2" x 2-1/2"	13	0.1419	12,500
1-23-81-54	1/2" x 2-1/2"	13	0.1419	12,450
1-23-81-55	1/2" x 2-1/2"	13	0.1419	12,550
1-23-81-56	1/2" x 2-1/2"	13	0.1419	12,650
1-23-81-57	1/2" x 2-1/2"	13	0.1419	12,600
1-23-81-58	1/2" x 2-1/2"	13	0.1419	12,500
Minimum				8,500

e Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 8 of 11

MECHANICAL TENSION TEST  
Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	3/8" x 1"	16	0.0775	5,650
1-23-81-2	3/8" x 1"	16	0.0775	5,700
1-23-81-3	3/8" x 1"	16	0.0775	5,500
1-23-81-4	3/8" x 1"	16	0.0775	5,500
1-23-81-5	3/8" x 1"	16	0.0775	5,550
1-23-81-6	3/8" x 1"	16	0.0775	5,600
1-23-81-7	3/8" x 1"	16	0.0775	5,400
1-23-81-8	3/8" x 1"	16	0.0775	5,500
1-23-81-9	3/8" x 1"	16	0.0775	5,650
1-23-81-10	3/8" x 1"	16	0.0775	5,250
1-23-81-11	3/8" x 1"	16	0.0775	5,700
1-23-81-12	3/8" x 1"	16	0.0775	5,700
1-23-81-13	3/8" x 1"	16	0.0775	5,500
1-23-81-14	3/8" x 1"	16	0.0775	5,650
1-23-81-15	3/8" x 1"	16	0.0775	5,600
1-23-81-16	3/8" x 1"	16	0.0775	5,750
1-23-81-17	3/8" x 1"	16	0.0775	5,600
1-23-81-18	3/8" x 1"	16	0.0775	5,550
1-23-81-19	3/8" x 1"	16	0.0775	5,700
1-23-81-20	3/8" x 1"	16	0.0775	5,450
1-23-81-21	3/8" x 1"	16	0.0775	5,650
1-23-81-22	3/8" x 1"	16	0.0775	5,750
1-23-81-23	3/8" x 1"	16	0.0775	5,600
1-23-81-24	3/8" x 1"	16	0.0775	5,650
1-23-81-25	3/8" x 1"	16	0.0775	5,550
1-23-81-26	3/8" x 1"	16	0.0775	5,550
1-23-81-27	3/8" x 1"	16	0.0775	5,650
1-23-81-28	3/8" x 1"	16	0.0775	5,650
1-23-81-29	3/8" x 1"	16	0.0775	5,550
1-23-81-30	3/8" x 1"	16	0.0775	5,750
1-23-81-31	3/8" x 1"	16	0.0775	5,400
1-23-81-32	3/8" x 1"	16	0.0775	5,600
Minimum				4,650

Duke Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 9 of 11

MECHANICAL TENSION TEST  
Continued

<u>LETCo.</u> <u>Piece No.</u>	<u>Bolt Size</u> <u>(In)</u>	<u>Threads</u> <u>Per Inch</u>	<u>Area</u> <u>(In<sup>2</sup>)</u>	<u>Ultimate</u> <u>Load</u> <u>(Lbs)</u>
1-23-81-1	3/8" x 1-1/4"	16	0.0775	7,600
1-23-81-2	3/8" x 1-1/4"	16	0.0775	7,400
1-23-81-3	3/8" x 1-1/4"	16	0.0775	7,350
1-23-81-4	3/8" x 1-1/4"	16	0.0775	7,600
1-23-81-5	3/8" x 1-1/4"	16	0.0775	7,300
1-23-81-6	3/8" x 1-1/4"	16	0.0775	7,350
1-23-81-7	3/8" x 1-1/4"	16	0.0775	7,750
1-23-81-8	3/8" x 1-1/4"	16	0.0775	7,650
1-23-81-9	3/8" x 1-1/4"	16	0.0775	7,250
1-23-81-10	3/8" x 1-1/4"	16	0.0775	7,350
1-23-81-11	3/8" x 1-1/4"	16	0.0775	7,650
1-23-81-12	3/8" x 1-1/4"	16	0.0775	7,650
1-23-81-13	3/8" x 1-1/4"	16	0.0775	7,750
1-23-81-14	3/8" x 1-1/4"	16	0.0775	7,750
1-23-81-15	3/8" x 1-1/4"	16	0.0775	7,300
1-23-81-16	3/8" x 1-1/4"	16	0.0775	7,650
1-23-81-17	3/8" x 1-1/4"	16	0.0775	7,550
1-23-81-18	3/8" x 1-1/4"	16	0.0775	7,650
1-23-81-19	3/8" x 1-1/4"	16	0.0775	7,250
1-23-81-20	3/8" x 1-1/4"	16	0.0775	7,200
1-23-81-21	3/8" x 1-1/4"	16	0.0775	7,100
1-23-81-22	3/8" x 1-1/4"	16	0.0775	7,750
1-23-81-23	3/8" x 1-1/4"	16	0.0775	7,350
1-23-81-24	3/8" x 1-1/4"	16	0.0775	7,400
1-23-81-25	3/8" x 1-1/4"	16	0.0775	7,750
1-23-81-26	3/8" x 1-1/4"	16	0.0775	7,700
1-23-81-27	3/8" x 1-1/4"	16	0.0775	7,300
1-23-81-28	3/8" x 1-1/4"	16	0.0775	7,250
1-23-81-29	3/8" x 1-1/4"	16	0.0775	7,250
1-23-81-30	3/8" x 1-1/4"	16	0.0775	7,300
1-23-81-31	3/8" x 1-1/4"	16	0.0775	7,500
1-23-81-32	3/8" x 1-1/4"	16	0.0775	7,600
Minimum				4,650

Duke Power Company  
Satawba Nuclear Station  
LETCo. Job No. CHS 81-016  
February 4, 1981  
Page 10 of 11

MECHANICAL TENSION TEST  
Continued

<u>LETCo.</u> <u>Piece No.</u>	<u>Bolt Size</u> <u>(In)</u>	<u>Threads</u> <u>Per Inch</u>	<u>Area</u> <u>(In<sup>2</sup>)</u>	<u>Ultimate</u> <u>Load</u> <u>(Lbs)</u>
1-23-81-1	3/8" x 1-1/2"	16	0.0775	5,750
1-23-81-2	3/8" x 1-1/2"	16	0.0775	6,100
1-23-81-3	3/8" x 1-1/2"	16	0.0775	5,900
1-23-81-4	3/8" x 1-1/2"	16	0.0775	5,700
1-23-81-5	3/8" x 1-1/2"	16	0.0775	6,300
1-23-81-6	3/8" x 1-1/2"	16	0.0775	6,350
1-23-81-7	3/8" x 1-1/2"	16	0.0775	6,450
1-23-81-8	3/8" x 1-1/2"	16	0.0775	6,050
1-23-81-9	3/8" x 1-1/2"	16	0.0775	6,100
1-23-81-10	3/8" x 1-1/2"	16	0.0775	5,850
1-23-81-11	3/8" x 1-1/2"	16	0.0775	5,800
1-23-81-12	3/8" x 1-1/2"	16	0.0775	6,300
1-23-81-13	3/8" x 1-1/2"	16	0.0775	5,800
1-23-81-14	3/8" x 1-1/2"	16	0.0775	5,900
1-23-81-15	3/8" x 1-1/2"	16	0.0775	6,000
1-23-81-16	3/8" x 1-1/2"	16	0.0775	6,300
1-23-81-17	3/8" x 1-1/2"	16	0.0775	6,300
1-23-81-18	3/8" x 1-1/2"	16	0.0775	5,850
1-23-81-19	3/8" x 1-1/2"	16	0.0775	5,800
1-23-81-20	3/8" x 1-1/2"	16	0.0775	6,000
1-23-81-21	3/8" x 1-1/2"	16	0.0775	5,900
1-23-81-22	3/8" x 1-1/2"	16	0.0775	6,250
1-23-81-23	3/8" x 1-1/2"	16	0.0775	5,950
1-23-81-24	3/8" x 1-1/2"	16	0.0775	6,350
1-23-81-25	3/8" x 1-1/2"	16	0.0775	6,000
1-23-81-26	3/8" x 1-1/2"	16	0.0775	6,100
1-23-81-27	3/8" x 1-1/2"	16	0.0775	5,900
1-23-81-28	3/8" x 1-1/2"	16	0.0775	5,800
1-23-81-29	3/8" x 1-1/2"	16	0.0775	6,650
1-23-81-30	3/8" x 1-1/2"	16	0.0775	5,950
1-23-81-31	3/8" x 1-1/2"	16	0.0775	6,300
1-23-81-32	3/8" x 1-1/2"	16	0.0775	6,000
Minimum				4,650



Lake Power Company  
 Catawba Nuclear Station  
 LETCo. Job No. CHS 81-016  
 February 4, 1981  
 Page 11 of 11

MECHANICAL TENSION TEST  
 Continued

LETCo. Piece No.	Bolt Size (In)	Threads Per Inch	Area (In <sup>2</sup> )	Ultimate Load (Lbs)
1-23-81-1	3/8" x 2-1/2"	16	0.0775	7,100
1-23-81-2	3/8" x 2-1/2"	16	0.0775	6,900
1-23-81-3	3/8" x 2-1/2"	16	0.0775	7,100
1-23-81-4	3/8" x 2-1/2"	16	0.0775	7,750
1-23-81-5	3/8" x 2-1/2"	16	0.0775	7,600
1-23-81-6	3/8" x 2-1/2"	16	0.0775	7,500
1-23-81-7	3/8" x 2-1/2"	16	0.0775	7,500
1-23-81-8	3/8" x 2-1/2"	16	0.0775	7,500
1-23-81-9	3/8" x 2-1/2"	16	0.0775	7,100
1-23-81-10	3/8" x 2-1/2"	16	0.0775	7,600
1-23-81-11	3/8" x 2-1/2"	16	0.0775	7,050
1-23-81-12	3/8" x 2-1/2"	16	0.0775	7,500
1-23-81-13	3/8" x 2-1/2"	16	0.0775	7,100
1-23-81-14	3/8" x 2-1/2"	16	0.0775	6,900
1-23-81-15	3/8" x 2-1/2"	16	0.0775	7,600
1-23-81-16	3/8" x 2-1/2"	16	0.0775	7,250
1-23-81-17	3/8" x 2-1/2"	16	0.0775	6,800
1-23-81-18	3/8" x 2-1/2"	16	0.0775	7,100
1-23-81-19	3/8" x 2-1/2"	16	0.0775	7,500
1-23-81-20	3/8" x 2-1/2"	16	0.0775	7,490
1-23-81-21	3/8" x 2-1/2"	16	0.0775	7,350
1-23-81-22	3/8" x 2-1/2"	16	0.0775	7,000
1-23-81-23	3/8" x 2-1/2"	16	0.0775	6,800
1-23-81-24	3/8" x 2-1/2"	16	0.0775	7,550
1-23-81-25	3/8" x 2-1/2"	16	0.0775	7,450
1-23-81-26	3/8" x 2-1/2"	16	0.0775	7,450
1-23-81-27	3/8" x 2-1/2"	16	0.0775	6,850
1-23-81-28	3/8" x 2-1/2"	16	0.0775	7,250
1-23-81-29	3/8" x 2-1/2"	16	0.0775	7,600
1-23-81-30	3/8" x 2-1/2"	16	0.0775	7,450
1-23-81-31	3/8" x 2-1/2"	16	0.0775	7,450
1-23-81-32	3/8" x 2-1/2"	16	0.0775	7,350
Minimum				4,650

Inspector(s):

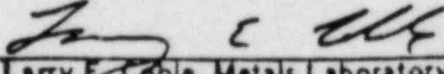
Larry E. Coble  
 Mark Westall

Reviewed by:

Edward M. Beck, P.E.  
 Metals Department Manager

Respectfully submitted,

LAW ENGINEERING TESTING COMPANY

  
 Larry E. Coble, Metals Laboratory Supervisor

# LAW ENGINEERING TESTING COMPANY

geotechnical, environmental & construction materials consultants

801 MINUET LANE  
P.O. BOX 11297 • CHARLOTTE, NORTH CAROLINA 28220  
(704) 523-2022



## REPORT OF CHEMICAL ANALYSIS

Client: DUKE POWER COMPANY  
Project: CATAWBA NUCLEAR STATION  
Newport, South Carolina

Office: Charlotte Metals  
Date: February 9, 1981  
Lab. No. CHS 81-016

Client P. O. No.: G2494-41

Material: Reported as Carbon Steel Externally Threaded Standard Fastener  
ASTM A-307 (See Below) Grade A

Heat No.: Unknown

Date Tested: 2/9/81

Procedure: In accordance with ASTM A-307-78, ASTM A-36-77, and ASTM E-30-77


### TEST RESULTS

LETCo. Piece No.	Elements					Size	
	Carbon	Manganese	Phosphorus	Sulfur	Silicon		
1-59	0.13	0.40	0.02	0.02	0.18	1/2" x	15/16"
1-23-81-9	0.15	0.51	0.01	0.01	0.16	1/2" x	1-3/16"
1-23-81-46	0.15	0.49	0.02	0.02	0.24	1/2" x	1-1/2"
1-23-81-27	0.16	0.50	0.02	0.02	0.15	1/2" x	1-3/4"
1-23-81-26	0.19	0.33	0.02	0.02	0.15	1/2" x	2"
1-23-81-26	0.15	0.48	0.01	0.02	0.15	1/2" x	2-1/4"
1-23-81-58	0.16	0.37	0.01	0.01	0.15	1/2" x	2-1/2"
1-23-81-32	0.12	0.29	0.01	0.01	0.13	3/8" x	3/4"
1-23-81-33	0.18	0.38	0.02	0.02	0.22	3/8" x	1"
1-23-81-33	0.21	0.84	0.02	0.02	0.44	3/8" x	1-1/4"
1-23-81-33	0.18	0.36	0.02	0.02	0.12	3/8" x	1-1/2"
1-23-81-33	0.16	0.36	0.02	0.01	0.14	3/8" x	2-1/2"
Required A-307	—	—	P.S.	0.15	—		
Required A-36	0.26	—	0.01	0.05	0.15 to 0.30		

Note: The single values are the maximum allowed in the required section.

Item 1-23-81-33, 3/8" x 1-1/2" exceeds the maximum of silicon per basic material specification.

Inspector(s): Larry E. Coble  
J. Sidney Rice, Jr.

Reviewed by:   
Edward M. Beck, P. E.  
Corporate Consultant/Metals

Respectfully submitted,  
LAW ENGINEERING TESTING COMPANY

  
Larry E. Coble, Metals Laboratory Supervisor

NUCLEAR REGULATORY COMMISSION  
Declass No. 50-413 OFFICE ERM. No. 53  
In the matter of Catawba  
Staff ✓  
Identified ✓  
Refined ✓  
Rejected ✓  
DATE 11/17/83  
Witness Ben Graham  
Reporter Ben Graham