

U. S. ATOMIC ENERGY COMMISSION
REGION II
DIVISION OF COMPLIANCE

Report of Inspection

CO Report Nos. 50-269/69-1
50-270/69-1
50-287/69-1

Licensee: Duke Power Company
License Nos. CFFR-33, 34, and 35
Category A

Dates of Inspection: January 6-8, 1969

Dates of Previous Inspection: September 25-27, 1968

Inspected By: *William C. Seidle* 1/29/69
William C. Seidle, Reactor Inspector Date

Reviewed By: *F. J. Long* 1/29/69
F. J. Long, Senior Reactor Inspector Date

Proprietary Information: None

SCOPE

An announced inspection was made of the three 2568 Mwt pressurized water power reactors under construction near Seneca, South Carolina. The major inspection items were concerned with the Unit 1 containmen. building penetrations, blasting, liner plate welding, containment building foundation preparation, concrete test results and placement of the Unit 2 containment building mat.

SUMMARY

Safety Items -- None

Nonconformance Items -- None

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Unusual Occurrences - During an on-site follow-up check of the Southern Boiler Shop weld problems involving eight Unit 1 containment building penetration sections (initially reported in CO Report No. 50-269/68-4), the inspector was informed of the following deficiency in the shop quality control inspection program: While erecting liner plate penetration section SP-25, a field welding inspector visually detected an inch long 3/8-inch deep crack in a shop weld joining a 12-inch ID penetration piece to the plate. Vendor shop radiographs of the weld clearly showed the defect but, due to an apparent breakdown in the shop quality control program, the crack was not detected prior to shipment (see Section D.1. and Management Interview Section).

Status of Previously Reported Problems - During the previous inspection, one item of nonconformance was noted: Cadweld tensile strength test records revealed that the minimum specified test requirements were not met during the splicing of 198-18S rebar joints for the period June 29, 1968, through July 17, 1968.

Corrective Action - Wells informed the inspector that on October 6, 1968, the Cadweld record numbering system was changed whereby the QC inspector can now determine by the sequential splice number when a specified tensile test is required. The inspector reviewed the Cadweld records for the past three months and noted that the frequency of the tensile tests met the specified requirements stated in Construction Specification No. OS-134-2 (Section 1.5.2).

Other Significant Items - Based on man-hours spent, the percent of construction completed for Units 1, 2 and 3 combined is 15 percent; for Unit 1, 20 percent (see Section C).

Defective shop welds in eight Unit 1 liner plate penetration sections, which delayed containment construction two months last summer, have been repaired (discussed in CO Report No. 50-269/68-4, Section D.1.). The sections are erected, and the placement of the concrete wall panels has resumed (see Management Interview Section and Section D.).

Placement of the Unit 2 containment building mat is in progress; three of the seven mat pours are complete (see Section C.).

A meeting date of February 4 has been set for Compliance to meet with Duke and B&W personnel to discuss the QA program associated with the fabrication of the Unit 1 reactor pressure vessel (see Section H.).

Management Interview - The inspector met with Lee, Wells, Rogers and Dick at the conclusion of the visit. The following items were discussed:

1. Shop Weld Defects in Unit 1 Containment Penetrations

NOTE: Lee attended the management interview, at the inspector's request, to discuss the shop weld deficiencies observed in eight Unit 1 penetration sections (Ref: CO Report No. 50-269/68-4).

The inspector began the discussion with a brief review of his November 15 visit to the Southern Boiler and Tank Works, Memphis, where the liner plate and penetration sections for the Oconee Units are being fabricated (Ref: CO Report No. 50-269/68-5). It was pointed out that the purpose of the visit was to review the Southern Boiler Shop QC program associated with the fabrication of the penetration sections for Unit 1 with particular attention given to recent improvements made in the program. The inspector stated that in the course of the shop visit, R. Strong, Chief Engineer, Southern Boiler Shop, informed him that Duke's weld design was poor for many of the weldments joining the penetration sleeves to the thickened portion of the liner plate section; adequate penetration was difficult, if not impossible, to achieve. At this point in the discussion, Lee was asked to elaborate on the poor weld design problems and the shop QC problems experienced earlier in the year. Lee replied that the weld design problems were due to an error in the shop drawings. Bechtel weld design drawings call for a 1/8-inch root gap between the penetration sleeve and the thickened penetration plate; full weld penetration is required. When Southern Boiler prepared their shop drawings from the Bechtel design drawings, they somehow omitted the root gap detail. The completed shop drawings were reviewed by both Duke and Bechtel Engineering; the root gap omission was not caught by either party. As a result, the sleeves were butted up to the plate and welded. Lee stated that many of the lack of penetration weld defects can be attributed to not having the specified root gap. However, he said this has not been the only problem. The Southern Boiler Shop was hit with a long and bitter strike after the contract was let, but before Duke's work was started. Many of their best weldors quit and replacements have been difficult to find. He stated that Southern Boiler's adoption of a financial incentive program for certified weldors whose work requires 100 percent radiographic inspection has produced a marked improvement in the quality of welds. Lee stated that Duke has also had problems with the third party QC welding inspection effort in the shop. (The Law Engineering Testing Company, Birmingham, Alabama, provides the third party shop inspection

services for Duke.) The problem has been primarily the lack of communication between Duke design engineers and the third party inspectors, according to Lee. He said Duke has learned the hard way that you cannot hand a set of drawings and specifications to the shop inspectors and automatically all salient inspection items will be covered. Rather, it is necessary to conduct briefing sessions with the shop inspectors to alert them to the QC inspection details that must be covered for the shop fabrication hardware in question. Lee stated that such briefing sessions are now being conducted for Duke's third party vendor shop inspectors.

At this point in the meeting, the inspector directed the discussion to the inch long shop weld crack that the field welding inspector visually detected in penetration section SP-25 during the fit-up of this section into the containment structure wall in mid-November 1968. This section arrived at the site on November 1, 1968, according to Wells. The inspector called Lee's attention to the fact that the Southern Boiler Shop radiographs that accompanied the penetration section to the site included two radiographs that clearly showed the crack. One radiograph showed the crack to be actually about three inches long and positioned near the penetrometer. At this point, the inspector asked Lee to view the two radiographs which were displayed at the meeting and observe, firsthand, that there was nothing subtle about this particular weld defect. After viewing the radiographs, Lee concurred with the inspector's observation. The inspector then posed the following questions to Lee:

Question No. 1: Why didn't the Southern Boiler Shop and Law Engineering QC Welding inspectors detect the SP-25 crack defect when conducting their visual examination of the welds or when examining the radiographs?^{1/}

Answer: Lee had no explanation, at this time, as to why the visual shop inspections did not detect the crack. However, his subsequent

^{1/} Duke Specification No. OS-139-3 (Appendix 5E), "Shop Inspection of Reactor Building Liner Plate and Accessory Steel," specifies that 100 percent of the welds shall be visually examined and one foot in each 50 feet completed in the flat, vertical, horizontal, and overhead positions will be radiographed.

comments implied that he would check into this matter. As for not detecting the crack in the radiographs, he said it is quite possible that during the transition from performing radiographic examinations on a spot-check basis to that of 100 percent examination, the QC shop inspectors may have missed these particular radiographs. Lee stated that a shop radiograph checklist has since been put into use whereby the QC inspector(s) must indicate by initialing the appropriate space that he did, indeed, review the specific radiograph.

Question No. 2: What assurance do you now have that all the other Southern Boiler Shop penetration section radiographs taken to date were reviewed by shop QC inspectors? Also, how do you know if all welds were visually examined in the shop?

Answer: Lee stated that he could not answer either question without first checking the shop QC checksheet records for each penetration section. He implied that such checks would be made. (This will be a follow-up item during the next inspection.) Wells injected the comment that the field QC welding inspectors have visually examined all Southern Boiler Shop welds to date as the hardware arrives on-site.

Question No. 3: Who in Duke's organization audits the QC inspection performance of the third party inspectors representing Duke in the vendor shops?

Answer: Lee stated the Design Engineering Department, Charlotte, is responsible for all vendor shop inspections. The cognizant mechanical, civil, electrical and instrument engineers make frequent visits to these shops at which time the QC inspection program is audited. He stated that it is not Duke's policy to have Duke inspectors in residence at vendor shops. He said that in the case of Southern Boiler, Duke has recently assigned F. R. Jackson, Staff Mechanical Engineer, to the shop on a part-time basis, i.e., two to three days every other week. (His qualifications in welding inspection are discussed CO Report No. 50-269/68-5.)

The inspector stated that in early February he plans to visit the principal offices of Duke for the purpose of discussing vendor shop quality control with the design engineering personnel. Lee stated he would look forward to the visit as this would give him and his staff an opportunity to review Duke's vendor shop QC program in detail.

2. Strain Gauge Installation - Units 2 and 3

As a follow-up to a Compliance Headquarters memorandum on this subject,^{1/} the inspector asked Lee if any consideration had been given to installing at least a few strain gauges in the Unit 2 and 3 containment buildings in order to demonstrate the response of these structures. Lee replied that the Unit 1 structure will contain over 230 strain gauges; Duke has no plans to install any gauges in either Units 2 or 3 as "there would be nothing new to learn in doing so." The inspector stated that both DRL and CO consider the installation of at least several strain gauges on Units 2 and 3 as highly desirable. Lee replied that Duke's position of not installing strain gauges in Units 2 and 3 was discussed in detail with DRL during the PSAR reviews and that Duke's position remains unchanged on this matter. The inspector did not pursue the subject any further.

3. Rebar Fitup Problem - Unit 1 Biological Shield Wall

In a previous inspection report (CO Report No. 50-269/68-4), the inspector discussed a rebar fitup problem he observed during the placement of 18-S rebar in the biological shield wall within the containment building. None of the rebars observed were shaped in a manner that would permit proper fitup of the Cadweld sleeve. This matter was called to the attention of L. D. Dail, Duke's Principal Civil Design Engineer, during the last visit. He made the comment that proper alignment of this type of Cadweld connection could probably never be satisfactorily achieved in these particular biological shield walls and that Duke intended to redesign this and other similar walls within the building using No. 11 rebar with a lap and tie joint. The inspector informed Lee that DRL, when made aware of this fitup problem,^{2/} expressed concern that the application of No. 11 rebar, using a lap and tie splice may not be adequate for the proposed design of these containment structures. Wells stated that no rebar design changes to the walls in question will be made in the Unit 1 structure. He also wanted it made clear that the rebar fitup problem did not involve the outside walls of the containment structure. Rogers stated that Duke Design Engineers are proposing the use of No. 11 rebar, using lap and tie splices, in the biological shield walls for Units 2 and 3.

^{1/} Reference Memorandum, J. P. O'Reilly, CO:HQ, to F. J. Long, CO:II, subject: Duke Power Company, CO Report Nos. 50-269, 270 and 287/68-4, dated 11/26/68.

^{2/} Ibid.

Inspector's note: Use of No. 11 rebar using lap and tie splices is consistent with Section 4.2. of Appendix 5D to the PSAR which states "...For reinforcing steel of size #11 and under, lap splices will be permitted in accordance with ACI 318-63, Chapter 8."

4. Nonconformance Item From Last Site Inspection

Wells discussed the changes made to the Cadweld record keeping system to correct deficiencies associated with the frequency at which specified tensile tests were performed (discussed in Status of Previously Reported Problems section of this report).

DETAILS

A. Persons Contacted

Duke Power Company

J. C. Rogers, Project Engineer
J. R. Wells, Principal Field Engineer/QA Engineer
R. L. Dick, Project Manager
W. S. Lee, Vice President - Engineering
J. T. Moore, Chief Welding Inspector
C. Wilmot, Welder
H. Scruggs, Stores Supervisor
C. York, Assistant Field Engineer - Keowee Project

Babcock & Wilcox Company

W. Faasse, Engineer - Erection Department, Barberton, Ohio

B. Administration and Organization

1. Duke Construction Personnel

The position of Field Engineer - Electrical was filled in November 1968 by C. E. Aycock. He holds an E. E. degree from North Carolina State University and has been employed by Duke for six years.

A. R. Thornton was recently hired as a Welding Inspector. He has eleven years of radiography experience which he acquired while working for PDM and the Thackal Chemical Corporation.

2. B&W Construction Personnel

The B&W Company now has a full-time engineering representative at the site. He is W. Faasse, Erection Department - B&W, Barberton, Ohio. Faasse is presently working with Duke personnel in developing procedures for the receipt, inspection, and storage of the steam generating equipment.

3. QC Organization - Duke

A copy of a new organization chart for quality control and technical support is attached as Exhibit A.

4. Labor Relations

In October 1968, 528 Duke construction employees voted on whether or not to join the labor union; the vote was 65 for a union, 463 against.

5. Piping Code Change

Duke has requested their pipe suppliers to meet the fabrication requirements of the new "Code For Pressure Piping," ASA B31.7, issued for trial and comment in February 1968. The piping code specified in the PSAR is ASA B31.1.

C. Construction Progress

1. Unit 1

The containment building liner plate is erected through the seventh horizontal ring; the concrete wall panels are placed through the fifth ring. The concrete work inside the containment building is complete up to ground level.

The first of three 600 ton, once-through steam generators for Unit 1 is expected to arrive on-site April 10, 1969. The first reactor pressure vessel (R&W) is scheduled to arrive on-site in mid-July 1969.

2. Unit 2

Placement of concrete for the containment building mat is in progress. The mat will be placed in seven separate pours; four in the first lift, three in the second lift. Three 700 cubic yard pie-shaped pours have been placed in the first lift.

3. Unit 3

The site preparation work is complete. Construction work has not started on this Unit.

NOTE: Photographs of construction progress are attached to the Region II copy of this report.

D. Containment Building Liner Plate - Unit 1

1. Follow-up On Shop Weld Deficiencies in Penetration Sections

During a site inspection visit in September 1968, the inspector was informed that defective shop welds were detected by field QC inspectors in eight penetration sections identified as SP-20, SP-21, SP-22, SP-23, SP-24, SP-25, SP-27, and SP-30. (The defects are discussed in CO Report No. 50-269/68-4, Section D.1.)

In mid-November 1968, the inspector visited the Southern Boiler Shop and Tank Works, Memphis, Tennessee, to review the QC program associated with the fabrication of the liner plate penetration sections. The inspector was particularly interested in recent improvements made in the shop QC inspection program as a result of the weld defects detected at the site. Details of the shop visit are discussed in CO Report No. 50-269/68-5.

As a follow-up to the penetration weld problem, the inspector talked with Moore to determine if the field QC welding inspectors had noted any recent improvements in the quality of the Southern Boiler Shop welds. Moore stated that he has seen a marked improvement in the quality of the shop welds. When asked if he had observed any significant defects in the welds associated with the eight shop-repaired penetration sections after they returned to the site, he replied that one had been observed. He said that during the erection of penetration section SP-25, a welding inspector visually detected an inch long by 3/8-inch deep crack in a weld connecting a 12-inch ID penetration sleeve to the

✓ SP --- Shop Piece

thickened liner plate section.^{1/} (The crack location is shown in Exhibit B.) He stated that the welding inspector checked to see if the crack went through the plate by applying dye penetrant to the crack and developer to the opposite side; the crack did not go through the plate. Moore said that later he checked the SP-25 shop radiographs that accompanied the penetration section to the site.^{2/} One radiograph clearly showed the crack defect; a second radiograph taken of the same weld after the repair of a slag defect, per the shop log, revealed the same crack defect as the original film. Moore stated that for some unexplained reason the crack was completely overlooked.

The inspector's follow-up discussion with Duke management on the matter of the undetected crack defect in the weld is covered in the Management Interview Section of this report.

2. Spot Check of Liner Plate Welding

During a tour of the liner plate receiving area, the inspector observed that a welder had just completed welding together two sections of A-36, 1/4-inch thick steel liner plates. The two sections, one 28 feet long, the other 32 feet long, were positioned in a vertical jig. The inspector obtained the following information from the welder and wells:

Welder's Name: Clark Wilmot

Welder's Mark: "9"; stamped at two-foot intervals along weld.

Welder's Qualification Status: A subsequent review of the current Welder's Qualification List, which is maintained in the Duke QC file, revealed that Wilmot qualified on June 25, 1968, by Welding Test No. 106. His welder's mark number was shown as "9" on the list.

Welding Process Used: Semi-automatic gas metal arc welding (MIG).

^{1/} Duke Specification No. C3-139 (Revised 4/8/68) specifies that the 12-inch ID seamless pipe sleeve will conform to ASTM A-333, Grade 6; the penetration section plate to ASTM A-516, Grade 70, Firebox Quality and ASTM A-300.

^{2/} Radiographs identified as SP-25 B60 and SP-25 B60R1.

Type of Welding Machine: "Cobramatic" - product of Harnischfeger. Gas composition - 75 percent Argon, 25 percent CO₂.

Electrode Description: Consumable wire electrode No. CO-37; diameter - .035 inch; wire heat No. 659V732F.

Liner Plate Heat Nos.: The heat numbers stamped in the plates were 27C824 and 69C693. Wells provided copies of the mill test reports for the above heat numbers; the reports are attached to the CO:II file copy of this inspection report as Exhibits C-1 and C-2.

Fitup: A continuous backup strip was used. The fitup gap appeared to be a nominal 1/4 inch as indicated by observing the top and bottom ends of the weld.

Weld Appearance: The inspector's visual examination of the weld revealed no arc strikes, surface cracks or craters, or undercutting. From the standpoint of eye appeal, the weld looked good.

Wind Protection: A rather elaborate plastic windbreak was provided for the welder, as wind can produce a deleterious effect on a MIG-type welding operation.

Welding Specifications: Duke Specification No. DP-2, "Semiautomatic Gas Metal Arc Welding Process - Liner Plate Welding," was reviewed by the inspector. Based on the items checked by the inspector, the field welding operation appeared to comply with the specification.

3. QC Review of Radiographs

The inspector asked Wells if anyone in Duke's QC management spot checks radiographs taken in the field to ascertain that a radiographer is not "cheating" by taking shots of the same weld over and over again. Wells replied that Duke welding inspectors do all of the field radiography work. He stated that each day he personally meets with the Chief Welding Inspector to discuss the radiograph progress and spot check the recent shots. He also pointed out that D. Ritchie, North Carolina State University graduate in M.E., Class of 1967, has the administrative control responsibility for all radiographs. In this capacity, he provides another review of the radiographs and would be cognizant of any film discrepancies.

E. Gadwelds - Units 1 and 2

In a spot check of the Gadweld records for the period October 6, 1968, to January 3, 1969, the inspector obtained the following information on sister splice test results:

<u>Date</u> 1968-69	<u>Unit No.</u>	<u>Rebar Size, Position, and Sequence No.</u>	<u>Test No.</u>	<u>Tensile Strength Results (PSI)</u>	<u>Cause of Failure</u>
10/14	1	14V-41	94	111,778	Pull Out
10/16	1	14H-26	95	107,556	Pull Out
10/16	1	18V-15	96	93,250	-
11/5	1	18V-68	101	100,500	-
1/3	1	14V-340	124	87,500	-
11/2	2	18H-100	99	88,750	Bar Broke
11/5	2	18H-141	100	97,750	-
11/7	2	18H-191	102	106,500	-
11/8	2	18H-245	103	102,250	-

During the period October 6, 1968, to December 31, 1968, the following number of Gadweld production splices and sister tests were made:

<u>Rebar Size and Position</u>	<u>No. Tests and Splices</u>
No. 11 H	24 production splices; no tests
No. 11 V	7 production splices; no tests
No. 11 VBP	176 production splices; 3 tests
No. 14 H	68 production splices; 2 tests (average tensile test strength - 104,222 PSI)

<u>Rebar Size and Position</u>	<u>No. Tests and Splices</u>
No. 14 V	270 production splices; 6 tests (average tensile test strength - 101,217 PSI)
No. 18 H	605 production splices; 14 tests (average tensile test strength - 97,535 PSI)
No. 18 V	270 production splices; 6 tests (average tensile test strength - 94,375 PSI)

The inspector noted that during the period October 6, 1968, to January 3, 1969, the following number of Cadwelds were rejected on the basis of visual examination:

<u>Size</u>	<u>No. Rejects</u>
No. 18 S	61
No. 14	10
No. 11	8

Slag in the Cadweld sleeve tap hole and insufficient amount of filler metal between sleeve and rebar were the main causes for rejection.

F. Concrete

1. Unit 1 Containment Building Walls

Current cylinder compression test records revealed the following information:

<u>Date</u>	<u>Location</u>	<u>7 Day Strength (PSI)</u>	<u>28 Day Strength (PSI)</u>	<u>Specified 28 Day Strength (PSI)^{1/}</u>
11/26	Wall Panel ^{2/} D-3	3891	6031	5000
12/4	Wall Panel F-5	3802	5712	5000
12/5	Wall Panel C-4	3767	5553	5000

^{1/} Ref. PSAR - Vol. II, Appendix 5B.

^{2/} Panel contains about 90 cu. yds.

The following information was obtained from a spot check of the concrete placement records:

<u>Date</u>	<u>Location</u>	<u>Slump</u>	<u>% Air</u>	<u>Batch Temperature</u>	<u>Air Temperature</u>
12/17	Wall Panel C-5	2-1/4"	3.5	42° F.	23° F.
12/20	Wall Panel A-5	3"	3.4	49° F.	-

NOTE: Hot water was used in the batching of concrete placed on December 17, 1968, (see above). The minimum placing temperature for the concrete is 40° F. as specified in Duke Specification No. OS-160 (Rev. 6/12/68), "Concrete for the Reactor Building."

2. Honeycombing

The inspector examined the exposed concrete surfaces of the containment structure for evidence of honeycombing defects; 1/ only some very slight honeycombing was detected in a two square foot area on the outside wall at the fourth and fifth ring elevation immediately to the left of the south buttress. In March 1968, the inspector examined the tendon inspection gallery for evidence of honeycombing and for voids around the tendon base plates; none of these defects were detected. (See CO Report No. 50-269/68-2.)

3. Unit 2 Containment Building Mat

The following information was obtained from a spot check of the concrete placement records:

<u>Date</u>	<u>Location</u>	<u>No. Cu. Yds.</u>	<u>Specified Strength (PSI)</u>	<u>Average Slump (Inches)</u>	<u>Average Air Content (%)</u>	<u>Average Batch Temp. (° F.)</u>	<u>Average Air Temp. (° F.)</u>
12/10/68	Pour No. 1	607	5000	3/4-2 3/4	2.0 - 4.5	46 - 50	32 - 42
12/18/68	Pour No. 2	700	5000	1 1/2-3	2.6 - 4.8	42 - 54	-----

1/ Ref. Memorandum, J. P. O'Reilly, CO:Hqs., to F. J. Long, CO:II, Subj: Duke Power Company, CO Report Nos. 50-269, 270 and 287/68-4, dated 11/26/68.

4. Foundations - Unit 2

Wells provided the inspector with the following information: Unit 2, like Unit 1, has a solid rock foundation. A 3000 psi strength concrete working slab was placed on top of the rock. Fissures in the rock were filled with a two parts sand, 1 part cement grout mixture. The grout was pumped into the fissures via 3½-inch diameter holes drilled on five foot centers through the working slab. The grout was introduced at 4 psig.

G. Blasting

The inspector asked Wells if any blasting has been performed near Unit 1 and/or 2 after concrete work had begun on either of these facilities. He replied that a few days after the Unit 1 containment building mat was placed some blasting was done near the mat. At this point, Wells called in York who provided the inspector with the following information:

On February 16, 1968, a shot was detonated 190 feet from the Unit 1 mat. The shot consisted of 34 holes containing 4.85 pounds of powder per hole.

Seismolog measurements were conducted at the Unit 1 mat. In using an energy ration = 1 the vibration measured 56 percent of allowable value.

The inspector asked York if he could relate the Seismolog blast shock measurements to seismic shock and thereby determine if the shocks imposed by the blasting were no greater than those the facility is designed to withstand for "green" concrete conditions. York replied that he did not have this information but could probably get it.

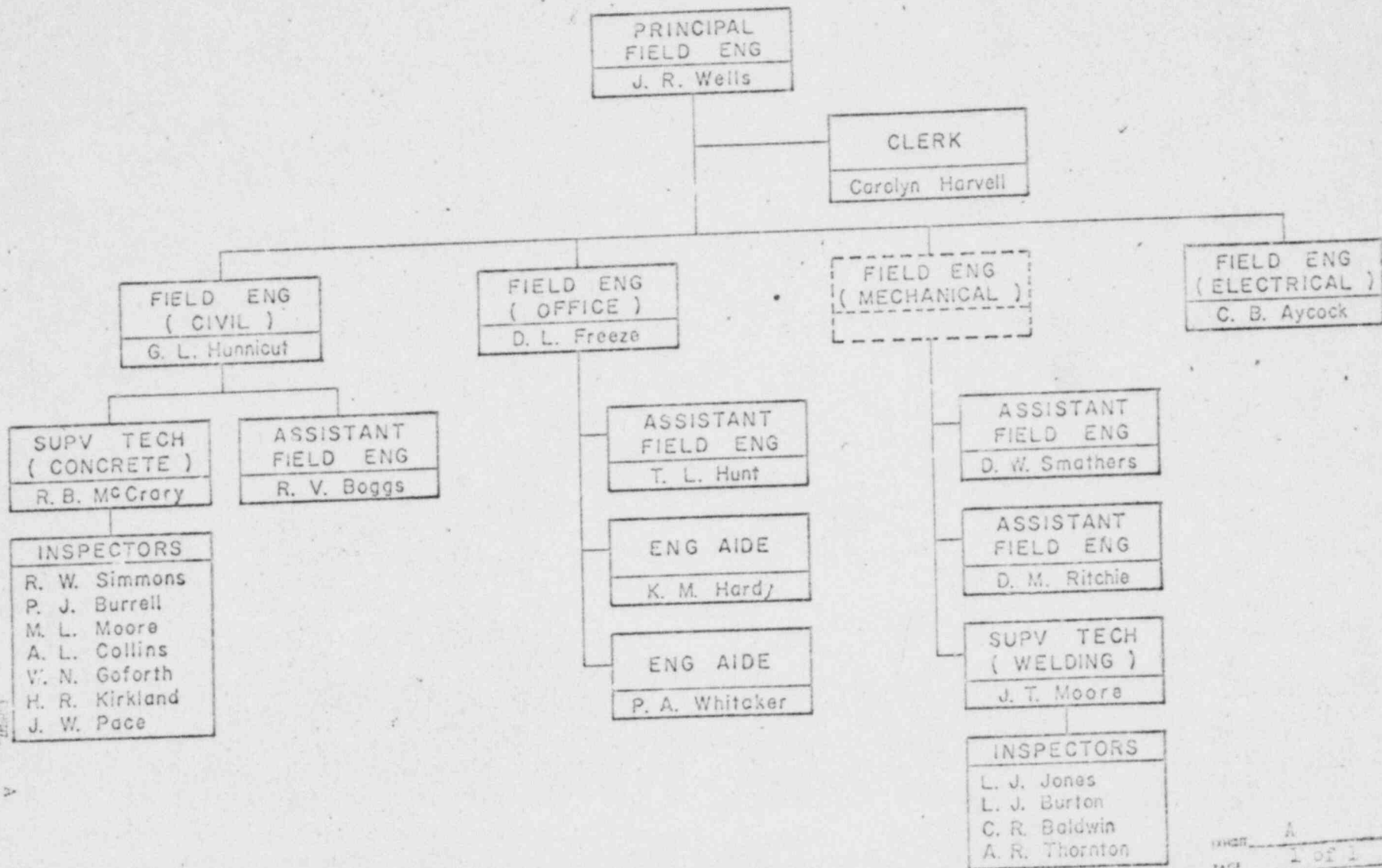
The inspector urged Wells to consider documenting in a report to his files all data on blasting performed near the containment buildings. Include in the report the results of all Seismolog measurements and relate same to seismic shock. Wells stated that he would request York to prepare such a report for the file. (This will be a follow-up item for the next inspection.)

H. Unit 1 Pressure Vessel Vendor Meeting

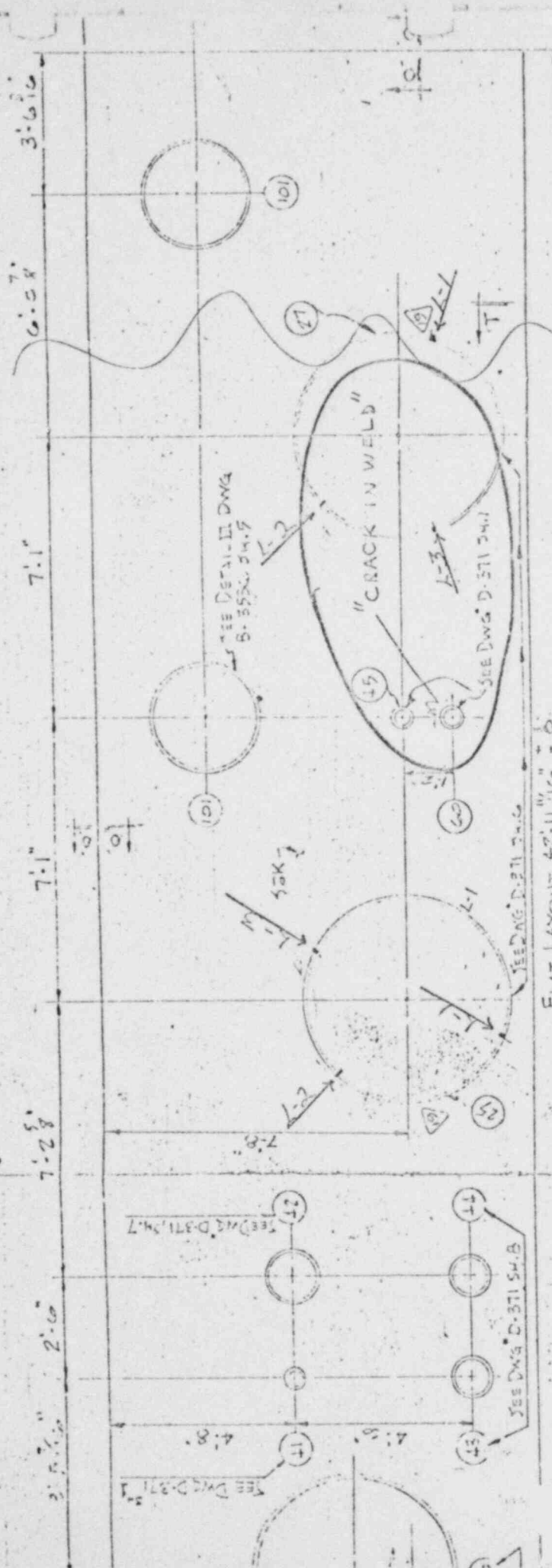
The inspector requested Lee to schedule a meeting whereby W. Reinmuth, CO:Hqs., R. Oller, CO:III, and the CO:II inspector could meet with Duke and B&W (pressure vessel vendor) to discuss the QA program associated with the vessel fabrication. Lee advised

CO:II by telecon on January 10, that he has scheduled the meeting for February 4 at the principle offices of Duke in Charlotte, North Carolina. This meeting had been previously scheduled for November 8, 1968, and was so reported in CO Report No. 50-269/68-4. The meeting was rescheduled to February 4 because of a last minute conflict in schedules.

DUKE POWER COMPANY
CONSTRUCTION DEPT.
OCONEE NUCLEAR STATION
ORGANIZATION FOR QUALITY CONTROL AND TECHNICAL SUPPORT



101
V



FLAT LAYOUT: 42:11 1/16" = 1"
 PENETRATION P.T. STAIN MK-32-25 1-K5-0.P
 ENTER 130° SIDE COLL TO 110° ON

Non Destructive Test Record
 Penetration for X-Ray

Penetration # 29

Penetr



20