U. S. Atomic Energy Commission
Region II
Division of Compliance

Report of Inspection

CO Report No. 50-313/69-3

Licensee: Arkansas Power and Light Company
(Arkansas Nuclear One)
License No. CPPR-57
Category A

Date of Inspection: June 17-20, 1969

Date of Previous Inspection: March 25-27, 1969

Inspected By: W.A. Crossman — 07.15.69
W. A. Crossman, Reactor Inspector (In Charge) — Date

V.L. Brownlee — 07.15.69
V. L. Brownlee, Reactor Inspector — Date

Reviewed By: F.J. Long — 7/16/69
F. J. Long, Senior Reactor Inspector — Date

Proprietary Information: None

Scope

A routine, announced inspection was performed at the Arkansas Nuclear One facility located near Russellville, Arkansas. The plant is a pressurized water reactor designed for a maximum power level of 2452 Mwt (852 Mwe).

The purpose of the inspection was to evaluate the implementation of Arkansas Power and Light's (AP&L) Quality Assurance Auditing program for vendor shops and construction site contractors.

The inspectors performed a record review and a progressive concreting inspection to assess Bechtel's implementation of the QA/QC program and record maintenance.

Summary

Safety Items - None

Nonconformance Items - Nonconformance with PSAR, Volume II, Appendix 5-C, Paragraph 6. Five Cadweld splices in the containment base slab were not inspected as evidenced by the fact that the packing material had not been removed. (Section C.2)

Status of Previously Reported Problems -

1. Fractured Shale[1/]

   The inspectors reviewed a letter from R. A. Schaible of H&T Geology to the Bechtel Corporation dated April 4, 1969. Schaible's visit of March 26-27, 1969 was for the purpose of inspecting exposed foundation and examining areas where the rock was reported to have "open cracks". The inspection covered several of these "open cracks", not particularly the one in question, from the previous report. His comments were, "This condition is common in rock excavation and additional cracks may be found as excavation and cleanup progress. Removal of loosened blocks will cause some overbreak but will not necessarily be detrimental to the foundation". His recommendations were to remove loose rock to below crack areas and place the concrete working slab immediately. The exposed vertical areas were gunited. This practice, as reported by Bechtel's QC personnel, was followed. The problem is considered adequately resolved.

2. Concrete Testing[2/]

   a. The inspectors reviewed Bechtel's implementation of the quality assurance files by testing the records required to

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1/ CO:II Report No. 50-313/69-2, Section C.1.

2/ CO:II Report No. 50-313/69-2, Section F.3.

support the section of the PSAR containing concrete requirements (5.1.3.1). Bechtel's QC personnel readily made available the concrete testing reports and mill certifications for reinforcing steel supporting the requirements of the PSAR. The cement is obtained from Dewey Portland Cement Company, Tulsa, Oklahoma, and is certified to conform to ASTM C-150 specifications. Water tests were performed by Barrow-Agee Laboratories. The water was certified to conform to AASHO-T26-51 specifications. Bechtel's specifications for concrete (Section D.2.b) were reviewed and Barrow-Agee's routine materials and production test reports were checked. The routine testing reports indicate that the PSAR requirements for testing are being met. The problem is considered adequately resolved.

b. The compression Test machine is a Forney Tester, model QC 150 DR, Serial No. 66209. The machine was calibrated April 2, 1969, by the Barrow-Agee Laboratories. The calibration was made using Morehouse proving ring No. 650, capacity 200,000 pound compression. Calibration was performed by James H. Pannell.

3. Receiving Inspection[1/]

Disposition of equipment received that is damaged, unidentified, or awaiting documentation and/or certification records was requested. Anderson replied that holding areas have been established both for out-of-door and weather-protected storage. These will be utilized by the receiving section. The receiving section has the responsibility of assuring complete documentation or disposal action before removal of equipment to the warehouse or return to the vendor. The problem is considered to be adequately resolved.

4. Interim Inspection During Storage[2/]

The onsite storage of equipment requiring interim inspection is nonexistent at this time. Anderson stated that he was not aware of Bechtel's plans for interim inspections on equipment in storage but he would ask.

The inspector will review the program during a subsequent inspection.

1/ CO:II Report No. 50-313/69-2, Section E.

2/ Ibid.

5. Adequacy of Installed Systems[1/]

A program to assure qualification testing to certify adequacy of installed systems has not been completed. Due to the absence of Bechtel's QA Engineer and the newness of Anderson as AP&L QC Coordinator, the subject was not concluded. A discussion of this program will be resumed during a subsequent visit.

Other Significant Items -

1. Bottoms has retired from AP&L and a new Chief QC Coordinator, Anderson, has been named (Section B.2). The organizational change has had a delaying effect on the perpetuation of AP&L's QA/QC effort (Section D.1.b).

2. Summer vacation scheduling had reduced Bechtel's onsite management to a marginally acceptable level (Section B.3).

3. Auditing of vendor shops by AP&L's QA committee has begun. The committee has been very active and is receiving considerable assistance from the corporate level of management (Section D.1.b).

4. An in-depth review of Bechtel's record system was performed. The Bechtel QC personnel were knowledgeable of the record system, filing procedures, and record contents. The filing system was found to be complete and conformed to the filing system index (Section D.2.a). The system is easily adaptable to an expanding program.

5. Work Performance

Work performance sampling indicated that the construction practices employed by Bechtel are of good quality (Section C).

6. Concrete

An in-depth review of records and placement of concrete was performed. The review indicates Champion is supplying quality concrete and Bechtel's placement methods are adequate (Section E).

Management Interview - Anderson and Bland were present as licensee representatives at the exit interview.

1/ CO:II Report 50-313/69-2, Section D.

Topics discussed included deficiencies in the auditing system employed by AP&L, inspection weaknesses and quality of construction.

1. AP&L Quality Audit

Three significant items were outlined.

a. The quality audit by AP&L of Bechtel's implementation of the quality control program was inadequate. The inadequacy was pointed out in the item of nonconformance whereby the Bechtel inspector failed to inspect five Cadweld splices (Section C.2).

b. The inspectors emphasized that AP&L auditors should check with closer attention the details contained in the records when performing an audit of Bechtel's filing system. The inspectors emphasized that the records must reflect the requirements set forth in the PSAR specifications (Section D.1.b).

c. AP&L's recordkeeping, filing system and documentation of auditing functions lacked the finesse of an orderly system. Anderson explained that a secretary was due aboard, the week of June 23, 1969. A record review/evaluation is to be performed and a systematic filing system developed (Section D.1.b).

2. Bechtel QA/QC Program

a. Record Retention

The retention vault and system of filing by Bechtel was pointed out as an excellent system. The "Q List" index offers a ready method of record filing and location. The indexing system and filing facilities are designed for easy expansion (Section D.2.a).

b. Implementation

The lack of inspection of the Cadwelds by the Bechtel QC inspector was pointed out as a failure of implementation by Bechtel of their QC program (Section C.2).

c. Concreting

The concrete batching, testing, transporting, and placing

inspection, coupled with a record review of concreting, indicated good construction practices and a sound filing system (Section E).

Details

A. Persons Contacted

1. AP&L

J. W. Anderson - Chief QC Coordinator
A. Bland - QC Inspector

2. Bechtel

J. Mace - Vacation replacement for W. J. Stubblefield Project Superintendent
A. Curtis - Vacation replacement for W. J. Stubblefield Project Superintendent
J. Ardell - Vacation replacement for D. Wainwright QA Engineer
R. Prince - Vacation replacement for B. Lex, Project Engineer

3. Champion Concrete

Schmanski - Batch Plant Superintendent
Schanus - Batch Plant Operator

4. Barrow-Agee

T. Tilley - Laboratory Testing Technician
W. Watkins - Batch Plant Technician

B. Administration and Organization

1. The project organizational structure for AP&L and Bechtel as outlined in CO Report No. 50-313/69-2, has not been changed.

2. Anderson has replaced Bottoms (retired) as Chief Quality Control Coordinator for AP&L. He also serves as Chairman for the QA Committee. He has been an employee of AP&L for twenty years. Technical qualifications will be obtained during the next inspection.

3. Chester Bean is to be brought aboard as AP&L's second QC inspector. He is now at the Lake Catherine facility training as a welding inspector. Technical qualifications will be obtained during the next inspection.

4. Bechtels's summer vacation scheduling has placed their project middle management in a technically vulnerable position. This was evidenced by the assignment of two non-site-oriented personnel, Prince and Ardell, from the San Francisco office for the immediate duration of the CO:II inspection.

   (a) Mace and Curtis have replaced Stubblefield as Project Superintendent.
   (b) Prince relieved Lex as Bechtel Project Engineer.
   (c) Ardell relieved Wainwright as Quality Assurance Engineer.

C. Construction Progress

1. Turbine Support

The turbine support base is complete and the reinforcing steel installed for the support columns. The first lift of concrete has been placed for four of the columns and forms were being erected for the second pour (Exhibit A, Picture No. 1). Visual observation of the placed concrete, reinforcing steel, forming practices and records check of materials and concrete test indicates that quality construction is being performed.

2. Containment

The containment tendon gallery and working slab have been completed. The containment base slab concrete forms are installed. All tendon trumpets were installed and reinforcing steel for the base slab was being placed. The containment base slab is to be a monolithic pour of approximately 4500 cubic yards. Pour date is scheduled for mid-August. Inspection of the tendon gallery base slab forms and trumpet installation indicated excellent workmanship. (Exhibit A, Picture Nos. 2, 3 & 4)

During the inspection of installed reinforcement steel, an item of nonconformance was identified (Exhibit A, Picture Nos. 5 & 6). Anderson stated that he would increase his own surveillance and bring this item of nonconformance to the attention of Bechtel's QA engineer for correction.

3. Auxiliary

Auxiliary Building floors for the first level were being placed (Exhibit A, Picture Nos. 7, 8 & 9). The inspectors observed the placing of concrete for two floors. Work areas were clean, free of water, and the installation of embedded items conformed with quality construction practices and specification requirements.

4. Construction Warehouse and Storage Yard

Bechtel has provided an 80' x 140' warehouse with a gravel covered, fenced storage area for receiving and security of qualified components. A large yard has been cleared and gravel based for storage of raw stock and miscellaneous storage. The storage yard is indexed for location and shoring blocks placed for ground clearance of equipment.

D. Quality Assurance

1. AP&L QA/QC

The inspectors reviewed with Bland and Anderson the licensee auditing function of Bechtel and vendor shop QC/QA programs.

a. QA Program

Two documents pertaining to the QC program generated by AP&L entitled "Quality Program for Arkansas Nuclear 1", and "Arkansas Power and Light Company Quality Program Guide" were reviewed. The documents define the objective of the quality program of AP&L and designate independent levels of assurance that the program will achieve.

The scope of the quality program includes all structures, systems, and components of the Arkansas Nuclear One Power Plant that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. The program covers design, construction, and operation of the structure systems and components. All activities affecting the safety-related functions of these structures, systems and components, including designing, purchasing, fabricating, handling, shipping, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling, and modifying, fall within the scope of the program. The documents further state

that all vendors and contractors responsible for the design, fabrication, shipping, or construction of any structures, systems, and components within the scope of the program are required to have competent organization to perform the specified quality activities.

The program is composed of three levels of activity: quality control, quality assurance, and quality auditing.

(1) Quality Control comprises activities in the quality program related to the physical characteristics of a material, structure, component, or system which provide a means to control the quality of the material, structure, component or system to predetermined requirements. Quality control includes a setting of quality criteria, specification of codes, standards and written procedures for verifying that the quality criteria are met, as well as the performance and documentation of the inspectors and tests specified.

(2) Quality Assurance comprises activities in the quality program directed toward verifying the adequacy and implementation of the quality control activities. Quality assurance includes design review to insure that proper and adequate codes, standards, and sound engineering practices as specified by the design engineer, as well as systematic inspection and documentation reviews to verify that the quality control activities specified, in fact, are being performed by qualified personnel using proper and calibrated equipment.

(3) Quality Auditing comprises those activities by the owner designed to insure that the quality assurance activities are functioning effectively. Quality auditing is a redundant level of quality assurance on a more limited basis. Specific quality auditing activities by the owner includes (1) the review of the quality assurance and quality control programs, (2) the review of all designs, drawings, specifications, and procurement documents for items within the quality program, and (3) periodic inspections, both on the construction site and in vendor shops, and (4) review of documentation from the quality assurance and quality control activities.

Bechtel Corporation has been retained by the owner as architect-engineer and contractor. Bechtel acts as the

owner's agent for quality assurance, both at the site and vendor shops. The owner, AP&L, performs the quality auditing function over the entire quality program. Bechtel Corporation performs the quality assurance functions through internal design review by chief engineers, field inspectors in vendor shops, and through the resident quality assurance engineer at the plant site.

The owner's quality auditing activity is implemented through the chairman of the quality assurance committee and his representatives, with the assistance of the members of the owner's quality assurance committee. These personnel do not repeat all quality control activities at the site, but rather verify that qualified Bechtel inspectors are on the job when required and are performing the specified quality control activities in accordance with the quality program.

b. Quality Assurance Committee (QAC)

The inspectors performed an audit of the AP&L QAC auditing program.

The QAC members are:
(1) John Anderson, Chairman
(2) Harvey Miller, Secretary
(3) H. T. Holmes
(4) R. W. Toler
(5) W. Cavanaugh
(6) T. Martin

The inspectors reviewed several vendor shop auditing trip reports performed by the QAC members. Anderson stated that corporate level management was lending its support to the QAC auditing program by personally performing some of the surveys. This practice appears to be desirable in that these personnel have the authority to draw upon resources not readily available to the QAC.

The following is a list of audit trip reports from the QAC files:

(1) October 10, 1968, Babcock & Wilcox (B&W) facilities at Barberton, Ohio, and Mt. Vernon, Indiana. Purpose: Review fabrication, testing procedures, and QC for the steam generator, tube sheets, tubes, steam generator head and wall steel plates.

(2) April 14-15, 1969, Anderson and Miller performed a quality assurance audit of the B&W facilities at Barberton and Mt. Vernon.

(3) April 18-19, 1969, Anderson performed a record review of the B&W facility at Lynchburg, Virginia, to audit B&W suppliers' QA programs.

(4) April 22, 1969, Anderson performed a quality assurance audit of the fabricator for the containment liner, Southern Boiler and Tank Works, Inc., Memphis, Tennessee.

(5) April 30, 1969, Anderson witnessed the containment base trumpet bearing plate anchorage deformation test at the Prescon Corporation, Corpus Christi, Texas. Additionally, he performed a QA/QC audit.

(6) May 1-2, 1969, Bottoms reevaluated the QA/QC program of the containment liner fabricator, Southern Boiler and Tank Works, Inc., Memphis, Tennessee.

(7) June 15, 1969, Phillips performed a QC audit of B&W facilities at Barberton, Ohio, and Mt. Vernon, Indiana.

(8) June 23, 1969, (scheduled) White is to perform a QA audit of the containment post-tensioning supplier, Prescon Corporation, Corpus Christie, Texas.

The inspectors reviewed, with the licensee, their program of onsite auditing. A cursory observation of the onsite auditing functions indicated that the QA/QC program lacked programmed auditing, formal reporting, adequate documentation, filing and a general knowledge as to what the filing system contained. The inspectors' conclusion that the onsite implementation of QA auditing was deficient as evidenced by the nonconformance item, Cadweld inspection (Section C.2).

Neither Anderson nor Bland was familiar with the previous filing or recordkeeping system kept by Bottoms as evidenced by the time and effort required to produce documents supporting QAC actions, test reports, authority for actions, etc. Anderson recognized that the AP&L QA recordkeeping and filing system were deficient and will take steps to obtain a secretary. Anderson stated that he will soon have an additional support of a secretary, an additional inspector,

and with his becoming more knowledgeable of the job functions, Anderson assured the inspectors that the recordkeeping system will improve.

Neither Anderson nor Bland were sufficiently knowledgeable of Bechtel's filing system nor could they assert that the file records adequately supported the PSAR requirements. An examination of Bechtel's records by the inspectors did indicate, however, that they were adequate and the method of filing was satisfactory.

c. Work Testing Group (WTG)

Anderson explained that the WTG has been organized and is functioning to prepare a comprehensive field testing program. The WTG will develop testing procedures for precritical testing, hot functional testing, critical testing, and power testing. He plans to follow the proceedings of this group closely to better prepare his group for auditing the testing program.

Members of the WTG are:
(1) Harvey Miller, Chairman, AP&L
(2) Russell Brown, Bechtel
(3) John Morowski, Bechtel
(4) Henry Bailey, B&W

The test group originally met March 19, 1969. In attendance were representatives of AP&L, Bechtel, and B&W. B&W presented a guide (TRG 68-62) for preparing nuclear power plant procedures for operation, emergency and maintenance.

The B&W scope is to contribute the test specifications for the NSS systems. AP&L's scope is to prepare the test specifications for all other systems required. Chapter 13 of the PSAR scopes AP&L's system of testing. There will be some interface and B&W offered to review any procedures of this interface as requested by AP&L. B&W contributed the overall test schedule. A copy of this test schedule is on file in CO:II.

2. Bechtel QA/QC

a. Record Maintenance and Control

The inspectors audited Bechtel's documentation of records,

filing system, and record maintenance. Bechtel's records are maintained in fireproof cabinets located in a centralized fireproof room.

Records are controlled by a master control document and file index, referred to as the "Q" list. The "Q" list identifies critical items. "Critical Items" are those items associated with the safeguard or safety systems as identified in the PSAR. Records requested by the inspectors were all produced in a timely and efficient manner. All records were properly documented and located in their respective place in the filing system. Bechtel's records were found to be in excellent conformance with the "Q" list. Bechtel attaches great significance to the documentation and recordkeeping of the "Critical Items".

The "Q" list is divided into four sections:

(1) Civil Structure
(2) Nuclear Mechanical
(3) Conventional Mechanical
(4) Auxiliary Electrical

The sections are further broken into five headings which give the index and supplementary information for the four sections:

(1) "Q" Number
(2) Description
(3) Specification Number
(4) Field Inspector
(5) Remarks

The field inspector column is used to designate which field engineers are to be assigned for QC. The field engineer/inspector designations are: R, reactor; C, civil; W, welding; P, piping; M, mechanical; I, instrumentation and E, electrical.

b. Inspection Manuals

The inspectors reviewed Bechtel's inspection and QA Manuals.

(1) Inspection Manual

Procurement Department, Bechtel Corporation

(2) Field Inspection Manual

Power and Industrial Division

(3) Nuclear Quality Assurance Manual

Power and Industrial Division

The above-listed documents provide excellent guidelines for a quality program of procurement, construction, and onsite handling of critical equipment and systems. Bechtel appears to be implementing the system as outlined in the manuals.

E. Concrete

The inspectors tested Bechtel's QC implementation by accomplishing a thorough progressive inspection of concrete specifications, concrete materials, materials storage and handling, batching, concrete testing, transport, placement and records keeping.

1. Specification Review

The inspectors reviewed Bechtel's specifications and procedures for concrete materials, materials handling, batching, transporting, placement and forming.

(a) Bechtel Specification No. 6600-C-26
(b) " " " 6600-C-28
(c) " " " 6600-C-302
(d) " " " 6600-G-1

The specifications for concrete documents contain the required ASTM tests and ACI requirements in accordance with PSAR (Section 5.1.3.1, concrete).

Records were reviewed from Bechtel's filing system for cement certifications, water aggregate, concrete, reinforcing steel and Cadweld splices. Documentation of PSAR and specification requirements are complete.

2. Materials

The sand, aggregate, cement storage and handling practices were found to be in accordance with the Bechtel concrete specifications and the ACI manual of concrete inspection. Sand and aggregate tests as per PSAR Section 5.1.3.1 are being performed two to three times per week.

3. Batching

a. Batch Plant

The batch plant is a Heltzel IBM card-controlled unit manufactured by Steel Form and Iron Company, Warren, Ohio. The batch plant scales were calibrated April 7, 1969, by the Toledo Scale Division, Fort Smith, Arkansas. The Toledo Scale Calibration Technician, Jess Loving, Barrow-Agee Certifying Agent, Tommy Tilley. Batch plant scales will be calibrated every six months or two hundred thousand cubic yards, whichever comes first as per Bechtel's concrete specifications (Section E.1). The automatic control system is manufactured by Wisconsin Electric Manufacturing Company, Milwaukee, Wisconsin. The operational checkout of the batch proportioning control system was performed by the Champion, Inc. personnel.

Concrete batching control is by a pour slip authorized by signature of the field engineer and project superintendent. The pour slip defines the pour number, location, date and time pour is to start, mix design, slump, maximum temperature, pour rate and yardage.

b. Design Mix

The design mix control is by IBM card. Several IBM cards may be selected for mix control depending on the amount of ice to be used for temperature control and the amount of large aggregate moisture content.

The temperature of the design mix is controlled by the batch mix water being ice cooled and the addition of crushed ice. The water cooling system ice tanks and the batch plant ice house are typical systems. The systems are in excellent repair, clean and functioning properly.

The batch plant has an automatic sand moisture compensating control. The batch plant superintendent has the responsibility of selecting the proper design mix IBM card to meet the pour slip requirements.

c. Testing

The Barrow-Agee Technician at the batch plant obtains test cylinders, performs temperature, slump, and air entrainment measurements. Records indicate that testing is performed as required by Bechtel's concrete specifications.

The inspectors performed an inspection of the Barrow-Agee Test Laboratory. The lab technician is Tommy Tilley. The lab performs daily sand and aggregate tests for gradation, clay lumps, organics, proportion of flat and elongated particles, moisture content of the sand and aggregate, and cylinder compression tests, and maintains the concrete cylinder curing vats.

The records check of Bechtel's files certify that the testing requirements of PSAR Section 5.1.31 (concrete) are being made at the required frequency and checked to conform with the required ASTM specifications.

The inspectors observed the compression test on two cylinders. The test was observed on the morning of June 20, 1969. It was a 28-day test of cylinder nos. 10248 and 10249. The cylinders were from pour No. 18, auxiliary building sump, elevation 313'-0", column line A3. The design batch mix was B2. The slump of this batch was 2 1/4 inches, air entrainment was 3.2%, weight per cubic foot was 145.5 pounds, temperature was 75°F, Class I structure, water to cement ratio was 0.46. Compression test for the seven-day test of cylinder No. 10248 was 3910 psi and 3860 psi for cylinder No. 10249. The twenty-eight day test for the B2 mix was 4315 psi for cylinder No. 10248 and 4530 psi for cylinder No. 10249. The Bechtel Corporation, Arkansas Nuclear One Concrete Mix Design, specifies B2 mix to have a 3000 psi minimum compression strength at 28 days (See Exhibit B).

4. Transport

The transporting of concrete from the batch plant to the pour site was by eight yard agitating trucks. During the period of observation, the batch plant production was 128 cubic yards per hour. Placement from the agitator trucks to the pour site is via hopper/conveyer belt. The transporting and placement were accomplished with a minimum loss of time and placement techniques were excellent (Exhibit A, photo Nos. 7, 8, 9, & 10).

5. Reinforcing Steel

The reinforcing steel is supplied by Armco Steel Corporation, Kansas City, Kansas, and Sandy Springs, Oklahoma. The reinforcing steel inspected for the base slab of the containment structure did conform to the PSAR Section 5.1.3.2 (reinforcing steel) and Supplement No. 4, Question 11.5.10. Reinforcing steel was size 18S, Grade 60, and conformed to ASTM A-615 and A-305. The reinforcing

steel was rolled from new billet steel made by the electric furnace process. The inspectors examined the installed reinforcement steel in four areas: the west half of the discharge flum of the auxiliary building, floor for the auxiliary building area 4, base slab of the containment shell, and turbine pedestal columns. All rebar was clean, no scaling or rust was noticed, and standing water was not present in these areas.

6. Cadweld Splices

The inspection of the Cadweld embedments consisted of observing two production splices of reinforcing bars No. 18S, examining 40 inplace Cadweld splices, examining the Cadweld storage facilities and Bechtel's records of Cadweld tests. Specifications for Cadweld splices are found in PSAR, Volume II, Appendix 5C.

Total Cadweld splices to date is approximately 450 units. Thirteen production splices have been removed for testing. Testing is performed by the Barrow-Agee Laboratories. The test records certify that all Cadwelds were tested and the reinforcing steel broke. Minimum tensile strength at break was 90.9 k.i.p. and maximum was 96.1 k.i.p. The minimum tensile strength exceeds ASTM A-615 specification for 18S, Grade 60 reinforcing steel.

The reject rate at the final day of our inspection had reached 9 per 450 units or a 2% rejection rate.

Cadweld splicing for the containment base slab is accomplished in an area aside from the base slab and then the reinforcing bars are placed individually into the base slab form structure.

During the inspection of the installed reinforcement steel and Cadweld splices for the base slab of the containment shell, the inspectors found five Cadwelds that were in place and had not been inspected as indicated by the asbestos packing still being in place. The uninspected Cadweld splices are Nos. 349, 350, 361, 366 and 178. See photographs for identification. The uninspected Cadweld splices appeared to be questionable to the inspectors since all other in place Cadwelds had been inspected and normal splicing and inspection was to have been accomplished at the remote splicing area. The inspectors brought the nonconformance problem to the attention of the license's inspectors. (See Exhibit A, Photo Nos. 5 & 6.)

Attachments:
1. Exhibit A (CO:HQ cy only)
2. Exhibit B

ARKANSAS NUCLEAR ONE — MAY 15, 1969

CONCRETE MIX DESIGNS (1 C.Y., S.S.D.) (PREVIOUS COVOID)

MIX NO.	STRENGTH (PSI @ DAYS	SLUMP (IN)	CEMENT (LBS.)	FLY ASH (LBS.)	1 1/2" AGG. (LBS.)	3/4" AGG. (LBS.)	SAND (LBS.)	WATER (GAL.)	WRA[1] (OZ.)	AEA (OZ.)
AG	2000 @ 28	-	607	106	--	--	2700	44.0	16.1	*
A1	2000 @ 28	3	320	56	--	1925	1420	23.0	8.5	*
A2	2000 @ 28	3	300	53	1048	979	1377	22.0	8.0	*
BG	3000 @ 28	-	767	135	--	--	2410	50.0	20.4	*
B1	3000 @ 28	3	420	74	--	1861	1317	27.1	11.2	*
B2	3000 @ 28	3	400	70	1021	989	1203	26.2	10.6	
B21	3000 @ 90	3	320	56	1040	1008	1335	22.2	10.2	*
CG	4000 @ 28	-	813	145	--	--	2380	48.0	21.6	*
C1	4000 @ 90	2	388	129	--	1888	1282	26.0	10.3	*
C2	4000 @ 90	2	371	123	1098	1000	1151	23.2	9.9	*
C3	4000 @ 28	3	439	78	--	1893	1286	26.1	11.7	*
C4	4000 @ 28	3	420	74	1093	997	1146	24.2	11.2	*
DG	5500 @ 28	-	978	172	--	--	2170	51.0	26.0	*
D1	5500 @ 28	2	540	95	--	1837	1196	28.2	14.4	*
D2	5500 @ 28	2	540	95	1018	987	1099	25.8	14.4	

NOTES:

1. Placewel L. S.

* Airecon - Vary to maintain 3 to 5% air

Lot 1 Page 3

Exhibit A - Five pages of construction photographs removed and retained by the Reactor Inspection and Enforcement Branch.