UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CONSUMERS POWER COMPANY	)	Docket No. 50-155
	)	
(Big Rock Point Nuclear Power Plant)	)	

ANSWER OF CONSUMERS POWER COMPANY
TO INTERROGATORIES PROPOUNDED BY
CHRISTA-MARIA, ET AL.

Pursuant to 10 C.F.R. § 2.740b and the schedule for discovery set forth in the Atomic Safety and Licensing Board's "Order Following Special Prehearing Conference," Consumers Power Company ("Licensee") hereby submits its answer to Interrogatory 3-5 propounded by Crista-Maria.

Interrogatory 3-5

Please answer all parts of Question 3-3 with respect to the spent fuel pool liner. Where the questions use the future tense, please answer with respect to past events and experience as well as with respect to the future.

A. Answer

(a) The spent fuel pool is lined with 3/16-inch stainless steel plate Type 304 hot rolled, annealed and pickled with a nuclear grade finish. The stainless steel liner was installed to improve pool water chemistry by providing separation between pool water and the concrete structure. A leak chase system was included which will first detect a leak through the stainless steel plate

and second isolate the area of leakage into eight zones or regions to facilitate repair work. The leak chase system utilizes a pre-existing four-inch stainless steel to carbon steel drain line to pass through the eight 3/8-inch OD Type 304 stainless steel leak chase lines to a sample basin. The four-inch drain line offers no means of escape for the spent fuel pool water since this drain line opening is covered with a section of 3/16-inch stainless steel plate followed by six inches of concrete.

(b) Nooter Corporation, St. Louis, Missouri, supplied the liner plate for spent fuel pool, bent plate channel and wall tubing

National Lead Company, Perth-Amboy, New Jersey, supplied the lead plate.

Witco Chemical supplied the Bituminous Paint (Black) Coating Pioneer #607-609

Wisconsin Protective Coating Corp. supplied the concrete coating materials, CPCo #3166 (Wisconsin #9009).

The overall design of the liner was done by Suntac/Catalytic with the aid of Bechtel Corporation.

(c) The spent fuel pool liner and accessories were purchased from the vendors identified in (b).

(d) The manufacturers of some of the spent fuel pool liner components are shown in the documents identified in Part B. If not shown in such documents, Consumers Power Company does not know who manufactured the components.

(e) The stainless steel plate is SA-240-Type 304 stainless steel. The composition of accessory steel is identified in Specification 10211-C-171. (See #68 in Part B, below.)

(f) An answer is not supplied with respect to the first sentence of this question. The second sentence in interrogatory (f) is answered as follows:
All welding procedures and performance qualification tests were qualified in accordance with Section IX of the ASME Code. In addition, the procedure qualification test plates were radiographed before sectioning. Performance qualification was required to be done by either radiography or destructive testing. Production welding was not to be done prior to Consumers Power Company's approval of welding procedures and procedure qualification records. One sample of weld, 12 inches in length, was required to be submitted to Consumers Power Company for each different welding process

before the start of any work. These samples were to be indicative of the minimum acceptable weld surface finish, and was used to judge the acceptability of subsequent work. All welds were to be tested by liquid penetrant method.

Liquid Penetrant Testing was to be performed in accordance with Appendix VIII, Section VIII, Division 1, of the ASME Boiler and Pressure Vessel Code and the following specific requirements:

Liquid penetrant testing to be by the solvent removable method. Penetration time of at least 10 minutes. Drying time of at least 5 minutes. The examination was to be made not sooner than 7 minutes nor later than 30 minutes after the developer was dried.

Acceptance standards were to comply with Paragraph NB-5352 of Section III of the ASME Code except that rounded indications with dimensions exceeding 1/32 inch were not acceptable.

Personnel performing liquid penetrant examinations were to be qualified in accordance with SNT-TC-1A, Supplement D, and their qualification records made available upon request.

All leaks, independent of size, were to be repaired by complete rewelding. The repaired area and minimum of 2 inches each side thereof were to be re-examined.

Hydro testing of the completed spent fuel pool liner was done in accordance with procedure No. QAP-1001-A dated February 6, 1974.

Procedure No. 34881-QAP-501-E dated August 30, 1973 describes the method of handling nonconforming material, components, parts and appurtenances during receipt, storage, fabrication and installation. See #9 in Part B, below.

Procedure No. 34881-QAP-501-B dated August 30, 1973 contains receiving, handling and storage quirements for materials, parts and components for the spent fuel pool liner. See #11 in Part B, below.

Procedure 34881-QPA-501-F dated August 30, 1973 provides for cleanliness and cleaning criteria of the spent fuel pool liner during fabrication and assembly. See #15 in Part B, below.

Specification No. 34881-4200-309 dated February 6, 1974 covers the welding of stainless steel pipe using Tungsten-inert-gas welding. This procedure is qualified in accordance with ASME Code Section IX. See #54 in Part B, below.

Specification No. 34881-4200-306 dated September 12, 1973 covers the welding of carbon steel using metal-arc welding. This procedure is qualified in accordance with ASME Code Section IX. See #53 in Part B, below.

Specification No. 34881-4200-301 dated November 12, 1973 covers the welding of stainless steel using Tungsten-inert-gas welding.

Specificaton No. 34881-QAP-601-A dated August 24, 1973 was established to provide a system for controlling and documenting welder qualifications and welding specification qualifications. See #58 in Part B, below.

Specification No. 34881-2400-109 dated August 24, 1973 describes the equipment, method and techniques to be used in testing both welded and fillet welded stainless steel plate. See #60 in Part B, below.

Specification No. 34881-2400-110 dated August 24, 1973 establishes the method and techniques to be used in the performance of liquid penetrant inspections. See #64 in Part B, below.

Nooter Drawing JN-D4170, Sheet 8 of 8 is a record of fit-up, welding, and visual and NDT inspections for the liner plate. See #23 in Part B, below.

(g) An answer is not supplied to this paragraph of Interrogatory 3-5.

(h) There have not been problems in the use of the spent fuel pool liner at the Big Rock Point Plant and no significant problems are expected. Leaks have occurred from time to time in fuel pool liners at other nuclear power reactors. For example, at the Palisades Nuclear Plant leaks are being experienced at a rate of approximately 5 gallons per hour. This experience does not present a safety concern because the integrity of the spent fuel pool concrete structure is not affected and sufficient makeup capability is provided to offset the observed leaks, thereby ensuring the safe storage of spent nuclear fuel. Moveover, the Palisades pool and pools generally include drain return systems which capture any water which escapes through the stainless steel liner to the concrete structure, collect it, and either deposit the water in a low-level radioactive waste collection system or send it through the water purification system and return the clean water to the pool.

(i) Consumers Power Company knows of no significant change that may occur to the spent fuel pool liner for Big Rock Point while it is exposed to the pool water. However, an insignificant amount of corrosion has occurred to the liner plate material since its installation in 1974, and it is expected such corrosion will continue over the future life of the plant. Neither the corrosion which has occurred nor that which is expected to occur, will have any obvious impact on the function of the liner.

Industry's experience with stainless steel liners installed in pools at boiling water reactors has demonstrated that stress corrosion cracking has not been a problem because of the water chemistry control measures taken with respect to the water contained in such spent fuel pools.

Leakage through the fuel pool liner has not occurred at the Big Rock Point plant and it is not expected to develop. However, drops of water have been collected at approximately 90 day intervals from the area between the liner and the concrete wall. The likely source of this small volume of moisture is condensate and/or water introduced from the cask wash-down area located in close proximity to the top of the plant fuel pool. If leakage were to occur in the Big Rock liner, a leak chase system is available to gather water

from the area between the liner and the concrete wall. This water would be processed through the plant radwaste equipment for recycling.

(j) See answers to (e), (f), (g) and (h).

(k) Suntac/Catalytic installed the spent fuel pool liner.

(l) A detailed description of the installation is provided in Fuel Pool Liner Work Package CWP-155 (GWO:6248).

(m) See answers to (f) and (g) and (l).

(n) Forty years - Standard practice at time of manufacture for nuclear power plant components. No documentation has been found relating to this choice of design life.

(o) The liner is exposed to the chemical and radioactive environment described in the answers to Interrogatories 3-3 and 3-7. The liner is not loadbearing; that is, the weight of the racks is borne by the concrete pool structure.

(p) The stresses described in (o) are considered negligible.

(q) No documentation has been found in Licensee's files that describes the type of combined loading analysis that was performed during the design of the liner. However, it is known that the liner is not seismically qualified.

(r) Consumers Power Company does not know why this particular liner design was chosen.

B. Documents Relied Upon

1. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point Plant, Fuel Pool Liner - Revised Work Package CWP-155; DT-FLP-062; December 4, 1973; (21 pages) 076359-076379.

2. Catalytic, Inc., Philadelphia, Pennsylvania 19102; Work Request; Shop Work Number CWP-155; pp. 14-25; 076380-076391.

3. Catalytic, Inc., Philadelphia, Pennsylvania 19102; Work Request; Shop Work Number WPW-155; pp. 26-42; 076392-076408.

4. Bechtel Corporation, San Francisco, Inspection Report; Report No. 1; 5/2/73; Page 1 of 1; "Q" List; S.O. No. L-3992; (Information Copy) 676834.

5. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; General Procedure for Control of Field Fabrication and Installation, Fuel Pool Liner; Suntac Contract No. 34491; Procedure No. 34491-QAP-501; (Information Copy), 672386-672388.

6. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; General Procedure for Control of Field Fabrication and Installation, Fuel Pool Liner; Suntac Contract No. 34491; Procedure No. 34491-QAP-501; 076213-076219.

7. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point, Fuel Pool Liner - "AFC" SS Pipe Weld and Hydro Test Procedures; DT-FPL-073; 2/15/74; (3 pages) 076285, 076292, 076302.

8. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point, Fuel Pool Liner - Revised Hydro Test Procedure; DT-FPL-065; December 28, 1973; (4 pages) 076299-076301, 076303.

9. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Procedure for: Nonconforming Material, Components Parts and Appurtenances, Fuel Pool Liner; Suntac Contract No. 34881; Procedure No. 34881-QAP-501-E; (Information Copy, 4 pages) 671961-671964.

10. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Procedure for: Conforming Material, Components Parts and Appurtenances, Fuel Pool Liner; Suntac Contract No. 34491; Procedure No. 34491-QAP-501-E; (8 pages) 076229-076236.

11. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Procedure for: Receiving, Handling and Storage of Materials, Parts and Components, Fuel Pool Liner; Suntac Contract No. 34881; Procedure No. 34881-QAP-501-B;(Information Copy, 3 pages) 671970-671972.

12. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Procedure for: Receiving, Handling and Storage of Materials, Parts and Components, Fuel Pool Liner; Suntac Contract No. 34491; Procedure No. 34491-QAP-501-B; (6 pages) 076220-076225.

13. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Procedure for: Documentation Control Center, Fuel Pool Liner; Suntac Contract No. 34881; Procedure No. 34881-QAP-501-D; (Information Copy, 3 pages) 671955-671957.

14. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Procedure for: Documentation Control Center, Fuel Pool Liner; Suntac Contract No. 34491; Procedure No. 34491-QAP-501-D; (3 pages) 076226-076228.

15. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Procedure for: Cleanliness and Cleaning, Fuel Pool Liner; Suntac Contract No. 34881; Procedure No. 34881-QAP-501-F; (Information Copy, 3 pages) 671958-671960.

16. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Procedure for: Cleanliness and Cleaning, Fuel Pool Liner; Suntac Contract No. 34491; Procedure No. 34491-QAP-501-F; (3 pages) 076237-076239.

17. Catalytic, Inc., Philadelphia, Pennsylvania 19102; Procedure for: Qualification of Nondestructive Examination Personnel, Fuel Pool Liner and Reactor Depressurization System; Suntac Contract No. 34881; Procedure No. 34881-QAP-701-A; (Information Copy, 3 pages) 671982-671984.

18. Suntact Nuclear Corporation, Philadelphia, Pennsylvania 19102; Procedure for: Qualification of Nondestructive Examination Personnel, Fuel Pool Liner and Reactor Depressurization System; Suntac Contract No. 34491; Procedure No. 34491-QAP-701-A; (3 pages) 076199-076201.

19. Catalytic, Inc., Philadelphia, Pennsylvania 19102; Procedure for: Qualification of Nondestructive Examination Personnel, Fuel Pool Liner and Reactor Depressurization System; Suntac Contract No. 34881; Procedure No. 34881-QAP-701-A; (3 pages) 076254-076256.

20. Bechtel Associates, Professional Corporation; Technical Specifications for Erection of Liner Plate for Spent Fuel Pool for the Consumers Power Company, Big Rock Point Plant, Charlevoix, Michigan; Job No. 10,211; 10,211-C172; (Information Copy, 11 pages).

21. Bechtel Company, Big Rock Point Plant, Charlevoix, Michigan, Consumers Power Company; Reactor Building Spent Fuel Pool Liner Sections and Details; Job No. 10,211; Drawing No. C-2; Rev. 4; New Dwg. No. 0740G20143 Rev. A; (Information Copy).

22. Bechtel Company, Big Rock Point Plant, Charlevoix, Michigan, Consumers Power Company; Reactor Building Spent Fuel Pool Liner Plans and Elevations; Job No. 10,211; Drawing No. C-1; Rev. 4; New Dwg. No. 0740G20142 Rev. A Sh.1; (Information Copy).

23. Nooter Corporation, St. Louis, Missouri 63166; Shop Weld Map Spent Fuel Pool Liner, Consumers Power Company, Big Rock Point Plant Bechtel Corporation, San Francisco, California; 4/26/73; Job No. L3992; Dwg. JN-D4170; Sheet 8 of 8.

24. Bechtel Associates, Professional Corp.; Technical Specifications for Purchase of Liner Plate for Spent Fuel Pool Area for the Consumers Power Company, Big Rock Point Plant, Charlevoix, Michigan; Job No. 10,211; 10,211-C171; (Information Copy, 9 pages).

25. Simplicity Engineering, Ludlow-Saylor, Star Wire; 10; Certification of Screen Wire Order; (Information copy, 1 page).

26. Nooter Corporation; May 7, 1971; Recommended Form of Procedure Specification and Manufacturer's Record of Rulings Qualification Test; (Information Copy, 1 page).

27. Special-T-Metals Company, Inc.; July 9, 1973; Letter to Nooter Corporation regarding Order Number 55690; (Information Copy, 1 page).

28. Consumers Power Company; Internal Correspondence; Gibs 59-73; September 14, 1973; (2 pages) 076123-076124.

29. Consumers Power Company; October 12, 1973; FPL-035; (1 page) 075892.

30. Consumers Power Company; May 2, 1973; Internal Correspondence; (Information Copy, 1 page) 676828.

31. Consumers Power Company; May 30, 1973; FPL-003; (Information copy, 2 pages) 676798-676799.

32. Consumers Power Company; May 31, 1973; FPL-004; (Information copy, 3 pages) 676792-676794.

33. Consumers Power Company; May 29, 1973; FPL-002; (Information Copy, 2 pages) 676800-676801.

34. Consumers Power Company; August 17, 1973; FPL-021; (Information Copy, 1 page).

35. Consumers Power Company; November 9, 1973; FPL-037; Ref: Spec. 34881-4200-307; (2 pages) 076310-076311.

36. Consumers Power Company; Internal Correspondence; September 5, 1973; (1 page) 075893.

37. Consumers Power Company; Internal Correspondence; Rang 49-74; March 18, 1974; (2 pages) 075915, 075918.

38. Consumers Power Company; Internal Correspondence; Rang 49-74; March 18, 1974; (2 pages) 075917-075918.

39. Consumers Power Company; Internal Correspondence; May 16, 1973; (2 pages) 676820-676821.

40. Consumers Power Company; Internal Correspondence; November 7, 1973; (2 pages) 075883-075884.

41. Consumers Power Company; Internal Correspondence; Rang 153-73; File 30160, ECCS; October 8, 1973; (1 page) 075881.

42. Consumers Power Company; Internal Correspondence; Rang 100-73; October 17, 1973; (1 page) 075882.

43. Bechtel Power Corporation; Interoffice Memorandum; August 20, 1973; (Information copy, 1 page).

44. Bechtel Power Corporation; May 3, 1973; (Information copy, 2 pages) 676832-676833.

45. Bechtel Power Corporation; May 8, 1973; (Information copy, 4 pages) 676822-676825.

46. Bechtel Associates, Professional Corp.; May 8, 1974; (Information copy, 1 page).

47. Bechtel Power Corp.; April 11, 1973; (Information copy, 2 pages) 676872-676873.

48. American Pipe and Steel Corp.; October 29, 1973; (2 pages) 076127-076128.

49. Suntac Nuclear Corp.; October 1, 1973; SURP-6; (1 page) 076152.

50. Catalytic, Inc.; 05311-670SP; Inter-office memo; September 14, 1973; (1 page) 075894.

51. Bechtel Associates, Professional Corp.; Technical Specifications for Subcontract for Purchase and Field Erection of Liner Plate for Spent Fuel Pool Area for the Consumers Power Company, Big Rock Point Plant, Charlevoix, Michigan; Job No. 10,211; 10,211-C-173; (Information Copy, 12 pages) 676903-676914.

52. Consumers Power Company; Job No. 10,211; 10,211-C-173; (Information Copy, 1 page) 676965.

53. Catalytic, Inc., Philadelphia, Pennsylvania 19102; Spec. No. SP-4200-CS-03A Rev. 0; Specification for Welding Carbón Steel Structural Members; Catalytic Contract No. 34880; Specification No. 34881-4200-306; (6 pages) 076163-076168.

54. Catalytic, Inc., Philadelphia, Pennsylvania 19102; Specification for Welding of Stainless Steel Pipe; Consisting of Spec. No. SP-4200-SS-01A Rev. 0; Catalytic contract no. 34881; Spec. No. 34881-4200-309; (6 pages) 076286-076291.

55. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; Big Rock Point Plant, Fuel Pool Liner MDCN No. 11; GWO: 6248; DT-FPL-075; February 26, 1974; (9 pages) 076066-076074.

56. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Engineering Design Change Notice; Contract Number 34881; February 19, 1974; (Information copy, 8 pages) 671845-671852.

57. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point Plant, Fuel Pool Liner - Revised Welding Procedure; DT-FPL-066; December 28, 1973; (10 pages) 076141-076150.

58. Catalytic, Inc., Philadelphia, Pennsylvania 19102; Specification for Welder and Welding Qualifications -- Fuel Pool Liner; Catalytic Contract No. 34881; Specification No. 34881-QAP-601-A; (Information Copy, 3 pages) 671976-671978.

59. Suntac Nuclear Comporation, Philadelphia, Pennsylvania 19102; Procedure for: Welder and Welding Qualifications Fuel Pool Liner; Suntac Contract No. 34491; Procedure No. 34491-QAP-601-A; (6 pages) 076202-065207.

60. Catalytic, Inc., Philadelphia, Pennsylvania 19102; Specification for Vacuum Box Leak Testing; Suntac Contract No. 34881; Specification No. 34881-2400-109; (3 pages) 076241-076243.

61. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Specification for Vacuum Box Leak Testing; Suntac Contract No. 34491; Specification No. 34491-2400-109; (3 pages) 076190-076192.

62. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Specification for Fuel Pool Liner; Suntac Contract No. 34881; Specification No. 34881-2400-102; (Information Copy, 4 pages) 672063-672066.

63. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Specification for Fuel Pool Liner; Suntac Contract No. 34491; Specification No. 34491-2400-102; (4 pages) 076209-076212.

64. Catalytic, Inc., Philadelphia, Pennsylvania 19102; Specification for Liquid Penetrant Testing; Catalytic Contract No. 34881; Specification No. 34881-2400-110; (6 pages) 076244-076249.

65. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Specification: Liquid Penetrant Testing; Suntac Contract No. 34491; Specification No. 34491-2400-110; (6 pages) 076193-076198.

66. Suntac Nuclear Corporation; Meeting Minutes - Big Rock Point; May 24, 1973; (Information Copy, 6 pages) 676802-676807.

67. NL Industries, Metal Division; September 19, 1973; (1 page) 075975.

68. Statement of Conformance; 7/23/73; P.O. No.: 10211-C-171-BC; Specification: 10211-C-171; (Information Copy, 1 page).

69. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point, Fuel Pool Liner - Additions to Work Package CWP-155; DT-FPL-076; 3/15/74; (3 pages) 076058-076060.

70. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point, Fuel Pool Liner - Design Change Notice; DT-FPL-058; 11/6/73; (2 pages) 076081-076082.

71. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point, Fuel Pool Liner - EDCN No. 8; DT-FPL-070; January 22, 1974; (4 pages) 076075-076078.

72. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point Plant, Fuel Pool Liner - EDCN No. 9; DT-FPL-072; January 25, 1974; (2 pages) 076079-076080.

73. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point Plant, Fuel Pool Liner - EDCN No. 10; DT-FPL-074; February 20, 1974; (3 pages) 076055-076057.

74. Suntac Nuclear Corporation, Philadelphia, Pennsylvania 19102; Alteration Notification; 08031-470P; Contract No. 34881/GWO-6248; December 17, 1973; Suntac Alteration Order No. 34881-1; (Information Copy, 3 pages) 672042-672044.

75. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point, Fuel Pool Liner, Vendor Certification and Information; DT-FPL-042; 9/17/73; (14 pages) 076264-076277.

Copies of all of the above are provided.

C. Documents Reviewed But Not Relied Upon

1. Bechtel Associates, Professional Corporation; Technical Specification Requirements for the Temporary Ventilation System for Welding of the Fuel Pool Liner Plate for Consumers Power Company, Big Rock Point, Charlevoix, Michigan; Specification No. 10211-M-1; Rev. 1; (Information Copy, 5 pages) 672426-672430.

2. Bechtel Associates, Professional Corporation; Technical Specifications for Purchase and Field Execution of Temporary Enclosure for Spent Fuel Pool Area for the Consumers Power Company, Big Rock Point Plant, Charlevoix, Michigan; SPEC/DES Guide No. 10,211-C1; (Information Copy, 3 pages).

3. Bechtel Associates, Professional Corporation, Technical Specification Requirements for the Sheet Metal Work for the Temporary Ventilation for Welding of the Fuel Pool Liner Plate for Consumers Power Company, Big Rock Point, Charlevoix, Michigan; Specification No. 10,211-M-5; (Information Copy, 15 pages) 672431-672445.

4. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point, Fuel Pool Liner - Tracked Machine SS Weld Procedure (AFC): DT-FPL-061; 11/29/73; (6 pages) 076304-076309.

5. Scheduling; (43 pages) 076089-076098.

6. Suntac Nuclear Corporation; Specification for Spent Fuel Pool Liner Installation; Suntac Contract No. 34881; Specification No. 34881-RCP-403; (Information Copy, 9 pages) 672006-672014.

7. Suntac Nuclear Corporation; Specification for Spent Fuel Pool Liner Installation; Suntac Contract No. 34491; Specification No. 34491-RCP-402; July 23, 1973; (9 pages) 076180-076188.

8. Suntac Nuclear Corporation; Specification for Spent Fuel Pool Liner Installation; Suntac Contract No. 34881; Specification No. 34881-RCP-402; (Information Copy, 9 pages) 671997-672005.

9. Suntac Nuclear Corporation; Specification for Spent Fuel Pool Liner Installation; Suntac Contract No. 34881; Specification No. 34881-2400-111; (Information Copy, 4 pages) 672076-672079.

10. Suntac Nuclear Corporation; Specification for Spent Fuel Pool Liner Installation Consisting of Radiation Protection Control for Spent Fuel Pool Decontamination and Liner Installation; Suntac Contract No. 34491; Specification No. 34491-2400-111; (4 pages) 076176-076179.

11. Nooter Corporation; Recommended Form Q of Procedure Specification and Manufacturer's Record of Driver Qualification Test; May 7, 1971; (Information Copy, 1 page).

12. Suntac Nuclear Corporation; Work Request; Shop Order Number CWP-153; (Information Copy, 1 page) 671891.

13. Suntac Nuclear Corporation; Work Request; Shop Order Number CWP-152; (2 pages) 075921-075922.

14. Consumers Power Company; DOCUMENT TRANSMITTAL: Generating Plant Modifications Department; GWO: 6248; Big Rock Point, Fuel Pool Liner Pool Decontamination Work Package; DT-FPL-040; 9/12/73; (4 pages) 076260-076263.

15. Consumers Power Company, DOCUMENT TRANSMITTAL: Generating Plant Modifications Department; GWO: 6248; Big Rock Point Plant, Fuel Pool Liner Addendum to work package CWP-152; DT-FPL-064; December 27, 1973; (4 pages) 076295-076298.

16. Suntac Nuclear Corporation; Work Request; Shop Order Number CWP-151; (3 pages) 076257-076259.

17. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 6248; Big Rock Point Plant, Fuel Pool Liner Work Request; DT-FPL-045; 9/29/73; (12 pages) 075926-075937.

18. Catalytic, Inc.; Work Request; Shop Work Number CWP-155; (32 pages) 075928-075969.

19. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 5908; Big Rock Point Plant, ECCS - Packaging and Shipping Specification W/EDCN No. 7; DT-ECS-050; January 22, 1974; (19 pages) 076100-076118.

20. American Vacuum Seam Tester; (8 pages) 076129-076136.

21. American Unitank Flange; (4 pages) 076137-076140.

22. Consumers Power Company; DOCUMENT TRANSMITTAL; Generating Plant Modifications Department; GWO: 5908; Big Rock Point Plant, Fuel Pool Liner - Decontamination Procedure Revision; DT-FPL-053; 10/8/73; (1 page) 076151.

23. Kelly Klosure Systems; 402-727-1344; Parts List; (19 pages) 075896-075912.

24. Consumers Power Company, DOCUMENT TRANSMITTAL, Generating Plant Modifications; GWO: 5909, Big Rock Point Plant, Fuel Pool Liner Installation Procedure and Spec. Index; 7/24/73; (6 pages) 076169-076174.

25. Consumers Power Company; DOCUMENT TRANSMITTAL, Generating Plant Modifications Department; GWO: 5909; Big Rock Point Plant, Fuel Pool Liner Installation; 4/18/73; (Information Copy, 3 pages) 676829-676831.

26. BRP Liquid Penetrant Examination; Procedure C172-5-1; Rang 90-73; (Information Copy, 11 pages) 676808-676818.

27. Check List for Hydrostatic Testing; Sheet 1 of 1; Q.A.-41a; (Information Copy, 1 page) 671995.

28. Consumers Power Company, Facility Change or Maintenance Order; (1 page) 075914.

29. Surveillance Inspection Report; UPI-221; Inspection Assignment No. 10,211-C-171-AC; (Information Copy, 1 page).

30. Inspection Check Sheet; A-7 Containment Liner Plates; (Information Copy, 1 page).

Copies of all of the above are provided.

D. Further Activities

None

Joseph Gallo

Joseph Gallo
One of the Attorneys for
Consumers Power Company

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CONSUMERS POWER COMPANY	)	Docket No. 50-155
	)	
(Big Rock Point Nuclear Power Plant)	)	

AFFIDAVIT OF DAVID P. HOFFMAN

COUNTY OF JACKSON)
) ss.
STATE OF MICHIGAN)

I, DAVID P. HOFFMAN, of lawful age, being first duly sworn, do state as follows:

I am employed by Consumers Power Company as the Nuclear Licensing Administrator. I am responsible for all corporate matters relating to licensing of operating nuclear power plants. A copy of my resume is attached.

I have joint responsibility with Carl L. Larsen for the answers to paragraphs (a) through (h) and (j) through (r) of Interrogatory 3-5.

In preparing answers to Interrogatory 3-5 I supervised and reviewed initial work in that respect done by Howard Fields, an employee in my charge. Since Mr. Fields has accepted a new position in another corporation, he is no longer available to answer the foregoing interrogatories. I have assumed that responsibility.

To the best of my knowledge and belief, the statements in this affidavit and the responses to Interrogatory 3-5 are true and correct.

David P. Hoffman

Subscribed and sworn to before me this 9th day of September 1980.

Dorothy H. Bartkus
Dorothy H Bartkus
Notary Public
Commission Expires March 26, 1983

RESUME

Personal Data

Name: David Paul Hoffman

Home Address: 242 E Liberty, Clark Lake, MI 49234
Home Phone: 517-529-4357
Birthdate: June 1, 1944
Birthplace: Alma, Michigan

Work Address: Consumers Power Company, 1945 W Parnall Road, Jackson, MI 49201
Work Phone: 517-788-1636

Married: Wife-Karen; two children-Sheila and Kurt

College Information

December, 1968 - BSME from the University of Michigan
May, 1970 - MSME from the University of Michigan

Areas of Specialization - Mechanical Engineering - thermodynamics, heat transfer and stress analysis.
Nuclear Engineering - nuclear physics, reactor theory and nuclear reactor power plants.

PE - August, 1976

Work Experience

November, 1979 to Present - Nuclear Licensing Administrator, Nuclear Activities Department, Consumers Power Company

Responsible for the direction of all licensing activities related to Consumers Power Company operating nuclear power plants. Responsibilities include: maintaining a continuing liaison with regulatory agencies and other segments of the nuclear power industry; coordinating activities of internal designs, supplies, and consultants relating to nuclear plant licensing; interpreting regulatory requirements and developing, implementing and supervising an effective Special Nuclear Material Safeguards Program, including material accountability; coordinating reporting requirements; distributing and recording licensing correspondence and maintaining licensing files and documentation; coordinating preparation of outgoing documents, drafts and routine licensing submittals to the Nuclear Regulatory Commission; preparing Special Nuclear Material accountability computer codes for operating nuclear plants.

February, 1977 to October, 1979 - Assistant Nuclear Licensing Administrator, Nuclear Activities Department, Consumers Power Company

Responsible for preparation, coordination and transmittal of licensing correspondence with the Nuclear Regulatory Commission, specifically for the Palisades Plant. Vice Chairman of the Safety and Audit Review Board.

October, 1975 to February, 1977 - Senior Engineer, Technical Services Group, Operating Services Department, Consumers Power Company

Areas of involvement included: Palisades Plant steam generator sleeving development program; Palisades Plant long term cooling equipment modification project; and miscellaneous mechanical design projects for both fossil and nuclear plants.

November, 1973 to October, 1975 - Senior Engineer, Air Quality Group, Environmental Engineering Division, Engineering Research Department, the Detroit Edison Company

Areas of involvement included: Project Engineer for ambient air quality monitoring programs with responsibility for the coordination of station operation and maintenance, analyzing historical and real-time data, predicting power plant impact using diffusion modeling techniques, and reporting to regulatory agencies; coordination and preparation of Environmental Impact Statements for power plants; miscellaneous activities relating to both air and water quality projects, such as 316a demonstration plans and air quality monitoring or diffusion studies; and review of various proposals and documents relating to nuclear fuel cycles and fusion projects.

May, 1970 to November, 1973 - Engineer, Thermal and Fluid Systems Group, Mechanical Division, Engineering Research Department, the Detroit Edison Company

Areas of involvement included: six-month assignment with the Generation Engineering Department to assist Project Management Organization in the evaluation of alternative cooling systems and the preparation and review of PSAR's and ER's; development of heat transfer models, eg, Spray Cooling System Thermal Performance Model and Monroe Power Plant Generator Failure Mode; Project Engineer for the evaluation of powered spray modules at the Enrico Fermi Power Plant site; assigned to the Edison Electric Institute and Electric Power Research Institute task forces and reviewed their respective reports. Areas of assignment included cooling systems, emergency core cooling systems, nuclear power cycles, and fusion; general projects requiring physical or mathematical modeling; occasional assignments as acting supervisor.

January, 1975 to August, 1975 - Instructor of Thermodynamics at Lawrence Institute of Technology, Southfield, Michigan (night school).

August, 1967 to May, 1970 - Senior Operator (Licensed by AEC), Ford Nuclear Reactor, University of Michigan.

Assignments included: Shift Supervisor on Reactor Operations Staff; assisted in the development of a core refueling computer program and was responsible for core refueling calculations; performed various maintenance projects on reactor systems.

May, 1966 to August, 1967 - Plant Engineer, Power Engineering Group, Engineering Department, Dow Chemical Company

Assignments included: various engineering jobs to improve or correct power plant maintenance problems; drafting.

Professional Society Memberships

American Society of Mechanical Engineers
Member of EPRI Safety and Analysis Task Force (utility advisory group)
Chairman of the EPRI Task Force Subcommittee Safety & Relief Valve Test Program

Publications

Computer Model of a Thermal Plume, ASCE National Water Resources Conference, Phoenix, Arizona, January, 1971; Co-author: R E Barry

Prediction of Thermal Plumes and Comparison with Field Data, Great Lakes Resources Conference, July, 1972; Co-author: R E Barry

Spray Cooling for Power Plants, American Power Conference, Chicago, May, 1973

Spray Cooling Fights Fog Best, Says Detroit Edison, Electric Light & Power, October, 1973

Additional Education Studies

September, 1970 - Audited Meteorology course - University of Michigan (1 semester)

September, 1971 - Edison Power Systems Engineering Course (9 months)

November, 1971 - Edison Engineering Economics (2 weeks)

September, 1973 - Environmental Impact of Nuclear Power Plants - University of California-Berkley (1 week)

September, 1973 - Edison (NUS) Introduction to Nuclear Physics, Part I (Reactor Physics) (4 months)

January, 1974 - Edison (NUS) Introduction to Nuclear Physics, Part II (Reactor Performance) (4 months)

September, 1974 - Edison (NUS) Introduction to Nuclear Physics, Part III (Radiation Protection and Chemistry) (4 months)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CONSUMERS POWER COMPANY	)	Docket No. 50-155
	)	
(Big Rock Point Nuclear Power Plant)	)	

AFFIDAVIT OF CARL L. LARSEN

COUNTY OF JACKSON)
) ss.
STATE OF MICHIGAN)

I, CARL L. LARSEN, of lawful age, being first duly sworn, do state as follows:

I am employed by Consumers Power Company as an Engineering Supervisor in the Generating Plant Modifications Department. I have overall responsibility within the Company for technical, cost and schedule aspects of the proposed spent fuel pool expansion at the Big Rock Point Plant. My resume is attached.

I have joint responsibility with David P. Hoffman for answering paragraphs (a) through (h) and (j) through (r) of Interrogatory 3-5.

To the best of my knowledge and belief, the statements in this affidavit and in the responses to Interrogatory 3-5 are true and correct.

Carl L. Larsen

Subscribed and sworn to before me this 9th day of September 1980.

Dorothy H. Bartkus
Notary Public
Commission Expires March 26, 1983

CARL LEE LARSEN

EXPERIENCE:

1979 to Present — Consumers Power Company since 1977 as Project Manager, responsible for several major modifications to operating nuclear power plants. Responsibilities include technical, cost and schedule aspects including vendor selection and construction interface.

1974 to 1979 — Gilbert/Commonwealth Associates, Inc. 1973 to 1979.

1978-1979 — Senior Licensing Engineer responsible for the preparation of security system design descriptions for a nuclear power plant, responses to USNRC questions on fire protection systems and technical support for hearings before the ACRS concerning a CP stage license application for a nuclear power plant.

1976 - 1978 — Responsible for the preparation of responses to USNRC questions during CP review of PSAR license application. Participated in technical meetings with USNRC Staff regarding USNRC questions on PSAR.

1975 - 1976 — Lead Safety Licensing Engineer responsible for coordinating the preparation of a Preliminary Safety Analysis Report for a nuclear power plant. Responsibility for the licensability of technical information for the PSAR. Coordinated the preparation of plant security documents and fire protection and emergency planning. Performed NSSS vendor evaluation and liaison between client and NSSS vendor.

1974 - 1975 — Performed technical and licensability review of PSAR and related sections of the Environmental Report. Assisted with shielding design experiments conducted at the University of Michigan.

EDUCATION: B. S. Nuclear Engineering, University of Michigan.
Graduate Engineering Studies, University of Michigan.

SOCIETIES: American Nuclear Society

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CONSUMERS POWER COMPANY	)	Docket No. 50-155
	)	
(Big Rock Point Nuclear Power Plant)	)	

AFFIDAVIT OF A. JOHN BIRKLE

COUNTY OF JACKSON)
) ss.
STATE OF MICHIGAN)

I, A. JOHN BIRKLE, of lawful age, being first duly sworn, do state as follows:

I am employed by Consumers Power Company as a Senior Staff Engineer. My job responsibilities are described in my resume (attached).

I am primarily responsible for the response to paragraph (i) of Interrogatory 3-5.

To the best of my knowledge and belief, the statements in this affidavit and the responses to paragraph (i) of Interrogatory 3-5 are true and correct.

A. John Birkle

A. John Birkle

Subscribed and sworn to before me this 9th day of September 1980.

Beverly A. Avery

Beverly A. Avery
Notary Public
My commission expires March 14, 1981

PROFESSIONAL RESUME FOR A JOINT BIDDER

Position:	Senior Staff Engineer
Education:	University of Illinois, 1956, BS in Metallurgical Engineering; University of Wisconsin, 1958, MS in Metallurgical Engineering
Experience:	
April 1971 - Present	Consumers Power Company - Section Head (Materials Section) - Provide material engineering services during various phases of electric plant projects during design, construction and start-up. Also review specifications, purchase orders, design criteria, bid evaluations and evaluates vendors and contractor performance. Supervise members of the section who provide services which include metallurgical engineering, coating and corrosion, welding engineering, nuclear inservice inspection, nondestructive testing, ASME Boiler and Pressure Vessel Code interpretation, chemical engineering, cathodic protection and water purity.
April 1971 - 1973	Assisted in the quality assurance efforts on Palisades, Midland, Quanicassee, Karn and Ludington construction/fabrication.
August 1968 - April 1971	CF&I Steel Corporation - Manager (Product Research and Development)
November 1965 - August 1968	Youngstown Sheet and Tube Company - Research Supervisor (Research Department)
June 1958 - November 1965	United States Steel Corporation - Senior Research Engineer (Applied Research Laboratory)
Awards:	Henry Marion Howe Medal for authoring a paper selected as the best of those published in Volume 58 of the ASM Transactions.
Technical Societies:	Member of: American Society for Metals American Welding Society American Society of Mechanical Engineers Prime Movers Executive Group Prime Movers Group

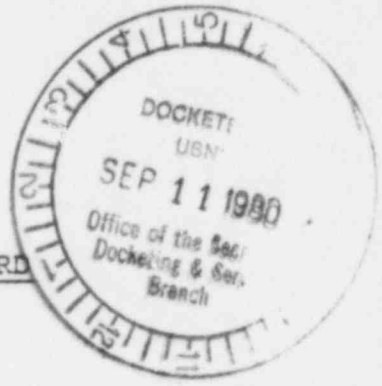
Edison Electric Institute Metallurgy, Piping, Welding and Corrosion Task Force (Chairman)
ASME Boiler and Pressure Vessel Code, Section III Subcommittee (Member)
Subgroup on General Requirements (Chairman)
Working Group on Steam Generator Inspection (Chairman)
Working Group on Standards (Member)
Materials Property Council Advisory Committee (Member)
Steam Power Panel
ASME Pressure Vessel and Piping Division, Materials and Fabrication Committee
Journal of Materials for Energy Systems (Manuscript Reviewer)

Publications/Patents/Lectures/Session Chairman:

Published approximately 25 papers on materials.

Received numerous patents on improved materials.

Participate in approximately three technical sessions per year as an author or session chairman.



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CONSUMERS POWER COMPANY	)	Docket No. 50-155
	)	
(Big Rock Point Nuclear Power Plant))		

CERTIFICATE OF SERVICE

I hereby certify that copies of "Answers of Consumers Power Company to Interrogatories Propounded by Christa-Maria, et al.," and attached affidavits and the documents indicated to be enclosed in the above-captioned proceeding were served upon the following persons by depositing copies thereof in the United States mail, first class postage prepaid, this 10th day of September, 1980.

Herbert Grossman, Esquire
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Dr. Oscar H. Paris
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Mr. Frederick J. Shon
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Janice E. Moore, Esquire
Counsel for NRC Staff
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

John O'Neill, II
Route 2, Box 44
Maple City, Michigan 49664

Christa-Maria
Route 2, Box 108C
Charlevoix, Michigan 49720

William S. Jordan, III, Esquire
Harmon & Weiss
1725 I Street, N.W.
Suite 506
Washington, D.C. 20006

Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Atomic Safety and Licensing
Appeal Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Docketing and Service Section
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Joseph Gallo

Joseph Gallo
One of the Attorneys for
Consumers Power Company

RELATED CORRESPONDENCE

"B" Document Filed in

2523

Consumers Power Company

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

JJZaborowski,
Big Rock Point Plant
FMMacri, P-14-230, Last

DT-FLP-062

GWO: 6248

Date: December 4, 1973

Plant: Big Rock Point Plant

Description: Fuel Pool Liner - Revised Work Package CWP-155

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSRang			X	WPCooke/RLWilson/	
	X	WClark				MCPatel	
					X	CJHeathman/GRAbel/	
						JJZaborowski	

From: FMMacri

Comments Requested by: 12/12/73

Documents:	Previous Review Rev	Previous Review Date
EDCN No 4		
CWP-155 Rev 2 (Liner Installation)	1	9/26/73

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri, P-14-230.

076399

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: _____

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

EXHIBIT NO. 5

DRAWING CLASSIFICATION

Plot Plan ☐
Process Flow Diagram ☐
Engineering Flow Diagram ☐
Architectural ☐
Civil ☐
Electrical ☐
Heat, Vent. & Air Conditioning ☐
Instrumentation ☐
Mechanical ☐
Piping ☐
Pressure Vessel ☐
Structural ☐
Work Package ☒

SUNTAC NUCLEAR CORPORATION
Philadelphia, Pennsylvania 19102

EDCN
ENGINEERING DESIGN CHANGE NOTICE

DATE 28 November 1973

EDCN Number 4 | Sheet ___ of ___

Rev. Number | Change Hours

Change Made By W.L. Pike | Check Made By

Process Approval

Project Approval

Client's Approval

Drawing Title: Procedure 34881-CWP-155, "Prefabricate and Install Liner in Spent Fuel Pool", Rev. 2, 11/28/73

Drawing Number or Numbers

Contract Number 34881

Change Description Or Sketch

Changes made to Procedure #34881-CWP-155, Rev. 1, are listed on the attached Field Change Notice.

These changes were made to allow the use of Specification 34881-4200-307, "Track Machine Welding Stainless Steel" in addition to Specification 34881-4200-301, "Welding Stainless Steel."

0763 60

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

RECEIVED
NOV 12 1973

WORK REQUEST

TO: FIELD SUPT. CLIENT REPRESENTATIVE PROJECT MGR. MGR., QUALITY ASSURANCE SUPV., RAD CON MGR., CONSTRUCTION ORIGINATOR	MATERIAL REQUIRED	SHOP ORDER NUMBER Rev. 2 CWP-155
	CHARGE 34881	DEPARTMENT CONSTRUCTION
	REQUISITIONER R.J. Tuohul	
	SAFETY REVIEW N/A	Q.A. ENGR. REVIEW W.P. Pike
	WELD ENGR. REVIEW	
	RAD CONTROL REVIEW RWP REQUIRED [X] yes [ ] no	CLIENT APPROVAL
	PROJECT MGR. APPRO H.C. Burkhardt 11/27 11-29-73	

APPLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

MAJOR FCN'S	
MINOR FCN'S	
CLEANLINESS GRADE	QAP-501F
WELDER QUALIFICATION	X
PIPE FREEZES REQUIRED	
SYSTEM CLASSIFICATION	
LAGGING (THERMAL INSUL.)	
PAINTING	

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES	
PREREQUISITES	X
NONPLANT CONT. WORK	X
PLANT CONT. WORK	
POST INSTALL TESTS	

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT	
REACTOR PLANT COOLDOWN	
REACTOR PLANT SHUTDOWN	
COMPONENT ISOLATED	X

QUALITY ASSURANCE RELEASE
FOR
MATERIAL WITHDRAWAL
AND
FABRICATION / INSTALLATION

FIELD Q. A. ENGINEER _____ DATE _____

FIELD CHANGE NOTICE

1. SUMMARY

1.1 TITLE Same as original work request.

1.2 PURPOSE Same as original work request.

1.3 AUTHORIZATION Same

1.4 REFERENCES Add 34881-4200-307 weld specification.

1.5 ENCLOSURES Same

1990 076361

W.P. Pike
*SIGNATURE

11-5
DATE

*The person designated to sign for an action verifies on personal observation and certifies by his signatur that the action has actually been performed in accord

6.2. Change "allow 1/16" to read "with no". Change "301" to read "307", add after "301""if required".

6.2.1 Change "301" to read "307".

6.3 Change "allow 1/16" to read "with no". Change "301" to read "307", add after "301""if required".

6.3.1 Change "301" to read "307".

6.4 Change "allow 1/16" to read "with no". Change "301" to read "307", add after "301""if required".

6.4.1 Change "301" to read "307".

6.5 Change "allow 1/16" to read "with no". Change "301" to read "307", add after "301""if required".

6.5.1 Change "301" to read "307".

7.1.1. Change "allow 1/16" to read "with no". Change "301" to read "307". Add after "301""if required".

7.1.2 Change "301" to read "307".

7.1.5 Change "allow 1/16" to read "with no". Change "301" to read "307". Add after "301""if required".

7.1.6 Change "301" to read "307".

7.1.9 Change "allow 1/16" to read "with no". Change "301" to read "307". Add after "301""if required".

7.1.10 Change "301" to read "307".

7.1.13 Change "allow 1/16" to read "with no". Change "301 to read "307".

7.1.14 Change 301" to read "307".

7.1.17 Change "allowing 1/16" to read "with no". Change "301 to read "307". Add after "301""if required".

7.1.18 Change "301" to read "307".

7.1.21 Change "allow 1/16" to read "with no". Change "301" to read "307". Add after "301""if required".

7.1.22 Change "301" to read "307".

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

7.1.25 Change "allowing 1/16" weld gap between assemblies" to read "using 3/16" x 2½" 304 stainless steel bar on pool side of plate centered over plate joint".

8.1.1 Change "allow 1/16" to read "with no". Change "301" to read "307". Add after "301""if required".

8.1.2 Change "301" to read "307".

8.1.5 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301""if required".

8.1.6 Change "301" to read "307".

8.1.9 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

8.1.10 Change "301" to read "307".

8.1.13 Change "allow 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

8.1.14 Change Change "301 to read "307".

8.1.17 Change "allowing 1/16" to read "with no". Change "301 to read "307". Add after "301" "if required".

8.1.18 Change "301" to read "307".

8.1.21 Change "allow 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

8.1.22 Change "301" to read "307".

8.1.25 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

8.1.26 Change "301" to read "307".

8.1.29 Change "allowing 1.16" to read "with no". Change "301"to read "307". Add after "301" "if required".

8.1.30 Change "301" to read "307".

9.1.1 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

9.1.2 Change "301" to read "307".

0363

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

9.1.5 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

9.1.6 Change "301" to read "307".

9.1.9 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

9.1.10 Change "301" to read "307".

9.1.13 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

9.1.14 Change "301" to read "307".

9.1.17 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required ".

9.1.18 Change "301" to read "307".

9.1.21 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

9.1.22 Change "301" to read "307".

9.1.25 Change "allowing 1/16" weld gap between assemblies " to read "using 3/16" x 2½" 304 stainless steel bar on pool side of plate centered over plate joint".

10.1.1 Change "allowing 1/16" to read"with no". Change "301" to read "307". Add after "301" "if required".

10.1.2 Change "301" to read "307".

10.1.5 Change Allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

10.1.6 Change "301" to read "307".

10.1.9 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

10.1.10 Change "301" to read "307".

10.1.13 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

10.1.14 Change "301" to read "307".

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

0710
4936

10.1.17 Change "allowing 1.16" to read "with no". Change "301" to read "307". Add after "301" "if required".

10.1.18 Change "301" to read "307".

10.1.21 Change"allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

10.1.22 Change "301" to read "307".

10.1.25 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

10.1.26 Change"301" to read "307".

10.1.29 Change "allowing 1/16" to read "with no". Change "301" to read "307". Add after "301" "if required".

10.1.30 Change "301" to read "307".

21.1 Add after "301" "Note these panels are to be welded together using 3/16" x 2½" 304 stainless steel bar place on the pool side of the plate and centered over the plate joint".

0763365

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

APPROVED FOR CONSTRUCTION
REV-0 9/12/73

TO: FIELD SUPT.
CLIENT REPRESENTATIVE
PROJECT MGR.
MGR., QUALITY ASSURANCE
SUPV., RAD CON
MGR., CONSTRUCTION

ORIGINATOR J U Lacon/ERD

MATERIAL REQUIRED	REV. 2 11/23/73 REV 1	SHOP ORDER NUMBER 9/26/73
As listed		CWP-155
CHARGE	DEPARTMENT	REQUISITIONER
34881	CONSTRUCTION	
SAFETY REVIEW	Q.A. ENGR. REVIEW	WELD ENGR. REVIEW
N/A	W.F. Burke	L.J. Pope
RAD CONTROL REVIEW RWP REQUIRED [X] yes [ ] no	CLIENT APPROVAL F. H. Mazzi/ERD 9/12/73	PROJECT MGR. APPROVAL N.C. Burbidge/ERD E.F. Turner

APPLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

CLEANLINESS GRADE	QAP-501F
WELDER QUALIFICATION	X
PIPE FREEZES REQUIRED	
SYSTEM CLASSIFICATION	
LAGGING (THERMAL INSUL.)	
PAINTING	

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES	
PREREQUISITE	X
NONPLANT CONT. WORK	X
PLANT CONT. WORK	
POST INSTALL TESTS	

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT	
REACTOR PLANT COOLDOWN	
REACTOR PLANT SHUTDOWN	
COMPONENT ISOLATED	X

QUALITY ASSURANCE RELEASE FOR MATERIAL WITHDRAWAL AND FABRICATION / INSTALLATION

FIELD Q. A. ENGINEER _____ DATE _____

1. SUMMARY

1.1 TITLE Prefabricate and installation of the spent fuel pool stainless steel liner.

1.2 PURPOSE To line the spent fuel pool with stainless steel.

1.3 AUTHORIZATION Consumers Power Company P/O

1.4 REFERENCES Consumers Power specification 10,211-C171 (Bechtel)weld specificat 34881-4200-301, 302, & 307

1.5 ENCLOSURES Bechtel Drawing C-1 Rev. 4 and C-2 Rev. 4, Nooter Drawings JND-417C Rev. 2, 41702 Rev.3, 41703 Rev.3, 41704 Rev.3, 41705 Rev.3, 41706 Rev. 41707 Rev.5, 41708 Rev. 3.

1.6 Welders shall be qualified for the specification and parameters as listed herein per Reference 1.

Verification, Cat. Q.A. _____ Date _____
*Signature

*The person designated to sign for an action verifies ba on personal observation and certifies by his signature that the action has actually been performed in accordan with the specified requirements.

2.0 Material

2.1 3/16" 304 S/S plate piece numbers, as shown on Nooter drawing JN-D-41706, WP-1 through WP-36.

2.2 3/16" 304 S/S plate piece number, as shown on Nooter drawing JN-D-41706, FP-1 through FP-5.

2.3 3/16" 304 S/S plate corner sections piece numbers, as shown on Nooter drawing JN-D-41707, WPC-5 through WPC-12, WPC-14 through WPC-18, and WPC-21 through WPC-25.

2.4 3/16" X 2-1/2" 304 S/S flat bar piece numbers, as shown on Nooter drawing JN-D-41707, WBU-1 through WBU-4.

2.5 3/16" 304 S/S reinforcing plate as shown on Nooter drawing JN-D-41707 detail 9.

2.6 3/16" 304 S/S reinforcing plate as shown on Nooter drawing JN-D-41707 detail 10.

2.7 2 each Skimmer duct 304 S/S as shown on Nooter drawing JN-D-41705 detail 5.

2.8 20 each Piper Hanger brackets 304 S/S as shown on Nooter drawing JN-D-41705 detail 11.

2.9 1 each S/S trash screen cover as shown on Nooter drawing JN-D-41705 detail 17.

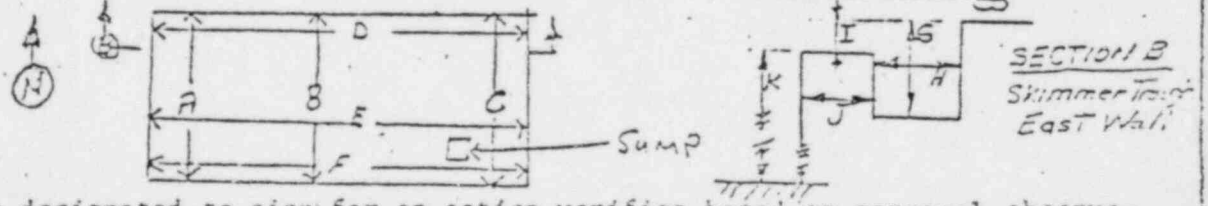
2.10 2 each (1-RH and 1-LH) 3/16" X 2-7/8 X 2-1/4 304 S/S cap plates as shown on Nooter drawing JN-D-41705.

2.11 2 each (1-RH and 1-LH) 3/16" X 3" X 5" 304 S/S cap plate as shown on Nooter drawing JN-D-41705

2.12 2 each (1-RH and L-LH) 3/16" X 3" X 3" 304 S/S filler end plates as shown on Nooter drawing JN-D-41705.

3.0 Prerequisite Before Starting Prefabrication of Spent Fuel Pool Liner Plate

3.1 Take spent fuel pool measurements and record the measurement.



*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

3.1.2 The measurements at the bottom of the spent fuel pool are:

A. _____ D. _____

B. _____ E. _____

C. _____ F. _____

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

3.1.3 The measurements at the top of the spent fuel pool are:

A. _____ D. _____

B. _____ E. _____

C. _____ F. _____

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

3.1.4 The measurements of the skimmer trough at the North end of the East wall are:

G. _____ J. _____

H. _____ K. _____

I. _____

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

3.1.5 The measurements of the skimmer trough at the South end of the East wall are:

G. _____ J. _____

H. _____ K. _____

I. _____

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

3.2.1 CWP-151, CWP-152, CWP-153 and CWP-154.

WG Supt._____ Date_____
*Signature

3.3 Rad control survey is to be made of the area and establish requirements, if any, for an RWP.

Performance, RC_____ Date_____
*Signature

4.0 Initial Conditions

4.1 Non-Plant Controlling

5.0 Description

The work described in this work package is the fabrication and installation of the stainless steel liner for the spent fuel pool.

6.0 Prefabrication of Spent Fuel Pool Liner

6.1 Fabricate the spent fuel pool floor plate using piece MK FP-1 through FP-5 as shown on Nooter drawing JN-D-41701.

6.2 Weld FW-1 - Fit up plate FP-1 with plate FP-2, with no weld, gap and tack weld 1/4" on 6" centers using weld procedure - 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

6.2.1 Weld joint FW-1 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

6.2.2. Liquid penetrant inspection and of weld joint FW-1.

Acceptance, Cat. Q.A._____ Date_____
*Signature

6.2.3 Vacuum box test of weld joint FW-1 after installation of floor plate.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

6.3 Weld FW-2 - Fit up plate FP-2 with FP-3, with no weld gap and tack weld 1/4" on 6" centers using weld procedure 34891-4200-307, if required.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

6.3.1 Weld joint FW-2 using weld procedure 34881-4200-307.

Performance, WG _____ Date _____
*Signature

6.3.2 Liquid penetrant inspection of weld joint FW-2.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

6.3.3 Vacuum box test of weld joint FW-2 after installation of floor plate.

Acceptance, Cat. _____ Date _____
*Signature

6.4 Weld FW-3 - Fit up plate FP-3 with FP-4, with no weld gap and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

6.4.1 Weld joint FW-3 using weld procedure 34881-4200-307.

Performance, WG _____ Date _____
*Signature

6.4.2 Liquid penetrant inspection of weld joint FW-3.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

6.4.3 Vacuum box test of weld joint FW-3 after installation of floor plate.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

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6.5 Weld FW-4 - Fit up plate FP-4 with plate FP-5 with no weld gap and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

6.5.1 Weld joint FW-4 using weld procedure 34881-4200-307.

Performance, WG _____ Date _____
*Signature

6.5.2 Liquid penetrant inspection of weld FW-4.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

6.5.3 Vacuum box test of weld joint FW-4 after installation of floor plate.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

7.0 Prefabricate Spent Fuel Pool Wall Plate Liners

7.1 Prefabricate west wall liner for spent fuel pool as shown on Nooter drawing JN-D-41702 Section A.

7.1.1 Fit up wall plate piece MK WP-1 with piece MK WP-2 with no weld gap between plate and tack weld plates 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG _____ Date _____
*Signature

7.1.2 Weld joint WPW-1 using weld procedure 34881-4200-307.

Performance, WG _____ Date _____
*Signature

7.1.3 Liquid penetrant inspection of weld joint WPW-1.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

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7.1.4 Vacuum box test of weld joint WPW-1 after installation of liner into spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.5 Fit up wall plate piece MK WP-3 with piece MK WP-2 with no weld gap between plates tack weld plates 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.6 Weld joint WPW-2 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

7.1.7 Liquid penetrant inspect weld joint WPW-2.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.8 Vacuum box test weld joint WPW-2 after liner is installed in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.9 Fit up wall plate piece MK WP-3 with piece MK WP-4 with no weld gap between plates tack weld on 6" centers using weld procedure 34881-4200- 307, if required.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.10 Weld joint WPW-3 using weld procedure 34881-4200- 307.

Performance, WG_____ Date_____
*Signature

7.1.11 Liquid penetrant inspect weld joint WPW-3.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

7.1.12 Vacuum box test weld joint WPW-3 after is installed in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.13 Fit up piece MK WP-19 with piece MK WP-20 with no weld gap between plates and tack weld 1/4"on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat Q.A._____ Date_____
*Signature

7.1.14 Weld joint WPW-4 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

7.1.15 Liquid penetrant inspection of weld joint WPW-4.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.16 Vacuum box test weld joint WPW-4 after installing liner into spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.17 Fit up piece MK WP-21 with piece MK WP-20 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.18 Weld joint WPW-5 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

7.1.19 Liquid penetrant inspect weld joint WPW-5.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

7.1.26 Weld joint WPW-7 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.27 Liquid penetrant inspect weld joint WPW-7.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.28 Vacuum box test weld joint WPW-7 after installing liner in Spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.29 Weld joint WPW-8 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.30 Liquid penetrant inspect weld joint WPW-8.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.31 Vacuum box test weld joint WPW-8 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.32 Weld joint WPW-9 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.33 Liquid penetrant inspect weld joint WPW-9.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.34 Vacuum box test weld joint WPW-9 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

7.1.35 Weld joint WPW-10 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.36 Liquid penetrant inspect weld joint WPW-10.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.37 Vacuum box test weld joint WPW-10 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.0 Prefabricate Spent Fuel Pool Wall Plate Liners

8.1 Prefabricate north wall liner for spent fuel pool as shown on Nooter drawing JN-D-41702 Section B.

8.1.1 Fit up wall plate piece MK-WP-5 with MK-WP-6 with no weld gap between plates and tack weld plates 1/4" on 6" centers using weld procedure 34881-4200- 307, if required.

Performance, WG_____ Date_____
*Signature

8.1.2 Weld joint WPW-11 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

8.1.3 Liquid penetrant inspect weld joint WPW-11.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.4 Vacuum box test weld joint WPW-11 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

8.1.5 Fit up wall plate piece MK-WP-6 with MK-WP-7 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
* Signature

8.1.6 Weld joint WPW-12 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

8.1.7 Liquid penetrant inspect weld joint WPW-12.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.8 Vacuum box test weld joint WPW-12 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.9 Fit up wall plate piece MK-WP-7 with MK-WP-8 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

8.1.10 Weld joint WPW-13 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

8.1.11 Liquid penetrant inspect weld joint WPW-13.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.12 Vacuum box test weld joint WPW-13 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

7.1.20 Vacuum box test weld joint WPW-5 after liner is installed in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.21 Fit up piece MK WP-22 with piece MK WP-21 with no weld gap between plates and tack 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.22 Weld joint WPW-6 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

7.1.23 Liquid penetrant inspect weld joint WPW-6.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.24 Vacuum box test weld joint WPW-6 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.25 Fit up the welded assembly, consisting of plates WP-1, WP-2, WP-3 and WP-4, with the welded assembly, consisting of plates WP-19, WP-22, WP-20 and WP-21, as shown on Nooter drawing JN-D-41702 using 3/16" x 2½" 304 stainless steel bar on pool side of plate centered over plate joint.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

8.1.13 Fit up wall plate MK-WP-8 with MK-WP-9 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

8.1.14 Weld joint WPW-14 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

8.1.15 Liquid penetrant inspect weld joint WPW-14.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.16 Vacuum box test weld joint WPW-14 after installing in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.17 Fit up wall plate MK-WP-23 with MK-WP24 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

8.1.18 Weld joint WPW-15 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

8.1.19 Liquid penetrant inspect weld joint WPW-15.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.20 Vacuum box test weld joint WPW-15 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

8.1.21 Fit up wall plate MK-WP-24 with MK-WP-25 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG _____ Date _____
*Signature

8.1.22 Weld joint WPW-16 using weld procedure 34881-4200-307.

Performance, WG _____ Date _____
*Signature

8.1.23 Liquid penetrant inspect weld joint WPW-16.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

8.1.24 Vacuum box test weld joint WPW-16 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

8.1.25 Fit up wall plate MK-WP-25 with MK-WP-26 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG _____ Date _____
*Signature

8.1.26 Weld joint WPW-17 using weld procedure 34881-4200-307.

Performance _____ Date _____
*Signature

8.1.27 Liquid penetrant inspect weld joint WPW-17.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

8.1.28 Vacuum box test weld joint WPW-17 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

8.1.29 Fit up wall plate MK-WP-26 with MK-WP-27 allowing with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance WG _____ Date _____

*The person designated to sign for an action Signatures based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

8.1.30 Weld joint WPW-18 using weld procedure 34881-4200-307.

Performance WG_____ Date_____
*Signature

8.1.31 Liquid penetrant inspect weld joint WPW-18.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.32 Vacuum box test weld joint WPW-18 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A. _____ Date_____
*Signature

8.1.33 Fit up wall plates MK-WP-5, WP-6, WP-7, WP-8 and WP-9 with MK-WBU-1 and MK-WBU-2 overlap to center of backing strap. Tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.34 Weld joint WPW-19 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.35 Liquid penetrant inspect weld joint WPW-19.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.36 Weld joint WPW-20 using weld procedure 34881-4200-301.

Performance WG_____ Date_____
*Signature

8.1.37 Liquid penetrant inspect weld joint WPW-20.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.38 Weld joint WPW-21 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

8.1.39 Liquid penetrant inspect weld joint WPW-21.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.0 Prefabricate Spent Fuel Pool Wall Plate Liners.

9.1 Prefabricate east wall liner for spent fuel pool as shown on Nooter drawing JN-D-41703 Section "C".

9.1.1 Fit up wall plate piece MK-WP-10 with MK-WP-11 no weld gap gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

9.1.2 Weld joint WPW-22 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

9.1.3 Liquid penetrant inspect weld joint WPW-22.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.4 Vacuum box test weld joint WPW-22 after installing liner in spent fuel tank.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.5 Fit up wall plate piece MK-WP-11 with MK-WP-12 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

9.1.6 Weld joint WPW-23 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

9.1.7 Liquid penetrant inspect weld joint WPW-23.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.8 Vacuum box test weld joint WPW-23 after installing liner in s. t fuel pool.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.9 Fit up wall plate piece MK-WP-12 with MK-WP-13 with no weld gap between plates and thick weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____Date_____
*Signature

9.1.10 Weld joint WPW-24 using weld procedure 34881-4200-307.

Performance, WG_____Date_____
*Signature

9.1.11 Liquid penetrant inspect weld joint WPW-24.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.12 Vacuum box test weld joint WPW-24 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.13 Fit up wall plate piece MK-WP-28 with MK-WP-29 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____Date_____
*Signature

9.1.14 Weld joint WPW-25 using weld procedure 34881-4200-307.

Performance, WG_____Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

1.1.15 Liquid penetrant inspect weld joint WPW-25.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.16 Vacuum box test weld joint WPW-25 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.17 Fit up wall plate MK-WP-29 with MK-WP-30 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance WG_____ Date_____
*Signature

9.1.18 Weld joint WPW-26 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

9.1.19 Liquid penetrant inspect weld joint WPW-26.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.20 Vacuum box test weld joint WPW-26 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.21 Fit up wall plate MK-WP-30 with MK-WP-31 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

9.1.22 Weld joint WPW-27 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

9.1.23 Liquid penetrant inspect weld joint WPW-27.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.24 Vacuum box test weld joint WPW-27 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.25 Fit up the welded assembly consisting of plates WP-10, WP-11, WP-12 and WP-13 with the welded assembly consisting of plates WP-28, WP-29, WP-30 and WP-31 as shown on Nooter drawing JN-D-41703 using 3/16" x 2½" 304 stainless steel bar on pool side of plate centered over plate joint.

Performance, WG_____ Date_____
*Signature

9.1.26 Weld joint WPW-29 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

9.1.27 Liquid penetrant inspect weld joint WPW-29.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.28 Vacuum box test weld joint WPW-29 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.29 Weld joint WPW-31 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

9.1.30 Liquid penetrant inspect weld joint WPW-31.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

9.1.31 Vacuum box test weld joint WPW-31 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.32 Weld joint WPW-30 using weld procedure 34881-4200-301.

Performance, WG._____Date_____
*Signature

9.1.33 Liquid penetrant inspect weld joint WPW-30.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.34 Vacuum box test weld joint WPW-30 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.35 Weld joint WPW-28 using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

9.1.36 Liquid penetrant inspect weld joint WPW-28.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.37 Vacuum box test weld joint WPW-28 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____Date_____
*Signature

10.0 Prefabricate Spent Fuel Pool Wall Plate Liners

10.1 Prefabricate south wall liner for spent fuel pool as shown on Nooter drawing JN-D-41703 Section "D".

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

10.1.1 Fit up wall plate piece MK-WP-14 with piece MK-WP-15 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

10.1.2 Weld joint WPW-32 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

10.1.3 Liquid penetrant inspect weld joint WPW-32.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.4 Vacuum box test weld joint WPW-32 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.5 Fit up wall plate piece MK-WP-15 with MK-WP-16 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

10.1.6 Weld joint WPW-33 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

10.1.7 Liquid penetrant inspect weld joint WPW-33.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.8 Vacuum box test weld joint WPW-33 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

10.1.9 Fit up wall plate piece MK-WP-16 with MK-WP-17 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200- 307, if required.

Performance, WG_____ Date_____
*Signature

10.1.10 Weld joint WPW-34 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

10.1.11 Liquid penetrant inspect weld joint WPW-34.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.12 Vacuum box test weld joint WPW-34 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.13 Fit up wall plate piece MK-WP-17 with MK-WP-18 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

10.1.14 Weld joint WPW-35 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

10.1.15 Liquid penetrant inspect weld joint WPW-35.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.16 Vacuum box test weld joint WPW-35 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8307070337

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

10.1.17 Fit up wall plate piece MK-WP-32 with MK-WP-33 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200- 307, if required.

Performance, WG_____ Date_____
*Signature

10.1.18 Weld joint WPW-36 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

10.1.19 Liquid penetrant inspect weld joint WPW-36.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.20 Vacuum box test weld joint WPW-36 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.21 Fit up wall plate piece MK-WP-33 with MK-WP-34 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

10.1.22 Weld joint WPW-37 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

10.1.23 Liquid penetrant inspect weld joint WPW-37.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.24 Vacuum box test weld joint WPW-37 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

10.1.25 Fit up wall plate piece MK-WP-34 with MK-WP-35 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

10.1.26 Weld joint WPW-38 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

10.1.27 Liquid penetrant inspect weld joint WPW-38.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.28 Vacuum box test weld joint WPW-38 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.29 Fit up wall plate piece MK-WP-35 with MK-WP-36 with no weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-307, if required.

Performance, WG_____ Date_____
*Signature

10.1.30 Weld joint WPW-39 using weld procedure 34881-4200-307.

Performance, WG_____ Date_____
*Signature

10.1.31 Liquid penetrant inspect weld joint WPW-39.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.32 Vacuum box test weld joint WPW-39 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

10.1.33 Fit up wall plates MK-WP-14, WP-15, WP-16, WP-17 and WP-18 with MK-WBU-3 and WBU-4 overlap to center of backing strap. Tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.34 Weld joint WPW-40 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.35 Liquid penetrant inspect weld joint WPW-40.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.36 Weld joint WPW-41 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.37 Liquid penetrant inspect weld joint WPW-41.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.38 Weld joint WPW-42 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.39 Liquid penetrant inspect weld joint WPW-42.

Acceptance, Cat. Q.A._____ Date_____
*Signature

11.0 Install prefabricated floor consisting of panels FP-1, FP-2, FP-3, FP-4 and FP-5 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

0 7 6 8 9 0

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

12.0 Install prefabricated west wall consisting of panels WP-1, WP-2, WP-3, WP-4, WP-19, WP-20, WP-21 and WP-22 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

13.0 Install prefabricated north wall consisting of panels WP-5, WP-6, WP-7, WP-8 and WP-9 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

14.0 Install prefabricated east wall consisting of panels WP-10, WP-11, WP-12, WP-13, WP-28, WP-29, WP-30 and WP-31 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG _____ Date _____
*Signature

Acceptance, Q.A. _____ Date _____
*Signature

15.0 Install prefabricated south wall consisting of panels WP-14, WP-15, WP-16, WP-17 and WP-18 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

8703090639

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

16.0 Install prefabricated upper section of south wall consisting of panels WP-32, WP-33, WP-34, WP-35 and WP-36 fit to lower panels allowing 3/16" gap and tack weld 1/4" on 6" centers to pieces WBU-3 and WBU-4 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG _____ Date _____
* Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

16.1 Weld upper south wall panels to bottom panels.

16.1.1 Weld joint WPW-43 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

16.1.2 Liquid penetrant inspect weld joint WPW-43.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

16.1.3 Weld joint WPW-44 using weld procedure 34881 -4200-301.

Performance, WG _____ Date _____
*Signature

16.1.4 Liquid penetrant inspect weld joint WPW-44.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

17.0 Install prefabricated upper section of north wall consisting of panels WP-23, WP-24, WP-25, WP-26 and WP-27 fit to lower panels allowing 3/16" gap and tack weld 1/4" on 6" centers to pieces WBU-1 and WBU-2 per Bechtel drawing No. 10211-C-1 and C-2.

Performance WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

17.1 Weld upper north wall panels to bottom panels.

17.1.1 Weld joint WPW-45 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

17.1.2 Liquid penetrant inspect weld joint WPW-45.

Acceptance, Cat. Q.A._____ Date_____
*Signature

17.1.3 Weld joint WPW-46 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

17.1.4 Liquid penetrant inspect weld joint WPW-46.

Acceptance, Cat. Q.A._____ Date_____
*Signature

17.1.5 Weld joint WPW-47 using weld procedure 34881-4200-302. This covers panels WP-23, WP-24, WP-25, WP-26 and WP-27 to existing carbon steel angle around spent fuel pool.

Performance, WG_____ Date_____
*Signature

17.1.6 Liquid penetrant inspect weld joint WPW-47.

Acceptance, Cat. Q.A._____ Date_____
*Signature

18.0 Weld joint WPW-48 using weld procedure 34881-4200-302. This covers attaching west wall panel to carbon steel angle top of pool.

Performance, WG_____ Date_____
*Signature

18.1 Liquid penetrant inspect weld joint WPW-48.

Acceptance, Cat. Q.A._____ Date_____
*Signature

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

19.0 Weld joint WPW-49 using weld procedure 34881-4200-302. This covers welding upper section of south wall panels WP-32, WP-33, WP-34, WP-35 and WP-36 to the carbon steel angle at top of spent fuel pool.

Performance, WG_____ Date_____
*Signature

19.1 Liquid penetrant inspect weld joint WPW-49.

Acceptance, Cat. Q.A._____ Date_____
*Signature

20.0 Weld joint WPW-50 using weld procedure 34881-4200-302. This covers welding upper section of east wall panels WP-28, WP-29, WP-30 and WP-31 to the carbon steel angle at top of spent fuel pool.

Performance, WG_____ Date_____
*Signature

20.1 Liquid penetrant inspect weld joint WPW-50.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.0 Install and fit up corner panels on east wall.

21.1 Fit up panel WPC-13, WPC-7, WPC-8 and WPC-2 to panels WP-10, WP-11, WP-12 and WP-13 tack weld, tack weld 1/4" on 6" centers using weld procedure 34881-4200-301. Note these panels are to be welded together using 3/16" x 2½" 304 stainless steel bar place on the pool side of the plate and centered over the plate joint.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.2 Weld joint WPW-51 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.3 Liquid penetrant inspect weld joint WPW-51.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.4 Weld joint WPW-52 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.5 Liquid penetrant inspect weld joint WPW-52.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.6 Weld joint WPW-53 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.7 Liquid penetrant inspect weld joint WPW-53.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.8 Weld joint WPW-54 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.9 Liquid penetrant inspect weld joint WPW-54.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.10 To install and fit up corner panels WPC-22, WPC-23, WCP-20E, WCP-4 and WCP-21 to panels WP-10 and WP-28 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.11 Weld joint WPW-55 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.12 Liquid penetrant inspect weld joint WPW-55.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.13 Weld joint WPW-56 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.14 Liquid penetrant inspect weld joint WPW-56.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.15 Weld joint WPW-57 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.16 Liquid penetrant inspect weld joint WPW-57.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.17 Weld joint WPW-58 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.18 Liquid penetrant inspect weld joint WPW-58.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.19 Weld joint WPW-59 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.20 Liquid penetrant inspect weld joint WPW-59.

Acceptance, Cat. Q.A._____ Date_____
*Signature

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.21 Install and fit up corner panels WPC-24 and WPC-25 to panels WP-13 and WP-31 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ DATE_____
*Signature

Acceptance, Cat. Q.A._____ DATE_____
*Signature

21.22 Weld joint WPW-60 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.23 Liquid penetrant inspect weld joint WPW-60.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.24 Weld joint WPW-100 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.25 Liquid penetrant inspect weld joint WPW-100.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.26 Install and fit up corner panels WPC-2, WPC-9 WPC-10 and WPC-3 to panels WP-14, WP-15, WP-16, WP-17, and WP-18 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.27 Weld joint WPW-61 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.28 Liquid penetrant inspect weld joint WPS-61.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

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21.29 Weld joint WPS-62 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.30 Liquid penetrant inspect weld joint WPW-62.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.31 Weld joint WPW-63 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.32 Liquid penetrant inspect weld joint WPW-63.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.33 Weld joint WPW-64 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.34 Liquid penetrant inspect weld joint WPW-64.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.35 Install and fit up corner panels WPC-24 and WPC-25 to WP-14 and WP-32 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.36 Weld joint WPW-65 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.37 Liquid penetrant inspect weld joint WPW-65.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.38 Weld joint WPW-66 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.39 Liquid penetrant inspect weld joint WPW-66.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.40 Install and fit up corner panels WPC-14 and WPC-15 to WP-18 and WP-36 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.41 Weld joint WPW-67 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.42 Liquid penetrant inspect weld joint WPW-67.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.43 Weld joint WPW-68 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.44 Liquid penetrant inspect weld joint WPS-68.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.45 Install and fit up corner panels WPC-3, WPC-11, WPC-12 and WPC-1 to WP-1, WP-2, WP-3 and WP-4 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.46 Weld joint WPW-69 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.47 Liquid penetrant inspect weld joint WPW-69.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.48 Weld joint WPW-70 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.49 Liquid penetrant inspect weld joint WPW-70.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.50 Weld joint WPW-71 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.51 Liquid penetrant inspect weld joint WPW-71.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.52 Weld joint WPW-72 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.53 Liquid penetrant inspect weld joint WPW-72.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.54 Install and fit up corner panels WPC-14 and WPC-15 to panels WP-1 and WP-19 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

NONCONFORMING MATERIAL, COMPONENTS PARTS AND APPURTENANCES | Page 1 | QAP-501-8

1.0 Scope:

This procedure describes the method of handling nonconforming material, components, parts and appurtenances during receipt, storage, fabrication and installation.

2.0 General:

2.1 An item is considered to be nonconforming upon receipt if it falls into one of the following categories:

a. It is damaged.

b. It does not conform to the drawings and specifications.

c. It is without the quality control documentation which was required to accompany or precede the shipment. (Also, see 2.3).

2.2 All shipments received in the field are examined for identification, key dimensions, quantity and damage in accordance with QAP-501-8, "Receiving, Handling and Storage of Materials, Parts and Components". Materials, components and appurtenances which have not been previously inspected by a SUNTAC Quality Assurance Representative for conformance to specifications are handled in the following manner:

a. Nonconforming items are tagged with a Hold Tag (Exhibit No. 36) and, where practical, placed in controlled storage until they are made conforming, returned to the Vendor, or scrapped. In the case of small items received in batches or lots, the container or shipping unit, (i.e., keg, bag or box) is tagged.

b. When size, weight or other considerations make the actual movement of a nonconforming item to a segregated location impracticable, such items shall be tagged and may be placed in their intended locations or general storage area.

c. At the time of tagging, a Nonconformance Report (Exhibit No. 37) is made out. This report shall include the identification, Vendor, purchase order number, specification number, a description of the nonconformance, the hold tag number and any other pertinent information. Copies are distributed to the Project Manager, the Field Quality Assurance Representative, Field Superintendent, the control files and others as required.

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SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT

CLIENT: CONSUMERS POWER COMPANY

LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34491

PROCEDURE NO. 34491-QAP-501-R

PROCEDURE FOR:

NONCONFORMING MATERIAL, COMPONENTS

PARTS AND APPURTENANCES

FUEL POOL LINER

APPROVED _____ DATE _____
CLIENT

APPROVED _____ DATE 7/2/73
SUNTAC PROJECT MANAGER

APPROVED _____ DATE 6/15/73
SUNTAC QUALITY ASSURANCE MANAGER

PREPARED BY _____ DATE 6-15-73
SUNTAC QUALITY ASSURANCE ENGINEER

									8107280	
A(E/A)										
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION					

4.0 Corrective Action:

4.1 A Hold Tag cannot be removed without the authorization of the Field Quality Assurance Representative. When a nonconformance is corrected, the corrective action is handled through the use of the Field Change Notice (Exhibit No. 101) or by a notation on the original Nonconformance Report.

4.2 The Field Quality Assurance Representative reviews the Nonconformance Report with the Field Superintendent and:

a. For minor repairs that can be accomplished using existing instructions and procedures, the Field Quality Assurance Representative and the Field Superintendent agree on the disposition and issue the corrective action using the procedure under 4.1.

b. For major repairs that require any changes to existing instructions and procedures or a new instruction or procedure, the Field Superintendent and Field Quality Assurance Representative recommend corrective action to the Home Office Project Engineering Team and the corrective action is issued as a drawing, specification or procedure, and/or an EDCN (Exhibit No. 5). The EDCN becomes part of the work package and is to be signed off as indicated.

2.0 General: (Continued)

2.2 (Cont'd.)

d. Where the nature of the nonconformance is such that the corrective measures to be taken to eliminate the nonconformance can be readily performed after installation (e.g., missing valve hand wheel), the item is hold tagged and a nonconformance report made out; however, the item may be installed and the correction made when convenient.

2.3 Shop-fabricated subassemblies, parts, components and appurtenances which are nonconforming because all or part of the specified quality control record documentation has not been received at the jobsite do not have to be tagged and may be released for installation provided the applicable Data Report has been received at the jobsite or the item has an authorized release for shipment from SUNTAC's representative. The Receiving Inspection Report (Exhibit No. 15) is made out listing the documentation deficiencies and nonconformances.

2.4 For materials to be used in jobsite fabrication or installation, certified mill test reports, if required, must be received for verification of specification compliance and must be approved by the assigned Quality Assurance Representative, before the material is released for use. When the Quality Assurance Representative reviews and approval cannot be accomplished upon material receipt at the jobsite, the material shall be Hold tagged, a Material Receiving Report made out and the material placed in controlled storage.

2.5 Items or materials found to be nonconforming during the process of fabrication or installation shall be hold tagged, a nonconformance report made out and further work stopped until resolution of the nonconformance has been determined.

3.0 Responsibility:

3.1 The Field Superintendent will assign storage areas for nonconforming materials.

3.2 The Field Quality Assurance Representative performs progressive inspection during receiving, storage, fabrication and installation as required. He also approves all corrective actions and initiates requests for engineering assistance on nonconformances as applicable.

21.55 Weld joint WPW-73 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.56 Liquid penetrant inspect weld joint WPW-73.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.57 Weld joint WPW-74 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.58 VOID

21.59 Liquid penetrant inspect weld joint WPW-74.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.60 Install and fit up corner panels WPC-16 and WPC-17 to panels WP-4 and WP-22 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.61 Weld joint WPW-75 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.62 Liquid penetrant inspect weld joint WPW-75.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

10470

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.63 Weld joint WPW-76 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.64 Liquid penetrant inspect weld joint WPW-76.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.65 Install and fit up corner panels WCP-1, WCP-5, WPC-6 and WPC-13 to WP-5, WP-6, WP-7, WP-8 and WP-9 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.66 Weld joint WPW-77 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.67 Liquid penetrant inspect weld joint WPW-77.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.68 Weld joint WPW-78 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.69 Liquid penetrant inspect weld joint WPW-78.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.70 Weld joint WPW-79 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

20 64 02

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.71 Liquid penetrant inspect weld joint WPW-79.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.72 Weld joint WPW-80 using weld procedure 34881--4200-301.

Performance, WG_____ Date_____
*Signature

21.73 Liquid penetrant inspect weld joint WPW-80.

Acceptance, Cat. Q.A_____ Date_____
*Signature

21.74 Install and fit up corner panels WPC-16 and WPC-17 to panels WP-5 and WP-23 and tack weld 1/4" on 6" corners using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.75 Weld joint WPW-81 using weld procedure 34881 -4200-301.

Performance, WG_____ Date_____
*Signature

21.76 Liquid penetrant inspect weld joint WPW-81.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.77 Weld joint WPW-82 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.78 Liquid penetrant inspect weld joint WPW-82.

Acceptance, Cat. Q.A._____ Date_____
*Signature

0764

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

CHECK LIST FOR HYDROSTATIC TESTING

Sheet 1 of 1 | Q.A.-41A
Rev. | Date
Ref. No.

Check List No. _____

Project _____ Job No. _____

System _____

Pool Level	Start	Stop	Hold Time	Test Results	Signature
10,000 Gallon					
20,000 Gallon					
30,000 Gallon					
40,000 Gallon					
50,000 Gallon					
60,000 Gallon					
70,000 Gallon					
80,000 Gallon					
90,000 Gallon					
100,000 Gallon					
Operating Level					

REMARKS: _____

FINAL TEST ACCEPTANCE
Performed by _____
Witnessed by _____

(1), S-Satisfactory U-Unsatisfactory. NR-Not Required

076303

21.79 Install and fit up corner panels WPC-18, WPC-19, WPC-20N, WPC-4 and WPC-21 to panels WP-9 and WP-27 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.80 Weld joint WPW-83 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.81 Liquid penetrant inspect weld joint WPW-83.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.82 Weld joint WPW-84 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.83 Liquid penetrant inspect weld joint WPW-84.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.84 Weld joint WPW-85 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.85 Liquid penetrant inspect weld joint WPW-85.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.86 Weld joint WPW-86 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.87 Liquid penetrant inspect weld joint WPW-86.

Acceptance, Cat. Q.A._____Date_____
*Signature

21.88 Weld joint WPW-87 using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

21.89 Liquid penetrant inspect weld joint WPW-87.

Acceptance, Cat. Q.A._____Date_____
*Signature

21.90 Vacuum box test all corner fillet weld seams, if feasible.

Acceptance, Cat. Q.A._____Date_____
*Signature

21.91 Fit up bottom corner panels WPC-2, WPC-8, WPC-7, WPC-13, WPC-6, WPC-5, WPC-1, WPC-12, WPC-11, WPC-3, WCP-10 and WCP-9 to bottom panels FP-1,FP2 FP-3, FP-4 and FP-5 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

Acceptance, Cat. Q.A._____Date_____
*Signature

21.92 Weld joint WPW-88 using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

21.93 Liquid penetrant inspect weld joint WPW-88.

Acceptance, Cat. Q.A._____Date_____
*Signature

21.94 Weld joint WPW-89 using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.95 Liquid penetrant inspect weld joint WPW-89.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.96 Weld joint WPW-90 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.97 Liquid penetrant inspect weld joint WPW-90.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.98 Weld joint WPW-91 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.99 Liquid Penetrant inspect weld joint WPW-91.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.100 Weld joint WPW-92 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.101 Liquid penetrant inspect weld joint WPW-92.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.102 Weld joint WPW-93 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.103 Liquid penetrant inspect weld joint WPW-93.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.104 Weld joint WPW-94 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.105 Liquid penetrant inspect weld joint WPW-94.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.106 Weld joint WPW-95 using weld procedure 34881 4200-301.

Performance, WG_____ Date_____
*Signature

21.107 Liquid penetrant inspect weld joint WPW-95.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.108 Weld joint WPW-96 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.109 Liquid penetrant inspect weld joint WPW-96.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.110 Weld joint WPW-97 using weld procedure 34881 -4200-301.

Performance, WG_____ Date_____
*Signature

21.111 Liquid penetrant inspect weld joint WPW-97.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.112 Weld joint WPW-98 using weld procedure 34881-4200-301

Performance, WG_____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.113 Liquid penetrant inspect weld joint WPW-98.

Acceptance, Cat. Q.A._____Date_____
*Signature

21.114 Weld joint WPW-99 using weld procedure 34S81-4200-301.

Performance, WG_____Date_____
*Signature

21.115 Liquid penetrant inspect weld joint WPW-99.

Acceptance, Cat. Q.A._____Date_____
*Signature

21.116 Vacuum box text bottom corner panel fillet weld seams, if feasible.

Acceptance, Cat. Q.A._____Date_____
*Signature

804970

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

BECHTEL CORPORATION
San Francisco

INSPECTION REPORT

Report No. 1
Date 5/2/73
Page 1 of 1

RECEIVED
MAY 17 1973
PLANT PROJECTS MANAGEMENT

BECHTEL P.O. NO.	10211-C-171-AC
ITEMS ON ORDER (QUANTITY)	Liner Plate for Spent Fuel Pool
NAME VENDOR	Hooter Corporation
SUPPLIER'S LOCATION	Berne - St. Louis, Missouri

"Q" List
DEV. NO.
ECN NO. 1-2002

1. CONTACTS & POSITIONS

Mr. Robert Siechhaus - Sales Engineer

2. ENGINEERING STATUS

Vendor checking drawings prior to submittal to Bechtel

INFORMATION COPY

3. MATERIAL STATUS

All on order, due to arrive by end of May, 1973

4. PRODUCTION SCHEDULE & COMPLETION DATE

Fabrication tentative start May 25, 1973. Completion tentative for July 5, 1973 less Item No. 3, which requires field "as built" drawings

5. DRAWINGS USED IN MAKING INSPECTION

Bechtel P.O. 10211-C-171-AC, Revision 0 with attachments listed less drawings: C-1 and C-2 which were missing from folder and have been requested.

6. MATERIAL SHIPPED TO DATE

None

7. INSPECTION TO DATE

Personal visit made to obtain the information contained in this report and for the filling-out of the attached "Summary of Initial Visit Discussion for Nuclear Q List Items, Inspection Check Sheet No. SPI-361". Next visit tentative week of May 28, 1973.

Further reports will follow.

DISTRIBUTION

Original to: Inspection Manager
Copies to: Project Engineer (2)
cc: Field Material Supervisor
cc: Job Superintendent (2)
cc: Expediter
cc:
cc:
cc:
cc:
cc:

INSPECTED BY: E. J. Fry
INSPECTOR SUPV.: T. L. McBeth
DATE: 5/10/73

676834

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34491
PROCEDURE NO. 34491-QAP-501

GENERAL PROCEDURE FOR

CONTROL OF FIELD FABRICATION AND INSTALLATION

FUEL POOL LINER

APPROVED _____ CLIENT DATE _____

APPROVED _____ SUNTAC PROJECT MANAGER DATE 4/2/73

APPROVED _____ SUNTAC QUALITY ASSURANCE MANAGER DATE 4-15-73

PREPARED BY _____ SUNTAC QUALITY ASSURANCE ENGINEER DATE _____

AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				

672386

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

1.0 Scope

This procedure describes the method of control for field fabrication, installation and examination of field and shop fabricated subassemblies.

2.0 General

The fabrication, installation and examination of work to be performed will be accomplished and documented by use of a work package prepared from Engineering specifications, drawings, procedures and instructions incorporating the applicable requirements of the contract.

The work package will include a step-by-step signoff for work completed and results recorded on the proper documents.

3.0 Procedure

3.1 The Construction Department

3.1.1 The work package will be prepared by the Construction Department and will contain the below listed requirements:

a. The cover sheet (Exhibit No. 100) will indicate the job title, job purpose, authorization to perform work, all specifications and procedures under "References," and all drawings under "Enclosures."

b. Material requirements will be fully described along with the appropriate specifications.

c. All prerequisites required to accomplish the work along with authorized signature.

d. Plant controlling work and initial conditions when required.

e. Work to be accomplished, sequence of work along with required signature at completion of each step.

3.1.2 Work packages will be approved by the Construction Manager, Quality Assurance, the Project Manager and the Client. As required, work packages will also be reviewed by the Suntac welding engineer, radiation control and the safety department.

3.2 The Quality Assurance Department

3.2.1 The Quality Assurance Engineer will review the work package to assure that the Quality Assurance requirements are adequate and will sign off in the appropriate block.

3.2.2 The Field Quality Assurance Representative will review the work package to assure that all materials and specifications or certifications are correct prior to starting work and will sign off in the appropriate block.

4.0 Quality Assurance Controls and Requirements

4.1 Material Control

Material control is assured by using the "Material Data Record" (Exhibit No. 18) with required signatures.

4.2 Receiving, Handling and Storage

Receiving, handling and storage will be accomplished per Suntac Quality Assurance Procedure No. 501-B.

4.3 Documentation Control

Documentation Control will be accomplished per Suntac Quality Assurance Procedure No. 501-D.

4.4 Nonconforming Materials

Nonconforming materials will be handled per Suntac Quality Assurance Procedure No. 501-E.

5.0 Deviations

Any deviations from the work package procedures, specifications or drawings will be handled on a Field Change Notice sheet (Exhibit No. 101) with the routing as indicated on Flow Chart (Exhibit No. 102).

672338

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
SUNTAC CONTRACT NO. 34491

CLIENT: CONSUMERS POWER COMPANY
PROCEDURE NO. 34491-QAP-501

LOCATION CHARLEVOIX, MICHIGAN

GENERAL PROCEDURE FOR

CONTROL OF FIELD FABRICATION AND INSTALLATION

FUEL POOL LINER

APPROVED _____ DATE _____
CLIENT

APPROVED W. C. Bird DATE 2/5/73
SUNTAC PROJECT MANAGER

APPROVED _____ DATE 6/15/72
SUNTAC QUALITY ASSURANCE MANAGER

PREPARED BY _____ DATE 6-15-73
SUNTAC QUALITY ASSURANCE ENGINEER

								0.6.9.0	
								6.1.3	
A E/A									
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				

1.0 Scope

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c. All prerequisites required to accomplish the work along with authorized signature.

d. Plant controlling work and initial conditions when required.

e. Work to be accomplished, sequence of work along with required signature at completion of each step.

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0725

3.2 The Quality Assurance Department

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Any deviations from the work package procedures, specifications or drawings will be handled on a Field Change Notice sheet (Exhibit No. 101) with the routing as indicated on Flow Chart (Exhibit No. 102).

Exhibit No. 100

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

TO: FIELD SUPT.
CLIENT REPRESENTATIVE
PROJECT MGR.
MGR., QUALITY ASSURANCE
SUPV., RAD CON
MGR., CONSTRUCTION

ORIGINATOR

MATERIAL REQUIRED		SHOP ORDER NUMBER
CHARGE	DEPARTMENT CONSTRUCTION	REQUISITIONER
SAFETY REVIEW	Q.A. ENGR. REVIEW	WELD ENGR. REVIEW
RAD CONTROL REVIEW RWP REQUIRED ☐ yes ☐ no	CLIENT APPROVAL	PROJECT MGR. APPRO

APPLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

CLEANLINESS GRADE
WELDER QUALIFICATION
PIPE FREEZES REQUIRED
SYSTEM CLASSIFICATION
LAGGING (THERMAL INSUL.)
PAINTING

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES
PREREQUISITES
NONPLANT CONT. WORK
PLANT CONT. WORK
POST INSTALL TESTS

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT
REACTOR PLANT COOLDOWN
REACTOR PLANT SHUTDOWN
COMPONENT ISOLATED

1. SUMMARY

1.1 TITLE

1.2 PURPOSE

1.3 AUTHORIZATION

1.4 REFERENCES

1.5 ENCLOSURES

QUALITY ASSURANCE RELEASE FOR MATERIAL WITHDRAWAL AND FABRICATION / INSTALLATION

FIELD Q. A. ENGINEER DATE

*The person designated to sign for an action verifies bas on personal observation and certifies by his signature that the action has actually been performed in accordan with the specified requirements.

076219

SUNTAC NUCLEAR CORPORATION

Philadelphia, Pennsylvania 19102

EXHIBIT 18

MATERIAL DATA RECORD

Item	Description	SA No.	Heat No.	Report #	Serial No.		P.O. No.	Mfr.

076217

NOTES

BILL OF MATERIAL

From	Description

Final Acceptance
Q.C. Inspector
Date
Auth. Inspector
Date
Cust. Inspector
Date

SUNTAC
ENGINEERING DEPARTMENT
Philadelphia, Pa. 19102

Line No.
Ref. Dwg. Area

Code Class	Contract #	Draw. No.	Sht. No.

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

TO: FIELD SUPT.
CLIENT REPRESENTATIVE
PROJECT MGR.
MGR., QUALITY ASSURANCE
SUPV., RAD CON
MGR., CONSTRUCTION

ORIGINATOR

MATERIAL REQUIRED		SHOP ORDER NUMBER
CHARGE	DEPARTMENT CONSTRUCTION	REQUISITIONER
SAFETY REVIEW	Q.A. ENGR. REVIEW	WELD ENGR. REVIEW
RAD CONTROL REVIEW RWP REQUIRED ☐ yes ☐ no	CLIENT APPROVAL	PROJECT MGR. APPROVA

PPLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

MAJOR FCN'S _____
MINOR FCN'S _____
CLEANLINESS GRADE _____
WELDER QUALIFICATION _____
PIPE FREEZES REQUIRED _____
SYSTEM CLASSIFICATION _____
LAGGING (THERMAL INSUL.) _____
PAINTING _____

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES _____
PREREQUISITES _____
NONPLANT CONT. WORK _____
PLANT CONT. WORK _____
POST INSTALL TESTS _____

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT _____
REACTOR PLANT COOLDOWN _____
REACTOR PLANT SHUTDOWN _____
COMPONENT ISOLATED _____

QUALITY ASSURANCE RELEASE
FOR
MATERIAL WITHDRAWAL
AND
FABRICATION / INSTALLATION

HELD Q. A. ENGINEER _____ DATE _____

FIELD CHANGE NOTICE

1. SUMMARY

1.1 TITLE

1.2 PURPOSE

1.3 AUTHORIZATION

1.4 REFERENCES

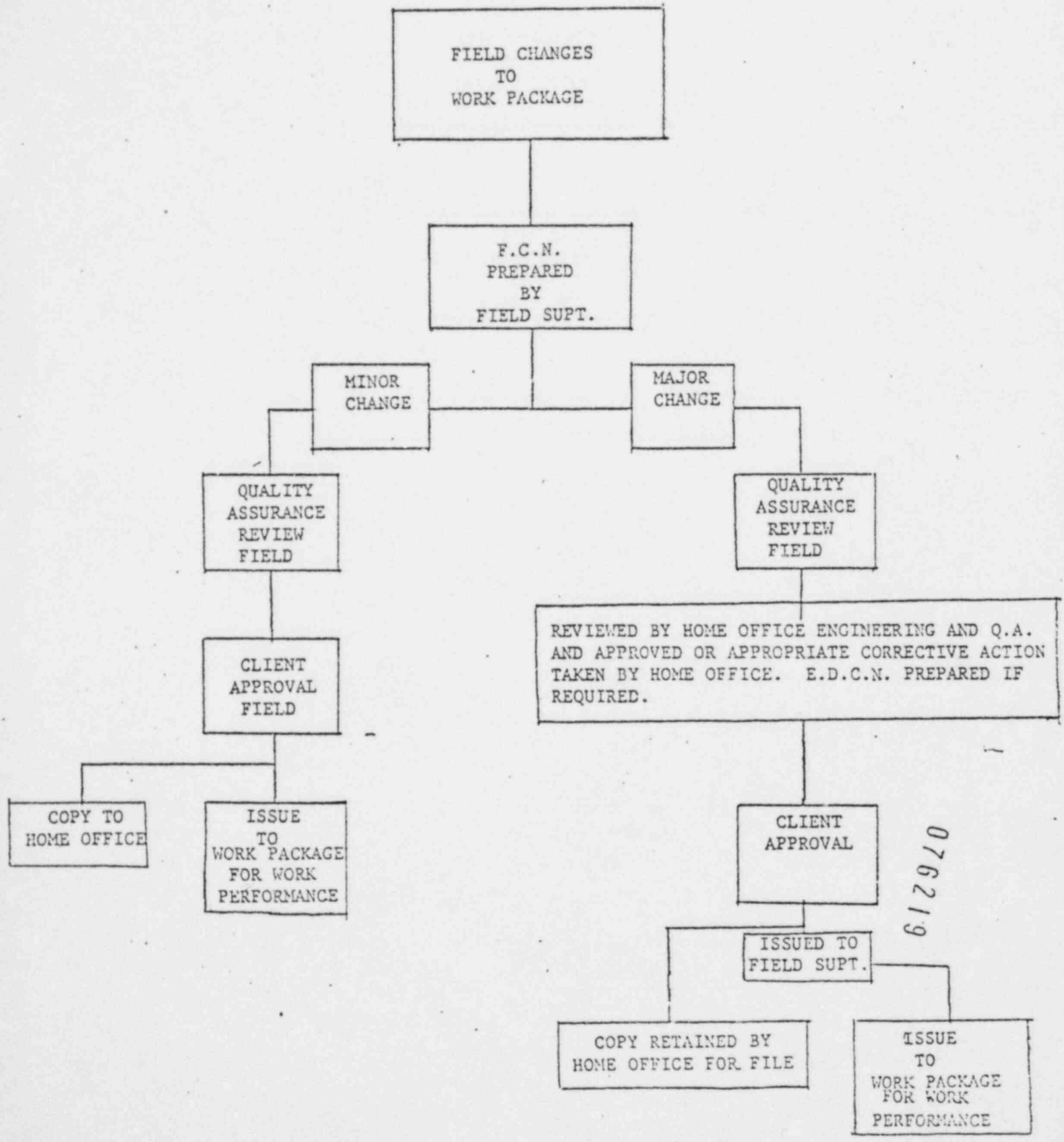
1.5 ENCLOSURES

8107180762

*SIGNATURE _____ DATE _____

*The person designated to sign for an action verifies bas on personal observation and certifies by his signature that the action has actually been performed in accordanc with the specified requirements.

Suntac Nuclear Corp.
Phila., Penna. 19102



CRAbel, BRPP
JJZabritski, BRPP
FMMacri, P-14-230, Last

Consumers Power Company

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

DT-FPL-073

GWO: 6248

Date: 2/15/74

Plant: Big Rock Point

File: Review Records

Description: Fuel Pool Liner - "AFC" SS Pipe Weld & Hydro Test Procedures

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSRang			X	RLWilson/AJPatel	
	X	WClark					
					X	~~GCHarrin/CRAbel~~	
						~~JJZabritski~~	JJZ 2/20/74

From: FMMacri

Comments Requested by: -

Documents:	Previous Review Rev	Date
Spec 3488-4200-309, Rev 0 (SS Pipe Weld)	A	1/2/74
Proced QAP-1001.A, Rev B (Hydro Test)	B	12/27/73

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to F. M. Macri.

0762335

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 2/14/74

Date Comments Transmitted to Originator:

Review Complete:

Date:

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT — SUNTAC CONTRACT NO. 3488I
CLIENT: CONSUMERS POWER COMPANY — PROCEDURE NO. QAP-1001.A
LOCATION CHARLEVOIX, MICHIGAN

PROCEDURE FOR:

HYDRO TEST

SPENT FUEL POOL LINER

APPROVED FOR CONSTRUCTION

APPROVED F. H. Marr / EJJ — DATE 6 Feb. 1974
CLIENT

APPROVED H. E. Bosch / for D.J.W. — DATE 30 Nov. 1973
SUNTAC PROJECT MANAGER

APPROVED T. J. Driscoll / for — DATE 3 Dec 1973
SUNTAC QUALITY ASSURANCE MANAGER

PREPARED BY Walter F. Pate — DATE NOV 21 1973
SUNTAC QUALITY ASSURANCE ENGINEER

0762970

0 (AFC)					DJW	EJJ	HCP		2/12/74
C (F/A)					[illegible]	EJJ	HCP		2/[illegible]/74
B (F/A)					DJW	EJJ	HCP		12/[illegible]/73
A-(F/A)					DJW	EJJ	HCP		11/30/73
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				

Consumers Power Company

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

CRAbel
JJZabritski
FMMacri, P-14-230
last

GWO: 6248

DT-FPL-065

Plant: Big Rock Point

Date: December 28, 1973

Description: Fuel Pool Liner - ~~Hydro Test Procedure~~ Revised

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
X		JSRang		X		WPCooke	
X		WClark				RLWilson	
						MCPatel	
				X	1	~~CJHartman~~	
					2	~~CRAbel~~	12/31/73
					3	~~JJZabritski~~	1/4/74

From: FMMacri

Comments Requested by: 1/10/74

Documents: EDCN No. 6

Procedure QAP-1001.A Rev. B. (Hydro-test)

Previous Review	
Rev	Date
A	11/30/73

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri

I understand from the procedure 4.1 A and 4.2 that CPCo is responsible for filling the SFP and allowing the 4 hour purple period; other parties are responsible for recycling? Has the recycling accomplished? 12/31/73

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 12/26/73

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

EXHIBIT NO. 5

DRAWING CLASSIFICATION	SUNTAC NUCLEAR CORPORATION	DATE 19 December 1973
Plot Plan ☐	Philadelphia, Pennsylvania 19102	EDCN Number 6 / Sheet ___ of ___
Process Flow Diagram ☐	ENGINEERING DESIGN CHANGE NOTICE	Rev. Number / Change Hours
Engineering Flow Diagram ☐		Change Made By E.F.Turner / Check Made By PC
Architectural ☐	Drawing Title Procedure for Hydro Test - Spent Fuel Pool Liner	Process Approval
Civil ☐		Project Approval
Electrical ☐	Drawing Number or Numbers QAP-1001A Rev. B-F/A	Contract Number 34881 GWO-6248
Heat, Vent & Air Conditioning ☐		Client's Approval
Instrumentation ☐		
Mechanical ☐		
Piping ☐		
Pressure Vessel ☐		
Structural ☐		
Specification ☒		

Change Description Or Sketch

The following sections were added to "Procedure for Hydro Test - Spent Fuel Pool Liner."

1. Paragraph 4.3 including form QA-41A for documentation
2. Paragraph 5.3
3. Section 6.0
4. Paragraph 6.1

076300

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34881
PROCEDURE NO. QAP-1001.A

PROCEDURE FOR:

HYDRO TEST

SPENT FUEL POOL LINER

APPROVED _____ CLIENT DATE _____

APPROVED _____ SUNTAC PROJECT MANAGER DATE 30 NOV. 1973

APPROVED _____ SUNTAC QUALITY ASSURANCE MANAGER DATE 3 Dec 1973

PREPARED BY _____ SUNTAC QUALITY ASSURANCE ENGINEER DATE NOV 21 1973

0796

AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				
B (F/A)						ETJ			12/11/73
A-(F/A)						ETJ			11/21/73

1.0 SCOPE

This procedure contains the requirements for hydro testing the completed spent fuel pool stainless steel liner.

2.0 REFERENCES

2.1 Bechtel Specification #10,211-C172.

3.0 GENERAL

3.1 At the completion of erection and liquid penetrant and vacuum box leak testing of the welds in the liner plates the pool shall be filled with water to the operating level and left to stand for 48 hours so that leak tightness can be checked through monitoring channels. The water used shall be unchlorinated clarified water.

4.0 PROCEDURE

4.1 Consumers Power Company will be responsible for filling the spent fuel pool for inspection of liner plate seam and fillet welding.

4.2 Rate of fill will be 25 gallons per minute for 10,000 gallons with a 4 hour recycle period between each 10,000 gallons.

4.3 The procedure and inspection results will be documented on Form QA-41A including signatures for final acceptance.

5.0 INSPECTION

5.1 The spent fuel pool liner will be inspected by the Quality Assurance Representative through monitoring channels at every 30,000 gallon interval until pool has been filled to operating level.

5.2 After pool has been filled to operating level it shall be maintained for a period of 48 hours. Monitoring trays will be inspected by the Quality Assurance Representative and any leakage noted.

5.3 If leakage is detected, the location will be noted by monitoring channel number, the pool emptied, and the leak repaired. The inspection procedure will then be repeated with the initial pool level set at the next lower 10,000 gallon level below that where the leakage was detected.

6.0 ACCEPTANCE CRITERIA

6.1 The test results will be considered acceptable when no leakage is evidenced during a period of 48 hours while the pool is being filled to the operating level.

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SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34881
PROCEDURE NO. 34881-QAP-501-E

INFORMATION COPY

PROCEDURE FOR:

NONCONFORMING MATERIAL, COMPONENTS

PARTS AND APPURTENANCES

FUEL POOL LINER

APPROVED FOR CONSTRUCTION

APPROVED J. M. Marchi/ERT CLIENT DATE 8/30/73

APPROVED W. P. Bunkhall SUNTAC PROJECT MANAGER DATE 7/2/73

APPROVED _____ SUNTAC QUALITY ASSURANCE MANAGER DATE 6-15-73

PREPARED BY _____ SUNTAC CONSULT ASSURANCE ENGINEER

AMENDMENT	CLIENT APPROVED	CLIENT DATE	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION DATE
			E.T.J.	H.F.B. 4/5/74
0 (AFC)				7/11/74
A (FIA)				

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1.0 Scope:

This procedure describes the method of handling nonconforming material, components, parts and appurtenances during receipt, storage, fabrication and installation.

2.0 General:

2.1 An item is considered to be nonconforming upon receipt if it falls into one of the following categories:

a. It is damaged.

b. It does not conform to the drawings and specifications.

c. It is without the quality control documentation which was required to accompany or precede the shipment. (Also, see 2.3).

2.2 All shipments received in the field are examined for identification, key dimensions, quantity and damage in accordance with QAP-501-B, "Receiving, Handling and Storage of Materials, Parts and Components". Materials, components and appurtenances which have not been previously inspected by a SUNTAC Quality Assurance Representative for conformance to specifications are handled in the following manner:

a. Nonconforming items are tagged with a Hold Tag (Exhibit No. 36) and, where practical, placed in controlled storage until they are made conforming, returned to the Vendor, or scrapped. In the case of small items received in batches or lots, the container or shipping unit, (i.e., keg, bag or box) is tagged.

b. When size, weight or other considerations make the actual movement of a nonconforming item to a segregated location impracticable, such items shall be tagged and may be placed in their intended locations or general storage area.

c. At the time of tagging, a Nonconformance Report (Exhibit No. 37) is made out. This report shall include the identification, Vendor, purchase order number, specification number, a description of the nonconformance, the hold tag number and any other pertinent information. Copies are distributed to the Project Manager, the Field Quality Assurance Representative, Field Superintendent, the control files and others as required.

2.0 General: (Continued)

2.2 (Cont'd.)

d. Where the nature of the nonconformance is such that the corrective measures to be taken to eliminate the nonconformance can be readily performed after installation (e.g., missing valve hand wheel), the item is hold tagged and a nonconformance report made out; however, the item may be installed and the correction made when convenient.

2.3 Shop-fabricated subassemblies, parts, components and appurtenances which are nonconforming because all or part of the specified quality control record documentation has not been received at the jobsite do not have to be tagged and may be released for installation provided the applicable Data Report has been received at the jobsite or the item has an authorized release for shipment from SUNTAC's representative. The Receiving Inspection Report (Exhibit No. 15) is made out listing the documentation deficiencies and nonconformances.

2.4 For materials to be used in jobsite fabrication or installation, certified mill test reports, if required, must be received, for verification of specification compliance and must be approved by the assigned Quality Assurance Representative, before the material is released for use. When the Quality Assurance Representative reviews and approval cannot be accomplished upon material receipt at the jobsite, the material shall be Hold tagged, a Material Receiving Report made out and the material placed in controlled storage.

2.5 Items or materials found to be nonconforming during the process of fabrication or installation shall be hold tagged, a nonconformance report made out and further work stopped until resolution of the nonconformance has been determined.

3.0 Responsibility:

3.1 The Field Superintendent will assign storage areas for nonconforming materials.

3.2 The Field Quality Assurance Representative performs progressive inspection during receiving, storage, fabrication and installation as required. He also approves all corrective actions and initiates requests for engineering assistance on nonconformances as applicable.

4.0 Corrective Action:

4.1 A Hold Tag cannot be removed without the authorization of the Field Quality Assurance Representative. When a nonconformance is corrected, the corrective action is handled through the use of the Field Change Notice (Exhibit No. 101) or by a notation on the original Nonconformance Report.

4.2 The Field Quality Assurance Representative reviews the Nonconformance Report with the Field Superintendent and:

a. For minor repairs that can be accomplished using existing instructions and procedures, the Field Quality Assurance Representative and the Field Superintendent agree on the disposition and issue the corrective action using the procedure under 4.1.

b. For major repairs that require any changes to existing instructions and procedures or a new instruction or procedure, the Field Superintendent and Field Quality Assurance Representative recommend corrective action to the Home Office Project Engineering Team and the corrective action is issued as a drawing specification or procedure, and/or an EDCN (Exhibit No. 5). The EDCN becomes part of the work package and is to be signed off as indicated.

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

HOLD TAG

Sheet 1 of 1	Exhibit No. 36
Rev. 0	Date 8/18/72
Ref.No.	

HOLD

(COLOR RED)

RELEASE FOR SHIPPING CLEARANCE

MAY NOT BE REMOVED WITHOUT AUTHORIZATION

DEVIATION

MATERIAL MILL TEST CERTIFICATIONS

NOT RECEIVED FOR PURCHASED VALVES

ITEMS PV-12

(COLOR - RED)

STATUS:

- ☐ To Be Removed From Jobsite
- ☒ Hold for Documentation
- ☐ Hold for Repair ____ or Modification ____
- ☐ Ins'all ____ and Repair ____ or Modify ____
- ☐ Other ____

By T. O'Neill Date 8/21/72 Control No. 1332

07623

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

NONCONFORMANCE REPORT

Sheet 1 of 1	Exhibit No. 37
Rev. 0	Date 5/3/72
Ref. No.	

JOB NO. _____

OWNER _____ PLANT _____ UNIT _____

STARTUP SYSTEM: NO. _____ NAME _____

Q.A. NO. _____ NONCONFORM. HOLD TAG NO. _____

SUBJECT: _____

PROBLEM:

APPARENT CAUSE: ENGR'G CONSTR. S.U. TEST PROC. OPER. ERROR

REFERRED TO: ENGR'G CONSTR. STARTUP

SOLUTION OR SUGGESTED ACTION:

REPLY REQUESTED OF _____ BY DATE 5/8/72

(USE FIELD REPORT REPLY FORM) REPLY RECEIVED DATE _____

AUTHORIZATION TO PROCEED WITHOUT A WRITTEN REPLY _____

DISTRIBUTION:

1. QA/PE - FILE
2. QAE
3. ENGR'G
4. CLIENT
5. Authorized Inspector

PREPARED BY SUNTAC NUCLEAR Q.A. REP.

Signed/Date _____

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

: FIELD SUPT.
CLIENT REPRESENTATIVE
PROJECT MGR.
MGR., QUALITY ASSURANCE
SUPV., RAD CON
MGR., CONSTRUCTION

ORIGINATOR

MATERIAL REQUIRED		SHOP ORDER NUMBER
CHARGE	DEPARTMENT CONSTRUCTION	REQUISITIONER
SAFETY REVIEW	Q.A. ENGR. REVIEW	WELD ENGR. REVIEW
RAD CONTROL REVIEW RWP REQUIRED ☐ yes ☐ no	CLIENT APPROVAL	PROJECT MGR. APPROV.

PLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

MAJOR FCN'S ____
MINOR FCN'S ____
CLEANLINESS GRADE ____
WELDER QUALIFICATION ____
IPE FREEZES REQUIRED ____
SYSTEM CLASSIFICATION ____
LAGGING (THERMAL INSUL.) ____
PAINTING ____

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES ____
PREREQUISITES ____
NONPLANT CONT. WORK ____
PLANT CONT. WORK ____
POST INSTALL TESTS ____

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT ____
REACTOR PLANT COOLDOWN ____
REACTOR PLANT SHUTDOWN ____
COMPONENT ISOLATED ____

QUALITY ASSURANCE RELEASE
FOR
MATERIAL WITHDRAWAL
AND
FABRICATION / INSTALLATION

FIELD Q. A. ENGINEER ____ DATE ____

FIELD CHANGE NOTICE

1. SUMMARY

1.1 TITLE

1.2 PURPOSE

1.3 AUTHORIZATION

1.4 REFERENCES

1.5 ENCLOSURES

0762235

*SIGNATURE ____ DATE ____

*The person designated to sign for an action verifies ba
on personal observation and certifies by his signature
that the action has actually been performed in accordan

EXHIBIT NO. 5

DRAWING CLASSIFICATION

- Plot Plan ☐
- Process Flow Diagram ☐
- Engineering Flow Diagram ☐
- Architectural ☐
- Civil ☐
- Electrical ☐
- Heat, Vent. & Air Conditioning ☐
- Instrumentation ☐
- Mechanical ☐
- Piping ☐
- Pressure Vessel ☐
- Structural ☐
- ☐

SUNTAC NUCLEAR CORPORATION

Philadelphia, Pennsylvania 19102

E D C N

ENGINEERING DESIGN CHANGE NOTICE

Drawing Title

Drawing Number or Numbers

Contract Number

DATE

EDCN Number

Sheet ___ of ___

Rev. Number

Change Hours

Change Made By

Check Made By

Process Approval

Project Approval

Client's Approval

Change Description Or Sketch

0762.36

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34881
PROCEDURE NO. 34881-QAP-501-B

APPROVED for CONSTRUCTION

PROCEDURE FOR:

RECEIVING, HANDLING AND STORAGE OF
MATERIALS, PARTS AND COMPONENTS
FUEL POOL LINER

APPROVED _____ CLIENT DATE 8/30/73

APPROVED _____ SUNTAC PROJECT MANAGER DATE _____

APPROVED _____ SUNTAC QUALITY ASSURANCE MANAGER DATE _____

PREPARED BY _____ SUNTAC QUALITY ASSURANCE ENGINEER

AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	DATE	APPROVED	DATE	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION					
0 (AFC)										9/6/73

671970

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

RECEIVING, HANDLING AND STORAGE OF MATERIALS, PARTS AND COMPONENTS — Page 1 — QAP-501-B

1.0 Scope:

This procedure contains receiving, handling and storage requirements for materials, parts and components for fuel pool liner.

2.0 General:

2.1 Material for field fabrication into nuclear components is either received with the required mill test report, certificates of compliance, etc., as applicable, or the certificates are transmitted separately in advance; otherwise, the material is nonconforming.

2.2 Receiving inspection will be performed on all shipments upon arrival at the jobsite. This inspection after arrival consists, as a minimum, of identification and damage determination by the Field Superintendent or his staff.

3.0 Procedure:

3.1 The Field Superintendent

a. In coordination with the Field Quality Assurance Representative establishes a receiving inspection hold area and designated storage areas prior to the arrival of shipments.

b. Checks incoming equipment for identification and damage.

c. Notifies the Field Quality Assurance Representative of the arrival of components, parts and appurtenances.

d. Assigns proper storage.

e. Prepares and forwards a copy of the Purchase Order Receiving form (Exhibit No. 13) to the Quality Assurance Representative for use during his inspection. The Purchase Order Receiving form is sent to the Field Superintendent by Procurement at the time the order is placed.

f. Bechtel ordered material will be inspected to Consumer Power purchase order and purchase order receiving form filled out to reflect this condition.

3.2 The Field Quality Assurance Representative

Advises Procurement of disposition of nonconforming items.

671971

b. Coordinates handling and storage requirements with the Field Superintendent.

c. Prepares Quality Assurance Receiving Inspection Report (Exhibit No. 15) on incoming materials for use in field fabrication and are checked for identification and traceability to mill test reports and certifications when required before being released to storage.

d. Reviews and verifies that the supplier and engineering requirements for handling and storage, including the use of special containers, hooks, slings and transporting vehicles, are followed.

e. If material, parts or components are found at receipt inspection to be nonconforming to design requirements, the Quality Assurance Representative processes the item in accordance with requirements of QAP-501-E of this procedure.

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34491
PROCEDURE NO. 34491-QAP-501-B

PROCEDURE FOR:

RECEIVING, HANDLING AND STORAGE OF

MATERIALS, PARTS AND COMPONENTS

FUEL POOL LINER

APPROVED _____ DATE _____
CLIENT

APPROVED [signature] DATE 7/2/73
SUNTAC PROJECT MANAGER

APPROVED [signature] DATE 6/15/73
SUNTAC QUALITY ASSURANCE MANAGER

PREPARED BY [signature] DATE 6-15-73
SUNTAC QUALITY ASSURANCE ENGINEER

8706220

A(5/0)					[illegible]	[illegible]	[illegible]		7/2/
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				

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7906221

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Exhibit No. 1

PURCHASE ORDER

FROM

SUNTAC NUCLEAR CORPORATION

1528 WALNUT STREET
PHILADELPHIA, PENNA. 19102

TO

MR. _____ CAN FURNISH INFORMATION REGARDING THIS ORDER

NEEDED DEL.	PROMISED DEL.	F. O. B. POINT	BILLING TERMS

RECEIVING INFORMATION

PAGE OF

DATE

REQ. NO.

ORDER NO.

ACCOUNT

_____ COPIES OF INVOICE WITH ORDER NUMBER INDICATED THEREON TO BE MAILED ON DATE OF SHIPMENT WITH BILL OF LADING OR EXPRESS RECEIPTS TO THE _____ OFFICE

SHIP TO: SUNTAC NUCLEAR CORP

ENTRY NO.	QUANTITY	MATERIAL AND DESCRIPTION	QUANTITY RECEIVED SHIPMENT NO. 1	2	3	4	5	6

SHIPMENT NO.	DATE	FREIGHT BILL NUMBER	AMOUNT	PREP. / COLL.	CARRIER	CAR NUMBER	WEIGHT OR NO. PACKAGES	RECEIVED BY
							0716.23	

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

Material Receiving Data Sheet	Sheet 1 of 1	Exhibit No. 14
	Rev. 0	Date 5/8/72
	Ref. No.	

Project _____ Job No. _____

M.R.I. No. _____

P.O. No. _____ Vendor _____

F.M.R. No. _____ Spec. No. _____

Q List No.(s) _____

System/Service(s) _____

For Supplementary Information Contact: _____

Site Receiving Material Super. Rep.: _____

Inspection By QA Representative: _____

ITEMS: _____

INSPECTION PROCEDURE TO BE UTILIZED: _____

STORAGE REQUIRED Inside Heated Outside Temp. Cont. Waterproof

PRIOR TO OFFLOADING NOTIFY _____

SPECIAL STORAGE AND/OR MAINTENANCE REQ. _____

QC DOCUMENTATION REQUIRED

Indicate Number of Copies in Appropriate Columns

R – Upon Receipt
C – Prior to Completion

	R	C		R	C
Offsite Insp. Rep. (TWX)			Welding Procedures		
Mill Test Report			Welder Certifications		
Material Certification			Nondestructive Tests Reports		
Specify 1			Specify 1		
2			2		
Dimensional Verification			3		
			4		
Vendor Storage Instr.			Test Reports		
Installation Manual					
Other: Remarks					

Distribution:
Material Supervisor
Project Superintendent
QA Engineer
Originator
Others:

Prepared By _____ (QA Engineer) Date 07/24

Reviewed By _____ (Project Engineer) Date

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

RECEIVING INSPECTION REPORT

Sheet 1 of 1 | Exhibit No. 15

Rev. 0 | Date 5/8/72

Ref.No.

Date

RIR Number

P.O. Number _____ Vendor _____ Shipment Number

P.O. Item No.	Quantity	Description	Nonconforming Tag Number	Ac-cepted	Re-jected	Nonconformance:
					1	

0762225

Quality Assurance Representative

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT

CLIENT: CONSUMERS POWER COMPANY

LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34881

PROCEDURE NO. 34881-QAP-501-D

INFORMATION COPY

PROCEDURE FOR:

DOCUMENTATION CONTROL CENTER

FUEL POOL LINER

APPROVED FOR CONSTRUCTION

APPROVED F. M. [illegible] CLIENT DATE 30 AUGUST 1973

APPROVED H. C. [illegible] SUNTAC PROJECT MANAGER DATE 7/3/73

APPROVED [illegible] SUNTAC QUALITY ASSURANCE MANAGER DATE 6/26/73

PREPARED BY W. F. Pike SUNTAC QUALITY ASSURANCE ENGINEER DATE 6-26-73

AMENDMENT	CLIENT APPROVED	CLIENT DATE	CLIENT APPROVED	CLIENT DATE	SUNTAC APPROVED	SUNTAC APPROVED	SUNTAC APPROVED	SUNTAC APPROVED	SUNTAC DATE
						EJT	[illegible]		[illegible]
O(AFC)					[illegible]	[illegible]	[illegible]		[illegible]
A (F/n)									

671955

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

DOCUMENTATION CONTROL CENTER

1.0 Scope

To establish a system for controlling all final documentation that represent objective evidence of the quality status of all aspects of the project.

2.0 General

2.1 All documentation is to be centrally located at one file center at the Home Office and one at the jobsite. At the completion of the project, all records will be consolidated.

2.2 Documentation supporting the quality shall be, to the greatest extent possible, preplanned and systematically developed from beginning to end of the project.

2.3 The documentation control system shall permit rapid retrieval of quality documentation supporting any item.

2.4 All documentation shall be reviewed for completeness by Quality Assurance Representative.

2.5 Documentation will consist of all exhibits required to perform work along with all work package sign-off, material certification, welder qualifications and welding procedure qualifications. One (1) copy of the latest revision of each specification shall be filed in the Project Quality Assurance files.

2.6 The Quality Assurance Representative shall correlate the documentation requirements for each item and shall establish prior to beginning of installation a documentation check list to ensure adherence to documentation requirements. The Quality Assurance file should reflect the current status of construction and will be available at all times for review.

3.0 Documentation

3.1 The records retention file shall include but is not limited to the following types of documentation:

a. Procedures and Specification

1. Structural
2. Piping
3. Mechanical
4. Welding
5. Nondestructive Testing
6. Vendor/Subcontractor

671956

b. Personnel Qualification Records

1. Nondestructive Test
2. Welding Records
3. Vendor/Subcontractor Qualification Certifications

c. Receiving Documentation Records

Vendor/Subcontractor completed records for raw materials and fabricated items including prescribed certifications.

d. Management and Control Reports

1. Calibration Records
2. Audit Reports

4.0 Responsibility

4.1 The requirements and responsibilities for implementing, operating and monitoring this procedure are the responsibility of the Quality Assurance Representative who shall:

1. Be responsible for the implementation and compliance with this procedure.

2. Review the files periodically for adequacy and completeness.

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34491
PROCEDURE NO. 34491-QAP-501-D

PROCEDURE FOR:

DOCUMENTATION CONTROL CENTER

FUEL POOL LINER

APPROVED _____ DATE _____
CLIENT

APPROVED H C Rau 6-11- DATE 7/3/73
SUNTAC PROJECT MANAGER

APPROVED [signature] DATE 6/26/73
SUNTAC QUALITY ASSURANCE MANAGER

PREPARED BY W. F. Pike DATE 6-26-73
SUNTAC QUALITY ASSURANCE ENGINEER

								076225	
ALFA)					H P	H C	H Q		6-1-73
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				

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INFORMATION COPY

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

SUNTAC CONTRACT NO. 34881

PROCEDURE NO. 34881-OAP-501-7

PLANT: BIG ROCK POINT

CLIENT: CONSUMERS POWER COMPANY

LOCATION: CHARLEVOIX, MICHIGAN

PROCEDURE FOR:

CLEANLINESS AND CLEANING

FUEL POOL LINER

APPROVED FOR CONSTRUCTION

APPROVED F M Marcilese (signature) — CLIENT — DATE 30 AUGUST '73

APPROVED H. C. Burkholder (signature) — SUNTAC PROJECT MANAGER — DATE 7/3/73

APPROVED (signature) — SUNTAC QUALITY ASSURANCE MANAGER — DATE 6/20/73

PREPARED BY Walter J. Pelo (signature) — SUNTAC QUALITY ASSURANCE ENGINEER — DATE 6/20/73

AMENDMENT	CLIENT APPROVED	CLIENT DATE	CLIENT APPROVED	CLIENT DATE	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION DATE
						EFJ	HCB		4/4/73
O(AFC)					HLP?	ICS?	HCB?		7/1/73?
A(E/A)									

671958

1. Cleanliness Requirements

1.1 General

Fabrication and assembly of equipment shall be conducted so as to minimize contamination during fabrication. Equipment shall not be manufactured with the expectation of cleaning only after completion of fabrication or assembly. Component parts or equipment shall be cleaned and maintained in a clean condition up to and including installation.

1.2 Acceptance Criteria for Cleanliness

Unless otherwise specified, equipment shall be clean to the extent that no contamination is visible to a person with normal visual acuity, natural or corrected, under an adequate lighting level on surfaces being inspected. The lighted areas should provide a lighting level of at least 50 foot candles on surfaces being inspected. Where surfaces cannot visually be inspected; e.g., crevices and inaccesible areas, but can be reached with a wiping cloth, the cleanliness may be determined by wiping the surfaces with a wet or dry cloth. In such cases, the cleanliness shall be evaulated on the basis of type and quantity of contamination.

1.2.1 Acceptance Criteria for Carbon Steel

Surface of welds and base metal shall be cleaned free of all mill scale, grease, dirt, weld spatter and other foreign materials. Solvents containing halides shall not be used on surfaces to be attached to stainless steel.

1.2.2 Acceptance Criteria for Stainless Steel

Surface of welds and base metal shall be cleaned free of all rust or pitting. Solvents containing halides shall not be used on surfaces of stainless steel. Iridescent temper films resulting from heat treatment and tightly adherent black oxide films that occur on the welds need not be removed.

1.2.3 Control of Tools Used in Cleaning

All tools will be color coded prior to start of fabrication. Tools for stainless steel will be coded blue and tools for use on carbon steel will be coded white.

a. Stainless steel welds shall be cleaned by brushing with austenitic stainless steel brushes which have not been used on carbon or low alloy steels.

b. Tools shall be controlled by the Field Superintendent and monitored by the Quality Assurance Representative for proper use.

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34491
PROCEDURE NO. 34491-QAP-501-F

PROCEDURE FOR:

CLEANLINESS AND CLEANING

FUEL POOL LINER

APPROVED ______________ DATE ______
CLIENT

APPROVED H. P. Burkholder DATE 7/3/73
SUNTAC PROJECT MANAGER

APPROVED [signature] DATE 6/20/73
SUNTAC QUALITY ASSURANCE MANAGER

PREPARED BY Walter [signature] DATE 6/20/73
SUNTAC QUALITY ASSURANCE ENGINEER

0762370

AMENDMENT	CLIENT APPROVED	CLIENT DATE	CLIENT APPROVED	CLIENT DATE	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION DATE
A(F/A)					H.L.P.	J.C.S.	N.C.B.		7/3/73

a. Stainless steel welds shall be cleaned by brushing with austenitic stainless steel brushes which have not been used on carbon or low alloy steels.

b. Tools shall be controlled by the Field Superintendent and monitored by the Ouality Assurance Representative for proper use.

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34831
PROCEDURE NO. 34831-QAP-701-A

APPROVED FOR CONSTRUCTION

PROCEDURE FOR:

QUALIFICATION OF NONDESTRUCTIVE EXAMINATION PERSONNEL

FUEL POOL LINER & REACTOR DEPRESSURIZATION SYSTEM

INFORMATION COPY

APPROVED J. H. Macri/cm DATE 24 AUG '73
CLIENT

APPROVED W C Rubbatt DATE 7/2/73
SUNTAC PROJECT MANAGER

APPROVED Jack C Nash DATE 6/20/73
SUNTAC QUALITY ASSURANCE MANAGER

PREPARED BY Walter F Lowe DATE 6/20/73
SUNTAC QUALITY ASSURANCE ENGINEER

AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT								
0 (AFC)						EJJ	HCB		9/18/73
A (F/A)					WLP	JCC	HCB		7/2/73

671982

CATALYTIC, INC.

PHILADELPHIA, PENNSYLVANIA 19102

QUALIFICATION OF NONDESTRUCTIVE EXAMINATION PERSONNEL PROCEDURE — Page 1 — QAP-701-A

1.0 Scope

This procedure describes the training and qualification of personnel who perform nondestructive examinations in the field.

2.0 References

ASME - Section V Nondestructive Examination.
ASNT-TC-1A American Society of Nondestructive Testing.
Quality Assurance Instruction No. 1 (Quality Assurance Personnel Training and Qualification Program Within the Corporate Manual).

3.0 General

3.1 All nondestructive examination personnel are trained and qualified in accordance with the referenced standards.

3.2 The Quality Assurance Representative for welding will be qualified to NDT Level II in the radiographic, magnetic particle and liquid penetrant methods.

3.3 All nondestructive testing personnel performance qualification testing is done by quality assurance NDT Level III personnel.

3.4 The Quality Assurance Representative will make all records and procedures available to the authorized inspector, when applicable.

3.5 Records of NDE personnel qualifications and eye examination tests shall be available at the site.

4.0 Responsibility

4.1 Quality Assurance NTD Level III Personnel

a. Conduct qualification examinations of prospective NDT personnel.

b. Record results of each qualification test on nondestructive testing personnel qualification record form (Exhibit No. 35) "Nondestructive Test Personnel Qualification Record."

c. Forward copies of NDT Levels I and II forms to the Field Superintendent and Quality Assurance Representative (Exhibit No. 35) "Nondestructive Test Personnel Qualification Record."

671984

Exhibit No. 35

NONDESTRUCTIVE TEST PERSONNEL QUALIFICATIONS RECORD

AGE SOCIAL SECURITY NO.

ARE

ARRIED YES ☐ NO ☐ SEPARATED ☐ DIVORCED ☐

TRAVEL YES ☐ NO ☐ LIMITED ☐

TE EXAMINATION DATES

	I	II	III
RT			
MT			
UT			
PT			

CERTIFICATION AND TRAINING

LEVEL I

	CERTIFICATION			GENERAL			SPECIFIC			PRACTICAL		
	CERT. DATE	PERCENTILE GRADE	EXAMINER	ASSIGNED GRADE	NO. OF HOURS	ACTUAL GRADE	ASSIGNED GRADE	NO. OF HOURS	ACTUAL GRADE	ASSIGNED GRADE	NO. OF HOURS	ACTUAL GRADE
RT												
MT												
UT												
PT												

LEVEL II

RT												
MT												
UT												
PT												

LEVEL III

RT				
MT				
UT				
PT				

EDUCATION

LEVEL	COURSE	NO. OF YEARS	GRADUATE	CERTIFICATE	
HIGH SCHOOL					
VOCATIONAL					
COLLEGE					
OTHER					

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
SUNTAC CONTRACT NO. 34491
CLIENT: CONSUMERS POWER COMPANY
PROCEDURE NO. 34491-QAP-701-A
LOCATION CHARLEVOIX, MICHIGAN

PROCEDURE FOR:

QUALIFICATION OF NONDESTRUCTIVE EXAMINATION PERSONNEL

FUEL POOL LINER & REACTOR DEPRESSURIZATION SYSTEM

APPROVED _____ DATE _____
CLIENT

APPROVED H. C. Rickle DATE 7/12/72
SUNTAC PROJECT MANAGER

APPROVED _____ DATE 6/20/72
SUNTAC QUALITY ASSURANCE MANAGER

PREPARED BY _____ DATE 6/20/72
SUNTAC QUALITY ASSURANCE ENGINEER

8111070119

A (5/6)									
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				

1.0 Scope

This procedure describes the training and qualification of personnel who perform nondestructive examinations in the field.

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3.2 The Quality Assurance Representative for welding will be qualified to NDT Level II in the radiographic, magnetic particle and liquid penetrant methods.

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c. Forward copies of NDT Levels I and II forms to the Field Superintendent and Quality Assurance Representative (Exhibit No. 35) "Nondestructive Test Personnel Qualification Record".

NONDESTRUCTIVE TEST PERSONNEL QUALIFICATIONS RECORD

Exhibit No. 35

NE   AGE   SOCIAL SECURITY NO. 076201

RIED YES ☐ NO ☐ SEPARATED ☐ DIVORCED ☐   TRAVEL YES ☐ NO ☐ LIMITED ☐

EXAMINATION DATES

	I	II	III
RT			
MT			
UT			
PT			

CERTIFICATION AND TRAINING

LEVEL I

	CERTIFICATION			GENERAL			SPECIFIC			PRACTICAL		
	CERT. DATE	PERCENTILE GRADE	EXAMINER	ASSIGNED GRADE	NO. OF HOURS	ACTUAL GRADE	ASSIGNED GRADE	NO. OF HOURS	ACTUAL GRADE	ASSIGNED GRADE	NO. OF HOURS	ACTUAL GRADE
RT												
MT												
UT												
PT												

LEVEL II

RT												
MT												
UT												
PT												

LEVEL III

RT				
MT				
UT				
PT				

EDUCATION

LEVEL	COURSE	NO. OF YEARS	GRADUATE	CERTIFICATE	
HIGH SCHOOL					
VOCATIONAL					
COLLEGE					
OTHER					

CATALYTIC, INC.

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT

CLIENT: CONSUMERS POWER COMPANY

LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34881

PROCEDURE NO. 34881-QAP-701-A

APPROVED FOR CONSTRUCTION

PROCEDURE FOR:

QUALIFICATION OF NONDESTRUCTIVE EXAMINATION PERSONNEL

FUEL POOL LINER & REACTOR DEPRESSURIZATION SYSTEM

APPROVED F. M. Macri/EJT — CLIENT — DATE 24 AUG '73

APPROVED H C Burkholder — SUNTAC PROJECT MANAGER — DATE 7/3/73

APPROVED A. C. Crain — SUNTAC QUALITY ASSURANCE MANAGER — DATE 6/20/73

PREPARED BY Walter L Pike — SUNTAC QUALITY ASSURANCE ENGINEER — DATE 6/20/73

07 5251

O (AFC)						EJT	HCB		9/12/73
A (F/A)					WLP	JCC	HCB		7/2/73
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT								

1. Cleanliness Requirements

1.1 General

Fabrication and assembly of equipment shall be conducted so as to minimize contamination during fabrication. Equipment shall not be manufactured with the expectation of cleaning only after completion of fabrication or assembly. Component parts or equipment shall be cleaned and maintained in a clean condition up to and including installation.

1.2 Acceptance Criteria for Cleanliness

Unless otherwise specified, equipment shall be clean to the extent that no contamination is visible to a person with normal visual acuity, natural or corrected, under an adequate lighting level on surfaces being inspected. The lighted areas should provide a lighting level of at least 50 foot candles on surfaces being inspected. Where surfaces cannot visually be inspected; e.g., crevices and inaccesible areas, but can be reached with a wiping cloth, the cleanliness may be determined by wiping the surfaces with a wet or dry cloth. In such cases, the cleanliness shall be evaulated on the basis of type and quantity of contamination.

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Surface of welds and base metal shall be cleaned free of all mill scale, grease, dirt, weld spatter and other foreign materials. Solvents containing halides shall not be used on surfaces to be attached to stainless steel.

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Surface of welds and base metal shall be cleaned free of all rust or pitting. Solvents containing halides shall not be used on surfaces of stainless steel. Iridescent temper films resulting from heat treatment and tightly adherent black oxide films that occur on the welds need not be removed.

1.2.3 Control of Tools Used in Cleaning

All tools will be color coded prior to start of fabrication. Tools for stainless steel will be coded blue and tools for use on carbon steel will be coded white.

0762

QUALIFICATION OF NONDESTRUCTIVE EXAMINATION PERSONNEL PROCEDURE

QAP-701-A

1.0 Scope

This procedure describes the training and qualification of personnel who perform nondestructive examinations in the field.

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ASNT-TC-1A American Society of Nondestructive Testing.
Quality Assurance Instruction No. 1 (Quality Assurance Personnel Training and Qualification Program Within the Corporate Manual).

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4.0 Responsibility

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b. Record results of each qualification test on nondestructive testing personnel qualification record form (Exhibit No. 35) "Nondestructive Test Personnel Qualification Record."

c. Forward copies of NDT Levels I and II forms to the Field Superintendent and Quality Assurance Representative (Exhibit No. 35) "Nondestructive Test Personnel Qualification Record."

NONDESTRUCTIVE TEST PERSONNEL QUALIFICATIONS RECORD

Exhibit No. 35

070250

NAME | AGE | SOCIAL SECURITY NO.

MARRIED YES ☐ NO ☐ SEPARATED ☐ DIVORCED ☐ | TRAVEL YES ☐ NO ☐ LIMITED ☐

VISE EXAMINATION DATES

	I	II	III
RT			
MT			
UT			
PT			

CERTIFICATION AND TRAINING

LEVEL I

	CERTIFICATION			GENERAL			SPECIFIC			PRACTICAL		
	CERT. DATE	PERCENTILE GRADE	EXAMINER	ASSIGNED GRADE	NO. OF HOURS	ACTUAL GRADE	ASSIGNED GRADE	NO. OF HOURS	ACTUAL GRADE	ASSIGNED GRADE	NO. OF HOURS	ACTUAL GRADE
RT												
MT												
UT												
PT												

LEVEL II

RT												
MT												
UT												
PT												

LEVEL III

RT				
MT				
UT				
PT				

EDUCATION

LEVEL	COURSE	NO. OF YEARS	GRADUATE	CERTIFICATE	
HIGH SCHOOL					
VOCATIONAL					
COLLEGE					
OTHER					

TECHNICAL SPECIFICATIONS

FOR

ERECTION OF

LINER PLATE FOR SPENT FUEL POOL

FOR THE

CONSUMERS POWER COMPANY

BIG ROCK POINT PLANT

CHARLEVOIX, MICHIGAN

INFORMATION COPY

No.	DATE	REVISIONS	BY	CHK'D	APP'D
3					
2					
1	6/19/73	Issued for Construction			
0	4/12/73	Issued for Client Review			

DESIGN: SF Power

JOB No. 10,211

10,211-C172

SHEET OF

Specification No. 10,211-C172

TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS

FOR

FIELD ERECTION OF

LINER PLATE FOR SPENT FUEL POOL

FOR THE

CONSUMERS POWER COMPANY

BIG ROCK POINT PLANT

CHARLEVOIX, MICHIGAN

APPENDIXES

A - TECHNICAL SPECIFICATIONS C171 "PURCHASE OF LINER PLATE FOR SPENT FUEL AREA"

TECHNICAL SPECIFICATIONS

FOR

ERECTION OF

LINER PLATE FOR THE SPENT FUEL POOL

1.0 WORK INCLUDED

The work includes unloading and transporting the stainless steel liner plate from the designated storage and work area to erection site, erecting in accordance with the drawings, and the testing of all field welds as specified herein.

2.0 RELATED WORK NOT INCLUDED

The following items of work are not included:

a. Furnishing and installing lead shielding.

b. Furnishing and installing trench channels and monitoring tubes.

c. Furnishing and placement of concrete shielding.

3.0 ABBREVIATIONS

ASME – American Society of Mechanical Engineers
AISC – American Institute of Steel Construction
ASTM – American Society for Testing and Materials
SNT – Society for Non-Destructive Testing

4.0 CODES AND STANDARD SPECIFICATIONS

Except as otherwise specified herein or shown on the drawings, materials, fabrication, erection, and testing shall be in accordance with the following codes and standard specifications to the extent indicated by references herein.

ASME	Section III, Boiler and Pressure Vessel Code, 1971 Edition and Addenda of Summer 1971, Winter 1971, and Summer 1972.
ASME	Section VIII, Division 1, Boiler and Pressure Vessel Code, 1971 Edition and Addenda of Summer 1971, Winter 1971, and Summer 1972.

ASME	Section IX, Boiler and Pressure Vessel Code, 1971 Edition and Addenda of Summer 1971, Winter 1971, and Summer 1972.
ASTM A 36-70a	Standard Specification for Structural Steel
ASTM A 167-70	Standard Specification for Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A 240-71	Standard Specification for Stainless and Heat Resisting Chromium and Chromium-Nickel Steel Plate, Sheet, and Strip for Fusion-Welded Unfired Pressure Vessels
ASTM A 276-70	Standard Specification for Stainless and Heat Resisting Steel Bars, and Shapes
ASTM A 479-71	Standard Specification for Stainless and Heat Resisting Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels
ASTM A 480-70	Standard Specification for General Requirements for Delivery of Flat-Rolled Stainless and Heat Resisting Steel Plate, Sheet, and Strip
SNT-TC-1A	Supplement D, Recommended Practice

5.0 DRAWINGS

The Owner will furnish the Contractor with one set of reproducible design drawings and one set of approved reproducible shop drawings for the Contractor's use. Shop drawings will include erection drawings showing all piece marks and other identifying marks.

6.0 FURNISHED MATERIALS AND EXISTING CONDITIONS

6.1 Materials furnished by others shall conform to the requirements of the standard specifications listed below:

a. Stainless steel plate shall be type 304, .05 maximum carbon and conform to ASTM designation A167 or A240 and shall be hot-rolled, annealed, pickled, and given a final Nuclear Finish.

b. Stainless steel bars and shapes shall be Type 304, .05 maximum carbon and conform to ASTM designation A276 or A479, and shall be hot finished, annealed and pickled.

c. French stainless steel embedments shall be type 304 .07 max. carbon.

6.2 Prior to commencing erection of liner plate in any area the Contractor shall inspect the existing conditions for compliance with the design drawings and these specifications. Concrete surfaces and embedded items which fail to meet the requirements of the drawings shall be reported to the Owner 10 days in advance of erection of liner plate to allow the Owner to make the necessary corrections.

6.3 The Owner, in the presence of the Contractor, will inspect all deficiencies reported by the Contractor. The Owner will either correct the deficiencies or authorize the Contractor to take corrective measures which will be paid for as extra work. Failure on the part of the Contractor to report any existing conditions which do not meet the requirements shall not relieve the Contractor of conforming to the requirements of these specifications.

6.4 Stainless steel liner plate furnished by others as cut plate or preassembled modules will have tolerances as set forth in ASTM Designation A 480 for width, length, camber and thickness. The Contractor, upon finding a plate which does not comply with the above specifications or the shop drawings, and which in the Contractor's opinion, will not permit him to install the plate in conformance with the design drawings and these specifications, shall notify the Owner accordingly. The Owner's decision shall be final as to what corrective measures, if any, shall be taken.

6.5 Any rework of the furnished plates, as authorized by the Owner's, shall be paid for as extra work. Failure on the part of the Contractor to notify the Owner of plates not conforming to the above specifications or drawings shall not relieve him from compliance with these specifications. Any reworking of liner plate not specifically authorized by the Owner shall be at the Contractor's expense.

6.6 Liner plate furnished by others shall be stored in an area on the site as determined by the Owner. Upon arriving on the jobsite, the Contractor shall take an inventory of all liner plate which is on hand and shall, if finding the material satisfactory, acknowledge receipt in writing. Should the Contractor, upon comparing his inventory with the shipping invoice furnished by the Owner find a material shortage or damaged material, he shall advise the Owner at once. The Owner in the presence of the Contractor, will verify that there is a shortage or that damaged materials does exist before accepting the Contractor's receipt.

6.7 The Contractor's receipt shall contain a list of all material received by piece marks as well as the number of pieces received, and shall be signed by the Contractor. Once the Contractor has acknowledged receipt in writing of any material, all handling, storage, and protection of such material shall be the responsibility of the Contractor. Any material which may become damaged, lost, or misused shall be replaced in accordance with Technical Specifications 10,211-C171 at the expense of the Contractor.

7.0 ERECTION

7.1 Contractor shall submit an outline of the erection procedure he proposes to use and the method of temporarily supporting liner plate to maintain the proper surface alignment. All construction methods and equipment used by the Contractor are subject to the prior approval of the Owner insofar as possible effect on the conduct or safety of other work on the jobsite is concerned. Particular care shall be taken in field handling and installing of liners to avoid pool side surface scratching and damage to edges.

7.2 Prior to placing liner plates, the exposed embedded channels, bolts and other attachments shall be in a thoroughly clean condition, free of all grout, cement coating or other foreign material. The surfaces of existing embedded angles at the top of the pool walls shall be free of loose materials, rust corrosion product and polished to bright metal, and shall be maintained in this condition during welding of the liner plates.

7.3 Field measurements indicate walls of the Spent Fuel Pool deviate from the alignment shown on the drawings. Liner plate installed against the existing concrete surfaces shall form a continuous smooth surface following the contour of the concrete. Liner plate shall be pushed against the walls to minimize the gap between the plate and the wall prior to welding of the liner in the pool.

7.4 Completed lining shall be reasonably flat and shall have good bearing against the surface of the concrete.

8.0 WELDING

8.1 All welding Procedures and Performance Qualification Tests shall be qualified in accordance with Section IX of the ASME Code. In addition, the procedure qualification test plates shall be radiographed before sectioning. Performance qualification may be done by radiography or destructive testing. Production welding shall not be performed prior to Owner's approval of welding procedures and procedure qualification records.

8.2 All seam welds shall be full penetration butt welds and where required, shall be ground from both sides to remove excessive crown with pool side ground to match adjacent plate finish except where shown otherwise on the drawings. Fillet welds where shown on drawings shall blend smoothly with the base material and be of uniform size.

8.3 All seam welds shall have a minimum of 2 passes except square edge welds with back-up strips shall have a minimum of 3 passes. The abutting ends of backing strips, when used shall be made continuous by welding.

8.4 Butt welds without backing strips shall be welded from both sides. The second side shall be prepared to sound metal by arc gouging, chipping, or grinding before welding. If arc gouging is used, the surfaces shall be ground to clean, sound metal prior to welding the second side.

8.5 Plates jointed by butt welding shall be matched accurately and retained in position during welding operations. Misalignment in a flat plane across completed joints shall not exceed 1/16 inch.

8.6 All welding performed under these specifications shall be in accordance with procedures specifically approved for the work, and by welders qualified to that procedure.

8.7 All seam welds shall be made by one of the following processes:

(a) Gas Tungsten Arc

(b) Shielded Metal Arc

(c) Gas Metal Arc in the spray transfer range.

(d) Other processes will not be considered unless Contractor's ability to use the processes is proved to the Owner's satisfaction. Information submitted to the Owner shall include complete details of Contractor's preparation, welding techniques, welding procedures, and experience for the specified application.

8.8 The Contractor shall maintain records showing extent of each welder's work, including weld preparation, welding process, and welding procedure.

8.9 All plug and slot welds shall be made with a gas tungsten process or combination of the above welding processes where the gas tungsten arc is used to make the first pass.

8.10 Workmanship and visual quality of welds shall be uniform in width and size throughout their full length. The minimum gap of all butt welds shall be 3/16 inch and maximum gap shall be 1/2 inch. During the course of the work, the need may arise for modification of the gap. This modification shall be submitted to the Owner for review and approval.

8.11 Filler metal for austenitic stainless steel welds shall be Type 308L selected and controlled to produce weld deposits with 8-25% ferrite as determined by the Schaeffler Diagram, or a magnetic ferrite indicator.

8.12 Each layer of welding shall be sufficiently smooth and free of slag cracks, pinholes, lack of penetration, and completely fused to the adjacent weld beads and base material so as to facilitate the proper application of the subsequent weld layers. In addition, the cover pass shall be free from coarse ripples, irregular surfaces, deep ridges or valleys between beads. Slight undercut not exceeding 1/32 inch in depth for up to 3 inches in 12 inches of weld length will be permitted.

8.13 Repair or chipping of welds, if required, shall be done in such a manner as not to gouge, groove, or reduce the thickness of the adjacent base metal by more than 1/32 inch.

8.14 Welds shall be cleaned by brushing with austenitic stainless steel brushes which have not been used on carbon or low alloy steels.

8.15 Grinding of welds, where required, shall be done with aluminum oxide or silicon carbide grinding wheels which have not been used on carbon or low alloy steels.

8.16 Injurious surface defects, such as caused by removal of temporary attachments, arc-strikes and mechanical damage shall be ground to sound metal. Any surface imperfection, the removal of which reduces the plate thickness by 1/32 inch or more shall be repaired by welding, using the gas tungsten arc process.

8.17 All weld repairs and areas where temporary welds have been made shall be suitably ground, and tested in accordance with these specifications.

8.18 One sample of weld, 12 inches in length, shall be submitted to the Owner, for each different welding process before the start of any work. These samples shall be indicative of the minimum acceptable weld surface finish, and will be used to judge the acceptability of subsequent work. This requirement may be waived where Contractor has previously performed the same type of work for Owner and has established a record of satisfactory performance.

8.19 Peening shall not be used without prior written approval by the Owner.

9.0 WELDING EXAMINATION

9.1 All welds, including those made by others on material furnished by others shall be vacuum box tested. Vacuum box testing shall be limited to areas where configuration permits equipment set up.

9.2 All welds made by the Contractor shall be tested by liquid penetrant method.

9.3 Liquid Penetrant Testing

a. Liquid penetrant examination shall be performed daily on all welds completed in the preceding 24 hours. Examination shall show no cracks or linear indications, and no round indications exceeding 1/32 inch.

b. Liquid penetrant testing shall be performed in accordance with Appendix VIII, Section VIII, Division 1, of the ASME Boiler and Pressure Vessel Code and the following specific requirements: Liquid penetrant testing shall be by the solvent removable method. The penetration time shall be at least 10 minutes. The drying time shall be at least 5 minutes. The examination shall be made not sooner than 7 minutes nor later than 30 minutes after the developer has dried. Acceptance standards shall comply with Paragraph NB5352, Section III of the ASME Code.

c. Personnel performing liquid penetrant examinations shall be qualified in accordance with SNT-TC-1A, Supplement D, and their qualification records made available upon request.

9.4 Vacuum box testing shall conform to the following minimum requirements.

a. The vacuum box shall be portable and have a viewing window large enough to review the complete test area, and to allow sufficient light to enter the box for proper examination. The box shall be capable of producing and holding a pressure differential of at least 8 psi. A gauge shall be placed in the system to verify the required pressure differential and to detect leaks in the equipment.

b. The leak detection solution shall be either LEAKTEC No. 577-V (American Gas & Chemicals, Inc.) or Leakseek (Newage Industries, Inc.) or other soap free, specially prepared solution as approved by the owner. The bubble forming properties shall be checked against a known leak at least every 4 hours during testing.

c. The test area shall be cleaned free of slag, scale, grease, paint or any other materials which would interfere with the testing procedure or the interpretation of the test.

d. The leak detection solution shall be applied evenly over the entire test area. The solution shall not be applied more than one minute prior to testing.

e. The vacuum box shall then be put in place and evacuated to at least a 5 psi pressure differential with respect to the atmospheric pressure.

f. The 5 psi minimum pressure differential shall be verified by the the gauge and maintained for a minimum time of 30 seconds. The solution shall be continuously observed for bubbles from the time evacuation of the box begins until 30 seconds after the required vacuum has been obtained.

9.5 Hydrostatic Testing

At the completion of erection and liquid penetrant and vacuum box leak testing of all welds in the liner plates, the pool shall be filled with water to the operating level and left to stand for 48 hours, so that leak tightness can be tested through monitoring channels. The water used shall be unchlorinated clarified water.

9.6 Repair of Leaks

a. When a leak is detected as a result of any of the above tests, the leak shall be repaired by complete removal of the defect and rewelding. The repaired area shall be reinspected by testing in accordance with these specifications.

b. A complete record of the tests performed, repaired areas, and the reinspections shall be maintained by the Contractor and submitted to the Owner for approval. A complete set of test records shall be submitted to the Owner at the conclusion of the work.

c. Repair work on field welds shall be done at the Contractor's expense. Repair work done on welds made by others will be paid for as extra work.

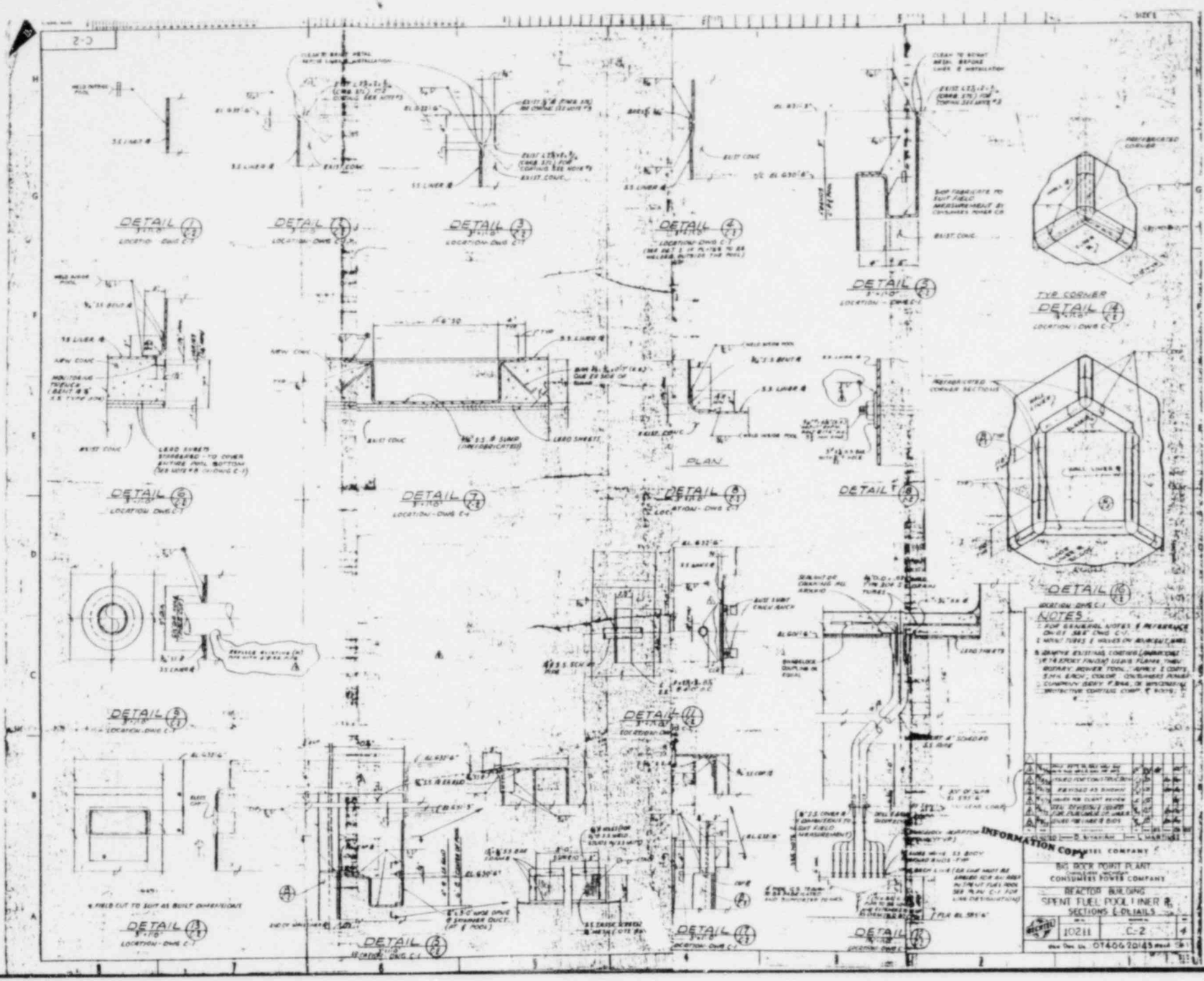
10.0 INSPECTION

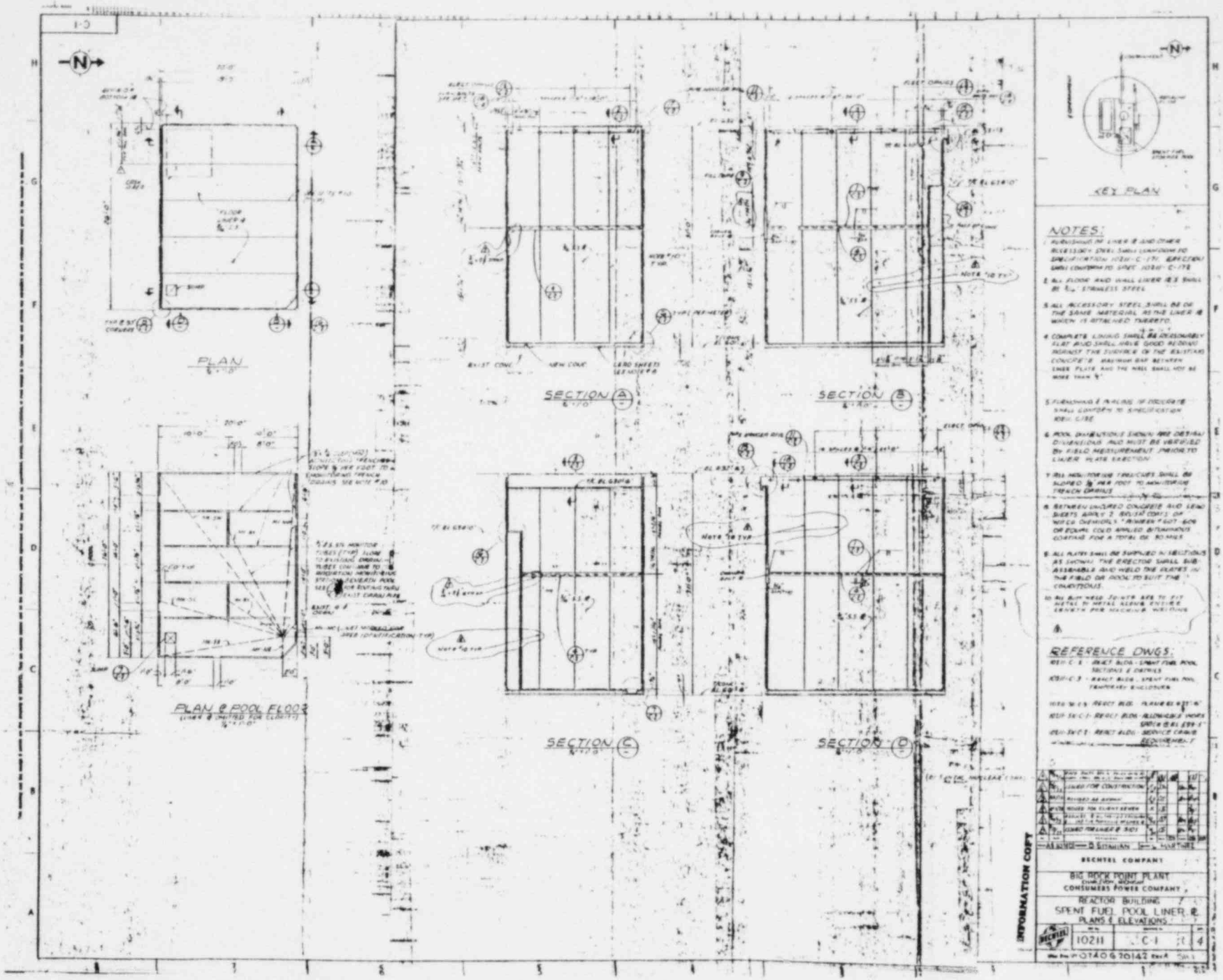
10.1 All material furnished by Contractor for field erection and all field erection operations including testing shall be subject to approval by the Owner for conformity with these specifications.

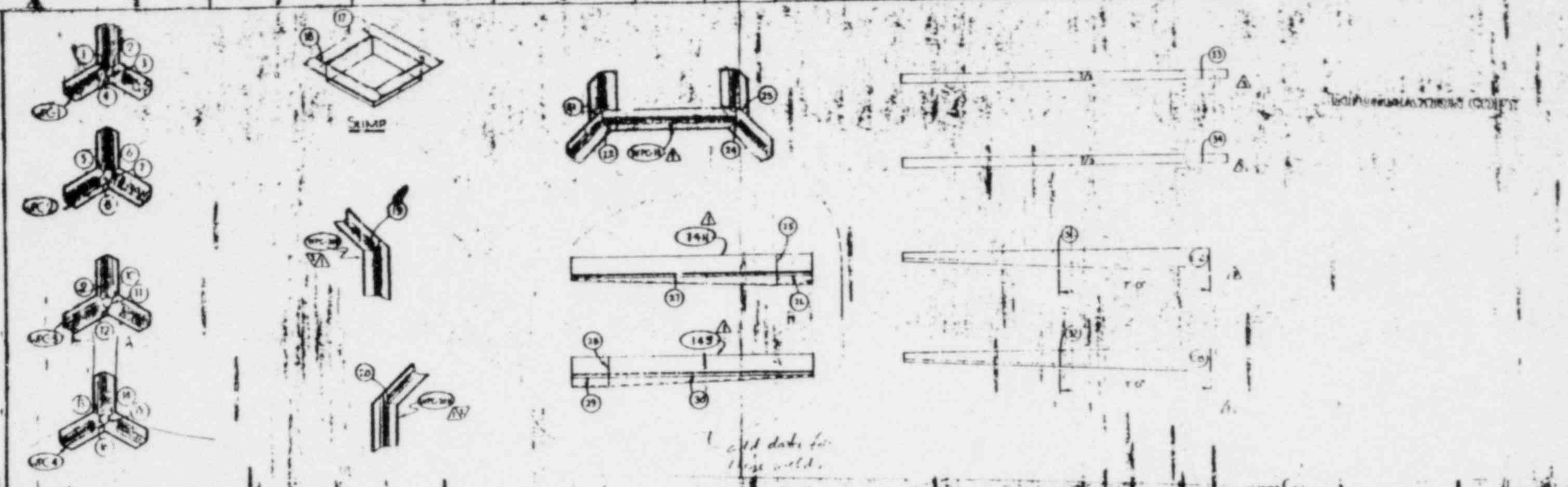
10.2 The Owner's Inspector shall be provided with free access at any time to all areas where work is progressing.

11.0 CLEANING

Pool side surface finish and cleanliness of welds and base metal shall be consistent with the specified material finishes. All surfaces shall be cleaned free of all mill scale, grease, dirt, weld spatter, and other foreign materials. Solvents containing halides shall not be used on stainless steel. Special care shall be taken to prevent iron contamination of the stainless steel surfaces. Wire brushes and grinding wheels used shall be new and free of iron. Wire brushes shall be of austenitic stainless steel and the grinding wheels shall be of aluminum oxide. Contractor shall submit a cleaning procedure to the Owner for approval.


PLAN
NOTES
BIG ROCK POINT PLANT
CONSUMERS POWER COMPANY
REACTOR BUILDING
SPENT FUEL POOL LINER &
SECTIONS & DETAILS
10211
C-2
INFORMATION Copy


PLAN
PLAN & POOL FLOOR
SECTION A
SECTION B
SECTION C
SECTION D
KEY PLAN
NOTES:
REFERENCE DWGS:
INFORMATION COPY
BECHTEL COMPANY
BIG ROCK POINT PLANT
CONSUMERS POWER COMPANY
REACTOR BUILDING
SPENT FUEL POOL LINER &
PLANS & ELEVATIONS
10211
C-1



No.	Fitup Inspection	Welded By	Visual Weld Inspection	Dye Penetrant Inspection		Remarks
1	OK R.J. ROHDE 7-9-73	J. MONTILEONE	OK R.J. ROHDE 7-[illegible]-73	OK R.J. ROHDE 7-[illegible]-73		NONE
2						
3						
4				OK R.J. ROHDE 7-17-73		SEE ATTACHED SKETCH
5						SEE ATTACHED SKETCH
6						NONE
7						NONE
8						SEE ATTACHED SKETCH
9						
10						
11						
12						NONE
13						SEE ATTACHED SKETCH
14						NONE
15						NONE
16						SEE ATTACHED SKETCH
17						SEE ATTACHED SKETCH
18						SEE ATTACHED SKETCH
19	OK R.J. ROHDE 7-10-73		OK R.J. ROHDE 7-11-73			NONE
20	OK R.J. ROHDE 7-10-73		OK R.J. ROHDE 7-11-73	OK R.J. ROHDE 7-11-73		SEE ATTACHED SKETCH
21	OK R.J. ROHDE 7-9-73		OK R.J. ROHDE 7-10-73	OK R.J. ROHDE 7-17-73		SEE ATTACHED SKETCH
22						NONE
23						SEE ATTACHED SKETCH
24						
25						
26						
27						
28						
29						
30						NONE
31	OK R.J. ROHDE 7-16-73	J. MONTILEONE	OK R.J. ROHDE 7-16-73	OK R.J. ROHDE 7-16-73		SEE ATTACHED SKETCH
32		J. MONTILEONE	OK R.J. ROHDE 7-16-73	OK R.J. ROHDE 7-16-73		NONE
33		D. WALKER	OK R.J. ROHDE 7-17-73	OK R.J. ROHDE 7-17-73		NONE
34		D. WALKER	OK R.J. ROHDE 7-17-73	OK R.J. ROHDE 7-17-73		

WELDS 1 THRU 24 & 31 THRU 34
WELD ROD HT# 64863

10211 000 C171 4

Results of all [illegible] in [illegible] drawing

We hereby certify that all fabrication and [illegible] inspection with this drawing no. JN D 4170B

NOOTER CORPORATION
Date 7-28-73

10211 000 C171 14

-- REQ'D

NOOTER CORPORATION
ST. LOUIS, MISSOURI 63166

Shop Weld Map
[illegible] Big Rock Liner [illegible]
Consumers Power Co.
Big Rock Point Plant
Bechtel Corporation
San Francisco, California

T. SULLIVAN

JOB NO. L3992
DWG. NO. JN D 4170
SHEET 8 OF 8

TECHNICAL SPECIFICATIONS

FOR

PURCHASE OF

LINER PLATE FOR SPENT FUEL POOL AREA

FOR THE

CONSUMERS POWER COMPANY

BIG ROCK POINT PLANT

CHARLEVOIX, MICHIGAN

FOR INFORMATION ONLY

INFORMATION COPY

NO.	DATE	REVISIONS	BY	CHK'D	APP'D
4	6/15/73	Issued for Construction			
3	4/12/73	Issued for Client Review			
2	4/6/73	Issued for Purchase			
1	3/23/73	Issued for Bid			

ORIGINATOR: S.Y. Tsao

JOB NO. 10,211

10,211-C171

SHEET OF

6.3 Titles of the detail drawings and erection drawings shall correspond with those of the Buyer's design drawings, and the purchase order number shall be shown on each sheet.

6.4 Approval of details drawings by the Buyer will not relieve the Seller of responsibility for the completeness and accuracy of all dimensions and details.

6.5 Detail and erection drawings shall bear the stamp of approval of the Buyer before fabrication of any material is commenced. If fabrication is started prior to approval, any change which may be required shall be at the Seller's expense.

7.0 FABRICATION

7.1 Where indicated on the drawings, liner plate shall be fabricated into preassembled modules.

7.2 Cutting, forming, welding and handling of plates shall be performed under the supervision of personnel experienced and qualified in working with the specified materials.

7.3 Stainless steel liner plate shall be formed cold. The minimum radius for corners shall be 1 inch unless otherwise shown.

7.4 Shop welding shall conform to the requirements of Section 8.0 and as shown on the drawings.

7.5 Tolerances

Stainless steel liner plates delivered to the jobsite as cut plate or preassembled modules shall not exceed the tolerances stated in ASTM designation A 480 for width, length, camber and thickness.

7.6 All shop fabricated pieces shall have identifying piece marks, and these piece marks shall be clearly located on erection drawing furnished by the Seller. Piece marks shall be made with waterproof paint or metal tags, and shall be placed on the plate side that will not be exposed after erection.

7.7 Material improperly detailed or wrongly fabricated, so that its erection in the field necessitates extra work, shall be the responsibility of the Seller, who shall pay the entire cost for correction of shop errors and the replacement of wrongly fabricated materials.

8.0 WELDING

8.1 All Welding Procedures and Performance Qualification Tests shall be qualified in accordance with Section IX of the ASME Code. In addition, the procedure qualification test plates shall be radiographed before sectioning. Performance qualification may be done by radiography or destructive testing. Production welding shall not be performed prior to Buyer's approval of welding procedures and procedure qualification records.

8.2 All welds shall be full penetration butt welds, except where shown otherwise on the drawings.

8.3 All welds shall have a minimum of 2 passes.

8.4 Butt welds without backing strips shall be welded from both sides. The second side shall be prepared to sound metal by arc gouging, chipping, or grinding before welding. If arc gouging is used, the surfaces shall be ground to clean, sound metal prior to welding the second side.

8.5 Plates jointed by butt welding shall be matched accuractely and retained in position during welding operations. Misalignment in a flat plane across completed joints shall not exceed 1/16 inch.

8.6 All welding performed under these Specifications shall be in accordance with procedures specifically approved for the work, and by welders qualified to that procedure.

8.7 All seam welds shall be made by one of the following processes:

(a) Gas Tungsten Arc

(b) Shielded Metal Arc

(c) Gas Metal Arc in the spray transfer range.

(d) Other processes will not be considered unless Seller's ability to use the processes is proved to the Buyer's satisfaction. Information submitted to the Buyer shall include complete details of Seller's preparation, welding techniques, welding procedures, and experience for the specified application.

8.8 The Seller shall maintain records showing extent of each welder's work, including weld preparation, welding process and welding procedure.

8.9 All plug and slot welds shall be made with a gas tungsten process or combination of the above welding processes where the gas tungsten arc is used to make the first pass.

8.10 Workmanship and visual quality of welds shall be uniform in width and size throughout their full length. The minimum gap of all butt welds shall be 3/16 inch and maximum gap shall be 1/2 inch. During the course of the work the need may arise for modification of the gap. This modification shall be submitted to the Buyer for review and approval.

8.11 Filler metal for austenitic stainless steel welds shall be Type 308L, selected and controlled to produce weld deposits with 8-25% ferrite as determined by the Schaeffler Diagram or a magnetic ferrite indicator.

ASME	Section VIII, Division 1, Boiler and Pressure Vessel Code, 1971 Edition and Addenda of Summer 1971, Winter 1971, and Summer 1972
ASME	Section IX, Boiler and Pressure Vessel Code, 1971 Edition and Addenda of Summer 1971, Winter 1971, and Summer 1972
ASTM A 167-70	Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A 240-71	Standard Specification for Stainless and Heat-Resisting Chromium and Chromium-Nickel Steel Plate, Sheet, and Strip for Fusion-Welded Unfired Pressure Vessels
ASTM A 276-70	Standard Specification for Stainless and Heat-Resisting Steel Bars, and Shapes
ASTM A 479-71	Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes for use in Boilers and other Pressure Vessels
ASTM A 480-71	Standard Specification for General Requirements for Delivery of Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
SNT-TC-1A	Supplement D, Recommended Practice

5.0 MATERIALS

5.1 Stainless steel plate shall be Type 304, .05 max. carbon and conform to ASTM designation A167 or A240, shall be hot-rolled, annealed, and pickled, and given a Nuclear finish as produced by the Allegheny Ludlum Steel Corp. or equal. All plate furnished under this Purchase shall conform to the sample submitted by the Seller with his bid and approved by the Buyer.

5.2 Stainless steel bars and shapes shall be Type 304, .05 max. carbon and conform to ASTM designation A276 or A479 and shall be hot finished, annealed, and pickled.

5.3 Certified copies of the mill test reports of the liner plates as specified by the applicable ASTM specification shall be submitted.

6.0 DETAIL DRAWINGS

6.1 The Seller shall furnish drawings and data in accordance with Form G-321-C. Erection drawings shall show piece marks as well as all details required for the field erection of the liner plate and embedded items.

6.2 The Buyer will furnish prints of engineering design drawings for each part of the work covered by these Specifications which will give all information required for shop detail drawings. The Buyer reserves the right to issue supplemental or revised drawings, and such drawings shall become a part of these Specifications.

Specification No. 10.211-CT

TECHNICAL SPECIFICATIONS

FOR

PURCHASE OF

LINER PLATE FOR SPENT FUEL POOL AREA

1.0 SCOPE

The work includes detailing, furnishing of materials, fabrication, and delivery of a complete liner plate system as specified herein and on the design drawings.

2.0 RELATED ITEMS NOT INCLUDED

The following items of work are not included:

a. Furnishing and Installing Lead Shielding
b. Furnishing and Placement of Concrete Shielding
c. Erection of Liner Plate
d. Unloading and field storage of all delivered materials.

3.0 ABBREVIATIONS

ASME – American Society of Mechanical Engineers
AISC – American Institute of Steel Construction
ASTM – American Society for Testing and Materials
SNT – Society for Non-Destructive Testing

4.0 CODES AND STANDARD SPECIFICATIONS

Except as otherwise specified herein or shown on the drawings, materials, fabrication, and testing shall be in accordance with the following codes and standard specifications to the extent indicated by references herein:

AISC	Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, February 12, 1969 and Supplement No. 1, November 1, 1970
ASME	Section III, Boiler and Pressure Vessel Code, 1971 Edition and Addenda of Summer 1971, Winter 1971, and Summer 1972

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TECHNICAL SPECIFICATIONS

FOR

PURCHASE OF

LINER PLATE FOR SPENT FUEL POOL AREA

FOR THE

CONSUMERS POWER COMPANY

BIG ROCK POINT PLANT

CHARLEVOIX, MICHIGAN

8.2 All welds shall be full penetration butt welds, except where shown otherwise on the drawings.

8.3 All welds shall have a minimum of 2 passes.

8.4 Butt welds without backing strips shall be welded from both sides. The second side shall be prepared to sound metal by arc gouging, chipping, or grinding before welding. If arc gouging is used, the surfaces shall be ground to clean, sound metal prior to welding the second side.

8.5 Plates jointed by butt welding shall be matched accurately and retained in position during welding operations. Misalignment in a flat plane across completed joints shall not exceed 1/16 inch.

8.6 All welding performed under these Specifications shall be in accordance with procedures specifically approved for the work, and by welders qualified to that procedure.

8.7 All seam welds shall be made by one of the following processes:

(a) Gas Tungsten Arc

(b) Shielded Metal Arc

(c) Gas Metal Arc in the spray transfer range.

(d) Other processes will not be considered unless Seller's ability to use the processes is proved to the Buyer's satisfaction. Information submitted to the Buyer shall include complete details of Seller's preparation, welding techniques, welding procedures, and experience for the specified application.

8.8 The Seller shall maintain records showing extent of each welder's work, including weld preparation, welding process and welding procedure.

8.9 All plug and slot welds shall be made with a gas tungsten process or combination of the above welding processes where the gas tungsten arc is used to make the first pass.

8.10 Workmanship and visual quality of welds shall be uniform in width and size throughout their full length. The minimum gap of all butt welds shall be 3/16 inch and maximum gap shall be 1/2 inch. During the course of the work the need may arise for modification of the gap. This modification shall be submitted to the Buyer for review and approval.

8.11 Filler metal for austenitic stainless steel welds shall be Type 308L, selected and controlled to produce weld deposits with 8-25% ferrite as determined by the Schaeffler Diagram or a magnetic ferrite indicator.

8.12 Each layer of welding shall be sufficiently smooth and free of slag, cracks, pinholes, and lack of penetration; and completely fused to the adjacent weld beads and base material so as to facilitate the proper application of the subsequent weld layers. In addition, the cover pass shall be free from coarse ripples, irregular surfaces, deep ridges and valleys between beads. Slight undercutting not exceeding 1/32 inch in depth for up to 3 inches by 12 inches of weld length will be permitted.

8.13 Repair or chipping of welds, if required, shall be done in such a manner as not to gouge, groove, or reduce the thickness of the adjacent base metal by more than 1/32 inch.

8.14 Welds shall be cleaned by brushing with austenitic stainless steel brushes which have not been used on carbon or low alloy steels.

8.15 Grinding of austenitic stainless steel where required, shall be done with aluminum oxide or silicon carbide grinding wheels which have not been used on carbon or low alloy steel.

8.16 Injurious surface defects, such as caused by removal of temporary attachments, arc-strikes, and mechanical damage shall be ground to sound metal. Any surface imperfection, the removal of which reduces the plate thickness by 1/32 inch or more shall be repaired by welding, using the gas tungsten arc process.

8.17 All weld repairs and areas where temporary welds have been made shall be suitably ground, and tested in accordance with these Specifications.

8.18 One sample of weld, 12 inches in length, shall be submitted to the Buyer, for each different welding process before the start of any work. These samples shall be indicative of the minimum acceptable weld surface finish, and will be used to judge the acceptability of subsequent work. This requirement may be waived where Seller has previously performed the same type of work for Buyer and has established a record of satisfactory performance.

8.19 Peening shall not be used without prior written approval by the Buyer.

9.0 WELD EXAMINATION

9.1 All welds shall be tested by liquid penetrant method.

9.2 Liquid Penetrant Testing shall be performed in accordance with Appendix VIII, Section VIII Division 1, of the ASME Boiler and Pressure Vessel Code and the following specific requirements:

a. Liquid penetrant testing shall be by the solvent removable method. The penetration time shall be at least 10 minutes. The drying time shall be at least 5 minutes. The examination shall be made not sooner than 7 minutes nor later than 30 minutes after the developer has dried.

b. Acceptance standards shall comply with Paragraph NB-5352, Section III of the ASME Code except that rounded indications with dimensions exceeding 1/32 inch are not acceptable.

c. Personnel performing liquid penetrant examinations shall be qualified in accordance with SNT-TC-1A, Supplement D, and their qualification records made available upon request.

9.3 All leaks, independent of size, shall be repaired by complete rewelding. The repaired area and a minimum of 2 inches each side thereof shall be re-examined.

9.4 A complete record of the liquid penetrant tests performed, repaired areas, and the examinations shall be maintained by the Seller and submitted to the Buyer's inspector for approval. A complete set of test records shall be submitted to the Buyer at the conclusion of the work.

10.0 CLEANING

Surface of welds and base metal shall be cleaned free of all mill scale, grease, dirt, weld spatter, and other foreign materials. Solvents containing halides shall not be used on stainless steel. Special care shall be taken to prevent iron contamination of the stainless steel surfaces. Wire brushing and grinding shall conform to Section 8.14 and 8.15.

11.0 SHIPMENT AND STORAGE

11.1 Handling, shipping and storage shall be done in a manner that will avoid damage to the material. Temporary peelable paper coating shall be used to protect the finish of the stainless steel plates. Materials shall be stored in a dry place.

11.2 If, in the opinion of the Buyer, any material is damaged to the extent that it is unsuitable for the intended use, it shall be suitably repaired or replaced.

10

GSI

☒ 304 Stainless Steel ☐ 316 Stainless Steel ☐ Other

Booter Corp.

P.O. Box 451

St. Louis, Missouri 63166

Your Order: 55399
Our Order: A-517-2

Gentlemen:

This is to certify that the wire screen furnished on your order is in conformance with the requirements, specifications, and standards as listed in your order, conforming to the following nominal chemical composition:

1 pc 37" x 6-1/2" wide, 1/4" mesh .080" wire T-304 Stainless

STANDARDS	304 STAINLESS STEEL	316 STAINLESS STEEL	OTHERS
Mesh	1/4" x 1/4"		
Wire Diameter	.080"		
Carbon (Max.)	.08		
Manganese (Max.)	2.00		
Silicone (Max.)	1.00		
Chromium	18.00-20.00	16.00-18.00	
Nickel	8.00-12.00	10.00-14.00	
Phosphorus (Max.)	.045		
Sulphur (Max.)	.030		
Other Elements			

L3992

INFORMATION COPY

Q. A. Bowen

Thanks Jay
Received copy
9-20-13

10

	Diameter	Area	Thickness Total Length, Lbs.	Minimum Wall Thickness psi	Character of Pattern & Elevation

Type of Bend ... 2 MACRO
Result ... ACCEPTABLE
Type of Bend ...
Result ...

We certify that the statements made in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Date ... MAY 7, 1971 ... Signed ... HOOTER CORPORATION
By ...

Check of welds of more than one diameter only and may be omitted to conform to the type and number of tests required by the Code.

SPECIAL-T-METALS CO., INC.
P. O. BOX 5178 • 818 KANSAS AVENUE • KANSAS CITY, KANSAS 66119
"FOR ALL THOSE HARD TO FIND ITEMS, CALL SPECIAL-T"

July 9, 1973

RECEIVED
MOOTER CORPORATION
JUL 1 1973
2H 7,8,9,10,11,12,1,2,3,4,5,6 PM
3

Mooter Corporation
1400 S. 3rd Street
St. Louis, Missouri 63100

Attention: Mr. Dave Jochen

Gentlemen:

Re: Your Order Number 55690 Dated June 11, 1973
Our Invoice Number F17484

This is to certify to the best of our belief and knowledge that the following items are Type 304 Stainless Steel:

48 Each - 5/8-11 x 3-1/2" Wej-It Expansion Bolts (L3992)
6 Each - 1/2-13 x 3-1/2" Ditto
48 Each - 5/8-11 Fin. Hex Nuts (L3992)

Sincerely yours,

SPECIAL-T-METALS CO., INC.

W. S. Owen

WSO:cg

L3992

Frank Ivy
Bechtel Corp.
7-20-73

SH 14

F 18 9

INFORMATION COPY

TO RLHaueter, P-11-105B

FROM LSGibson, P-21-117

DATE September 14, 1973

SUBJECT Review of General Office Audits of Big Rock Point Plant Activities

Consumers Power Company

INTERNAL CORRESPONDENCE
Gibs 59-73

CC GSKeeley, GJWalke, GBMatheney, TEMcElroy, REDeWitt, RBSewell, ELMurri, DMNoble, WJBeckius, CJHartman, RAMcCaleb, JZReynolds, JSRang, JJZabritski, File: QA BU Review Sheet

As specified in QA Procedure BU-006, I have reviewed the audits conducted by the General Office Staff of Big Rock Point Plant Activities for the first six months of 1973. During this period, the frequency of required audits in the area of Nuclear Fuel, Licensing, Chemistry, Instrumentation and Control and Reactor Physics was changed from quarterly to semi-annually. Each of these areas shall be audited once during the first six months of the year, and once during the last six months. The audits need not be spaced exactly six months apart, however, subsequent period audits in a given area that are performed within 90 days will not normally be considered as meeting the intent of the requirement.

The following is a summary of deviations or items requiring followup found during this quarter's audits:

1. Licensing

   No deficiencies noted.

2. Maintenance and Operations

   a. The main items of concern were Preventive Maintenance Procedures or lack of them. This item has been identified both by the AEC and other auditors. A significant amount of effort is being expended on resolving the deficiency.

   b. There did not appear to be a written procedure for handling Facility Change Requests. It was recommended that further explanation be written down.

3. Chemistry

   There was no chemistry audit performed this quarter. This remains an overdue item.

4. Quality Assurance

   No significant deficiencies noted.

0761 23

5. Health Physics

As a result of site and vendor audits, new procedures were required for identifying film badges and assigning exposure to location exposure was received at.

6. Instrumentation and Control

a. The auditor checked on instrument calibration, testing forms, and failure report forms. He did not feel there was any problems in these areas.

From a quality assurance standpoint, I do not feel that the plant has a system that provides evidence or assurance that equipment used to calibrate safety related systems is calibrated to required standards.

b. As a result of problems at another utility, BRP is ensuring that safety system settings are set to allow for instrument drift without exceeding a limiting safety setting. We should be careful how we discuss safety system settings in Technical Specifications so as not to get into the same corner again.

Mr. C. J. Hartman
Big Rock Point Plant

~~CH~~
~~DRL~~
~~CEA~~
F.1c - SFP

Consumers Power Company

COPY

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

Preliminary

October 12, 1973

FPL-035
Ref: 1. Memo SUFP-6
2. Spec 34481-ECP-402
3. Work Package CWP-152

BIG ROCK POINT PLANT
Fuel Pool Liner
Decontamination Procedure
GWO 6248

Mr. H. C. Bushkoff
Suntac Nuclear Corp
1528 Walnut Street
Philadelphia, PA 19102

Dear Mr. Bushkoff:

We have reviewed the proposed Revision 1 to Ref 2, Decontamination Procedure for Spent Fuel Pool, in which the waste radioactive shipping containers are to be changed from Type B to Type A due to weight restrictions. Based on the evaluation that the source is special form material, the procedure is approved as revised.

As previously discussed with Mr. Turner, we have also reviewed and approved Work Package CWP-152, Decontamination of Spent Fuel Pool Walls and Floor.

Yours very truly,

Original Signed By
F. M. MACRI

FMM/klb

F. M. Macri
Engineering Coordinator
Generating Plant Modifications Dept

CC: RDWilder, Suntac
JSRang
CJHartman
WClark
WPCooke/RLWilson/MCPatel
File (2)

0758 92

3016C

COPY

TO: WStocks, Parnall I

FROM: RMStrang, Parnall II

DATE: May 2, 1973

SUBJECT: Big Rock Point Plant -
Stainless Steel Liner for Fuel Pool

Consumers Power Company

INTERNAL CORRESPONDENCE

CC: RMHaas, Parnall II
JMHang, Parnall II
CWFrench, Parnall I

In order to provide for proper accounting of the charges associated with this project it is necessary to assign two work orders. This is necessary as a payment of $117,000 from Bechtel is being credited to this project and should not receive any allocation of Company overheads.

Therefore, I have designated General Work Order 5909 as a nonoverhead work order to cover the $117,000 payment from Bechtel and have assigned a new Work Order 6248 to cover the total cost of the installation of the liner. These two work orders should be covered under Project E10-73-11. By copy of this letter I am requesting the Accounting Department to reinder Work Order 5909 from Project E10-73-97 to E10-73-11. I am also requesting that the negative overheads shown in the March Budget Item Summary under Work Order 5909 be transferred out and the charges for Generating Plant Modifications Department supervision which have cleared to this work order be transferred to Work Order 6248.

Please take whatever steps are necessary to correct your charging associated with this project and if there are any questions, please do not hesitate to call.

INFORMATION COPY

676828

Dean
file 30166

JSR

Consumers Power Company

COPY

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

May 30, 1973
FPL-003

BIG ROCK POINT PLANT
Spent Fuel Pool Liner
Bechtel Ref File 0270
GWO 5909

Mr. B. S. Fusheck
Bechtel Corp
Fifty Beale St
San Francisco, California 94119

Dear Mr. Fusheck:

Confirming my telephone conversations with you and Mr. Minkowski, comments on the Nooter Corp Liquid Penetrant Examination, NDE-302, are as follows:

1. Section 3.1 - Concerning use of liquid penetrants, Consumers Power Company prefers to use Sherwin Inc Penetrant DP-51. However, Sherwin Inc Penetrant DP-40 will be allowed for use if the Freon propellant is replaced with air or nitrogen or the penetrant is applied with a brush.

2. Section 4.1 - If cleaning of the plate material is by abrasive blasting, sand or shot blasting or other processes which result in peening are prohibited.

3. Section 6 - Please have field inspector verify that personnel performing liquid penetrant evaluation are indeed qualified to Level II.

4. Procedure does not require that personnel applying penetrant must be qualified to Level I. Please have this requirement incorporated into the procedure and have field inspector verify certification of personnel.

5. Procedure does not have a post cleaning section for removal of penetrant from weld area. Please have appropriate section incorporated into procedure.

6. Please provide a copy of Nooter Corp Procedure NDE-10, referenced in Section 6.0 for CP Co information.

INFORMATION COPY

676798

Mr. E. W. Fuehrer
Bechtel Corp
Big Rock Point Plant, GMD 5909
May 30, 1973, FPL-003

If you have any questions concerning the above, please advise.

Yours very truly,

FMM

F. M. Macri
Engineering Coordinator
Generating Plant Modifications Dept

FMM/klb

CC: MWarring
KSDeWitt
GSKeeley
AJBirkle
CQHills

676759

JSR File 50-155 BRP

COPY

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

May 31, 1973
177-206

BIG ROCK POINT PLANT
Spent Fuel Pool Liner
Bechtel Ref File 0270
GWO 5909

Mr. B. M. Pusheck
Bechtel Corp
Fifty Beale St
San Francisco, California 94119

Ref: 1. Bechtel Letter Dated 4/12/73
2. CP Co Letter Dated 5/28/73, FPL 002

Dear Mr. Pusheck:

We have reviewed the spent fuel pool liner installation drawings and specifications with the following comments which confirm my telephone conversations with you and Mr. Minkowski:

1. Specification 10211-C-171, Rev 2

A. Section 3.1 - It is our understanding that the "Nuclear Finish" specified for the liner plates is equivalent to 90% of the surface having a 100 micro inches (RMS) or better finish and 10% equivalent to a 150 micro inches finish.

B. Section 3.7 - If process (b) is used (shielded metal arc welding) a procedure (or specification) for care of electrodes (baking and etc) is required.

2. Specification 10211-C-172, Rev A

A. Section 6.1 (e) - Crunch embedments have been changed to stainless steel (Ref 2). Change ASTM designation accordingly.

B. Section 8.2 - Change first sentence to read: "All seam welds shall be full penetration butt welds and if required, shall be ground from both sides to remove excessive cream with pool side ground to match adjacent plate finish."

676792

C. Section 9.3 - Include examination by vacuum box leak technique for all welds; i.e. shop as well as field welds. This requirement is in addition to the liquid penetrant tests. Vacuum box leak testing is to be limited to those areas where configuration permits equipment set up.

D. Section 9.2 - In first line delete "helium testing" and insert "liquid penetrant and vacuum box leak testing."

3. Drawing 10211-C-1, Rev 2, Fuel Pool Liner Plate Plans

No comments.

4. Drawing 10211-C-2, Rev 2, Liner Plate Details

A. Detail 12 - Provide a stainless steel plate between concrete and entrance to existing 4" drain. If tubing wall thickness is sufficient, weld leak tubes to plate, otherwise provide for seal.

B. Detail 12 - Add note to mount leak chase lines and valves to adjacent wall.

C. Detail 15 - Determine if a leak tight seal is required between trash screen flange and stainless steel liner. If so, please provide in the design.

5. Specification 10211-C1, Rev A

A. All framing material must be either noncombustible or Class A fire retardant pressure impregnated wood.

B. It had been suggested by Consumers Power Company that a flexible fire retardant material, e.g. griffolyn, be investigated for use in constructing the enclosure roof and walls. However, the strong draft created by the ventilation system (10" static pressure fan) precludes use of a flexible material. Therefore, it is recommended that the design retain the Kelley-Klosure panels. Following completion of the job, this material will become plant property.

6. Drawing 10211-C-3, Rev A

A. To facilitate handling and transferring of materials to the pool, the following is desired for the fuel pool enclosure design:

(1) Provide for enclosure roof extension on east end to accommodate ventilation fan and filters (Dwg M-130).

(2) Provide for second entrance and door on east end of enclosure.

676793

B. Show detail illustrating how stiffback clamps are fastened to angles and beams.

C. Illustrate or add clarifying note for the following:

(1) Method used to secure roof panels to structure; i.e. we desire easy removal for facilitating transfer of material into pool.

(2) Method used to secure angles to the roof and wall panels.

(3) Method used to secure enclosure base plate to floor (if it is to be secured).

Following incorporation of the above into the design approval is given to issue "Approved for Construction" documents. Please forward ten copies of drawings and specifications for our distribution.

Yours very truly,

FMM/klD

F. M. Macri
Engineering Coordinator
Generating Plant Modifications Dept

CC: JWMalstrom
CMKeeley
CAHunt
REPerry
FLewitt
CCHartman

676794

INFORMATION COPY

COPY

Consumers Power Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

July 29, 1973

FTL-002

BIG ROCK POINT PLANT
Special Fuel Pool Liner
Bechtel Ref File 0270
GSD 5909

Mr. E. E. Purbeck
Bechtel Corp
Fifty Beale Street
San Francisco, Calif 94119

Dear Mr. Purbeck:

Confirming my telephone conversations with you and Mr. Minkowski, please initiate action for the following:

1. Issue a change to PO 10771-C-171-AC to have Item 63, 1/8" beat plate channels, fabricated from Type 304 stainless steel instead of carbon steel. It is our understanding that this change will incur an additional cost of $350.

2. To have spare stainless steel material available for field changes, please provide for the following and advise of additional cost:

   A. One 3/16" Type 304 stainless steel liner plate, hot rolled annealed and pickled with nuclear finish, of approximate size 5'x5'.

   B. Six 10' lengths of 3/16" liner plate, as above, with minimum width of 3".

3. Proceed with necessary procurement action to have the temporary ventilation fan, pre-filter and HEPA filter on site by July 15, 1973.

4. Comments concerning the liner plate shop drawings (Proter Corp) are as follows:

   A. Material note on drawings should specify hot rolled and pickled as per Specification 10771-C-171, Rev 2.

INFORMATION COPY

Mr. [illegible]
[illegible] Corp
Big Rock Point Plant, GMO 5309
May 23, 1973

B. Vacuum box leak testing is not a requirement of Specification C171. Therefore, delete Note C on Drawing JN-0-41793.

Following incorporation of the above into the drawings, approval is given to proceed with shop fabrication.

Should you have any questions concerning the above, please advise.

Yours very truly,

FMH

F. M. [illegible]
Engineering Coordinator
Generating Plant Modifications Dept

FMM/klb

CC: JWHalstrom
TJRandolph
GSKeeley
RBDeWitt

INFORMATION COPY

676861

Consumers Power Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

August 17, 1973

FPM-001

JOB 10211

RECEIVED
BECHTEL CORP.
AUG 21 1973
POWER DIVISION
S. F.

BIG ROCK POINT PLANT
Fuel Pool Liner
Material Status
CMO 6248 (5909)

Mr. B. N. Pusheck
Bechtel Corp
Fifty Beale Street
San Francisco, California 94105

Dear Mr. Pusheck:

This is to advise you of the status of Bechtel ordered material received at the jobsite:

1. Stainless Steel Plate, PO 10211-C-171, Nooter Invoice 20016.

Material received, inspected and found to be satisfactory. Payment per invoice can proceed.

2. Absolute Filters, PO 10211-M-1-AC, Flanders Filters Inc, Invoice 73-1157.

Material received, inspected and found to be satisfactory. Payment per invoice can proceed. Freight bill received from Parker Motor Freight, CR-612011, has been returned to you for resolution since PO states shipping charges are prepaid.

3. Centrifugal Fan, PO 10211-M-2-AC, Westinghouse Electric Corp (no invoice received as yet).

Material received and found to be deficient in that assembly lacks drive motor, drive belts and belt cover. Please take necessary action with the vendor to correct the deficiencies noted.

Per our conversation of August 3, 1973 submit invoices for payment to Bechtel of Items 1 and 2 above to our Accounts Payable Dept.

Yours very truly,

F. M. Pheri
Engineering Coordinator
Generating Plant Modifications Dept

FM/hlb

CC: WClark
RDWilson
TLRandolph

INFORMATION COPY

RECEIVED
NOV 12 1973
H. C. BUSHKOFF

Consumers Power Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

November 9, 1973

FPL-037
Ref: Spec 34881-4200-307

BIG ROCK POINT PLANT
Fuel Pool Liner
Tracked Welding Procedure
GWO 6248

Mr. H. C. Bushkoff
Suntac Nuclear Corp
1528 Walnut Street
Philadelphia, PA 19102

Dear Mr. Bushkoff:

We have reviewed referenced specification titled "Tracked Machine Welding Stainless Steel" and have the following comments:

1. Section 3.3 — Use of tack welds should not be a requirement as clamping to the pallets has provided good alignment. It is suggested that tack welds be optional and, if used, spaced as required.

2. Section 3.4 — The field has suggested that this paragraph be revised to allow a 1/64 inch maximum undercut without a length restriction. It is our interpretation that this is within the specified requirement that "undercutting, not exceeding 1/32 inch depth up to 3 inches in 12 inches of weld length, will be permitted."

3. Sections 3.8 and 5.1 — It is suggested that a manual repair weld process also be permitted, e.g. specification 34491-4200-303.

4. Section 5.4 — Specify maximum air gap allowed for proper weld fit-up of plates consistent with the procedure qualification tests.

5. Since this procedure represents a change to the design drawings, elimination of 1/16 inch gap between plates, an Engineering Design Change Notice is required.

0169304

Mr. H. C. Bushkoff
BIG ROCK POINT PLANT
Tracked Welding Procedure
GWO 6248

Following incorporation and/or resolution of the above, approval is given to issue "Approved for Construction" document.

Yours very truly,

F. M. Macri

F. M. Macri
Engineering Coordinator
Generating Plant Modifications Dept

FMM/mkb

CC: RDWilder
AJBirkle
RBDeWitt/JSRang
WClark
MCPatel/RLWilson/WPCooke

To CJHartman, Big Rock Point Plant

RL Wilson

FROM RLWilson, P-14-251

DATE September 5, 1973

SUBJECT Big Rock Point Plant - CWO 5909
Fuel Pool Liner
Trouble calls

SFP Reference Correspondence

Consumers Power Company

INTERNAL CORRESPONDENCE

CC RLHauter, P-11-105
REDenise, Traverse City
WClark, Big Rock Point Plant

Situations may arise relative to the subject project at night, on weekends or holidays which require the attention of the Generating Plant Modifications Department. Please obtain our assistance by contacting one of the following individuals. We request that you attempt to obtain assistance by calling in the order listed:

W. Clark	(517) 893-2262
R. L. Wilson	(517) 553-2945
W. P. Cooke	(517) 782-2062

We prefer that you do not contact project contractors directly, but obtain their services through one of the above representatives.

075893

SAFETY ANALYSIS FOR BIG ROCK POINT SPENT FUEL POOL LINER PLATE MODIFICATIONS

Dated March 15, 1974

As described in the BRP FHSR Section 5.12.4, the spent fuel storage pit is utilized for the following purposes:

a. Storing used fuel elements in racks until shipment.

b. Underwater inspection of certain irradiated fuel elements.

c. Storage of reactor head during refueling in the event that it is too radioactive to allow dry storage.

d. Underwater loading of spent fuel shipping cask.

e. Storing damaged fuel channels, control rods, in-core flux tubes and other highly radioactive equipment until disposal.

The existing storage pit surface consisted of several coats of a protective coating applied by the Amercoat Corporation to the concrete base. This coating began to blister and peel allowing the demineralized water to enter into the concrete. The danger of the low pH water entering the concrete is that eventually over a period of time the re-bar will be attacked and the pressure build-up from the resultant corrosion will spall the concrete wall. "Hungry" water of this type has been known to work itself through a 6-8-foot wall of concrete.

The modification or repair work consisted of relining the spent fuel pool with 3/16 inch stainless steel plate-type 304 hot-rolled, annealed and pickled with a nuclear finish to prevent further attack on the concrete structure. Should a leak in the stainless steel plate occur, a leak chase system was included which will first detect a leak and second isolate the area of leakage into eight (8) zones or regions to facilitate repair work. The liner plate enclosure adds an inner boundary to contain the water which did not exist originally and even postulating a massive rupture of the liner plate still allows the water to be contained within the concrete walls. Therefore, the liner plate installation minimizes even further the chances of the water escaping from the storage pit.

The leak chase system utilized the existing four (4)-inch drain line to pass through the eight 3/8 inch OD Type 304 stainless steel leak chase lines to a sample station. Again, even assuming a massive rupture of the liner plate, the four (4)-inch drain line offers no means of escape for the pool water since this drain line opening is covered with a section of 3/16 inch stainless steel plate followed by six inches of concrete.

In addition, the materials and components were fabricated and installed in accordance with QA and QC approved procedures on file at the plant site, the Nuclear Operations Department and the Generating Plant Modifications Department.

Based on this analysis, there does not appear to be any unreviewed safety questions involved as described in 10CFR50.59.

JS Rand

TO CJHartman, Charlevoix

FROM JSRang, P-21-313 JSR

DATE March 18, 1974

SUBJECT Facility Change - Spent Fuel Pool
File: Facility Change Requests

Consumers Power Company

INTERNAL CORRESPONDENCE

Rang 49-74

CC GCTyson, Charlevoix

RC: RLH
DMN

The installation of the spent fuel pool liner plate falls into one of those "gray" area categories in determining whether or not it involves a change to the existing facility. Since the repair work does involve a leak chase system, which was not included in the original spent fuel pool system, it was decided that to eliminate all doubts that a facility change request should be completed.

The spent fuel storage pit is considered to be safety related equipment as described in the ANS-22, Standard Draft No 4, Revision 1 dated May 1973. This is based on the reasoning that the pool is a storage facility for irradiated fuel bundles and should the water be lost, the post accident conditions will parallel those of a LOCA in the primary system. For this reason then the following safety analysis is attached for inclusion into the next meeting of the PRC. (Should be documented prior to loading fuel into fuel pool).

To CJHartman, Charlevoix

FROM JSRang, P-21-313 JSR

DATE March 18, 1974

SUBJECT Facility Change - Spent Fuel Pool
File: Facility Change Requests

Consumers Power Company

INTERNAL CORRESPONDENCE

Rang 49-74

CC GCTyson, Charlevoix

RC: RLH
DMH

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SAFETY ANALYSIS FOR BIG ROCK POINT SPENT FUEL POOL LINER PLATE MODIFICATIONS

Dated March 15, 1974

As described in the BRP FHSR Section 5.12.4, the spent fuel storage pit is utilized for the following purposes:

a. Storing used fuel elements in racks until shipment.

b. Underwater inspection of certain irradiated fuel elements.

c. Storage of reactor head during refueling in the event that it is too radioactive to allow dry storage.

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In addition, the materials and components were fabricated and installed in accordance with QA and QC approved procedures on file at the plant site, the Nuclear Operations Department and the Generating Plant Modifications Department.

Based on this analysis, there does not appear to be any unreviewed safety questions involved as described in 10CFR50.59.

AHD - 2416
DRP

To: File

From: FDNeri, P-14-226

Date: May 16, 1973

Subject: Big Rock Point Plant - CMO 5909
Spent Fuel Pool Liner Installation
Meeting Report with Suntac Nuclear Corp.

CONSUMERS POWER Company
INTERNAL CORRESPONDENCE

cc: RBDewitt, P-21-307
VJDang, P-21-313
RLHaueter, P-11-105B
CSKeeley, P-14-434A
CQHills, P-14-232
GJHartman
Big Rock Point Plant
WPCooke, P-14-233A
MCPatel, P-14-229
RLWilson, P-14-231

A meeting was held at Suntac Nuclear Corp. of Rockville, Maryland, on Wednesday, May 9, 1973. The following personnel were present:

Consumers Power Company	Suntac Nuclear Corp.
MCPatel	FDArrowsmith
FDNeri	JVIacono
	JCClapp
	RJStocky

Purpose

The purpose of this meeting was to discuss the construction and testing schedules for the fuel pool liner installation.

Discussion

1. Suntac was advised that a Quality Assurance Program would be instituted during the construction and testing phases. This change in direction is due to the possibility of the ECCS employing the pool. Suntac agreed and would plan on instituting the Catalytic ASME Procedures Manual.

   The QA requirements specified in Memo of January 29, 1973, Rang to Patel, was provided to Suntac.

2. Bechtel specs and drawing for the temporary enclosure ventilation system were submitted to Suntac for comment. CPCo requested comments by May 21, 1973, along with comments on liner plate installation specs and drawings previously submitted.

   Concerning the liner plate installation Spec C-172, Suntac stated that Heli-Arc Welding is the preferred method of the three options provided. Suntac will submit appropriate procedures and qualifications to CPCo by end of May.

INFORMATION COPY

676820

File
Big Rock Point Plant - CPO 5309
May 16, 1973

Suntac requested that vendor shop drawings of liner plate be forwarded for their review. CPCo will transmit as soon as received from Bechtel.

3. Schedule aspects were discussed. Highlights are as follows:

(a) December 31, 1973 is target completion date - Suntac believes job can be completed 4-6 weeks prior to this. Start date for liner installation is September 1.

(b) July 15, 1973 is scheduled date for Bechtel to have long lead items on the site.

(c) Erection of fuel pool enclosure to be completed about July 31 to allow for pool draining and decontamination by CPCo. Suntac suggested that pool decontamination be performed by Suntac to provide continuity to work force since liner installation is to start about September 1. Decontamination work would be done by Catalytic Laborers and CPCo could provide health physics monitoring. It was noted that no additional cost would be involved for the decontamination service. CPCo will consider these suggestions and advise shortly.

The Fuel Pool Radiation Survey contained in Memo of January 15, 1973, Axtell to Rang, was provided to Suntac.

(d) For transferring material into the containment a schedule will have to be established with the plant. Also, CPCo personnel will operate the cranes for Suntac and a day-to-day schedule should be established with the plant.

(e) Suntac construction schedule will be submitted for review by June 1.

4. Testing requirements for the pool were discussed. Suntac strongly recommended that vacuum box leak testing be included with the dye penetrant testing in view of the time required to fill and drain the pool. CPCo agrees with this recommendation.

5. A plant visit by Suntac personnel was tentatively scheduled for Monday, May 21.

676821

TO - File

FROM FMMacri, P-14-230

DATE November 7, 1973

SUBJECT Big Rock Point Plant
Spent Fuel Pool Liner Meeting Report
CWO 6248

Consumers Power Company

INTERNAL CORRESPONDENCE

CC WPCooke, P-14-233A
RBDeWitt, P-21-307
CJHartman, BRPP
CAHunt, P-14-420B
MCPatel, P-14-229
JSRang, P-21-313
RWRogness, P-14-419
RLWilson, P-14-231

A meeting was held in Jackson on Friday, October 26, 1973 with the following Consumers Power Co personnel in attendance:

CAHunt	MCPatel	RWRogness
FMMacri	JSRang	RLWilson

Purpose

The purpose of the meeting was to discuss the fuel pool liner floor design and, in particular, the effect of the lead shielding plates on overall structural integrity.

Discussion

1. The fuel pool liner floor design consists of two 1/2-inch thick lead sheets, 6 inches of new concrete, and the 3/16-inch stainless steel plate. The presence of the lead has raised doubts as to the structural integrity of the design. Specifically, it has been postulated that the installed lead sheets may form gaps and voids between lead and existing concrete which could cause cracking of the concrete and possible liner failure, particularly in areas of high stress such as the fuel cask loading area. The purpose of the lead is to cover intense radiation areas on the fuel pool floor which cannot be removed by nominal decontamination methods. Thus, the lead provides radiation shielding for the construction crew while working within the pool. It had been suggested that the lead plates be placed in a layer of wet mortar as a means to minimize surface irregularities. This, however, adds greatly to the construction effort and, to some extent, defeats the purpose of providing lead shielding. Based on the following points, it was concluded that the design as shown is satisfactory and no changes are required.

A. The lead plates are in good condition in that they have flat surfaces, straight edges, and sharp corners. The possibility of having gaps and voids between sheets is remote, since the pool floor is totally covered by six inches of concrete thus encapsulating all of the lead. If any gaps are present between horizontal layers, the poured concrete will fill while initial irregularities between vertical lead layers will be compensated for by the lead conforming to the underlying surface due to its weight and that of the concrete.

B. In the cask loading area, the design is adequate for receiving the 60-ton cask. The cask loading plate must be utilized as before to protect the liner from concentrated loads. The pad will be re-used or replaced as required.

C. For the cask-crane accident condition, no special features have been provided for in the liner design. However, the presence of the liner does not increase the hazards of this accident from that which previously existed.

2. Although the design drawings indicate complete covering of the floor with one inch of lead, it was concluded that this is not necessary, ie lead is only required in the areas where radiation hot spots are present. From a structural standpoint, the difference between floor areas containing six inches of concrete and one inch of lead or just seven inches of concrete is insignificant.

TO FMMacri, P-14-230

FROM JSRang, P-21-313

DATE October 8, 1973

SUBJECT Spent Fuel Pool Project - ECCS Modification

CC CJHartman, Charlevoix
CRAbel, Charlevoix

Consumers Power Company

INTERNAL CORRESPONDENCE

Rang 153-73

File 30100, ECCS

Copy JFP Luiz correspondence

This confirms our telecon of October 2, 1973 in which an apparent misconception was discussed concerning one phase in the construction of the spent fuel pool liner project. Specifically, the lead sheets are to be placed over the existing pool floor only if additional shielding is required for the workman beyond that generated by the six inches of concrete. The shielding requirements cannot be determined with any degree of accuracy until after the pool is nearly emptied of water. At this time, readings will be taken to determine the radiation exposures expected in the pool floor area.

C. R. Abel has raised another question, which I must apologize for not addressing sooner, and that is should the lead sheets be required on the floor, does the possibility exist for cracking of the liner plate where heavy objects, such as the 60-ton spent fuel cask, will be positioned? It appears that gaps could be formed above the lead sheets after a time period since it is difficult to position two layers of lead sheets in a level plane without forming ridges and air pockets and thus allow the concrete poured above the lead sheets to crack and settle. This, in turn, would cause a gap between the liner plate and concrete to occur which, if excessive, could allow the liner plate to crack when heavy loads are placed on it.

This also confirms, as mentioned in our telecon of October 2, that both the Operations Department as well as the Big Rock Plant recommends that of the two locations offered, the ECCS blowdown tank be located in the area next to the personnel lock, providing, of course, the support structure will be able to withstand this additional weight.

0758811

1-JSRang
1-RWRogness } 10/17/73

To FMMacri, P-14-230

From CAHunt/RWRogness, P-14-419

Date October 17, 1973

Subject Big Rock Plant
Spent Fuel Pool Liner

CSH
RA
File - SFP Liner "Correspondence"

Consumers Power Company

INTERNAL CORRESPONDENCE
Design 100-73

cc

We have investigated the potential failure noted in JSRang's letter. We find the floor to be safe under static conditions but that a problem could arise under some conditions while placing the cask in the pool.

(1) The voids under the lead plates could be eliminated by placing the lead sheets in a mortar bed originally to secure uniform bearing. This would require painting the plates per Note 8 before placing.

(2) The Plant was contacted for some information during the investigation, during this conversation we were told the cask pad had been removed from the pool and the Plant had no plans to replace it. We feel the pad should be replaced to protect the floor liner plate from concentrated loads. Additional pads should be considered as well to prevent damage from sharp-edged tools and equipment used in the pool.

(1) DISCUSSED THE SUGGESTION OF PLACING LEAD IN MORTAR BED W/ CATALYTIC & BECHTEL BECAUSE THE LEAD PLATES ARE IN GOOD SHAPE, IE, FLAT, STRAIGHT EDGES & SHARP CORNERS. CATALYTIC BELIEVES THIS IS NOT NECESSARY - AT MOST THEY RECOMMEND INSPECTING THE EXISTING FLOOR AND, IF NECESSARY, APPLY CONCRETE TO SMOOTH OUT IRREGULARITIES. CONCRETE WOULD BE ALLOWED TO CURE PRIOR TO LEAD PLACEMENT. BECHTEL IS CONSIDERING THE SUGGESTION AND WILL ADVISE OF THEIR OPINION, ALTHOUGH THEIR IMMEDIATE REACTION WAS NOT TO DO THIS. BOTH RECOMMENDED THAT LEAD SHOULD BE PLACED OVER ENTIRE FLOOR TO MINIMIZE VARIATION IN (FLOOR) DEFLECTION DUE TO [redacted] DIFFERENCES IN MATERIAL THICKNESS.

GENERATING PLANT
OCT 13 1973
MODIFICATIONS DEPARTMENT

(2) PAD MUST BE INSTALLED - WE ARE PLANNING TO REUSE EXISTING IF IN SATISFACTORY CONDITION OR TO REPLACE WITH NEW.

7MM
10/17/73

0750882

Bechtel Power Corporation

Interoffice Memorandum

To: E. P. May

Subject: Consumers Power Company
Big Rock Point Plant-Job 10211
Spent Fuel Pool Liner
File: 0480, M-4, C-171

Date: August 20, 1973

From: B. N. Pusheck

Of: SF Power

At: 16 Beale/2nd Flr.

Copies to: R. B. Madayag
H. O. Minkowski

Enclosure: 1) Consumers 8/17/73 letter

In accordance with the instructions in Enclosure 1), please notify accounting to proceed with payment for the following approved invoices:

a. P.O. 10211-C-171 (Kootar) invoice No. 20016 for amount of $48,591.00

b. P.O. 10211-M-4 (Flanders Filters) invoice No. 73-1157 for amount of $1,044.00

Hold payment on Westinghouse Electric Corp. invoice No. MJ 91658 for $190.00 until order is complete and material is received and approved.

In accordance with Consumers previous instructions, Bechtal should submit billing for reimbursement to Consumers Power Company's accounting department.

B. N. Pusheck

B. N. Pusheck
Project Engineer

BnP:arr

INFORMATION COPY

JSR

This work is proceeding, Copy is forwarded for the full work.

Russ

Bechtel Power Corporation
Engineers—Constructors

Fifty Beale Street
San Francisco, California
Mail Address: P.O. Box 3965, San Francisco, CA 94119

May 3, 1973

4 Cy
3016

Consumers Power Company
1945 West Parnall Road
Jackson, Michigan 49201

Attention: Mr. M. C. Patel

Subject: Consumers Power Company
Big Rock Point Plant-Job 10211
Spent Fuel Pool Modifications
Estimate
File: 0270, 0190, C-171YR

GENERATING PLANT
MAY 7 1973
MODIFICATIONS
DEPARTMENT

Reference: a) Telecon M. Patel to B.N. Pusheck, 4/18/73
b) Bechtel letter of 4/12/73
c) Bechtel letter of 3/16/73

Gentlemen:

As requested in Reference a), we have obtained quotations from Nooter Corp. for cancellation of the liner plate purchase order for the following dates:

Cancellation on May 15, 1973	$38,000 plus handling cost for material disposal
Cancellation on July 15, 1973	$49,800

Liner purchase is proceeding in accordance with Purchase Order No. 10211-C-171-AC, Rev. 1, dated April 4, 1973. Shop detail drawings are expected this week.

In order to incorporate changes due to increased cost of the liner plate purchase and to design development, we have reviewed the definitive estimate transmitted by Reference c). Our review indicates an increase of $20,000, is required for the pool liner. The estimate for the other three categories of work remains unchanged. Of the increase, $9700 is due to cost of the liner plate purchase, the remaining increase reflects the current design as indicated by the drawings and specification transmitted to you by our letter of Reference b). With the exception of the

current design drawings and specifications, basis of the estimate is unchanged from that stated in our letter of Reference c).

The revised estimate is as follows:

Temporary Cover Over Pool	$ 50,000
Lead and Concrete Shielding on Floor of Pool	70,000
Pool Liner	130,000
Bechtel Engineering and Home Office	50,000
TOTAL PROJECT	$ 300,000

If you have any questions regarding the estimate, please advise me.

Very truly yours,

B. N. Pusheck

B. N. Pusheck
Project Engineer
Bechtel Associates
Professional Corp.

BNM/ma

Bechtel Power Corporation
Engineers—Constructors
Fifty Beale Street
San Francisco, California
Mail Address: P.O. Box 3965, San Francisco, CA 94119

May 8, 1973

Consumers Power Company
1945 West Parnall Road
Jackson, Michigan 49201

Attention: Mr. M. Patel

Subject: Consumers Power Company
Big Rock Point Plant Job 10,211
Spent Fuel Pool Modifications
Liner Plate Purchase
File: 0270, C-171 YL

Enclosure: 1) Nootar Corp. Letter
dated April 30, 1973

Gentlemen:

Transmitted for your information is letter, Enclosure 1), confirming Nootar Corporation's quotes for furnishing liner plate, leak detection system tubing, and channels. Included in the letter are cancellation changes for May 15 and July 15.

Very truly yours,

B. N. Punheck
Project Engineer
Bechtel Associates
Professional Corp.

HCM/ace
Encl.

INFORMATION COPY

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TO: ENGRG.
EST.

DATE: MAY 2 1973
FROM: BECHTEL PURCHASING

POWER DIVN. R. P.

GENERATING PLANT
MAY 11 1973
MODIFICATIONS DEPARTMENT

April 30, 1973

Bechtel Corporation
Engineers - Constructors
P. O. Box 3965
San Francisco, California 94119

Attention: Mr. John E. Baker

Reference: Bechtel Job No. 10211
Consumers Power Company

Gentlemen:

This is to confirm our earlier TWX's dated March 27, 1973 and April 30, 1973, concerning the above reference job.

We are pleased to quote you for furnishing the following materials:

1 Lot	- 3/16" Type 304 stainless steel linerplate, hot rolled, annealed and pickled with [illegible] clear finish.		$37,500.00
1 Lot	- 3/16" Type 304 stainless steel plate formed corners with 1½" inside radius.		$ 3,000.00
20 LF	- 3/16" Type 304 stainless steel plate liner for overflow weir and trough.		$ 3,000.00
1 Lot	- Miscellaneous Type 304 stainless steel shapes and plate and 1½" diameter pipe rail.		$ 3,100.00
1 Lot	- Temporary peelable paper covering.		$ 1,000.00
320 LF	- 3/8" O.D. x 0.035" wall tubing Type 304 stainless steel.	LOT	$ 2,200.00
320 LF	- 1/2" bent plate channels, 1½" wide web with varying height flanges, ASTM A-36 steel.		

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COPY

Thank you for this opportunity to quote on your requirements.

Yours very truly,

HOOTER CORPORATION

Robert H. Stockhams
Sales Engineer

RHS/nf

INFORMATION COPY

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COPY

COPY

MAY 13 1974

May 8, 1974

Consumers Power Company
1945 West Parnall Road
Jackson, Michigan 49201

Attention: Mr. F. Macri

Subject: Consumers Power Company
Big Rock Point Plant-Job 10211
Original Drawing Transmittal
File: 0270, 0815

Reference: a) Transmittal Form No. P&I 84760

Gentleman:

In accordance with prior agreement, we are transferring custody of the original Bechtel drawings listed below to Consumers Power Company. We are transmitting them under separate cover with Reference a). We will retain a microfilm of each of these drawings for our records. We understand Consumers Power Company will make as-built revisions to the drawings to reflect changes, if any, made during construction.

Drawing No.	Rev. No.	Title
C-1	4	Spent Fuel Pool Liner Plate, Plans & Elevations
C-2	4	Spent Fuel Pool Liner Plate, Sections & Details
C-3	1	Temporary Enclosure For Spent Fuel Pool; Plan, Section & Details
M-100	0	Temporary Fuel Pool Ventilation Exhaust System

Very truly yours,

B N Pusheck

B. N. Pusheck
Project Engineer
Bechtel Associates
Professional Corp.

BNP/ma

INFORMATION COPY

Bechtel Power Corporation

Please advise us if you require copies of shop detail drawings mailed to you for coordination with the installation contractor. Naturally, we will review the shop drawings and we request that any comments generated by Consumers or the contractor be coordinated through Bechtel.

Very truly yours,

B N Pusheck

B. N. Pusheck
Project Engineer
Bechtel Associates
Professional Corp.

HOM/ma

INFORMATION COPY

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BUSHKOFF

AMERICAN PIPE & STEEL CORPORATION

ATLANTIC 9-4383

CUMBERLAND 3-2181

2201 COMMONWEALTH. P.O. BOX 191. ALHAMBRA. CALIFORNIA — 91802

34881-2400-5-121

October 29, 1973

Mr. E. G. Baldi
1528 Walnut Street
Philadelphia, Pennsylvania 19102

Dear Mr. Baldi:

Enclosed find a copy of the Packing List, Parts List and Maintenance Instructions for your Order #34491-2400.-5

These additional copies were requested by Mr. W. Jones.

Very truly yours,

R. D. Butler

Enclosures

0791127

Bechtel Power Corporation
Engineers – Constructors
Fifty Beale Street
San Francisco, California
Mail Address: P.O. Box 3965, San Francisco, CA 94119

April 11, 1973

Consumers Power Company
1945 West Parnall Road
Jackson, Michigan 49201

Attention: Mr. M. C. Patel

Subject: Consumers Power Company
Big Rock Point Plant-Job 10,211
Spent Fuel Pool Modifications
Liner Plate Purchase
File: 0270, C-171 YR

Reference: a) CPCo. letter, March 7, 1973
b) Telecon, M. Patel w/B. Pusheck
March 21, 1973

Gentlemen:

In accordance with your direction contained in Reference a), negotiations have been carried out with Nooter Corporation to furnish liner plate material for the subject work. As directed by you in the Telecon of Reference b), the purchase is to include furnishing of stainless tubing and carbon steel channels used in the leak detection system.

A quote of $49,300 was obtained from Nooter Corporation to furnish the material consisting of approximately 33,000 lbs. 3/16" type 304 stainless, steel plate with Nuclear finish, (similar to that used for Palisades) including miscellaneous shapes and attachments, and 320 lineal feet each of stainless steel tubing and carbon steel channels. Shipment of all items to the site is expected to be completed on or before July 15, 1973.

We find the terms of the quotation to be acceptable and in accordance with your instructions of Reference b), a purchase order has been issued to Nooter in the amount of $49,800. In accordance with the order, Nooter has proceeded with ordering of the liner plate material.

STRAIGHT BILL OF LADING – SHORT FORM – Original – Not Negotiable.

Yellow Frgt.

SHIPPER'S NO. 41688

CARRIER

CARRIER'S NO.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading.

AT Alhambra, CA 19 73 FROM American Pipe & Steel Corp.

CONSIGNED TO Suntac Nuclear Corp.

DESTINATION c/o Consumers Power Co. STATE Michigan COUNTY Charlevoix

DELIVERY ADDRESS Big Rock Point Plant Modification Dept. Attn: Robert Fisher - Field Supt.

ROUTE

DELIVERING CARRIER VEHICLE INITIALS NO

NO. PKGS	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, SPECIAL MARKS	WEIGHT	CLASS OR RATE	CHECK COLUMN
2	1 - A-100 American Vacuum Seam Tester w/A-100 Inspection Box Electric Motor			
	1- Spare A-100 Gasket			
	1/2 pt. Contact Cement			
	P.O. #34491-240075			

To Be Prepaid

If this shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.

NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

per

The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Uniform Freight Classification.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

8-10

(2)

American Pipe & Steel Corp. Shipper, Per _____ Agent, Per _____

2201 W. Commonwealth Ave. Alhambra, CA

(1)

ditype 683

076128

F11111

SUNTAC NUCLEAR

SUNTAC NUCLEAR CORPORATION

1525 WALNUT STREET • PHILADELPHIA, PA. 19102 • (215) 546-8950

1 October 1973 SUFP-6

Consumers Power Company
Room P-14-226
1945 West Parnall Road
Jackson, Michigan 49201

ATTENTION: F. M. Macri
Engineering Coordinator

SUBJECT: Consumers Power Company
Big Rock Point Plant Modifications
Spent Fuel Pool Liner

REF: CPC-GWO-6248
SUNTAC Contract #34881

Dear Frank:

Enclosed are five copies of SUNTAC Specification No. 34481-RCP-402: Decontamination Procedure for Spent Fuel Pool, Revision 1. The revision of this procedure consists of the deletion of the drum weight limit of 880 pounds which was contained in the last sentence of section 5.1, page 7.

This weight limit had been included in the original specification since it was previously assumed the particulate trapped in the filter and strainer would be a Type B quantity of normal form radioactive material. On this assumption, maximum 55 gallon drum weight allowed by 49 CFR, Part 178 is 880 pounds. Since the particulate will be contained in a sealed filter housing which in turn will be completely encased in concrete, it can be assumed to be special form material. This then, is a Type A quantity of radioactive material which has no weight limit per container.

Your approval of Revision #1 is hereby requested.

Very truly yours,

H. C. Bushkoff

H. C. Bushkoff
Project Manager

HCB/dew
ENCLOSURE
CC: R. Wilder
E. Turner
R. Fisher
File

0761 52

05311-670SP

INTER-OFFICE MEMO

CATALYTIC, INC.

C&A File - Spent Fuel Pool Relining - correspondence

TO: H.C. Bushkoff AT 1528 Walnut St. Philadelphia, Pa.

FROM: R.J. Fisher AT Charlevoix, Mich.

DATE: 14 September 1973

COPY TO: W. Clark CP
C.J. Hartman CP
J.V. Iacono
F.M. Macri CP
G.C. Tyson CP

SUBJECT: Work schedule for the week ending September 26, 1973

On Thursday September 13, 1973 a meeting was held between Consumers Power Co. and Suntac Nuclear Corp. for the purpose of discussing the work which is scheduled to be accomplished at the Big Rock Point plant during the week ending September 26, 1973. The Consumers Power Co. was represented by Misters C.J. Hartman, W. Clark and G.C. Tyson. Suntac Nuclear Corp. was represented by Mr. R.J. Fisher. The Kelly closure installation around the spent fuel pool is to be completed by mid-week. The completion of this enclosure depends on the progress made by Consumers Power Co. in completing the removal of hardware in the spent fuel pool. The foundation platform for the H & V system is scheduled to be completed on Friday September 14, 1973. The H & V subcontractor (Arms & Cole, Inc.) indicated that he would be at the Big Rock Point plant about mid-week to start installation of the H & V system. However, a later conversation with him indicated that this date might slip a day or two. He stated he was estimating a completion date of October 1, 1973 for the H & V sytem installation. Suntac will make every effort to improve this completion date for the H & V system. The preparation of the fitters for installation into the 55 gallon drums of concrete and the fitting out of the decontamination pump will be worked. The qualification of the welding procedure will start during this week.

In conclusion it would appear at this point in time that the completion of the H & V system is the controlling job , because it was felt that this system must be in operation before any decontamination work began on the spent fuel pool.

R.J. Fisher

R.J. Fisher
Suntac Nuclear Corp.
Project Superintendent

RJF/lkh

0758894

BECHTEL ASSOCIATES
PROFESSIONAL CORPORATION

TECHNICAL SPECIFICATIONS

FOR

SUBCONTRACT FOR

PURCHASE AND FIELD ERECTION OF

LINER PLATE FOR SPENT FUEL POOL AREA

FOR THE

CONSUMERS POWER COMPANY

BIG ROCK POINT PLANT

CHARLEVOIX, MICHIGAN

NO.	DATE	REVISIONS	BY	CHK	APP'D
		Issued for client approval			
		Issued for design			

676903

JOB NO.

REV.

SHEET OF

TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS

FOR

SUBCONTRACT FOR

PURCHASE AND FIELD ERECTION OF

LINER PLATE FOR SPENT FUEL POOL AREA

FOR THE

CONSUMERS POWER COMPANY

BIG ROCK POINT PLANT

CHARLEVOIX, MICHIGAN

TOTAL PRICE delivered FOB our jobsite Charlevoix, Michigan. $49,800.00

TERMS: Net thirty (30) days.

The above quoted prices have been estimated on the following basis.

1. Nooter would take no exceptions to Bechtel General Conditions dated May, 1968.

2. Nooter proposes to use welding processes and welding operators previously qualified for this type of work. Procedural and welder qualifications, if required, would be done as an extra to the purchase order.

3. The 320' of 3/8" O.D. tubing would be furnished in straight random lengths for fabrication in the field by others.

4. The 320' of carbon steel monitoring channel would be furnished in random length pieces not exceeding 10'.

Ok this is out

5. The formed corner piece (straight lengths) would be furnished in two pieces per wall, corner and floor to wall corner. Three-way formed corners will be furnished in one piece per the drawing.

Per Telecon with Mario on 5/2/73 this will be O.K. S.S.

6. The formed section of linerplate as shown in Detail 5 of Bechtel Drawing C-2 will be fabricated in the shop to "as-built" pool dimensions and furnished in two 10' pieces.

DELIVERY: At the present time, we anticipate receipt of the necessary mill material approximately eight (8) weeks after receipt of an order.

Drawings can be submitted four (4) weeks after receipt of your order.

Shop fabrication will require approximately five (5) weeks after receipt of material or final approved drawings, whichever is the later.

Approximately one (1) week should be allowed for shipment of material at the jobsite.

In addition to the above, the following cancellation charges would apply.

Cancellation date - May 15, 1973 - Cancellation charge - $38,000.00.

Cancellation date - July 15, 1973 - Cancellation charge - $49,800.00.

APPENDIXES

A FORM G-321-C, DRAWING AND DATA REQUIREMENTS

TECHNICAL SPECIFICATIONS

FOR

SUBCONTRACT FOR

PURCHASE AND FIELD ERECTION OF

LINER PLATE FOR THE SPENT FUEL POOL AREA

1.0 WORK INCLUDED

The work includes detailing, furnishing of materials, fabrication, delivery, erection and testing of a complete liner plate system.

2.0 RELATED WORK NOT INCLUDED

The following items of work are not included:

a. Spent Fuel Pool Decontamination
b. Furnishing and Installing Lead Shielding
c. Furnishing and Placement of Concrete Shielding

3.0 ABBREVIATIONS

ASME – American Society of Mechanical Engineers
AISC – American Institute of Steel Construction
ASTM – American Society for Testing and Materials
SNT – Society for Non-Destructive Testing

4.0 CODES AND STANDARD SPECIFICATIONS

Except as otherwise specified herein or shown on the drawings, materials, fabrication, erection, and testing shall be in accordance with the following codes and standard specifications to the extent indicated by references herein.

ASME — Section III, Boiler and Pressure Vessel Code, 1971 Edition and Addenda of Summer 1971, Winter 1971, and Summer 1972

ASME — Section VIII, Division 1, Boiler and Pressure Vessel Code, 1971 Edition and Addenda of Summer 1971, Winter 1971, and Summer 1972

AISC	Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, February 12, 1969, Supplement No. 1, November 1, 1970, and Supplement No. 2, December 8, 1971.
ASME	Section IX, Boiler and Pressure Vessel Code, 1971 Edition and Addenda of Summer 1971, Winter 1971, and Summer 1972.
ASTM A 36-70a	Standard Specification for Structural Steel
ASTM A 108-69	Standard Specification for Cold-Finished Steel Bars and Shafting
ASTM A 167-70	Standard Specification for Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A 240-71	Standard Specification for Stainless and Heat Resisting Chromium and Chromium-Nickel Steel Plate, Sheet, and Strip for Fusion-Welded Unfired Pressure Vessels
ASTM A 276-70	Standard Specification for Stainless and Heat Resisting Steel Bars, and Shapes
ASTM A 479-71	Standard Specification for Stainless and Heat Resisting Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels
ASTM A 480-70	Standard Specification for General Requirements for Delivery of Flat-Rolled Stainless and Heat Resisting Steel Plate, Sheet, and Strip
ASTM A 480-71	Standard Specification for General Requirements for Delivery of Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
SNT-TC-1A	Supplement D, Recommended Practice

5.0 DRAWINGS

5.1 The Contractor will furnish prints of reproducible engineering design drawings for each part of the work covered by these Specifications which will give all pertinent data required for shop fabrication drawings. The Contractor reserves the right to issue supplemental or revised drawings, and such drawings shall supersede portions of these Specifications.

5.2 The Subcontractor shall furnish drawings and data in accordance with Form G-321-C. Erection drawings shall show piece marks as well as all details required for the field erection of the liner plate.

5.3 Titles of the detail drawings and erection drawings shall correspond with those of the Contractor's design drawings, and the purchase order number shall be shown on each sheet.

5.4 Approval of detail drawings by the Contractor will not relieve the Subcontractor of responsibility for the completeness and accuracy of all dimensions and details.

5.5 Detail and erection drawings shall bear the stamp of approval of the Contractor before fabrication of any material is commenced. If fabrication is started prior to approval, any change which may be required shall be at the Subcontractor's expense.

6.0 FURNISHED MATERIALS AND EXISTING CONDITIONS

6.1 Materials shall conform to the requirements of the standard specifications listed below:

a. Stainless steel plate and pipe shall be type 304, .05 maximum carbon and conform to ASTM designation A167 or A240 and shall be cold-rolled, annealed, pickled, with No. 2D Finish. All plate furnished under this Subcontract shall conform to the sample submitted by the Subcontractor prior to fabrication and approved by the Contractor. 5

b. Stainless steel bars and shapes shall be Type 304, .05 maximum carbon and conform to ASTM designation A276 or A479, and shall be hot finished, annealed and pickled.

c. Certified copies of the mill test reports of the liner plates, as specified by the applicable ASTM specification shall be submitted.

6.2 Prior to commencing erection of liner plate in any area the Subcontractor shall inspect the existing conditions for compliance with the design drawings and these specifications. Concrete surfaces and embedded items which fail to meet the requirements of the drawings shall be reported to the Contractor 10 days in advance of erection of liner plate to allow the Contractor to make the necessary correction.

6.3 The Contractor in the presence of the Subcontractor will inspect all deficiencies reported by the Subcontractor. The Contractor will either correct the deficiencies or authorize the Subcontractor to take corrective measures which will be paid for as extra work. Failure on the part of the Subcontractor to report any existing conditions which do not meet the requirements shall [illegible] the Subcontractor [illegible] requirements of these specifications.

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7.0 FABRICATION

7.1 Where indicated on the drawings, liner plate shall be fabricated into preassembled modules.

7.2 Cutting, forming, welding and handling of plates shall be performed under the supervision of personnel experienced and qualified in working with the specified materials.

7.3 Stainless steel liner plate shall be formed cold. The minimum radius for corners shall be 1 inch.

7.4 Welding shall conform to the requirements of Section 9.0, and as shown on the drawings.

7.5 Holes for penetrations shall be cut as shown on drawings. Edges and adjacent surfaces shall be smooth, uniform, and free of fins, tears, cracks and other defects which would adversely affect the quality or strength of a weld.

7.6 Tolerances

a. Stainless steel liner plates delivered to the jobsite as cut plate or preassembled modules shall not exceed the tolerances stated in ASTM designation A-480 for width, length, camber and thickness.

7.7 All fabricated pieces shall have identifying piece marks, and these piece marks shall be clearly located on erection drawing furnished by the Subcontractor. Piece marks shall be made with waterproof paint or metal tags, and shall be placed on the plate side that will not be exposed after erection.

7.8 Material improperly detailed or wrongly fabricated, so that its erection in the field necessitates extra work, shall be the responsibility of the Subcontractor, who shall pay the entire cost for correction of shop errors and the replacement of wrongly fabricated materials.

8.0 ERECTION

8.1 Subcontractor shall submit an outline of the erection procedure he proposes to use and the method of temporarily supporting liner plate to maintain the proper surface alignment. All construction methods and equipment used by the Subcontractor are subject to the prior approval of the Contractor insofar as [illegible] effect on the conduct or safety of other work on the jobsite is concerned. Particular care shall be taken in field handling and installing of liners to avoid [illegible] scratching and damage to edges.

8.2 Prior to placing liner plates, the [illegible] embedded [illegible] and other [illegible] attachments shall be in a thoroughly clean condition, free of [illegible] cement [illegible] or other [illegible] the liner [illegible].

8.3 Field measurements indicate walls of the Spent Fuel Pool deviate from the alignment shown on the drawings. Liner plate installed against the existing concrete surfaces shall form a continuous smooth surface following the contour of the concrete. Liner plate shall be pushed against the walls to minimize the gap between the plate and the wall prior to welding of the liner in the pool.

9.0 WELDING

9.1 All welding Procedures and Performance Qualification Tests shall be qualified in accordance with Section IX of the ASME Code. In addition, the procedure qualification test plates shall be radiographed before sectioning. Performance qualification may be done by radiography or destructive testing. Production welding shall not be performed prior to Contractor's approval of welding procedures and procedure qualification records.

9.2 All seam welds shall be full penetration butt welds, except where shown otherwise on the drawings. Fillet welds where shown on drawings shall blend smoothly with the base material and be of uniform size.

9.3 All seam welds shall have a minimum of 2 passes except square edge welds with back-up strips shall have a minimum of 3 passes. The abutting ends of backing strips, when used shall be made continuous by welding.

9.4 Butt welds without backing strips shall be welded from both sides. The second side shall be prepared to sound metal by arc gouging, chipping, or grinding before welding. If arc gouging is used, the surfaces shall be ground to clean, sound metal prior to welding the second side.

9.5 Plates and pipe segments jointed by butt welding shall be matched accurately and retained in position during welding operations. Misalignment in a flat plane across completed joints shall not exceed 1/16 inch.

9.6 All welding performed under these specifications shall be in accordance with procedures specifically approved for the work, and by welders qualified to that procedure.

9.7 All seam welds shall be made by one of the following processes:

(a) Gas Tungsten Arc

(b) Shielded Metal Arc

(c) Gas Metal Arc in the spray transfer mode

(d) Other processes will not be [illegible] unless Subcontractor's ability to use the processes is proved to the Contractor's satisfaction. [illegible] submitted to the Contractor shall include [illegible] details of Subcontractor's proposed welding [illegible] and [illegible] for the specified application [illegible]

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9.8 The Subcontractor shall maintain records showing extent of each welder's work, including weld preparation, welding process, and welding procedure.

9.9 Workmanship and visual quality of welds shall be uniform in width and size throughout their full length. The minimum gap of all butt welds shall be 3/16 inch and maximum gap shall be 1/2 inch. During the course of the work, the need may arise for modification of the gap. This modification shall be submitted to the Contractor for review and approval.

9.10 Filler metal for austenitic stainless steel welds shall be Type 308L selected and controlled to produce weld deposits with 8-25% ferrite as determined by the Schaeffler Diagram, or a magnetic ferrite indicator.

9.11 Each layer of welding shall be sufficiently smooth and free of slag cracks, pinholes, lack of penetration, and completely fused to the adjacent weld beads and base material so as to facilitate the proper application of the subsequent weld layers. In addition, the cover pass shall be free from coarse ripples, irregular surfaces, deep ridges or valleys between beads. Slight undercut not exceeding 1/32 inch in depth for up to 3 inches in 12 inches of weld length will be permitted.

9.12 Repair or chipping of welds, if required, shall be done in such a manner as not to gouge, groove, or reduce the thickness of the adjacent base metal by more than 1/32 inch.

9.13 Welds shall be cleaned by brushing with austenitic stainless steel brushes which have not been used on carbon or low alloy steels.

9.14 Grinding of welds, where required, shall be done with aluminum oxide or silicon carbide grinding wheels which have not been used on carbon or low alloy steels.

9.15 Injurious surface defects, such as caused by removal of temporary attachments, arc-strikes and mechanical damage shall be ground to sound metal. Any surface imperfection, the removal of which reduces the plate thickness by 1/32 inch or more shall be repaired by welding, using the gas tungsten arc process.

9.16 All weld repairs and areas where temporary welds have been made shall be suitably ground, and tested in accordance with these specifications.

9.17 One sample of weld, 12 inches in length, shall be submitted to the Contractor for each different welding process before the start of the work. These samples shall be indicative of the minimum acceptable weld surface finish, and will be used to judge the acceptability of subsequent work. This requirement may be waived where Subcontractor has previously performed the same type of work for Contractor and has established a record of satisfactory performance.

9.18 Peening shall not be used without the written approval of the Contractor.

10.0 WELDING EXAMINATION

10.1 All welds shall, where possible, be tested by the vacuum box method. The liquid penetrant test shall be performed only where the vacuum box test is not possible.

10.2 Vacuum box testing shall conform to the following minimum requirements.

a. The vacuum box shall be portable and have a viewing window large enough to review the comp[illegible] at [illegible], and to allow sufficient light to enter the box for proper examination. The [illegible] shall be capable of producing and holding a pressure differential of at leas[illegible] si. A gauge shall be placed in the system to verify the required pressure differential and to detect leaks in the equipment.

b. The leak detection solution shall be either LEAKTEC No. 577-V (American Gas & Chemicals, Inc.) or Leakseek (Newage Industries, Inc.) or other soap free, specially prepared solution as approved by the Contractor. The bubble forming properties shall be checked against a known leak at least every 4 hours during testing.

c. The test area shall be cleaned free of slag, scale, grease, paint or any other materials which would interfere with the testing procedure or the interpretation of the test.

d. The leak detection solution shall be applied evenly over the entire test area. The solution shall not be applied more than one minute prior to testing.

e. The vacuum box shall then be put in place and evacuated to at least a 5 psi pressure differential with respect to the atmospheric pressure.

f. The 5 psi minimum pressure differential shall be verified by the gauge and maintained for a minimum time of 30 seconds. The solution shall be continuously observed for bubbles from the time evacuation of the box begins until 30 seconds after the required vacuum has been obtained.

10.3 Liquid Penetrant Testing

a. Liquid penetrant examination shall be performed daily on welds completed in the preceding 24 hours. Examination shall show no cracks or linear indications, and no rounded indications exceeding 3/32 inch.

b. Liquid penetrant testing shall be performed in accordance with Appendix VIII, Section VIII, Division 1, of the ASME Boiler and Pressure Vessel Code and the following specific requirements. Liquid penetrant testing shall be by the solvent removable method. The penetration time shall be at least 10 minutes. The drying time shall be at least 5 minutes. The examination shall be made not sooner than 7 minutes nor later than 30 minutes after the developer has dried. Acceptance standards shall comply with Paragraph NB-5352, Section III of the ASME Code, except that rounded indications with dimensions exceeding 3/32 inch are not acceptable.

c. Personnel performing liquid penetrant examinations shall be qualified in accordance with SNT-TC-1A, Supplement D, and their qualification records made available upon request.

10.4 Hydrostatic Testing

At the completion of erection and testing of all welds in the liner plates, the pool shall be filled with water by others to the operating level and left to stand for 48 hours, so that leak tightness can be tested by the Subcontractor through monitoring channels. The water used shall be unchlorinated clarified water. After the test is completed the pool shall be drained by the Subcontractor.

10.5 Repair of Leaks

a. When a leak is detected as a result of any of the above tests, the leak shall be repaired by complete removal of the defect and rewelding. The repaired area shall be reinspected by testing in accordance with these specifications.

b. A complete record of the tests performed, repaired areas, and the reinspections shall be maintained by the Subcontractor and submitted to the Contractor for approval. A complete set of test records shall be submitted to the Contractor at the conclusion of the work.

c. Repair work on welds shall be done at the Subcontractor's expense.

11.0 INSPECTION

11.1 All material furnished by Subcontractor for erection and all erection operations including testing shall be subject to approval by the Contractor for conformity with these specifications.

11.2 The Contractor's Inspector shall be provided with free access at any time to all areas where work is progressing.

12.0 CLEANING

Pool side surface finish and cleanliness of welds and base metal shall be consistent with the specified material finishes. All surfaces shall be cleaned free of all mill scale, grease, dirt, weld spatter, and other foreign materials. Solvents containing halides shall not be used on stainless steel. Special care shall be taken to prevent iron contamination of the stainless steel surfaces. Wire brushes and grinding wheels used shall be new and free of iron. Wire brushes shall be of austenitic stainless steel and the grinding wheels shall be of aluminum oxide. Subcontractor shall submit a cleaning procedure to the Contractor for approval.

13.0 SHIPMENT AND STORAGE

13.1 Handling, shipping and storage shall be done in a manner that will avoid damage to the material, and that will protect the surface of the stainless steel plates. Materials shall be stored in a dry place.

13.2 If, in the opinion of the Contractor, any material is damaged to the extent that it is unsuitable for the intended use, it shall be suitably repaired, or replaced.

14.0 MEASUREMENT AND PAYMENT

14.1 Stainless steel liner plate will be measured in pounds for material delivered to the jobsite outside the containment in accordance with these specifications and drawings.

Payment will be made at the Contract price per pound for liner plate and will include full compensation for all materials, labor, equipment, tools, and incidentals involved in furnishing, fabricating, testing, and delivering to jobsite outside the containment.

14.2 Erection and testing of liner plate will be measured and paid for on a lump sum basis. Payment will be made at the contract lump sum price and shall constitute full compensation for furnishing all labor, materials, tools, equipment, and incidentals involved in transporting liner plate from storage area outside containment to work area inside containment and fabrication, erection and testing as specified herein and as shown on the drawings.

A				
B				
C				
D				
E				
F				
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J				
K				
L				
M				
N				
P				
R				

Q2022-R1-370P

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT PLANT
CLIENT: CONSUMERS POWER COMPANY
LOCATION CHARLEVOIX, MICHIGAN

CATALYTIC CONTRACT NO. 34881
SPECIFICATION NO. 34881-4200-306

APPROVED FOR CONSTRUCTION

SPECIFICATION

for

WELDING CARBON STEEL
STRUCTURAL MEMBERS

CONSISTING OF

SPEC. NO. SP-4200-CS-03A Rev. 0

REFERENCE ATTACHMENTS:

ITEM NUMBER	DESCRIPTION

APPROVED _____ DATE _____

APPROVED F. M. Mansi/ERD (CLIENT) DATE 9/12/73

APPROVED N C Peschken (CATALYTIC) DATE 9/5/73

PREPARED BY R J GOYNE (CATALYTIC) DATE 8/10/73

07 0113

AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
								3	
O(AFC)					RJG	EZT	DCO	NCP	9/17/73
B(F/A)					[illegible]	EZT	DCO	NCP	9/12/73
A(F/A)					RJG	EZT	NCP	NCB	8/10/73
	CLIENT				CATALYTIC, INC.				

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PREPARED BY	DATE	WELDING SPECIFICATION NO. SP-4200-CS-03A	
G.S. Cheruvuli	9/17/73	Page 1 of 5	
APPROVED BY	DATE	METAL-ARC WELDING CARBON STEEL PIPE	REV.
R. J. Coyne	17-SEP 1973		0

For Contract 34881 Only

1.00 PROCESS

1.01 This specification covers the welding of carbon steel using metal-arc welding. This procedure is qualified in accordance with ASME Code Section IX.

2.00 GENERAL REQUIREMENTS

2.01 All welders using these procedures shall be qualified in accordance with ASME Code Section IX.

2.02 The edges or surfaces of parts to be joined by welding may be prepared by sawing, machining, chipping, grinding, or flame cutting as shown in Section 7.00. The edges shall be cleaned of all slag, oil, grease, and excessive amounts of scale or rust to present a substantially smooth surface for welding.

2.03 The first bead shall give complete penetration and fusion without icicles or other excessive projections. Back-up rings shall not be used.

2.04 Tack welds shall be small and of the same quality and made by the same process as the root pass. Cracked or improper tacks shall be removed. All layers of welding, including tacks, shall have a good even appearance. There shall be practically no undercut on the side walls of the groove or the surface of the base material. The surface of each bead including the final pass shall be cleaned and any visible cracks, porosity, or slag removed by chipping, grinding or scarfing. Welds shall not be peened except for normal cleaning.

2.05 All repair welds shall be subjected to the heat treatment, examination and testing requirements of the original weld.

2.06 The receipt, storage, baking, drying and disbursal of all welding filler metals shall be maintained under strict control to assure that all completed welds conform fully to approved welding specification requirements.

2.07 Each weld shall be uniform in width and size throughout its ~~full~~ length and each layer of welding shall be smooth and free of slag, inclusions, cracks, porosity, lack of fusion and undercut (~~except~~ to extent permitted by the governing code). The lower pass shall be free of coarse ripples, irregular surface, non-uniform bead patterns, high crown and deep ridges or valleys between beads to the extent necessary to permit meaningful examination.

3.00 MATERIALS

3.01 The material to be welded shall be Type P - Number 1 as listed in Table Q-11.1, ASME Code Section IX.

3.02 The filler metal shall be ASME SFA 5.1 Class E-6010, ASME Group F3 electrodes as listed in Table Q-11.2, ASME Code Section IX, and shall be of quality equal to Fleetweld 5 (Lincoln) Airco 6010 (Air Reduction Co.) or AP-6010-IP (Air Products & Chemical Corp.).

4.00 WELDING PROCEDURES

4.01 All welding shall be performed substantially as shown in Section 7.00 using coated electrodes with direct current, reverse polarity. Procedures and welders qualification records shall be in reproducible form on formats similar to those shown in Section IX of the ASME Boiler and Pressure Vessel Code.

5.00 HEAT TREATMENT

5.01 Preheating is not normally required, but when temperatures are below 32°F the pipe shall be warmed before welding. Preheat temperature of 175°F to 275°F shall be required when the carbon content exceeds 0.30%.

5.02 Stress relieving is performed in accordance with code rules. ANSI and ASME Section I piping shall be stress relieved at joints where the pipe wall thickness is 3/4 inch and larger. Stress relief may be required for smaller than 3/4 inch thickness by some state, municipal, or client rules. When stress relieving is necessary it shall be shown on the Pipe Line Designation Table.

5.03 Carbon steel pipe shall be stress relieved at 1100 and 1200F for one hour per inch of thickness with one hour minimum, followed by cooling in still air. The maximum stress relief temperature shall not exceed the maximum specified by more than 100°F.

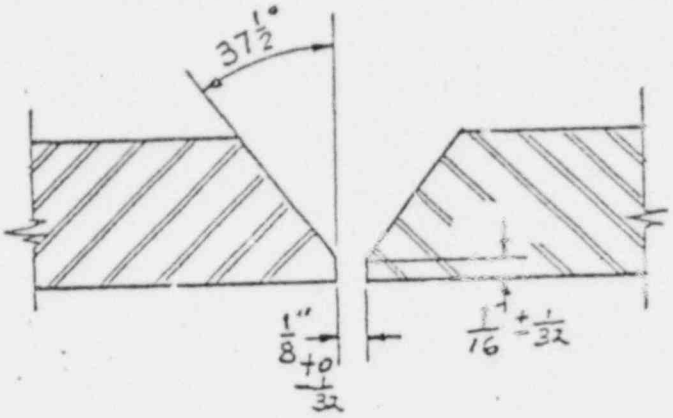
6.00 RADIOGRAPHY

6.01 Not normally required except by ASME Code Section I.

6.02 Radiography is required by ASME Code Section I when the following limitations are exceeded. (1) When pipe to contain steam exceeds 16-inch nominal pipe size or 1-5/8 inch thickness. (2) When pipe to contain water exceeds 10 inch nominal pipe size or 1-1/8 inch thickness. Where Radiograph is necessary, it shall be shown on the Pipe Line Designation Table.

7.00 PREPARATION OF BASE MATERIAL AND WELDING

7.01 Preparation of base material



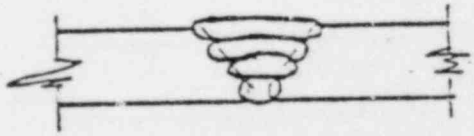
7.02 Welding

VERTICAL FIXED PIPE

Test position 2G

HORIZONTAL FIXED PIPE

Test position 5G



PASSES	ELECTRODE DIA.	AMPS.
1	1/8"	90-115
1/4" TK, 2-3 1/2" TK, 2-6 3/4" TK, 2-13	5/32"	115-140

CATALYTIC, INC.

PHILADELPHIA 2, PA.

CC-583 R1, 8/61

WELDING SPECIFICATION NO. SP-4200-CS-03 A

RECORD OF PROCEDURE AND PERFORMANCE QUALIFICATION TESTS

Record of Procedure (Procedure or Performance) Qualification Test

Welding Specification No. SP-4200-CS-03 Date 8-2-63

Welding Process Metal Arc Manual or Automatic Manual

Material Spec. A-106 (ASTM) Welded to A-106 (ASTM) of P-No. 1 to P-No. 1 (Qualifies for 3/16" to

Pipe Diameter and Wall Thickness 6" Schedule 80 (.864" wall thick.)

Filler Metal Spec. A-233 (ASTM) Weld Metal Analysis (A-No. 1) Filler Metal F. No. F-3

Flux Trade Name and Number (if submerged arc) --

Composition of nonconsumable electrode, if used --

Inert Gas Shield, if used; Composition -- Trade Name -- Flow Rate --

Preheat Temperature Range None Stress Relieving Time and Temp. None

Type of Backing Ring or Gas, if used None

Single or Multiple Pass Welding Multiple Single or Multiple Arc Single

Joint Dimensions Accord with SP-4200-CS-03, Par. 7.01

Welder: Name F. AECK Stamp No. A Test No.

Test Conducted by H. H. Hufford

Remarks E-6010 Weldrod

Reduced-Section-Tensile Test

Specimen No.	Dimensions: Width	Dimensions: Thickness	Area	Ultimate Total Load lb.	Ultimate Unit Stress lb. Per Sq. Inch	Character of Failure and Location
FA6-2G	.757	.435	.329	21500	65360	WELD
FA12-2G	.753	.413	.311	20500	65920	WELD

Face ~~or Side~~ Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen		
FA-5	2G	Specimen Bent 180	X Degrees in Jig	PASSED
FA-10	2G	Specimen Bent 180	X Degrees in Jig	PASSED

Root ~~or Side~~ Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen		
FA-2	2G	Specimen Bent 180	X Degrees in Jig	PASSED
FA-7	2G	Specimen Bent 180	X Degrees in Jig	PASSED

The undersigned certifies that the statements made in this report are correct and that the test welds were prepared, welded and tested in accordance with the Requirements of Section 6, Chapter 4, ASA Code for Pressure Piping, and Section IX of the ASME Boiler and Pressure Vessel Code.

Accepted By Carl A. Tankbruen

Representing PITTSBURGH TESTING LABORATORY

Date Aug 2, 1963

CATALYTIC CONSTRUCTION CO.

By H. H. Hufford Date 8/2/63

Appendix D to Section 6 "Code for Pressure Piping" ASA-B31.1-1955, Pages 117 & 118

8/10/40

CATALYTIC, INC.
PHILADELPHIA 3, PA.

CC-533 R1, 9/63

WELDING SPECIFICATION NO. SP-4200-CS-03A

RECORD OF PROCEDURE AND PERFORMANCE QUALIFICATION TESTS

Record of Procedure (Procedure or Performance) Qualification Test

Welding Specification No. SP-4200-CS-03 Date 8-2-63

Welding Process Metal Arc Manual or Automatic Manual

Material Spec. A-106 (ASTM) Welded to A-106 (ASTM) of P-No. 1 to P-No. 1 (Qualifies for 3/16" to .864" wall thick.)

Pipe Diameter and Wall Thickness 6" Schedule 80

Filler Metal Spec. A-233 (ASTM) Weld Metal Analysis (A-No. 1) Filler Metal F. No. 3

Flux Trade Name and Number (if submerged arc) ---

Composition of nonconsumable electrods, if used --

Inert Gas Shield, if used; Composition -- Trade Name -- Flow Rate --

Preheat Temperature Range None Stress Relieving Time and Temp. None

Type of Backing Ring or Gas, if used None

Single or Multiple Pass Welding Multiple Single or Multiple Arc Single

Joint Dimensions Accord with SP-4200-CS-03, Par. 7.01

Welder: Name F. AECK Stamp No. A Test No.

Test Conducted by H. H. Hufford

Remarks E-6010 Weldrod

Reduced-Section-Tensile Test

Specimen No.	Dimensions Width	Dimensions Thickness	Area	Ultimate Total Load lb.	Ultimate Unit Stress lb. Per Sq. Inch	Character of Failure and Location
FA6-5G	.820	.411	.337	22000	65290	WELD
FA12-5G	.766	.400	.306	20250	66190	WELD

Face or Side Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen	
FA-5	5G	Specimen Bent 180 X Degrees in Jig	PASSED
FA-10	5G	Specimen Bent 180 X Degrees in Jig	PASSED

Root or Side Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen	
FA-2	5G	Specimen Bent 180 X Degrees in Jig	PASSED
FA-7	5G	Specimen Bent 180 X Degrees in Jig	PASSED

The undersigned certifies that the statements made in this report are correct and that the test welds were prepared, welded and tested in accordance with the Requirements of Section 6, Chapter 4, ASA Code for Pressure Piping, and Section IX of the ASME Boiler and Pressure Vessel Code.

Accepted By Carl L. Dambaun

Representing PITTSBURGH TESTING LABORATORY

Date Aug 2, 1963

CATALYTIC CONSTRUCTION CO.

By H. H. Hufford Date 8/12/63

Appendix D to Section 6 "Code for Pressure Piping" ASA-B31.1-1955, Pages 117 & 118

08022-R1-370P

CATALYTIC, INC.
PHILADELPHIA, PA. 19102

PLANT: BIG ROCK POINT PLANT — CATALYTIC CONTRACT NO. 34881
CLIENT: CONSUMERS POWER COMPANY — SPECIFICATION NO. 34881-4200-309
LOCATION CHARLEVOIX, MICHIGAN

SPECIFICATION

for

WELDING OF STAINLESS STEEL PIPE

CONSISTING OF

SPEC. NO. SP-4200-SS-01A REV. 0

APPROVED FOR CONSTRUCTION

APPROVED _____ DATE _____

APPROVED F.H. Mazzi / ERT (CLIENT) DATE 6 Feb. 1974

APPROVED C.T. Gruber, W.C. Ruebelmann (CATALYTIC) DATE 2 JAN. 1974

PREPARED BY G. Uhrmacher (CATALYTIC) DATE 2 JAN. 1974

2 Jan 1974

07 9288

0-AFC						EJ			2/12/74
1 (F/A)						EJ			1/3/74
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				CATALYTIC, INC.				

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PREPARED BY	DATE	WELDING SPECIFICATION NO. SP-4200-SS-01A Page 1 of 5	
G. Cherwinski	2 Jan. 74		
APPROVED BY	DATE	TUNGSTEN INERT GAS WELDING STAINLESS STEEL PIPE	REV.
R. S. Goyne	2 Jan 1974		0

For Contract 34881 Only

1.00 PROCESS

1.01 This specification covers the welding of stainless steel pipe using tungsten-inert-gas welding. This procedure is qualified in accordance with ASME Code Section IX.

2.00 GENERAL REQUIREMENTS

2.01 All welders using these procedures shall be qualified in accordance with ASME Code Section IX.

2.02 The edges or surfaces of the parts to be joined by welding may be prepared by sawing, machining, chipping, grinding or arc gouging as shown in Section 7.00. The edges shall be cleaned of all slag, oil, grease and dirt to present a clean and substantially smooth surface for welding.

2.03 The first bead shall give complete penetration and fusion without icicles or other excessive projections. Back-up rings shall not be used.

2.04 Tack welds shall be small and of the same quality and made by the same process as the root pass. Cracked or improper tacks shall be removed. All layers of welding, including tacks, shall have a good even appearance. There shall be practically no undercut on the side walls of the groove or the surface of the base material. The surface of each bead including the final pass shall be cleaned and any visible cracks, porosity, or slag removed by chipping, grinding or arc scarfing. Welds shall not be peened except for normal cleaning.

2.05 The receipt, storage and disbursal of all welding gas, electrodes and wire shall be maintained under strict control to assure that all completed welds fully conform to the welding procedure requirements.

3.00 MATERIALS

3.01 The material to be welded shall be Type P-number 8 as listed in Table Q-11.1, ASME Code Section IX.

3.02 The filler metal shall conform to ASME SFA 5.9, ASME Group F7 welding rod as listed in Table Q-11.2, ASME Code Section IX, and shall be of quality equal to those listed in Section 3.03.

3.03

Base Material		WELDWIRE		
	Type	Arcos Corp.	Air Products	McKay
304	ER 308	Chromenar 308	AP-308	308
316	ER 316	Chromenar 316	AP-316	316
317	ER 317	Chromenar 317	AP-317L	317
304L	ER 308L	Chromenar 308L	AP-308L	308L
316L	ER 316L	Chromenar 316L	AP-316L	316L
347	ER 347	Chromenar 347	AP-347	347

4.00 WELDING PROCEDURES

4.01 All welding shall be performed substantially as shown in Section 7.00 using bare filler wire.

4.02 The electrode shall be 3/32" Thoriated Tungsten per AWS 5.12-69 used with direct current straight polarity.

4.03 Argon gas 99.995% minimum purity shall be used as the arc shield and the inside of the pipe shall be purged with argon, helium, or nitrogen.

5.00 HEAT TREATMENT

5.01 None allowed.

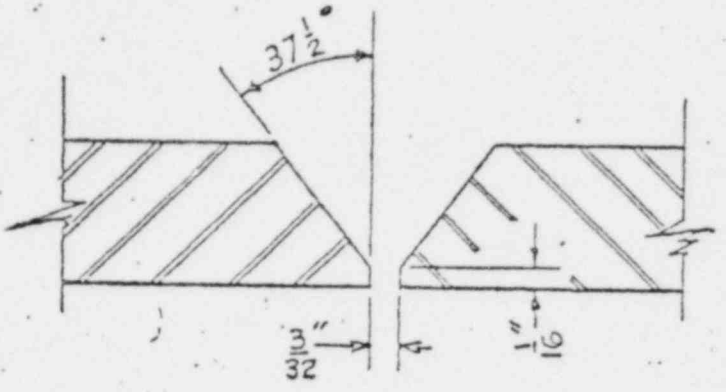
6.00 TESTING

6.01 Testing of welds shall be conducted by the Liquid Penetrant Procedures as described in Catalytic Specification #34881-2400-110.

TUNGSTEN INERT GAS WELDING
STAINLESS STEEL PIPE

7.00 PREPARATION OF BASE MATERIAL AND WELDING

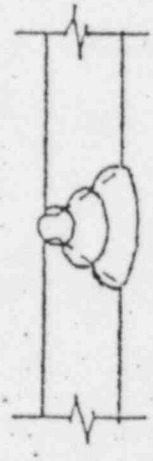
7.01 Preparation of base material



7.02 Welding

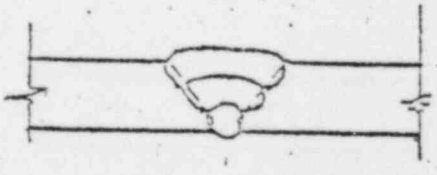
VERTICAL FIXED PIPE

Test position 2G



HORIZONTAL FIXED PIPE

Test position 5G



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PASSES	FILLER WIRE DIA.
ALL	3/32"

18010-1264SP
(CC-537 P1)

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

Welding Specification No. SP-4200-SS-01A
Page 4

RECORD OF PROCEDURE AND PERFORMANCE QUALIFICATION TESTS

Record of PROCEDURE (Procedure or Performance) Qualification Test

Welding Specification No. SP-4200-SS-01A Date July 28, 1967
Welding Process TIG Manual or Automatic Manual
Material Spec. SP304 ASTM Welded to SP304 ASTM of P-No. 8 to P-No. 8
Pipe Diameter and Wall Thickness 6", Schedule 40 Qualities for 1/16" to (.560" Wall Thickness)
Filler Metal Spec. ER308 ASTM Weld Metal Analysis (A-No. 7) Filler Metal F. No. 7
Flux Trade Name and Number (if submerged arc)
Composition of nonconsumable electrode, if used 2% Thoriated Tungsten
Inert Gas Shield, if used; Composition Argon Trade Name Flow Rate 10-20 cfh.
Preheat Temperature Range None Stress Relieving Time and Temp. None
Type of Backing Ring or Gas, if used Argon
Single or Multiple Pass Welding Multiple Single or Multiple Arc Single
Joint Dimensions Accord with 4200-SS-01A
Welder: Name H. Jenkins Stamp No. 2 Test No.
Test Conducted by A. T. Knight, Jr.
Remarks

Reduced-Section-Tensile Test

Specimen No.	Dimensions Width	Thickness	Area	Ultimate Total Load lb.	Ultimate Unit Stress lb. Per Sq. Inch	Character and Location of Failure
#1	0.749	0.261	0.1955	16,460	84,190	out of weld
#2	0.750	0.264	0.1980	16,660	84,140	out of weld

Face or Side Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen
#1	Face 2G	Specimen Bent 180° X Degrees in Jig Satisfactory
#3	Face 2G	Specimen Bent 180° X Degrees in Jig Satisfactory

Root or Side Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen
#2	Root 2G	Specimen Bent 180° X Degrees in Jig Satisfactory
#4	Root 2G	Specimen Bent 180° X Degrees in Jig Satisfactory

The undersigned certifies that the statements made in this report are correct and that the test welds were prepared, welded and tested in accordance with the Requirements of Section G, Chapter 4, ASA Code for Pressure Piping, and Section IX of the ASME Boiler and Pressure Vessel Code.

Accepted By
Representing
Date

CATALYTIC, INC.
By A. T. Knight, Jr. Date 7/28/67

Lehigh Testing Laboratories, Inc. LTL/168147

Appendix D to Section G "Code for Pressure Piping" ASA-B31.1-1955, Pages 117 & 118

0176

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

Welding Specification SP-4200-SS-01A

RECORD OF PROCEDURE AND PERFORMANCE QUALIFICATION TESTS

Record of PROCEDURE (Procedure or Performance) Qualification Test

Welding Specification No. SP-4200-SS-01A Date July 28, 1967
Welding Process TIG Manual or Automatic Manual
Material Spec. TP304 (ASTM) Welded to TP304 (ASTM) of P.No. 8 to P.No. 8
Pipe Diameter and Wall Thickness 6", Schedule 40 (.560" Wall Thickness) Qualifies for 1/16" to
Filler Metal Spec. ER308 (ASTM) Weld Metal Analysis (A-No. 7) Filler Metal F. No. 7
Flux Trade Name and Number (if submerged arc)
Composition of nonconsumable electrode, if used 2% Thoriated Tungsten
Inert Gas Shield, if used; Composition Argon Trade Name Flow Rate 10-20 cfh.
Preheat Temperature Range Stress Relieving Time and Temp.
Type of Backing Ring or Gas, if used Argon
Single or Multiple Pass Welding Multiple Single or Multiple Arc Single
Joint Dimensions Accord with 4200-SS-01A
Welders Name H. Jenkins Stamp No. 3 Test No.
Test Conducted by A. T. Knight, Jr.
Remarks

Reduced-Section-Tensile Test

Specimen No.	Dimensions: Width	Thickness	Area	Ultimate Total Load lb.	Ultimate Unit Stress lb. Per Sq. Inch	Character of Failure and Location
#1	0.750	0.262	0.1965	16,380	83,360	in weld
#2	0.750	0.260	0.1950	16,400	84,100	out of weld

Face or Side Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen
#1	face 5G	Specimen Bent 180° X Degrees in 4" Satisfactory
#3	face 5G	Specimen Bent 180° X Degrees in 4" Satisfactory

Root or Side Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen
#2	root 5G	Specimen Bent 180° X Degrees in 4" Satisfactory
#4	root 5G	Specimen Bent 180° X Degrees in 4" Satisfactory

The undersigned certifies that the statements made in this report are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section 6, Chapter 4, ASA Code for Pressure Piping, and Section IX of the ASME Boiler and Pressure Vessel Code.

Accepted By
Representing
Date

CATALYTIC, INC.
By A. T. Knight, Jr.

Lehigh Testing Laboratories, Inc.

LTL/16814C

Appendix D to Section 6 Welds for Pressure Piping ASA-B31.1-1955, Pages 117 & 118

Consumers Power Company

CMAbel, ERDP
JJZabritski, ERDP
FWMacri, P-14-230, Last

DOCUMENT TRANSMITTAL
Generating Plant Qualifications Department

DT-FPL-075

CMC: 6240

Date: February 26, 1974

Plant: Big Rock Point Plant
Fuel Pool Liner

File: Review Records

Description: EDCN No 11

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSBang			X	RWWilson/NCPatel	
	X	WClark			X	CWHeymann/CRAbel	RA 2/27/74
						JJZabritski	JJZ 2/4/74

From: FWMacri

Comments Requested by: ---

Documents: EDCN No 11 - As Built Weld Maps

Previous Review	
Rev	Date

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FWMacri, P-14-230.

0769

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 2/26/74

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

EXHIBIT NO. 5

DRAWING CLASSIFICATION

Plot Plan ☐
Process Flow Diagram ☐
Engineering Flow Diagram ☐
Architectural ☐
Civil ☐
Electrical ☐
Heat, Vent & Air Conditioning ☐
Instrumentation ☐
Mechanical ☐
Piping ☐
Pressure Vessel ☐
Structural ☐
Weld Maps XX

SUNTAC NUCLEAR CORPORATION

Philadelphia, Pennsylvania 19102

EDCN

ENGINEERING DESIGN CHANGE NOTICE

DATE 19 February 1974

EDCN Number 11 | Sheet ___ of ___

Rev. Number | Change Hours

Change Made By W.L. Pike | Check Made By

Process Approval E. F. Turner

Project Approval

Client's Approval

Drawing Title Weld maps as built - Pool Liner, Consumers Power Co., Charlevoix, Michigan

Drawing Number or Numbers: SK-3,4,5,6 & 7

Contract Number: 34881

Change Description Or Sketch

The attached sketches are revisions to the original weld maps for the Pool Liner showing welds as installed. Sketches #3 and #4 indicate welds not shown on original weld map. Sketches #5, #6 and #7 show new weld numbers.

These weld maps are referenced in the following documents:

1. Work Procedure #34881-155, "Prefabricate and Install Liner in Spent Fuel Pool", Rev. 2 - 28 November 1973.

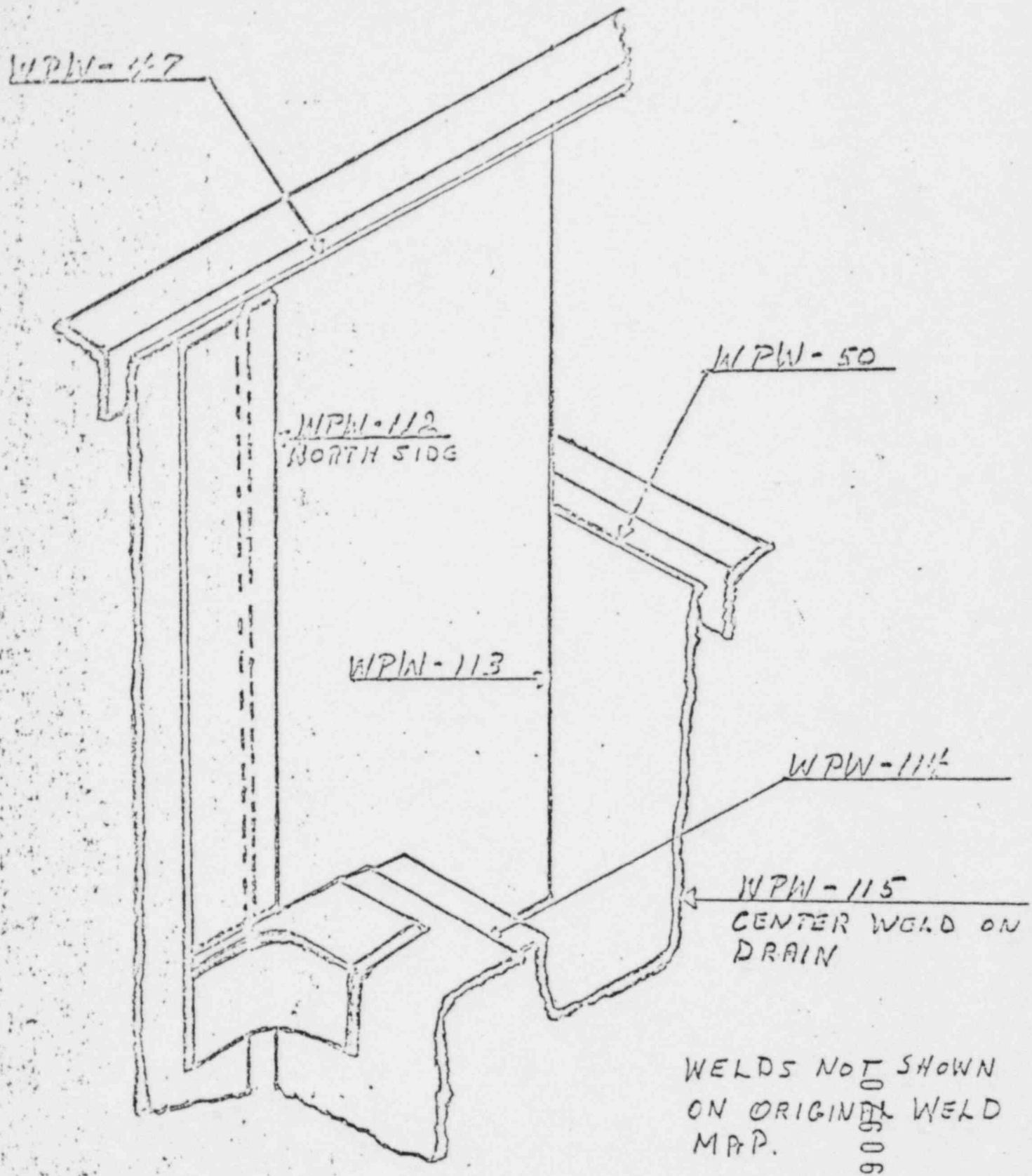
2. Specification #34-81-4200-301, "Welding Stainless Steel", Rev. 1, 19 December 1973.

3. Specification #34881-4200-302, "Welding Stainless Steel to Carbon Steel," Rev. 0, 4 September 1973.

4. Specification #34881-4200-304, "Metal Arc Welding - Stainless Steel," Rev. 0, 4 September 1973.

5. Specification #34881-4200-305, "Metal Arc Welding - Stainless Steel to Carbon Steel," Rev. 0, 4 September 1973.

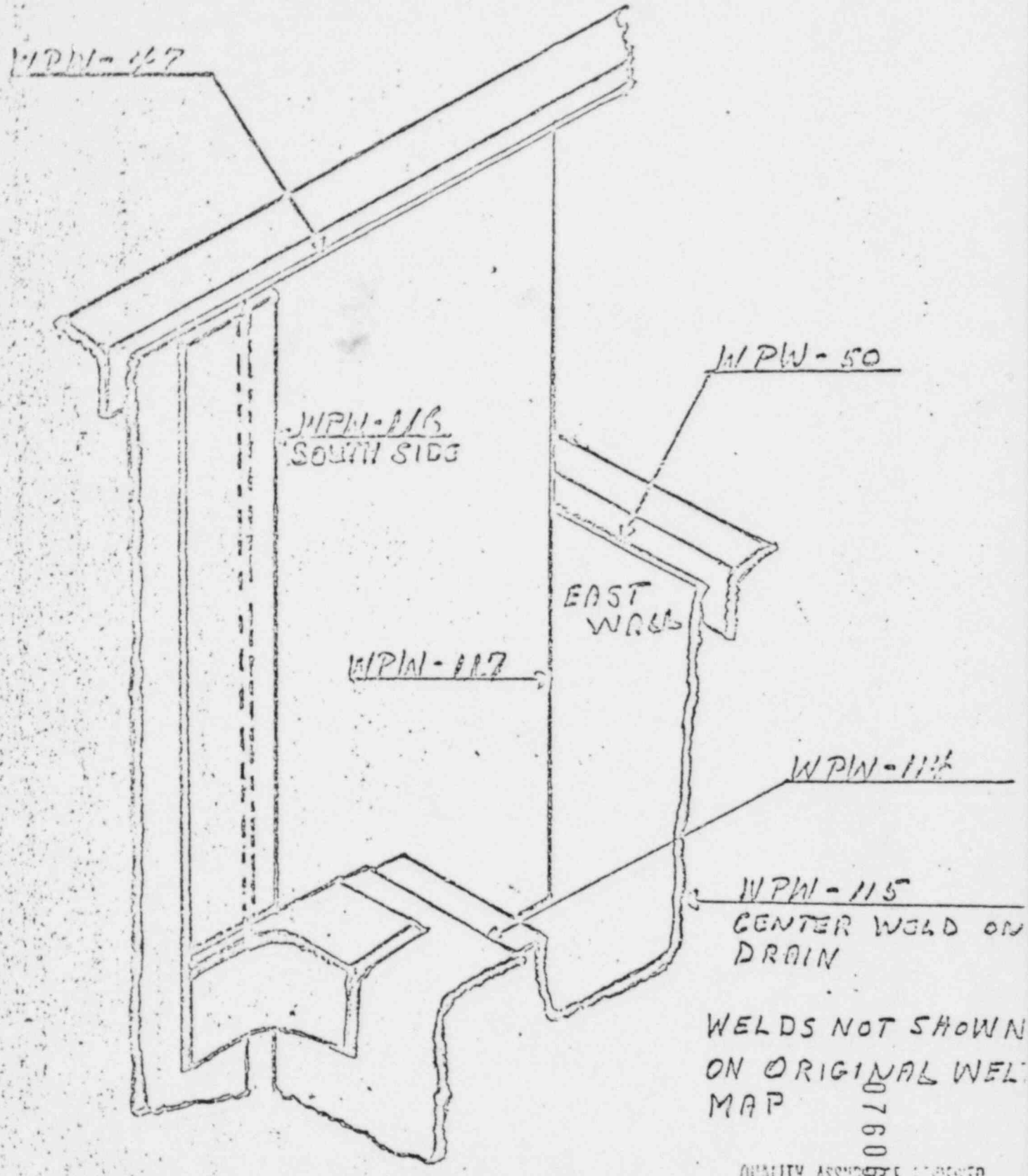
7760067



WELDS NOT SHOWN ON ORIGINAL WELD MAP.

W. L. PIKE

SK-3

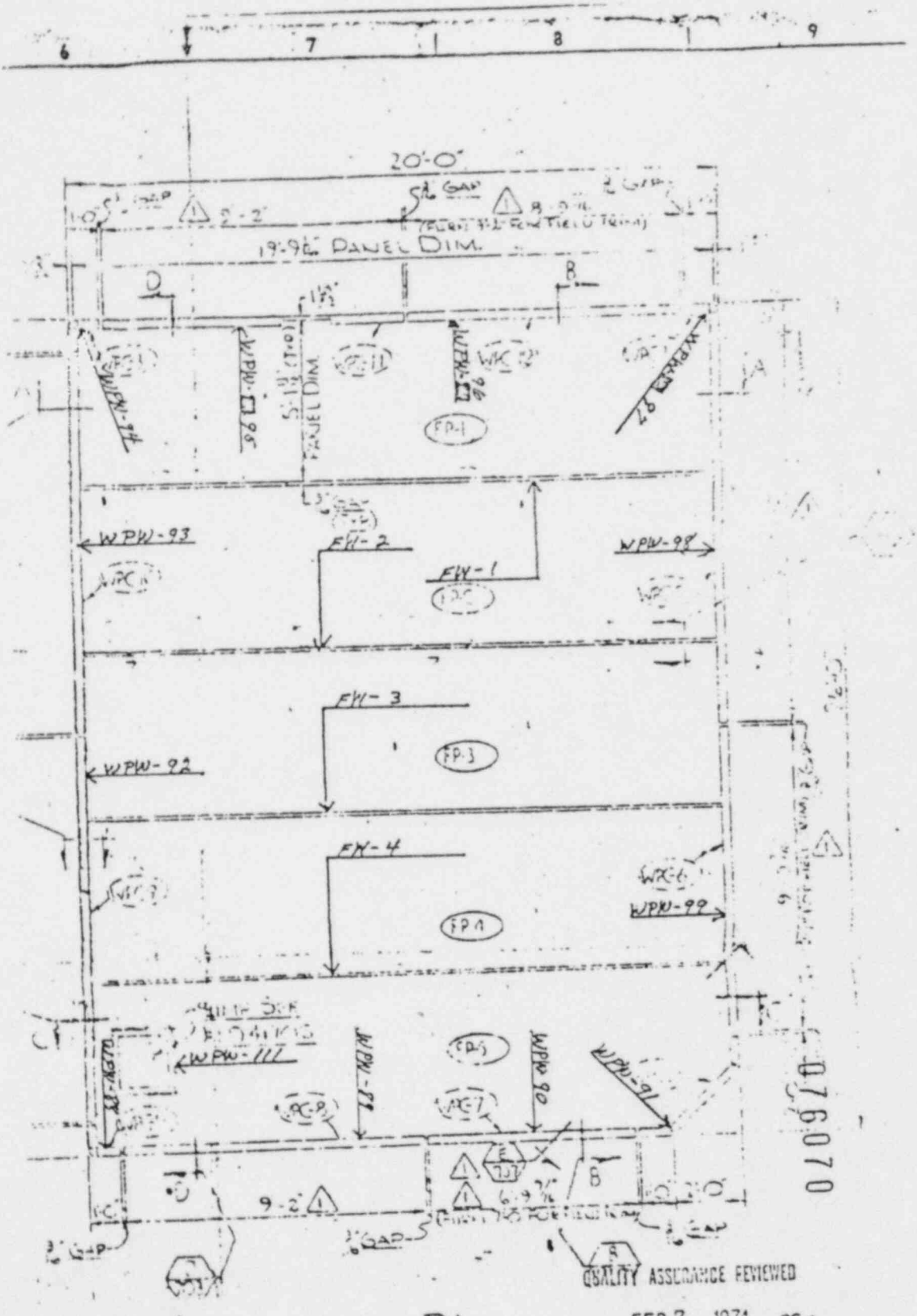


WELDS NOT SHOWN ON ORIGINAL WELD MAP

FEB 7 19

W. L. PIKE

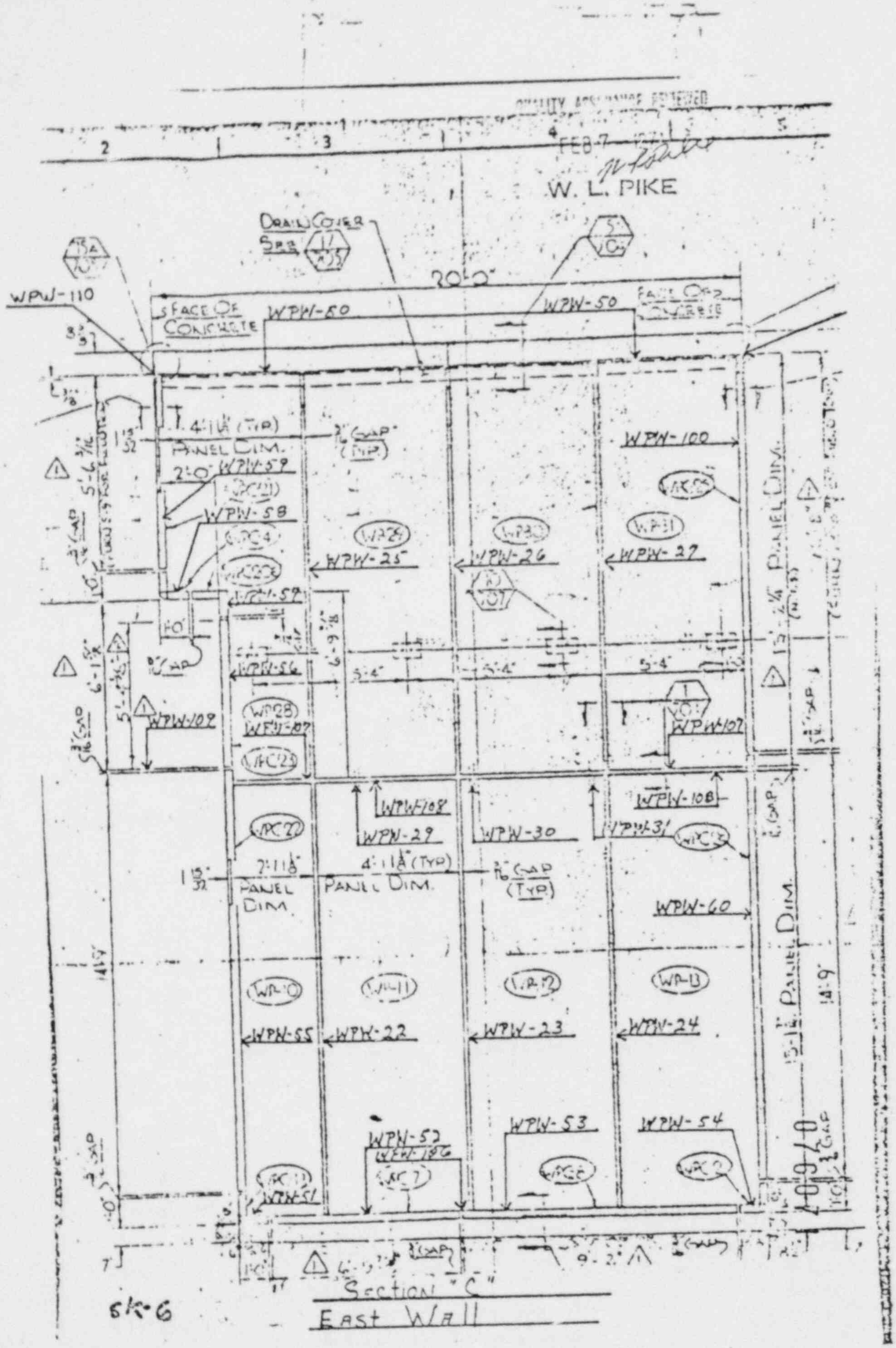
SK-4

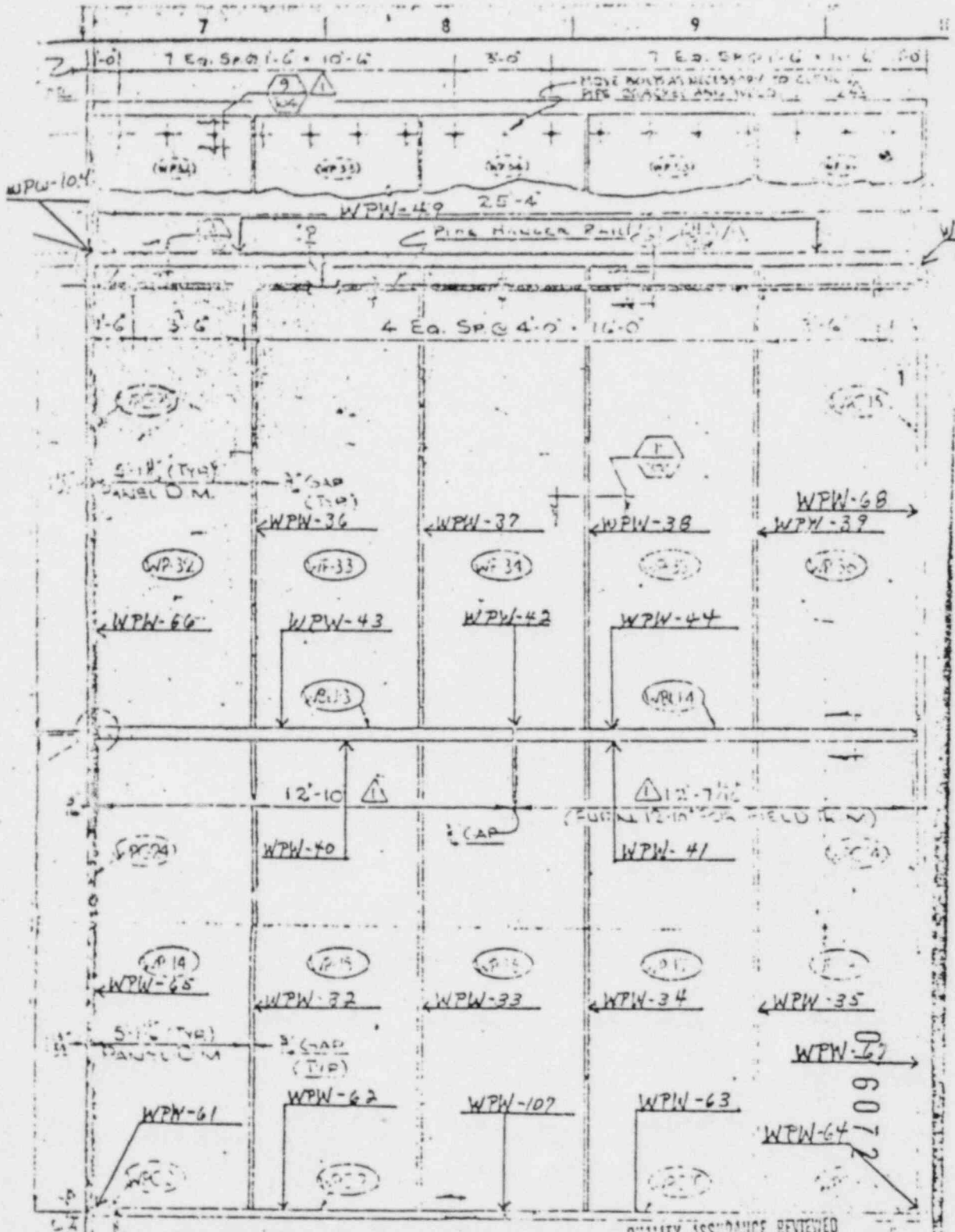


Floor Plan
SK-5

FEB 7 1974
W. L. PIKE

D76070


QUALITY ASSURANCE REVIEWED
FEB 7
W. L. PIKE
DRAIN COVER SEE
30'-0"
WPW-110
FACE OF CONCRETE
WPW-50
WPW-50
FACE OF CONCRETE
4'-11 1/8" (TYP)
PANEL DIM.
1/16" GAP (TYP)
WPW-59
WPW-58
WPW-100
WPW-25
WPW-26
WPW-27
WPW-57
WPW-56
WPW-109
WPW-107
WPW-107
PANEL DIM.
WPW-108
WPW-108
WPW-29
WPW-30
WPW-31
4'-11 1/8" (TYP)
PANEL DIM.
PANEL DIM.
1/16" GAP (TYP)
WPW-60
WPW-55
WPW-22
WPW-23
WPW-24
WPW-52
WPW-53
WPW-54
WPW-51
PANEL DIM.
WP-10
WP-11
WP-12
WP-13
WP-28
WP-29
WP-30
WP-31
SK-6
Section "C"
East Wall

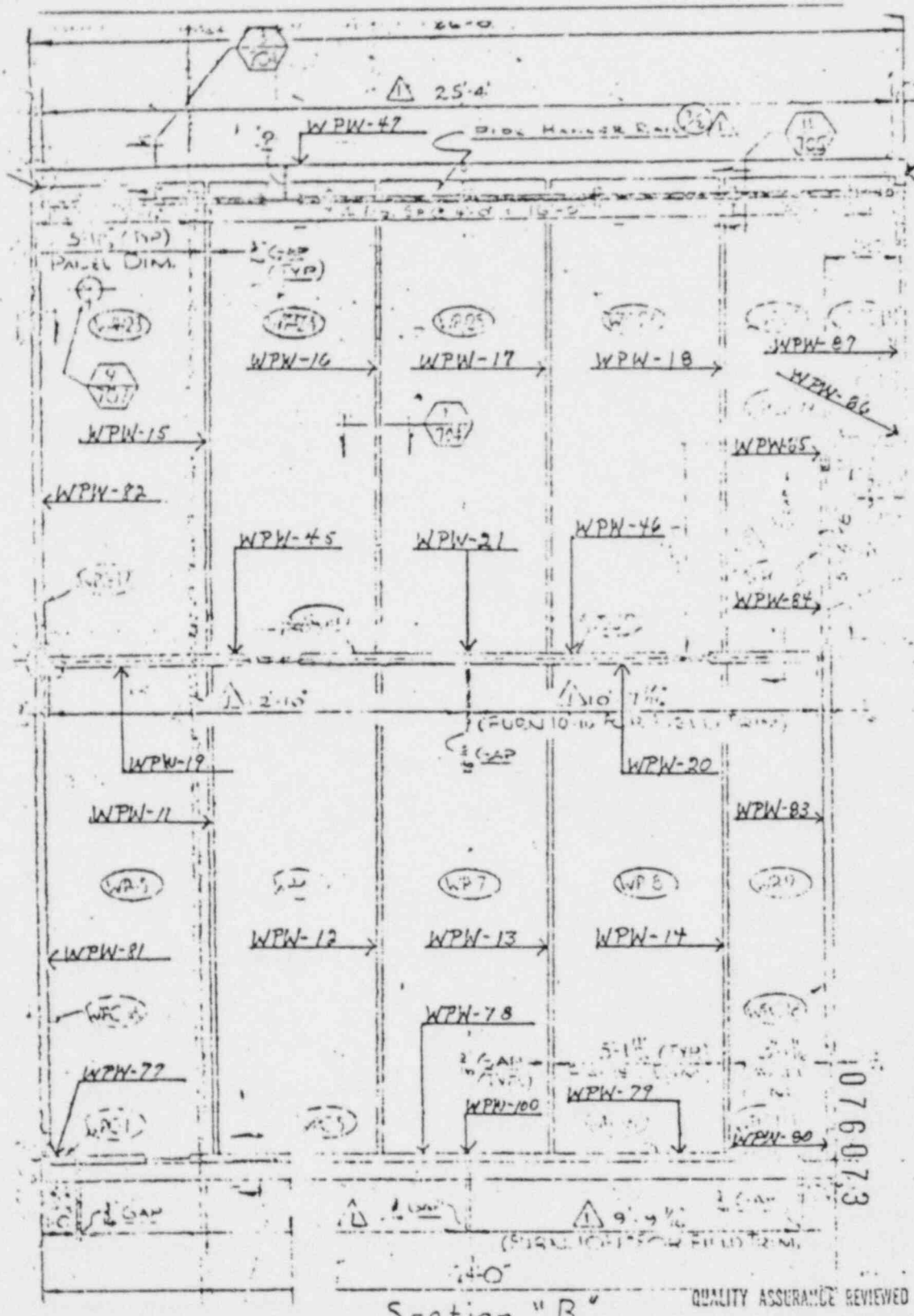


SK-6

Section "D"
South Wall

FEB 7 1974

W. L. PIKE



SK-7

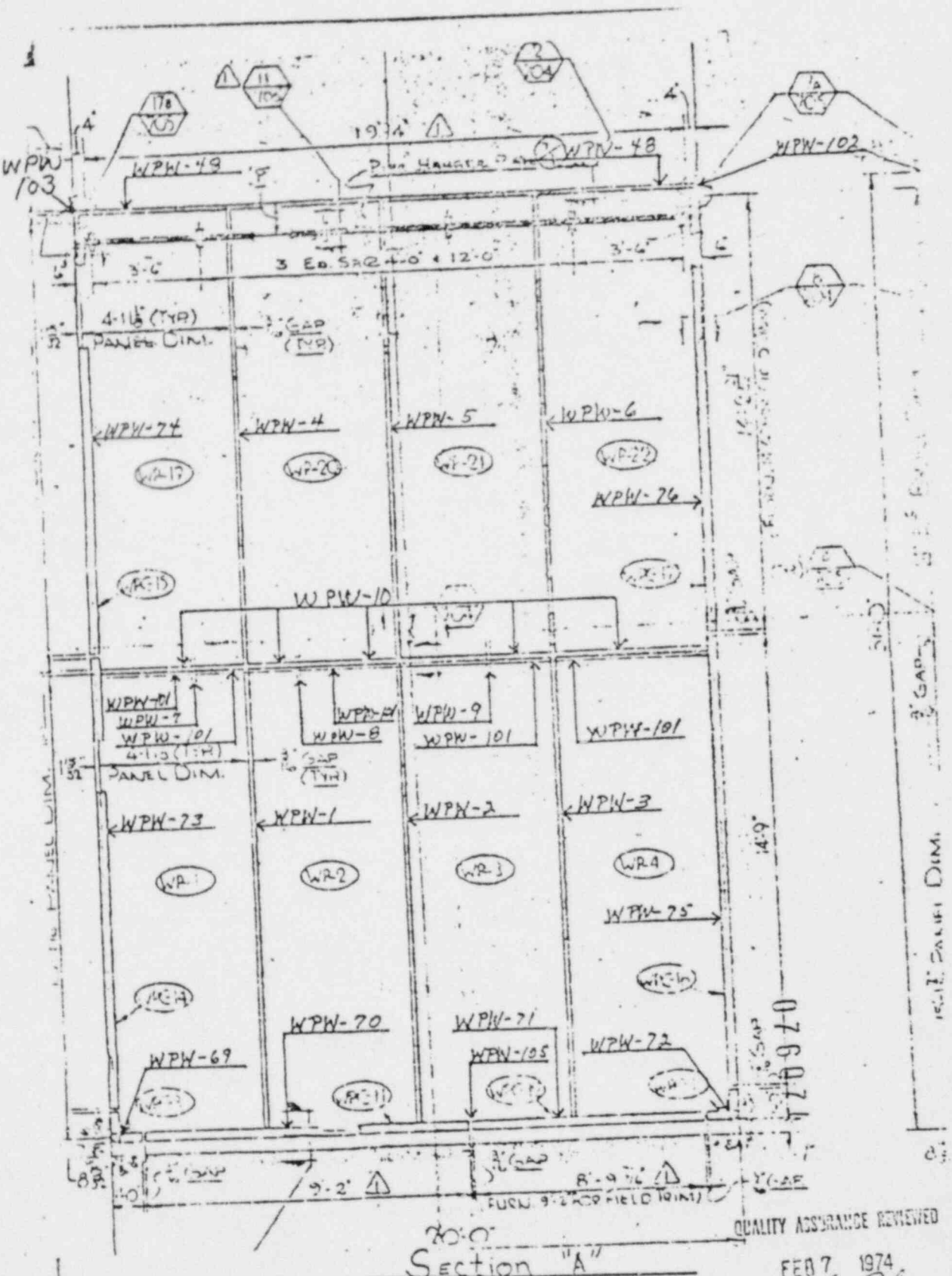
Section "B"
North Wall

QUALITY ASSURANCE REVIEWED

FEB 7 1974

W. L. PIKE

10760723



Section "A"
West Wall

5k-7

EXHIBIT NO. 5

DRAWING CLASSIFICATION	SUNTAC NUCLEAR CORPORATION	DATE 19 February 1974
Plot Plan ☐	Philadelphia, Pennsylvania 19102	EDCN Number 11 — Sheet ___ of ___
Process Flow Diagram ☐	ENGINEERING DESIGN CHANGE NOTICE	Rev. Number — Change Hours
Engineering Flow Diagram ☐		Change Made By W.L. Pike — Check Made By
Architectural ☐	Drawing Title: Weld maps as built - Pool Liner, Consumers Power Co., Charlevoix, Michigan	Process Approval E. F. Turner
Civil ☐		Project Approval
Electrical ☐		
Heat, Vent & Air Conditioning ☐	Drawing Number or Numbers: SK-3,4,5,6 & 7 — Contract Number: 34881	Client's Approval
Instrumentation ☐		
Mechanical ☐		
Piping ☐		
Pressure Vessel ☐		
Structural ☐		
Weld Maps ☒		

Change Description Or Sketch

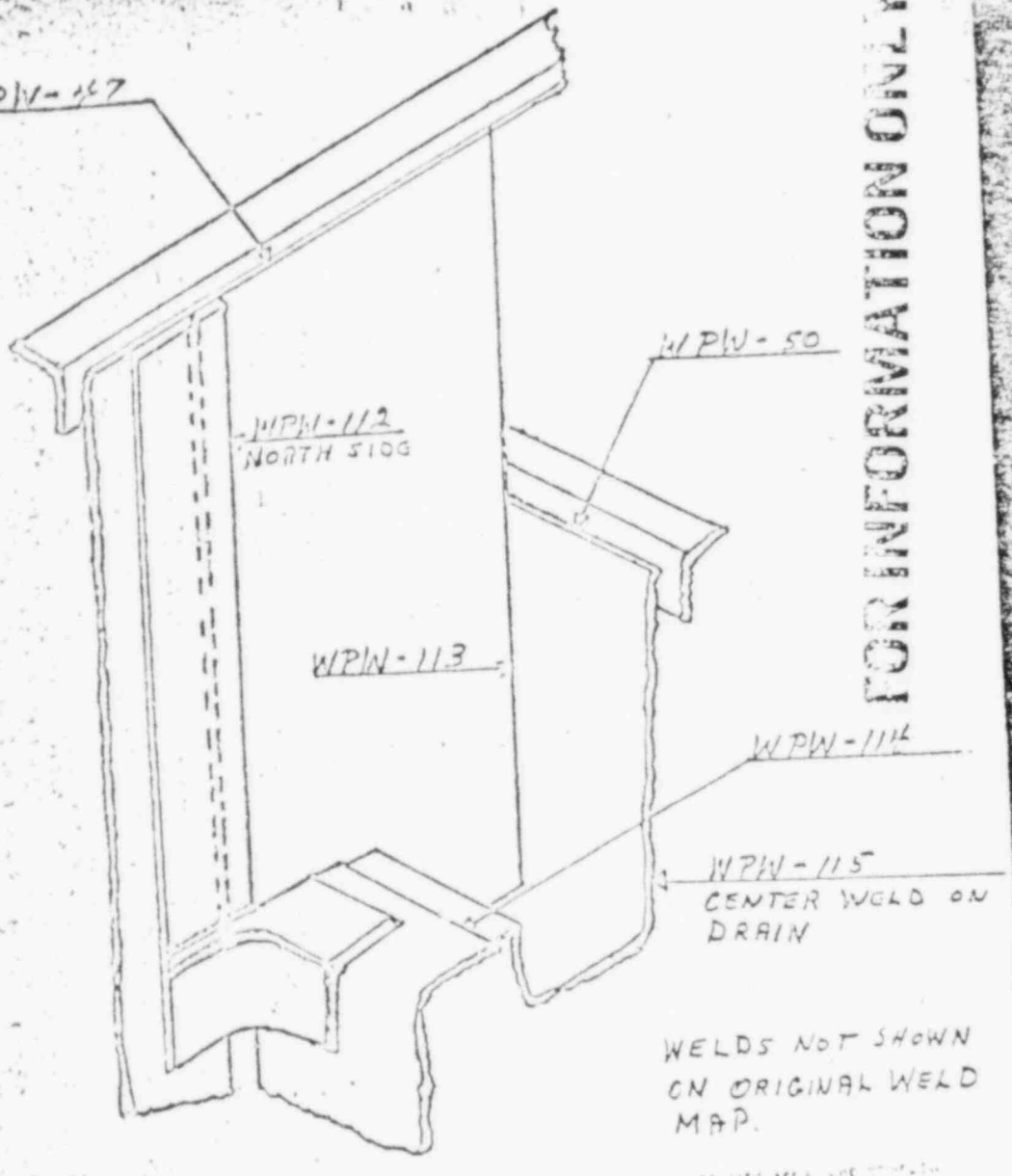
The attached sketches are revisions to the original weld maps for the Pool Liner showing welds as installed. Sketches #3 and #4 indicate welds not shown on original weld map. Sketches #5, #6 and #7 show new weld numbers.

These weld maps are referenced in the following documents:

1. Work Procedure #34881-155, "Prefabricate and Install Liner in Spent Fuel Pool", Rev. 2 - 28 November 1973.
2. Specification #34-81-4200-301, "Welding Stainless Steel", Rev. 1, 19 December 1973.
3. Specification #34881-4200-302, "Welding Stainless Steel to Carbon Steel," Rev. 0, 4 September 1973.
4. Specification #34881-4200-304, "Metal Arc Welding - Stainless Steel," Rev. 0, 4 September 1973.
5. Specification #34881-4200-305, "Metal Arc Welding - Stainless Steel to Carbon Steel," Rev. 0, 4 September 1973.

FOR INFORMATION ONLY

671845



FOR INFORMATION ONLY

WELDS NOT SHOWN ON ORIGINAL WELD MAP.

SEE ECN ASSURANCE [illegible]

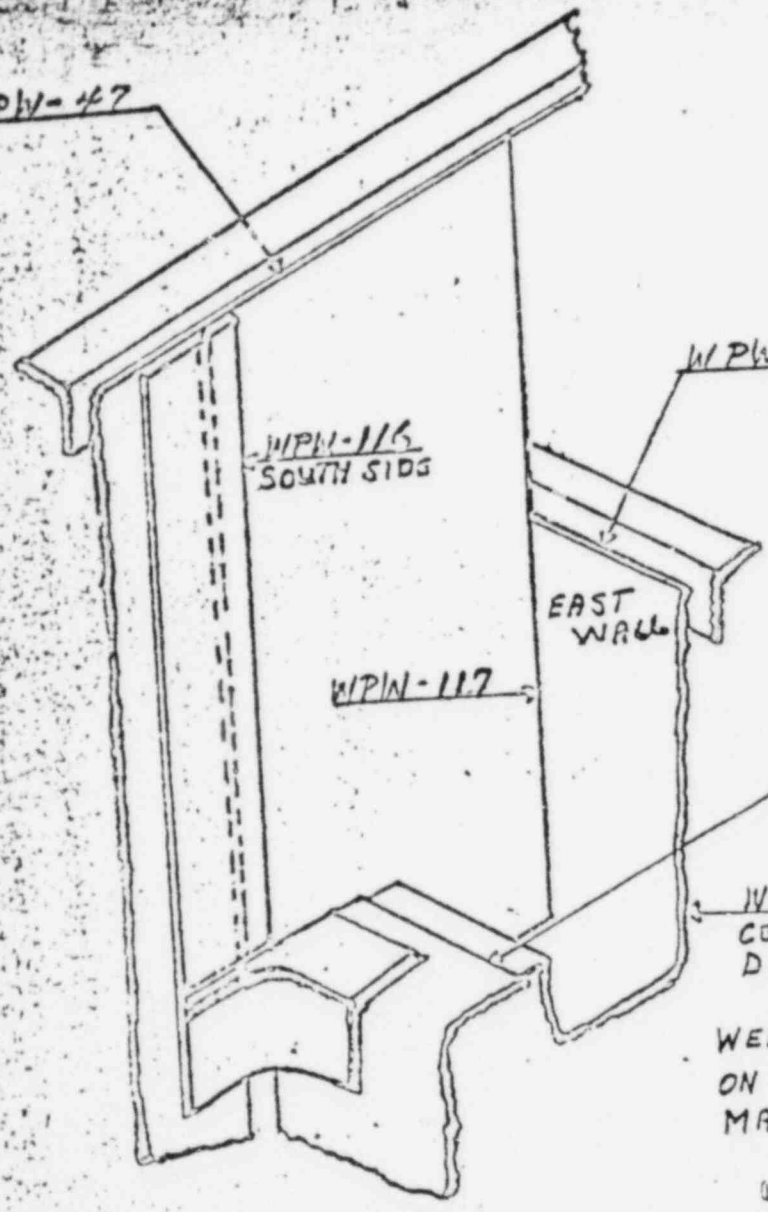
FEB 1 1974

W. L PIKE

SK-3

671846

FOR INFORMATION ONLY



WELDS NOT SHOWN ON ORIGINAL WELD MAP

QUALITY ASSURANCE REVIEWED

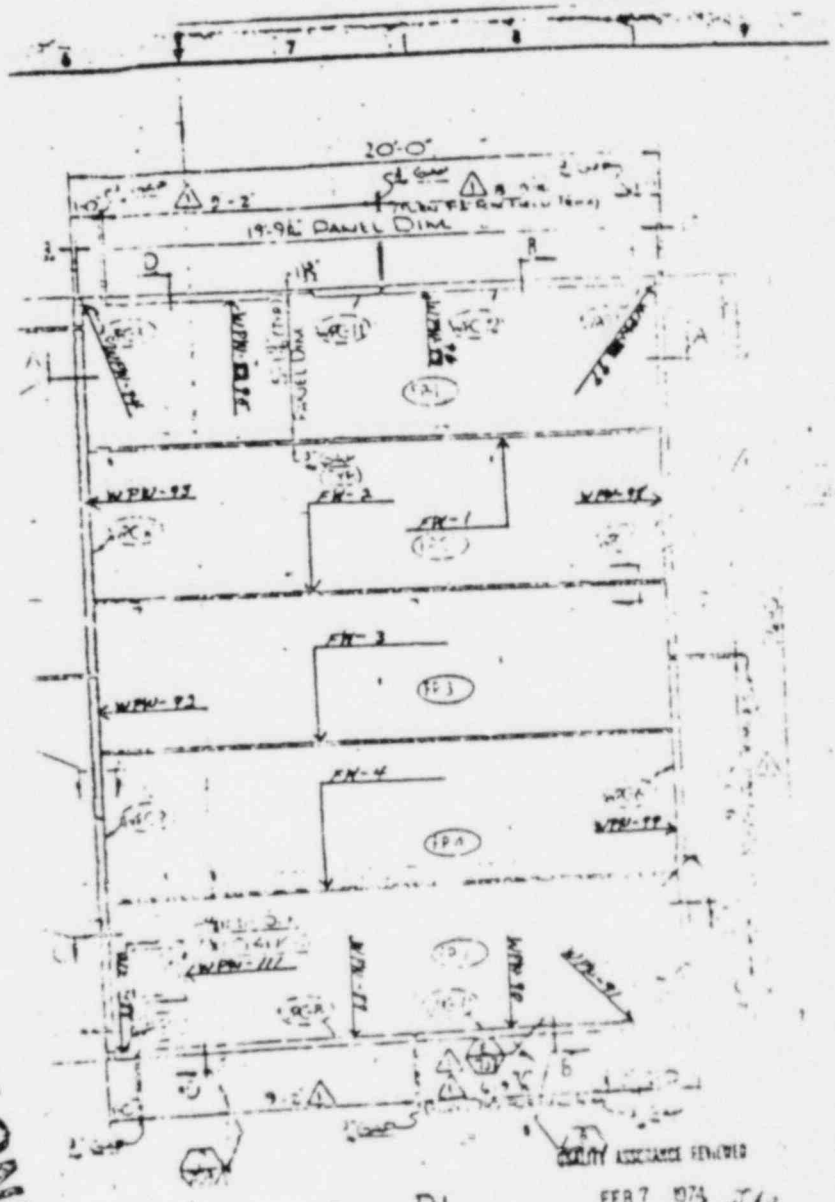
FEB 7 1974

W. L. Pike

W. L. PIKE

SK-4

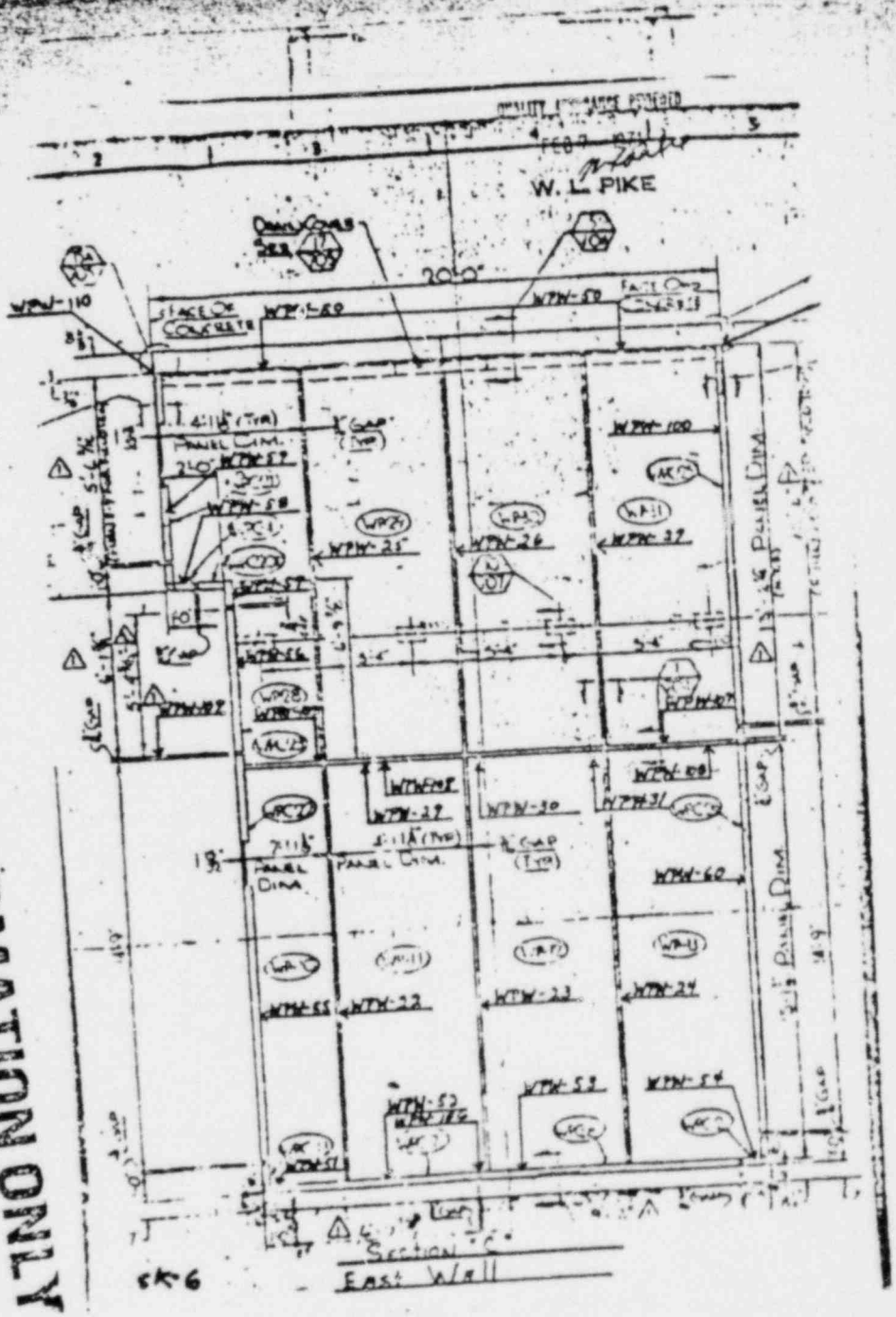
671847



Floor Plan
SK-5

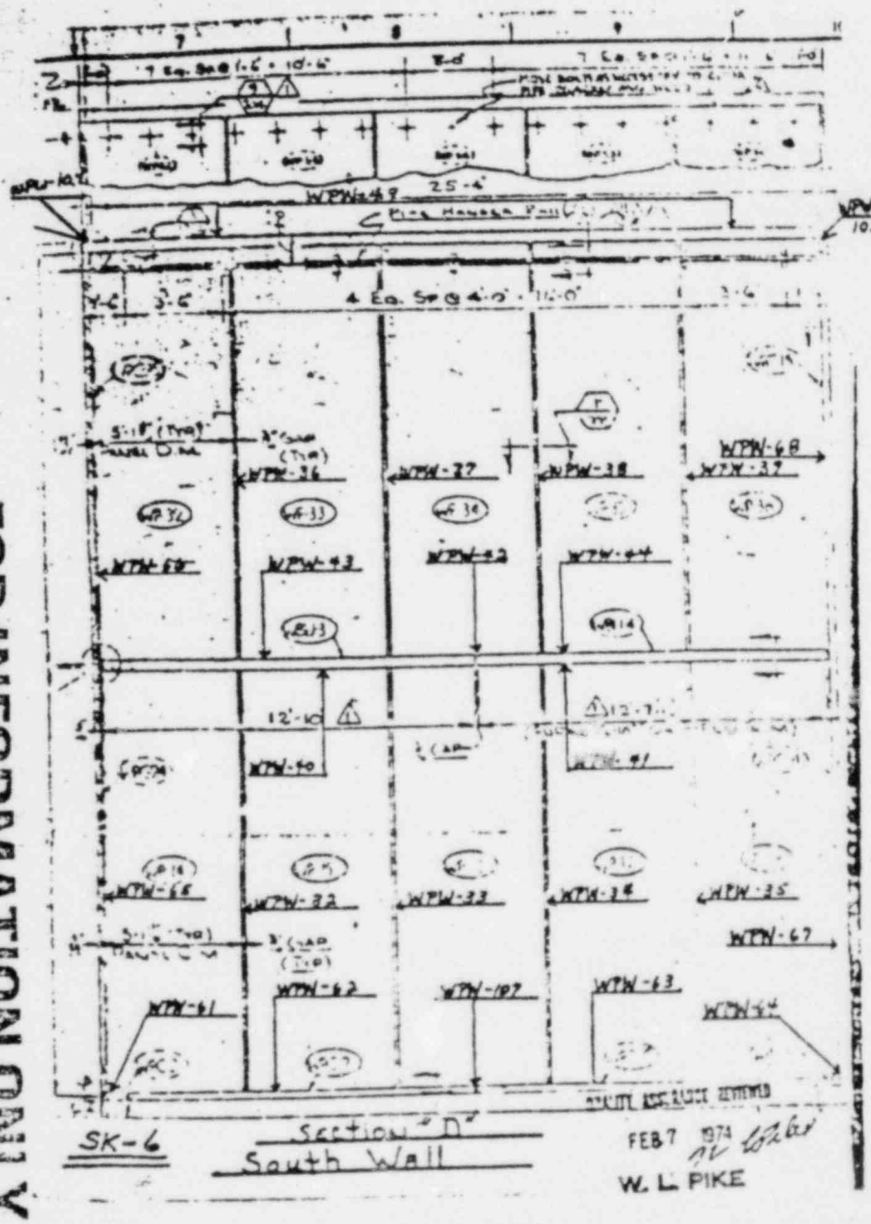
FOR INFORMATION ONLY

671848



FOR INFORMATION ONLY

671849



SK-6

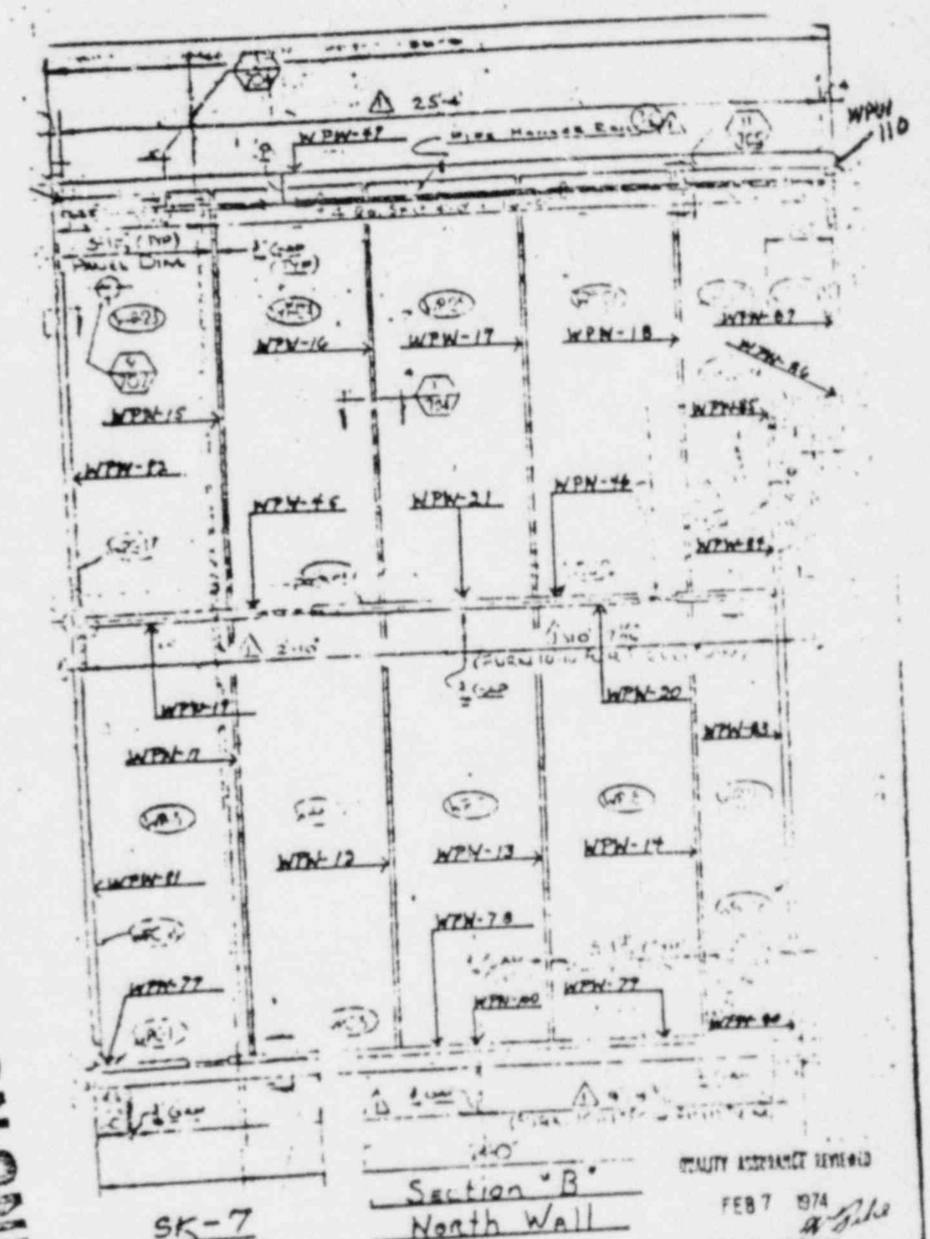
Section "D"
South Wall

FEB 7 1974

W. L. PIKE

FOR INFORMATION ONLY

671850



FOR INFORMATION ONLY

671851

FOR INFORMATION ONLY

Consumers Power Company

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

~~GMHarrison~~
~~GRAbel~~
~~JJZabritski~~
FMMacri, P-14-230
last
DT-FPL-066

GWO: 6248

Plant: Big Rock Point

Date: December 28, 1973

Description: Fuel Pool Liner - Revised Welding Procedure

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSRang			X	WPCooke	
	X	WClark			X	RLWilson	
					X	MCPatel	
				~~1~~	~~X~~	~~GJHartman~~	
				2	X	CRAbel	1/2 1/3/74
				3	X	JJZabritski	1/3 1/4/74

From: FMMacri

Comments Requested by: 1/10/74

Documents: EDCN No. 7

Specification no. 34881-4200-301 Rev.1 (S.S.Weld.)

W/Weld procedure qualification test results

Previous Review	
Rev	Date
0	9/4/73

Please review ~~the above document(s) and initial this form to indicate~~ completion of review. Return this form and transmit comments to FMMacri

1-07-61

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 12/26/73

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

File SFP "Q/A"

EXHIBIT NO. 5

DRAWING CLASSIFICATION	SUNTAC NUCLEAR CORPORATION	DATE 19 December 1973
Plot Plan [ ]	Philadelphia, Pennsylvania 19102	EDCN Number 7 / Sheet ___ of ___
Process Flow Diagram [ ]	EDCN ENGINEERING DESIGN CHANGE NOTICE	Rev. Number / Change Hours
Engineering Flow Diagram [ ]		Change Made By E.F. Turner / Check Made By
Architectural [ ]	Drawing Title Specification for Welding Stainless Steel	Process Approval EFT
Civil [ ]		Project Approval AC Bushfield
Electrical [ ]	Drawing Number or Numbers 34881-4200-301 (Rev. 1(AFC))	Contract Number 34881
Heat, Vent & Air Conditioning [ ]		Client's Approval
Instrumentation [ ]		
Mechanical [ ]		
Piping [ ]		
Pressure Vessel [ ]		
Structural [ ]		
Specification [X]		

Change Description Or Sketch

The following changes were made to Specification #34881-4200-301, Rev. 0 (AFC), "Specification for Welding Stainless Steel."

1. Paragraph 2.3, qualification positions changed from "1G, 2G, and 3G" to "2G, 3G, and 4G."

2. Page 4, amperage changed as follows:

Pass No.	Was	Changed To
7	70 - 110	70 - 125
All Other	80 - 110	80 - 125

C8022-R1-370P

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT PLANT — CATALYTIC CONTRACT NO. 34881
CLIENT: CONSUMERS POWER COMPANY — SPECIFICATION NO. 34881-4200-301
LOCATION CHARLEVOIX, MICHIGAN

SPECIFICATION

for

WELDING STAINLESS STEEL

CONSISTING OF

SEE CONTENTS

REFERENCE ATTACHMENTS:

APPROVED FOR CONSTRUCTION

ITEM NUMBER	DESCRIPTION
	I hereby certify that this plan, specifications or report was prepared by me or under my direct supervision and that I am a duly registered professional engineer under the Laws of the State of Michigan.
Date 11/12/73 Reg No. 11417	J. E. Geiger
APPROVED	DATE
APPROVED F. [illegible] / NCB CLIENT	DATE 24 August 1973
APPROVED N. C. Buckwalter QA CATALYTIC	DATE 7/2/73 7 June 1973
PREPARED BY G. S. Chetkovich CATALYTIC	DATE 4 September 1973

AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
1 (AFC)					G.C	[illegible]	NCB	[illegible]	12/17/73
0 (AFC)					[illegible]	EJ	NCB		8/6/73
A (F/A)					[illegible]	J.CC	NCB		7/17/73

CATALYTIC, INC.
PHILADELPHIA, PENNA. 19102

WELDING STAINLESS STEEL

SPECIFICATION NO. 34881-4200-301 Page 1

1.0 SCOPE

1.1 This specification covers the welding of stainless steel using Tungsten-inert-gas welding. It shall be used only for welding the Type 304 stainless steel lining for the Spent Fuel Pool at the Big Rock Point Plant.

2.0 QUALIFICATION

2.1 This procedure shall be qualified in accordance with the ASME Code Section IX. In addition, the procedure qualification test plates shall be radiographed before sectioning.

2.2 Welders using this procedure shall be qualified in accordance with the ASME Code Section IX.

2.3 Procedure and welders shall be qualified by welding plate in the 2G, 3G and 4G positions as shown in the ASME Code Section IX Fig. Q-3.

2.4 Weld test plates shall be examined by a certified test laboratory.

3.0 GENERAL REQUIREMENTS

3.1 The edges or surfaces of the parts to be joined by welding may be prepared by sawing, machining, chipping, grinding or arc gouging as shown in Section 7.0. The edges shall be cleaned of all slag, oil, grease and dirt to present a clean and substantially smooth surface for welding. Surfaces prepared by arc gouging shall be ground smooth to remove carbon contamination.

3.2 Plates joined by welding shall be matched accurately and retained in position during welding operations. Misalignment in a flat plane across completed joints shall not exceed 1/16 inch.

3.3 Tack welds shall be small and of the same quality and made by the same process as the root pass. Cracked or improper tacks shall be removed. Ends of tack welds shall be ground to a feather edge.

3.4 All layers of welding shall have a good, even appearance. The surface of each bead shall be cleaned and any visible cracks, porosity or slag removed by grinding. Undercuts, not exceeding 1/32 inch depth up to 3 inches in 12 inches of weld length, will be permitted. Fillet welds shall blend smoothly with the base material and be of uniform size.

3.5 Butt welds without backing strips shall be welded from both sides. The second side shall be prepared to sound metal by chipping, or grinding before welding.

3.6 Weld shall be cleaned by brushing with austenitic stainless steel brushes which have not been used on carbon or low alloy steels.

3.7 Grinding of welds, where required, shall be done with aluminum oxide or silicon carbide grinding wheels which have not been used on carbon or low alloy steels.

3.8 Injurious surface defects, such as caused by removal of temporary attachments, arc-strikes and mechanical damage shall be ground to sound metal. Any surface imperfection, the removal of which reduces the plate thickness by 1/32 inch or more, shall be repaired by welding.

3.9 Weld repairs shall be subject to the requirements of this specification.

3.10 One sample butt weld, 12 inches in length, shall be submitted to the owner before the start of production welding. This sample shall be indicative of the minimum acceptable weld surface appearance, and will be used to judge the acceptability of subsequent work.

3.11 The sequence of welding for all seams shall be done in accordance with a weld map that will be issued separately.

3.12 The weld gap, 1/16 ± 1/32, shall be maintained during welding at the root pass; the root land thickness shall not exceed 1/16 inch.

3.13 The application of heat to correct distortion and dimensional deviations is prohibited.

3.14 The maximum preheat and interpass temperature for welding shall be 350°F - contact pyrometers only shall be used for determining temperature.

3.15 Vertical welding shall be done vertical-up.

4.0 MATERIALS

4.1 The material to be welded shall be Type P-number 8 as listed in Table Q-11.1, ASME Code Section IX.

4.2 The filler metal shall conform to ASME SFA 5.9, Type 308L, ASME Group F7 welding rod as listed in Table Q-11.2, ASME Code Section IX.

The filler metal shall be selected and controlled to produce weld deposits with 8-25% ferrite as determined by the Schaeffler Diagram.

0745

4.3 The receipt, storage, and disbursal of the welding gas, rod or wire shall be maintained under strict control (Ref. Procedure No. CI-QAI-502) to assure that all completed welds conform fully to approved welding procedure specification requirements for welding materials.

5.0 WELDING PROCEDURES

5.1 All welding shall be performed substantially as shown in Section 7.0 using bare filler wire.

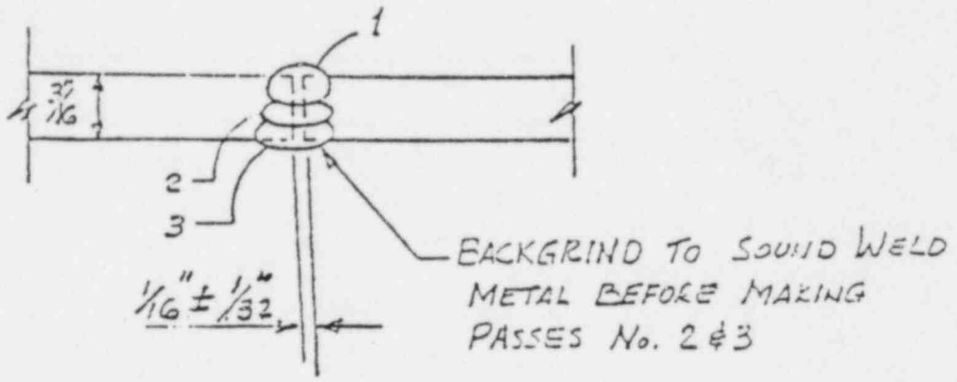
5.2 The electrode shall be 3/32" Thoriated Tungsten per AWS 5.12-69 used with direct current straight polarity.

5.3 Argon gas 99.995% minimum purity shall be used as the arc shield.

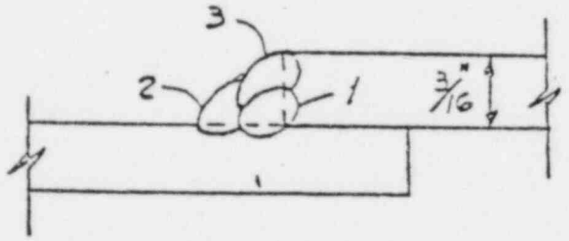
6.0 HEAT TREATMENT

6.1 None allowed.

7.0 Preparation of Base Material and Welding



BUTT JOINTS



LAP JOINTS

PASS No.	WIRE DIA.	AMPS.
1	1/16" OR 3/32"	70 - 125
ALL OTHER	3/32"	80 - 125

076147

CATALYTIC, INC.
Philadelphia, Pennsylvania 19102

BSTD-1272P

RECORD OF PROCEDURE AND PERFORMANCE QUALIFICATION TESTS

Page 5 of 6

Record of PROCEDURE No. 1 Qualification Test
(Procedure or Performance)

Welding Specification No. 31831-4200-301 Date 9/28/73

Welding Process TIG Manual or Automatic Manual

Material Spec. A-240 (ASTM) Welded to A-240 (ASTM) of P No. P-6 to P No. P-8

Pipe Diameter and Wall Thickness Plate Thickness .178 to .205

Filler Metal Spec. SFA-5.9 (AWS-ASTM) Weld Metal Analysis (A No. 308L) Filler Metal F. No. F 7

Flux Trade Name and Number (if submerged arc) NA

Composition of nonconsumable electrode, if used NA

Inert Gas Shield, if used Composition Argon Trade Name Argon Flow Rate 20 CFH

Preheat Temperature Range > 32° Stress Relieving Time and Temp. NA Single

Type of Backing Ring or Gas, if used NA

Single or Multiple Pass Welding Multiple Single or Multiple Arc Single

Joint Dimensions Accord with Insp. 31831-4200-301

Welder Name G. McAllister Stamp No. BM-1 Test No. One

Test Conducted by W. J. Pike

Remarks Plate thickness as marked on each plate.

Reduced Section-Tensile Test

Specimen Number	Dimensions Width	Dimensions Thickness	Area	Ultimate Total Load Lb.	Ultimate Unit Stress Lb. per square inch	Character of Failure and Location
1	1.250	.187	.145	12,125	83,620	Weld
2	1.250	.187	.147	12,600	85,714	Weld

Face or Side Bend Test

Specimen Number	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen
1-F	2G	Specimen Bent 180° X Degrees in Jig Passed
2-F	2G	Specimen Bent 180° X Degrees in Jig Passed

Root or Side Bend Test

Specimen Number	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen
1-R	2G	Specimen Bent 180° X Degrees in Jig Passed
2-R	2G	Specimen Bent 180° X Degrees in Jig Passed

The undersigned certifies that the statements made in this report are correct and that the test welds were prepared, welded and tested in accordance with the Requirements of Section 6, Chapter 4, ASA Code for Pressure Piping, and Section IX of the ASME Boiler and Pressure Vessel Code

Accepted By Alexander Salomon

Representing Consumers Power Co.

Date Oct 31, 1973

CATALYTIC, INC.

By W. J. Pike Date 11-1-73

0761148

CATALYTIC, INC
Philadelphia Pennsylvania 19102

18010 1272P

RECORD OF PROCEDURE AND PERFORMANCE QUALIFICATION TESTS

Record of [illegible] (Procedure or Performance) Qualification Test

Welding Specification No 3A221-4200-301 Date 9/28/73

Welding Process TIG Manual or Automatic Manual

Material Spec. A-240 (ASTM) Welded to A-240 (ASTM) of P No. P-8 to P No. P-8

Pipe Diameter and Wall Thickness Plate Thickness .178 to .205

Filler Metal Spec SFA-5.9 (ASTM) Weld Metal Analysis A No. 308L Filler Metal F. No. F 7

Flux Trade Name and Number if submerged arc NA

Composition of nonconsumable electrode, if used NA

Inert Gas Shield, if used. Composition Argon Trade Name Arson Flow Rate 20 CFH

Preheat Temperature Range > 32° Stress Relieving Time and Temp. NA

Type of Backing Ring or Gas if used NA

Single or Multiple Pass Welding Multiple Single or Multiple Arc Single

Joint Dimensions Accord with Spec. 3A221-4200-301

Welder Name G. McAlister Stamp No. BM-1 Test No. One

Test Conducted by W. L. Fike

Remarks Plate thicknesses as marked on each plate.

Reduced-Section-Tensile Test

Specimen Number	Dimensions Width	Dimensions Thickness	Area	Ultimate Total Load Lb.	Ultimate Unit Stress Lb. per square inch	Character of Failure and Location
1	1.250	.127	.164	13,100	79,878	Weld
2	1.250	.127	.150	12,475	83,167	Weld

Face or Side Bend Test

Specimen Number	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen			
1-F	3G	Specimen Bent	180°	X Degrees in Jig	Passed
2-F	3G	Specimen Bent	180°	X Degrees in Jig	Passed

Root or Side Bend Test

Specimen Number	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen			
1-R	3G	Specimen Bent	180°	X Degrees in Jig	Passed
2-R	3G	Specimen Bent	180°	X Degrees in Jig	Passed

8/19/20

The undersigned certifies that the statements made in this report are correct and that the test welds were prepared, welded and tested in accordance with the Requirements of Section 6, Chapter 4, ASA Code for Pressure Piping, and Section IX of the ASME Boiler and Pressure Vessel Code

Accepted By Alexander Solomon

Representing Southern Power Co

Date Oct 31 1973

CATALYTIC, INC.

By W. L. Fike Date 11-1-73

CATALYTIC, INC.
Philadelphia, Pennsylvania 19102

18010 12/72P

RECORD OF PROCEDURE AND PERFORMANCE QUALIFICATION TESTS

Record of PROCEDURE (Procedure or Performance) Qualification Test

Welding Specification No 31-881-4200-301 Date 9/28/73

Welding Process TIG Manual or Automatic Manual

Material Spec. A-240 (ASTM) Welded to A-240 (ASTM) of P No. P-8 to P No. P-8

Pipe Diameter and Wall Thickness Plate Thickness .178 to .205

Filler Metal Spec. SFA-5.9 (AS TM) Weld Metal Analysis (A No. 308L) Filler Metal F. No. F 7

Flux Trade Name and Number (if submerged arc) NA

Composition of nonconsumable electrode, if used NA

Inert Gas Shield, if used: Composition Argon Trade Name Argon Flow Rate 20CFH

Preheat Temperature Range >32° Stress Relieving Time and Temp. NA

Type of Backing Ring or Gas, if used NA

Single or Multiple Pass Welding Multiple Single or Multiple Arc Single

Joint Dimensions Accord with Spec. 31-881-4200-301

Welder: Name G. McAlister Stamp No. BM-1 Test No. One

Test Conducted by W. L. Pike

Remarks Plate thickness as marked on each plate.

Reduced Section Tensile Test

Specimen Number	Dimensions: Width	Dimensions: Thickness	Area	Ultimate Total Load Lb.	Ultimate Unit Stress Lb. per square inch	Character of Failure and Location
1	1.250	.187	.156	13,150	84,295	Weld
2	1.250	.187	.143	14,375	100,524	Weld

Face or Side Bend Test

Specimen Number	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen			
1-F	45	Specimen Bent	180°	X Degrees in Jig	Passed
2-F	45	Specimen Bent	180°	X Degrees in Jig	Passed

Root or Side Bend Test

Specimen Number	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen			
1-R	45	Specimen Bent	180°	X Degrees in Jig	Passed
2-R	45	Specimen Bent	180°	X Degrees in Jig	Passed

The undersigned certifies that the statements made in this report are correct and that the test welds were prepared, welded and tested in accordance with the Requirements of Section 6, Chapter 4, ASA Code for Pressure Piping, and Section IX of the ASME Boiler and Pressure Vessel Code

Accepted By Alexander Solomon CATALYTIC, INC.

Representing Catalytic Process Co

Date Oct 31 1973 By W. L. Pike Date 11-1-73

68022-81-8709

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: CHARLEVOIX, MICHIGAN

CATALYTIC CONTRACT NO. 34881
SPECIFICATION NO. 34881-QAP-601-A

SPECIFICATION

for

WELDER AND WELDING QUALIFICATIONS - FUEL POOL LINER

CONSISTING OF

REFERENCE ATTACHMENTS:

671976

ITEM NUMBER

DESCRIPTION

APPROVED FOR CONSTRUCTION

APPROVED J M Hinchman DATE 24 AUGUST 1973

APPROVED [illegible] DATE 9/6/73

APPROVED [illegible] CATALYTIC DATE 6-15-73

PREPARED BY [illegible] CATALYTIC DATE 6-15-73

O(AFC)						WLP	JCC	HCF		7/6/73
A(FA)										
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE	
	CLIENT				CATALYTIC, INC.					

WELDER AND WELDING QUALIFICATIONS

SP #34881-QAP-601-A
Page 1

1.0 Scope

To establish a system for controlling and documenting welder qualifications and welding specification qualification.

2.0 References

ASME Section III Nuclear Power Plant Components
ASME Section IX Welding Qualifications
Welding Specification No. 34881-4200-302 Welding Stainless Steel to Carbon Steel
Welding Specification No. 34881-4200-301 Welding Stainless Steel

3.0 Welding Specifications and Procedures

3.1 Welding specifications and procedures are prepared by the Welding Engineer under the direction of the Project Manager. Each Specification and procedure shall be reviewed and approved in accordance with QAI-201.A within the Catalytic Corporate Manual.

3.2 Welding procedures shall be transmitted to the Construction Department who will have the responsibility of qualifying the procedure.

3.3 The Welding Supervisor shall record the welding procedure qualification test results on Exhibit No. 32 and transmit the results of the test to the Welding Engineer.

3.4 The Welding Engineer shall review the welding procedure qualification test report and assure that the test will qualify the procedure in accordance with applicable code.

The Welding Engineer will revise the welding procedure by making the welding procedure qualification test record part of the procedure. The revision shall be reviewed and approved in accordance with QAI-201.A.

3.5 All approved welding procedures will be distributed to the field in accordance with QAI-202.A.

3.6 All revisions to welding procedures or specification shall be originated by the Welding Engineer and reviewed in the same manner for approval as described in Para. 3.1.

4.0 Welding Filler Metal Control

4.1 The Welding Engineer shall be responsible for qualifying electrodes per applicable specifications.

4.2 Warehouse personnel assigned by the Field Superintendent shall be responsible for proper maintenance of electrodes holding oven temperature and disbursing proper filler metal.

4.3 Welders shall only have in their possession at any time filler metal as specified in the applicable welding procedure.

4.4 Individual welders shall be responsible for keeping their work area clear of unauthorized filler metal and for time lapse on rod out of oven requirements.

4.5 If welding gas bottles are used, the field office will control receipts and disbursements of welding gas bottles by means of a log sheet.

5.0 Welder Qualification

5.1 General

All welders and welding operations shall be qualified in accordance with the applicable welding procedure prior to start of any system welding.

5.2 Responsibilities

The Field Welding Supervisor (Field Superintendent):

(a) Supervises all welder performance qualification testing.

(b) Records the test results of each test.

(c) Maintains current list of all qualified welders, and each specific procedure qualified, and dates last qualified.

(d) Forwards original copy of welder qualification and maintains record to the Field Quality Assurance Representative.

(e) The Field Quality Assurance Representative will audit all welder qualifications and maintenance of qualification records for proper conformance. He will incorporate any changes into the permanent quality assurance record.

671978

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34491
PROCEDURE NO. 34491-QAP-601-A

PROCEDURE FOR:

WELDER AND WELDING QUALIFICATIONS

FUEL POOL LINER

APPROVED	CLIENT	DATE
APPROVED	N C Richter SUNTAC PROJECT MANAGER	DATE 6/12/73
APPROVED	JAH C. COLES SUNTAC QUALITY ASSURANCE MANAGER	DATE 6/15/73
PREPARED BY	Walter F Pike SUNTAC QUALITY ASSURANCE ENGINEER	DATE 5-15-73

								7502	
A (5/A)									
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				

1.0 Scope

To establish a system for controlling and documenting welder qualifications and welding specification qualification.

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ASME Section IX Welding Qualifications
Welding Specification No. 34491-4200-302 Welding Stainless Steel to Carbon Steel
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a. Supervises all welder performance qualification testing.

b. Records the test results of each test.

c. Maintains current list of all qualified welders, and each specific procedure qualified, and dates last qualified.

d. Forwards original copy of welder qualification and maintains record to the Field Quality Assurance Representative.

e. The Field Quality Assurance Representative will audit all welder qualifications and maintenance of qualification records for proper conformance. He will incorporate any changes into the permanent quality assurance record.

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

Exhibit No. 24

Field Welding Check List

GENERAL INFORMATION

1. Suntac Job No. _____ Unit No. _____
2. System or Component _____
3. Engineering Specification No. _____
4. Iso or Drawing No. _____
5. SA/ASTM Material _____
   Type and Grade _____
6. Welding Procedure and Revision No. _____
7. Welder Qualification _____
8. Weld No. _____ Q No. _____
   Original ☐ Repair No. _____
9. Pipe Diameter _____
10. Joint Thickness _____
11. Backing Rings Required ☐ Inserts Required ☐

REQUIREMENTS

12. Purge Required ☐ Gas Type _____
13. Preheat temp. °F _____
14. Interpass temp. °F _____
14. PWHT temp. °F _____ Hold time _____

WELD INSPECTION

16. Cleanliness, bevel, alignment, spacing, etc. _____ REQUIRED
17. Release for welding _____ REQUIRED
18. Weld Completed _____ REQUIRED
19. Visual Examination _____ REQUIRED
20. Weld Reinforcement Check _____ REQUIRED
21. Release for NDE _____ REQUIRED

NON-DESTRUCTIVE EXAMINATION

22. Radiography _____ ☐
23. Liquid Penetrant _____ ☐
24. Magnetic Particle _____ ☐
25. Other NDE _____ ☐

26. FILLER METAL

Covered		Bare	
E7018	☐	E70S-2	☐
E6010	☐	ER308L	☐
E308L - 16	☐	ER308	☐
E308 - 16	☐	ER309	☐
E309 - 16	☐		
Other _____		Other _____	

27. Above Requirements Certified Correct

Quality Assurance Engineer _____ Date _____

FOR FIELD USE ONLY

Recorded Results	Q.A. Engr.	A.I.	Date
12A. Purge and Gas			
13A. Preheat temp. °F _____			
14A. Interpass temp. °F _____			
15A. PWHT temp. °F _____ Hold time _____ Chart No. _____ Curve No. _____			
16A. Cleanliness, bevel, alignment, spacing, etc. _____			
17A. Released for welding _____			
18A. Weld completed _____			
19A. Visually examined _____			
20A. Weld reinforcement checked _____			
21A. Released for NDE _____			

29. Welder's name(s) and symbol — Date

_____ _____

_____ _____

_____ _____

0762 05

31. Above Results Certified Correct

_____ _____

Authorized Welding Representative — Date

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

Filler Metal Withdrawal Authorization

Exhibit

Sheet 1 of 1 | No. [illegible]

Rev. 0 | Date 5/8/72

Ref. No. _____

Job No. _____ Unit No. _____

System or Component _____ Q Number _____

Iso or Drawing Number _____ Weld Number _____

Welding Procedure and Revision Number _____

Type of Filler Metal	Diameter					Required Control Designation
Coated	3/32	1/8	5/32	3/16	Other	
E7018						
E6010						
E308-16						
E308L-16						
E309-16						
Other						
Bare						
E70S-2						
ER308						
ER308L						
ER309						
Other						

Authorized by _____ Date _____
Welding Engineer

WELDER ASSIGNMENT

Welder's Name _____ Symbol _____

Welder's Name _____ Symbol _____

Assigned by _____ Date _____
Supervisor or Foreman

FILLER METAL

Issued by _____ Date _____
Rod Attendant

Heater # _____

9029 70

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

RECORD OF PROCEDURE AND PERFORMANCE QUALIFICATION AND TEST

Exhibit No. 3

Record of _____ (Procedure or Performance) Qualification Test

Welding Specification No. _____ Date _____

Welding Process _____ Manual or Automatic _____

Material Spec. _____ (ASTM) Welded to _____ (ASTM) of P-No. _____ to P-No. _____

Pipe Diameter and Wall Thickness _____

Filler Metal Spec. _____ (ASTM) Weld Metal Analysis (A-No. _____) Filler Metal F. No. _____

Flux Trade Name and Number (if submerged arc) _____

Composition of nonconsumable electrode, if used _____

Inert Gas Shield, if used; Composition _____ Trade Name _____ Flow Rate _____

Preheat Temperature Range _____ Stress Relieving Time and Temp. _____

Type of Backing Ring or Gas, if used _____

Single or Multiple Pass Welding _____ Single or Multiple Arc _____

Joint Dimensions Accord with _____

Welder: Name _____ Stamp No. _____ Test No. _____

Test Conducted by _____

Remarks _____

Reduced-Section-Tensile Test

Specimen No.	Dimensions Width	Dimensions Thickness	Area	Ultimate Total Load lb.	Ultimate Unit Stress lb. Per Sq. Inch	Character of Failure and Location

Face or Side Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen	
		Specimen Bent	X Degrees in Jig
		Specimen Bent	X Degrees in Jig

Root or Side Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen	
		Specimen Bent	X Degrees in Jig
		Specimen Bent	X Degrees in Jig

0762

The undersigned certifies that the statements made in this report are correct and that the test welds were prepared, welded and tested in accordance with the Requirements of Section 6, Chapter 4, ASA Code for Pressure Piping, and Section IX of the ASME Boiler and Pressure Vessel Code.

Accepted By _____

Representing _____ By _____ Date _____

Date _____

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34881
SPECIFICATION NO. 34881-2400-109

SPECIFICATION

for

VACUUM BOX LEAK TESTING

CONSISTING OF

APPROVED FOR CONSTRUCTION

APPROVED 7. M Mazzi/ETT (CLIENT) DATE 8/24/73
APPROVED W. C. Burkhoff/ETT (CLIENT) DATE 7/5/73
APPROVED [signature] (SUNTAC) DATE 7/5/73
PREPARED BY Walter F Pilla (SUNTAC) DATE 7-5-73

0 (AFC)					[signature]	ETT	NCB		9/10/73
A (FIA)					WLP	V.C.B	NCB		7/-/73
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT								

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

VACUUM BOX LEAK TESTER

SPECIFICATION NO. 34881-2400-109

1.0 Scope

1.1 This specification describes the equipment, method and techniques to be used in testing butt welded and fillet welded stainless steel plates. The application to fillet welds is limited to testing of areas where geometry permits equipment set up. This specification applies to the pool liner installation at the Big Rock Point Point Nuclear Power Plant, Charlevoix, Michigan.

2.0 Equipment Requirements

2.1 The vacuum box shall be rectangular in shape and designed for testing straight seams. The top shall be equipped with a clear window for viewing and the bottom flange shall be covered with a sponge rubber gasket for sealing against the plate to be tested.

2.2 The vacuum pump shall have the capacity of producing and maintaining 10 psi vacuum when the leak tester is in operation.

2.3 The leak tester shall be equipped with a vacuum gage, 0-15 psi, 2 inch dial that will indicate the vacuum in the box. This gage will initially have an accuracy verification certificate.

2.4 The leak detection solution will be either Leak Tec No. 577-V or a mixture of liquid detergent (1 part), glycerin (1 part), and water (4-½ parts).

2.5 The vacuum pump shall be driven by either a gasoline motor or an electric motor of suitable size.

2.6 A three way cock shall be provided to allow application of vacuum to the box or to admit air to the box after testing has been completed.

3.0 General

3.1 Prior to testing, check power unit and vacuum pump for proper lubrication.

3.2 Test vacuum box on a smooth plate to insure that it is capable of sealing and maintaining at least 8 psi vacuum.

4.0 Technique

4.1 Paint seams to be tested generously with leak detection solution described in 2.4.

4.2 Place inspection box over coated seam section and turn three way cock to apply vacuum. The weld is inspected through the window and leaks will be evidenced by clusters of bubbles that form where leakage occurs.

4.3 If leakage is evident at the gasket surface, apply pressure with the heel of each hand to the ends of the vacuum box. Also with the fingertips, push in on the edge of thee gasket at the point on each end of the box where the gasket crosses the weld joint.

4.4 Weld being tested should be held under 8 psi vacuum for at least 10 seconds before being considered leak free. An acceptable weld will show no bubble formation. Leaks will be marked by suitable means for repair.

4.5 After a section of weld has been tested, turn three way cock to release vacuum and lift box to position for the next test. Allow 3 inches overlap to insure areas under the box gasket are tested. Do not slide box as this will cause damage to the gasket.

4.6 All repaired welds will be retested until approved.

5.0 Post Test Cleaning

5.1 After completion of testing, all leak detection solution will be removed, using demineralized water and lint free rags.

6.0 Responsibility

6.1 All testing will be conducted by the work group with a Quality Assurance man observing. A log sheet will be used to record results, including repair work needed and corrective action that was accomplished.

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SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34491
SPECIFICATION NO. 34491-2400-109

SPECIFICATION

for

VACUUM BOX LEAK TESTING

CONSISTING OF

APPROVED _____ DATE _____
CLIENT

APPROVED W. C. Bischoff 1/8/73 DATE 7/5/73

APPROVED W. C. Corp DATE 7/5/73

PREPARED BY Wilfred L Pike DATE 7-5-73
SUNTAC

0769

A (5/8)									
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				

1.0 Scope

1.1 This specification describes the equipment, method, and techiques to be used in testing butt welded stainless steel plates. This specification applies to the pool liner installation at the Big Rock Point Nuclear Power Plant, Charlevoix, Michigan.

2.0 Equipment Requirements

2.1 The vacuum box shall be rectangular in shape and designed for testing straight seams. The top shall be equipped with a clear window for viewing and the bottom flange shall be covered with a sponge rubber gasket for sealing against the plate to be tested.

2.2 The vacuum pump shall have the capability of producing and maintaining 10 psi vacuum when the leak tester is in operation.

2.3 The leak tester shall be equipped with a vacuum gage, 0-15 psi, 2 inch dial that will indicate the vacuum in the box. This gage will initially have an accuracy verification certificate.

2.4 The leak detection solution will be either Leak Tec No. 372A or a mixture of liquid detergent (1 part), glycerin (1 part), and water (4-1/2 parts).

2.5 The vacuum pump shall be driven by either a gasoline motor or an electric motor of suitable size.

2.6 A three way cock shall be provided to allow application of vacuum to the box or to admit air to the box after testing has been completed.

3.0 General

3.1 Prior to testing, check power unit and vacuum pump for proper lubrication.

3.2 Test vacuum box on a smooth plate to insure that it is capable of sealing and maintaining at least 8 psi vacuum.

4.0 Technique

4.1 Paint seams to be tested generously with leak detection solution described in 2.4.

4.2 Place inspection box over coated seam section and turn three way cock to apply vacuum. The weld is inspected through the window and leaks will be evidenced by clusters of bubbles that form where leakage occurs.

4.3 If leakage is evident at the gasket surface, apply pressure with the heel of each hand to the ends of the vacuum box. Also with the fingertips, push in on the edge of thee gasket at the point on each end of the box where the gasket crosses the weld joint.

4.4 Weld being tested should be held under 8 psi vacuum for at least 10 seconds before being considered leak free. An acceptable weld will show no bubble formation. Leaks will be marked by suitable means for repair.

4.5 After a section of weld has been tested, turn three way cock to release vacuum and lift box to position for the next test. Allow 3 inches overlap to insure areas under the box gasket are tested. Do not slide box as this will cause damage to the gasket.

4.6 All repaired welds will be retested until approved.

5.0 Post Test Cleaning

5.1 After completion of testing, all leak detection solution will be removed, using clean water and lint free rags.

6.0 Responsibility

6.1 All testing will be conducted by the work group with a Quality Assurance man observing. A log sheet will be used to record results, including repair work needed and corrective action that was accomplished.

INFORMATION COPY

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: CHARLEVOIX, MICHIGAN.

SUNTAC CONTRACT NO. 34881
SPECIFICATION NO. 34881-2400-102

SPECIFICATION

for

Fuel Pool Liner

CONSISTING OF

QUALITY ASSURANCE PROGRAM REQUIREMENTS FOR NON-NUCLEAR MATERIALS, PARTS, COMPONENTS AND SERVICES

SEE CONTENTS

APPROVED FOR CONSTRUCTION

APPROVED 7 H Macomber SUNTAC DATE 30 AUGUST '73
APPROVED H O Rombakoff CLIENT DATE 7/3/73
APPROVED [illegible] SUNTAC DATE 7/3/73
PREPARED BY [illegible] SUNTAC DATE 7-3-73

AMENDMENT	CLIENT APPROVED	CLIENT DATE	CLIENT APPROVED	CLIENT DATE	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	DATE
						EJT	HCB		11/5/73
0 (AFC)					DAC	[illegible]	[illegible]	[illegible]	[illegible]
A (F/A)									

672063

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

CONTENTS

1.0 Scope

1.1 This specification establishes the quality assurance requirements for contractors/suppliers furnishing materials, parts, components and services that are classified as non-nuclear.

2.0 Requirements

2.1 The contractor/supplier shall maintain a system which will assure that all supplies and services provided to Suntac Nuclear Corporation and their agent conform to design drawings, specifications, codes and standards as specified within the contract document or purchase order, whether the items have been manufactured or processed within the contractor's/supplier's facilities or procured from subcontractor or subvendor.

3.0 Control of Seller Changes

3.1 Seller shall notify Suntac Nuclear Corporation or its agent prior to affecting any changes in design definition, workmanship standards, contract or purchase order requirements. Such changes shall be reviewed and approved by Suntac Nuclear Corporation or its agent.

3.2 The supplier/contractor shall assume the responsibility for the adequacy and quality of all materials, parts, components and services supplied by him.

4.0 Special Processes

4.1 The supplier/contractor shall maintain a program for the control of all metallurgical, chemical, material cleaning and bonding, welding, coating, plating and other processes where uniform, high quality cannot be assured by inspection of the articles alone.

In addition, special inspection processes, such as radiography, ultrasonic test, liquid penetrant and magnetic particle shall be controlled to assure that the results uniformly and accurately indicate true quality.

4.2 When required by contract, the supplier/contractor shall obtain the necessary Suntac Nuclear Corporation approval prior to proceeding with processing materials for delivery on this contract.

When welding is to be performed, the supplier shall utilize only welders qualified in accordance with approved and qualified weld procedures.

4.3 Procedures and Personnel Qualifications of Special Processes are to be made available to Suntac Nuclear Corporation for review and approval prior to commencement of work, when applicable.

5.0 Identification and Control of Materials, Parts, Components and Services

5.1 The supplier/contractor shall have a system to provide for identification and control of materials, parts, components and services. Items requiring identification shall be identified by heat no., part no. or serial no., etc., or by other appropriate means to assure traceability of the material to their document records.

5.2 Methods of marking on the item shall be in accordance with purchase order or contract requirements and shall be such as will not cause direct or incipient damage to the item. Containers and packaging shall be marked so that the item can be identified without opening.

6.0 Purchaser and Their Agents Right of Access

6.1 Suntac Nuclear Corporation and their agent shall be permitted free access at all times to all facilities furnishing materials, parts, components and services through the life of the particular contract or purchase order.

7.0 Source Inspection Release for Shipment by Purchaser

7.1 Suntac Nuclear Corporation shall be notified by the supplier five (5) working days in advance of all shipments of materials, parts and components. No shipments will be made by the supplier until final inspection by Suntac Nuclear Quality Assurance has been initiated.

Suntac Nuclear Quality Assurance reserves the right to waive the inspection in writing giving the supplier the authorization to make shipment.

8.0 Documentation

8.1 A Certificate of Conformance along with all other test reports and applicable documents as specified in the design specification must accompany all shipments made against each item of the contract. Certificates must be signed by a representative and duly authorized member of the supplier's management orgnization.

8.2 Distribution of all documentation shall be as specified in the contract or purchase order.

NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: CHARLEVOIX, MICHIGAN

SUNTAC CONTRACT NO. 34493
SPECIFICATION NO. 34491-2400-102

SPECIFICATION

for

Fuel Pool Liner

CONSISTING OF

QUALITY ASSURANCE PROGRAM REQUIREMENTS FOR NON-NUCLEAR MATERIALS, PARTS, COMPONENTS AND SERVICES

SEE CONTENTS

APPROVED _____ DATE _____

APPROVED [illegible] DATE _____

APPROVED [illegible] CLIENT DATE 7/3/72

PREPARED BY [illegible] SUNTAC DATE 7/3/72

SUNTAC DATE 7-3-72

8007090

AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				

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8.0 Documentation

8.1 A Certificate of Conformance along with all other test reports and applicable documents as specified in the design specification must accompany all shipments made against each item of the contract. Certificates must be signed by a representative and duly authorized member of the supplier's management orgnization.

8.2 Distribution of all documentation shall be as specified in the contract or purchase order.

076212

08021-21-370P

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT PLANT
CLIENT: CONSUMERS POWER COMPANY
LOCATION CHARLEVOIX, MICHIGAN

CATALYTIC CONTRACT NO. 34881
SPECIFICATION NO. 34881-2400-110

SPECIFICATION

for

LIQUID PENETRANT TESTING

APPROVED FOR CONSTRUCTION

APPROVED E. M. [illegible] /EFT — CLIENT — DATE 24 August 1973
APPROVED H. C [illegible] — CATAL[illegible] PROJECT MANAGER — DATE 16 July 1973
APPROVED Jack [illegible] pp QA — CATALYT[illegible] QUALITY ASSURANCE MAN. — DATE 16 July 1973
PREPARED BY R. E. [illegible] — CATALYTIC LEVEL III — DATE 16 July 1973

0624

O (AFC)						EFT	HCB		9/11/73
A (FIA)						REP	J.C.C.	HCB		9/11/73
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				CATALYTIC, INC.				

LIQUID PENETRANT TESTING

1.0 Scope

1.1 This procedure establishes the method and techniques to be used in the performance of liquid penetrant inspections. It describes the visible dye, solvent removal method of detecting weld discontinuities open to the surface in ferrous and nonferrous materials which are non-porous. This procedure applies to the pool liner installation at the Big Rock Point Nuclear Power Plant, Charlevoix, Michigan.

2.0 References

ASME Boiler and Pressure Vessel Code Section VIII Div. 1 1971 Edition
ASME Boiler and Pressure Vessel Code Section III Paragraph NB5352 1971 Edition
1972 Book of ASTM Standards (ASTM E-165-65) Standard Methods for Liquid Penetrant Inspection
Quality Assurance Corporate Manual, Section VII

3.0 General

3.1 Liquid penetrant testing shall be performed in accordance with Appendix VIII Section VIII Division 1 of the ASME Boiler and Pressure Vessel Code.

3.2 Liquid penetrant testing shall be by the solvent removal method, using approved materials supplied by Sherwin, Inc., 5007 East Washington Boulevard, Los Angeles, California. 90040.

3.3 Personnel performing liquid penetrant examinations shall be qualified in accordance with Suntac Nuclear Corporation Procedure QAP-701-A and their qualification records made available upon request.

3.4 Area to be tested shall be adequately lighted to insure that there is no loss of sensitivity of the test.

3.5 Acceptance standards shall be in accordance with this procedure which are extracted from ASME Boiler and Pressure Vessel Code, Section III, 1971, Paragraph NB5352 and specific requirements from Consumers Power Company.

3.6 Final inspection shall be performed on materials in the final surface condition.

3.7 Completed repairs shall be reexamined by the method originally used for detection of the defect.

3.8 Liquid penetrant test shall be performed at all the stipulated stages of welding in accordance with the requirements of ASME Code Section III Div. 1 and all specific requirements from Consumers Power Company.

4.0 Technique

4.1 Surface Preparation

4.1.1 The surface to be examined and adjacent area within one (1) inch shall be dry and free of lint, dirt, grease, scale or any other matter that would prevent penetrant from entering discontinuities.

4.1.2 Cleaning prior to penetrant application shall be performed using acetone and clean dry cloths that are free of color, chemicals and lint.

4.1.3 Allow cleaner to dry for a minimum of five (5) minutes before applying penetrant.

4.1.4 The temperature of the surface to be examined shall not be below 60°F or above 125°F during the application or examination. If material is below 60°F, external heat may be applied providing a temperature indicator is employed (tempstick) in order to limit temperature to 125°F.

4.2 Penetrant Application

4.2.1 Penetrant shall be applied by brushing or spraying.

4.2.2 The entire surface to be examined shall be wetted with penetrant. Penetrant shall be reapplied as required to maintain wetted surface.

4.2.3 Penetrant shall remain on surface a minimum of ten (10) minutes.

4.2.4 Only Sherwin DP51 penetrant shall be used.

4.3 Penetrant Removal

4.3.1 Excess penetrant shall be removed from surface with absorbent paper or clean, dry cloths free of color, chemicals, and lint.

4.3.2 A clean, dry cloth moistened with Sherwin DR60 shall be used to remove remaining excess penetrant. Care shall be taken not to remove penetrant from discontinuities.

4.3.3 Flushing or spraying the surface prior to developer applications is prohibited.

0792

4.4 Developing

4.4.1 Only Sherwin D100 developer shall be used.

4.4.2 Developer shall be thoroughly agitated prior to application.

4.4.3 The developer shall be applied in a smooth light even coat.

4.4.4 Prior to application of developer, a minimum period of five (5) minutes shall be allowed to insure the cleaning solvents have evaporated.

4.5 Examination Procedure

4.5.1 To determine the true size and type of a discontinuity, the surface shall be watched during the application and drying of the developer.

4.5.2 Final interpretation shall be made after allowing the penetrant to bleed out for a minimum of seven (7) minutes to a maximum of thirty (30) minutes.

4.5.3 Large areas shall be inspected in increments to facilitate the prescribed time schedules.

5.0 Acceptance

5.1 Relevant indications (mechanical discontinuities)at the surface will be evident by the bleeding out of penetrant. Any nonrelevant indication which appears to be relevant shall be retested to verify whether or not actual defects are present.

5.2 A Liquid Penetrant Test will be rejectably upon any of the following indications listed below:

a. Any cracks or linear indications

b. Rounded indications with dimensions greater than 1/32 inch.

c. Four or more rounded indications in a line separated by 1/16 inch or less edge to edge.

d. Ten or more rounded indications in any 6 square inch of surface with the major dimension of this area not to exceed 6 inches with the area taken in the most unfavorable location relative to the indications being evaluated.

6.0 Post Examination Cleaning

All penetrant materials shall be removed from surfaces using Sherwin surface cleaner DR60 or acetone and a clean dry cloth.

7.0 Documentation

7.1 Test results shall be documented on Suntac's Exhibit No. 30, "Liquid Penetrant Inspection Report."

7.2 Material test certifications for penetrant, developer, and remover shall be available at the site as well as NDE personnel qualification, certification, and eye examination records.

8.0 Responsibility

8.1 The Field Superintendent shall notify the Quality Assurance Representative of welds that are scheduled to be inspected.

8.2 The Quality Assurance Representative shall perform the inspections, complete Exhibit No. 30 and distribute documentation.

Catalytic, Inc.

Philadelphia, Pennsylvania 19102

Exhibit No. 30

S.O. Number _____

Sheet Number _____

System _____

Job Number _____

Date _____

Page ____ of ____

LIQUID PENETRANT INSPECTION REPORT

Client	Material Description	Material Type

Penetrant System: Solvent Removable ☐ Water Washable ☐	Brand Name	Penetrant ☐ ☐	Batch No.	Remover ☐ Water ☐	Batch No.	Developer	Batch No.	Surface Condition

Temperature °F	Precleaner Type and batch Number	Cleaner Drying Time Minutes	Dwell Time Minutes	Penetrant Removal Method: Solvent Wiped ☐ Water Spray ☐

Remover Drying Time Minutes	Development Time Minutes	Post Cleaner Solvent ☐ Water ☐	Code or Specification	Evaluated by: ASNT Lev.

Piece or Weld No	ACCEPT	REJECT	LINEAR	ROUNDED	Description of Indications
					076249

Certified Correct: _____ Quality Assurance Representative _____ Date

Reviewed and Accepted: _____ Authorized Code Inspector _____ Date

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT — SUNTAC CONTRACT NO. 34491

CLIENT: CONSUMERS POWER COMPANY — Specification No. 34491-2400-110

LOCATION CHARLEVOIX, MICHIGAN

SPECIFICATION

LIQUID PENETRANT TESTING

APPROVED _____ DATE _____
CLIENT

APPROVED H. C. Rothert DATE 7/16/73
SUNTAC PROJECT MANAGER

APPROVED _____ DATE 7/16/73
SUNTAC QUALITY ASSURANCE MANAGER

PREPARED BY _____ DATE 7-16-73
SUNTAC LEVEL III

AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				

LIQUID PENETRANT TESTING

1.0 Scope

1.1 This procedure establishes the method and techniques to be used in the performance of liquid penetrant inspections. It describes the visible dye, solvent removal method of detecting weld discontinuities open to the surface in ferrous and nonferrous materials which are nonporous. This procedure applies to the pool liner installation at the Big Rock Point Nuclear Power Plant, Charlevoix, Michigan.

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4.3.3 Flushing or spraying the surface prior to developer applications is prohibited.

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4.4.1 Only Sherwin D100 developer shall be used.

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5.2 A Liquid Penetrant Test will be rejectable upon any of the following indications listed below:

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c. Four or more rounded indications in a line separated by 1/16 inch or less edge to edge.

d. Ten or more rounded indications in any 6 square inch of surface with the major dimension of this area not to exceed 6 inches with the area taken in the most unfavorable location relative to the indications being evaluated.

6. Post Examination Cleaning

All penetrant materials shall be removed from surfaces using Sherwin surface cleaner DR60 or acetone and a clean dry cloth.

7.0 Documentation

Test results shall be documented on Suntac's Exhibit No. 30, "Liquid Penetrant Inspection Report".

8.0 Responsibility

8.1 The Field Superintendent shall notify the Quality Assurance Representative of welds that are scheduled to be inspected.

8.2 The Quality Assurance Representative shall perform the inspections, complete Exhibit No. 30 and distribute documentation.

SUNTAC NUCLEAR CORPORATION
Philadelphia, Pennsylvania 19102

LIQUID PENETRANT INSPECTION REPORT

Exhibit No. 30

Date _____

Page ____ of _____

076198

O. Number _____
est Number _____
stem _____
b Number _____

Part	Material Description	Material Type

Penetrant System: Solvent Removable ☐ Water Washable ☐	Brand Name	Penetrant ☐ ☐	Batch No.	Remover ☐ Water ☐	Batch No.	Developer	Batch No.	Surface Condition

Temperature °F	Precleaner Type and Batch Number	Cleaner Drying Time Minutes	Dwell Time Minutes	Penetrant Removal Method: Solvent Wiped ☐ Water Spray ☐

Remover Drying Time Minutes	Development Time Minutes	Post Cleaner Solvent ☐ Water ☐	Code or Specification	Evaluated by: ASNT Lev.

Part or Weld No	Number of	Length of	Linear	Rounded	Description of Indications

Certified Correct: _____ Quality Assurance Representative

_____ Date

30166

MEETING MINUTES - BIG ROCK POINT

MAY 24, 1973

Attendees:

Frank Macri	Consumers Power Company	
Jim Rang	"	"
William Clarke	"	"
Sy Hartman	"	"
Charles Axtell	"	"
Vince Iacono	Suntac Nuclear Corporation	
Jon Stouky	"	" (author)

cc:
P. D. Arrowsmith
J. C. Clapp
J. Farrell
R. Wilder

Subject: Big Rock Point Fuel Pool Liner Installation

The meeting was held to further acquaint SUNTAC with the facilities, to clarify questions raised by SUNTAC review of the Bechtel specifications and to determine the current schedule for the work.

Discussion

The following SUNTAC comments were made on the specifications:

Plate Procurement Specification

A general SUNTAC question as to whether SUNTAC will be responsible for assuring adequate vendor Q. A. documentation and compliance resolved by deciding that Consumers will be responsible for assuring adequacy of both plate vendor and installer Q. A. directly. This will include weld rod and welder certification.

Plate Erection Specification

The question of meeting the requirements of Safety Guide 31 per se never came up. For SUNTAC's purposes, we assume that the requirements of Safety Guide 31 will be met.

676802

The requirements for grinding welds was resolved as follows: SUNTAC will provide a weld sample (probably TIG) which will be the standard for field welding. It is not anticipated that weld of the sample quality will have any significant crown or surface defects, and will not require grinding. The liner backside welds will not be ground. Any grinding on the inside surfaces (removal of handling clips, etc.) will be done to a dull finish.

All welds will be dye penetrant (instead of helium leak) tested using cleaner, penetrant and developer acceptable to Consumers. Dye penetrant inspection will be performed by an ASNT Level II Inspector. All welds will also be tested by the acuum box soap bubble technique prior to hydrostatic testing of the pool.

A weld repair procedure which permits repair of the full penetration seam welds from one side only will be prepared by SUNTAC for Consumers Power Company approval.

A general comment concerning items in Paragraph 9.3, which is a contractors warranty statement, was made by SUNTAC to the effect that we could not assume undo liability. Although this was not resolved at the meeting, SUNTAC's position, which is that we will be bound by warranty terms in the contract between Consumers and SUNTAC, was later discussed with Frank Macri.

The dye penetrant to be used will have to be specified, approved by Consumers and batch certifications provided.

It was decided that we could weld lifting devices on the stainless steel plate if necessary but we will have to provide a procedure for their installation and removal.

Specification 10211-M-1

SUNTAC questioned whether the plant would supply a CAM for the filter inlet and/or outlet. Consumers will not supply this and will provide adequate grab sampling to assure that the fuel pool enclosure air is below MPC's at all times.

Specification 10211-M-2

No Comment

Specification 10211-M-3

No Comment

Specification 10211-M-4

SUNTAC questioned whether Consumers would require an in-place DOP efficiency test, and if so, whether SUNTAC or Consumers would do it. Consumers decided that the manufacturer's certification would be sufficient.

Consumers suggested that the housing be fitted with ports and a differential pressure gage across the filter.

Specification 10211-M-5

The same comment applies regarding the provision of test ports for flow balancing.

Concrete Placing Specification

No cure time is specified for the concrete. Although there was no resolution of this, SUNTAC will give the concrete sufficient cure time prior to continuing work in the pit. This will assure that spalling of the concrete will not occur.

Enclosure Specification

SUNTAC questioned whether the enclosure was designed to withstand a 10" W.G. vacuum. Vent ports will be installed to prevent damage to the enclosure.

Special Notes

The following general comments were made by Consumers and SUNTAC:

1. SUNTAC equipment shipping schedules should be sent to Frank Macri by Jon Stouky. Frank will get them to the plant. All material should be addressed to SUNTAC in care of the Plant Superintendant.
2. Jim Rang requested SUNTAC's estimate of the cost of various fuel pool draining and storing options other than disposal in the lake. These will be provided during the week of June 4.

3. SUNTAC should plan on using construction trailers for their work force. The trailers will be placed on the blacktop area in front of the offices.

4. It was agreed that SUNTAC would provide labor to decontaminate the pool, Consumers will remove all equipment from the pool and Consumers will provide Health Physics surveys of the pool during decontamination.

5. The following critical dates were provided by Consumers:

   - Complete fuel and waste shipping by August 1 (the enclosure should be installed the second half of July).
   - All Consumers Power Company material is to be on-site by July 15 (we will move the liner directly from the truck to the containment, if possible).
   - The pool can be drained in a few days to storage or in about 20 days maximum if processed. Fuel pool draining will commence when fuel shipping is complete.
   - The job should be complete by the end of 1973.
   - SUNTAC agreed to provide a detailed schedule of activities by June 8.

6. During a tour of the containment, the best method of bringing materials (assuming they will fit in the closed air-lock) into the containment was discussed. Although it was not resolved, the following points were made:

   - SUNTAC will move the equipment and/or concrete through the air-lock if it is inconvenient to shut the plant down.
   - A maximum of two shutdowns would be required. They might have to be scheduled on week-ends.

7. SUNTAC will provide coveralls (other than white) for the labor force to use between the trailer and the change area, thus eliminating the need for use of Consumers locksmiths in the facility.

34881-1800-2-2R1

INDUSTRIES

METAL DIVISION

Atlanta Region

W. D. SMITH
Manager

September 19, 1973

TO WHOM IT MAY CONCERN:

This is to certify the sheet lead furnished Suntac Nuclear Corporation on Order No. 34491-1800-2 conforms to Federal Specification QQ-L-201f, Grade B with a minimum lead content of 99.5%.

Yours very truly,

N L INDUSTRIES, INC.

F. E. Rainwater
Assistant to Manager

FER:mat

(8)

07596S

QUALITY ASSURANCE REVIEWED

25 SEP 1973

L. W. KUHLMAN, JR.

446

Box 7008, Station C, Atlanta, Georgia 30309
451 Bishop Street, N.W., Atlanta, Georgia 30318 • (404) 876-7361
Division of N L Industries, Inc.

STATEMENT OF CONFORMANCE

We certify that the listed equipment and required documentation for same meet the requirements of the purchase order and applicable specifications:

P. O. NO. 1021-C-171-AC REV. 3 Rev 4 added by telex

SPECIFICATION: 10,211-C-171 REV. 1

PRIME VENDOR: NOOTER CORP.

SUPPLIER: SAME

ADDRESS: ST. LOUIS MO.

DESCRIPTION OF EQUIPMENT: STAINLESS STEEL LINER PLATE FOR SPENT FUEL POOL, - 304 S.S. 320 FEET BENT PLATE CHANNELS, - 304 S.S. 320 FEET 3/8" OD X .035 WALL TUBING, - 304 S.S.

IDENTIFICATION: MISCELLANEOUS NUTS, BOLTS, PLATE (CROP)

a. ITEM NOS WP-1 THRU WP-36, FP-1 THRU FP-5, CP-1 & CP-2, WP2-1 THRU WP2-25, C-1 THRU C-23, WCM-1 THRU WCM-4,

b. EQUIPMENT NOS. SHOP ORDER MARK L-7092

c. TAG NOS. SAME AS ABOVE

APPROVED EXCEPTIONS: DRAWINGS APPROVAL (2)
WELD MAP APPROVAL (3)

Signature (Supplier Representative)

Title

7/23/73
Date

Distribution:
Original: Supplier to transmit to Jobsite
cc: Purchasing Inspector (P)
Supplier

3798 (11-71)

1021-000-C171-19-1

Consumers Power Company — Jackson, Michigan
FMMacri, P-14-230, Last

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

GWO: 6248 — DT-FPL-076

Plant: Big Rock Point — Date: 3/15/74

Description: Fuel Pool Liner - Additions to Work Package CWP-155 — File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSRang			X	~~CWHartman~~/LRigel/	RA 3/22/74
						JJSchrit~~chi~~	3/25/74
					X	RLWilson/MCPatel	

From: FMMacri

Comments Requested by: -

Documents:	Previous Review Rev	Previous Review Date
BDCW No. 12		
CWP-155, Rev 3	2	11/26/73

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri.

8609070

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 3/13/74

Date Comments Transmitted to Originator:

Review Complete:

Date:

EXHIBIT NO. 5

DRAWING CLASSIFICATION

Plot Plan ☐
Process Flow Diagram ☐
Engineering Flow Diagram ☐
Architectural ☐
Civil ☐
Electrical ☐
Heat, Vent. & Air Conditioning ☐
Instrumentation ☐
Mechanical ☐
Piping ☐
Pressure Vessel
Structural
Work Procedure

SUNTAC NUCLEAR CORPORATION
Philadelphia, Pennsylvania 19102

EDCN
ENGINEERING DESIGN CHANGE NOTICE

DATE 1 March 1974

EDCN Number 12 | Sheet ___ of ___

Rev. Number | Change Hours

Change Made By J.V. Iacono | Check Made By

Process Approval E. F. Turner

Project Approval

Client's Approval

Drawing Title: Construction work package CWP-155, Rev. 3 "Prefabricate & Install Liner in Spent Fuel Pool"

Drawing Number or Numbers

Contract Number 34881

Change Description Or Sketch

Additions to work package consistant with revised weld maps that were issued on EDCN #11 dated 19 February 1974.

076059

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

CONSTRUCTION WORK PACKAGE

		SHOP ORDER NUMBER Rev. 3 CWP-155
CHARGE 34881	DEPARTMENT CONSTRUCTION	MGR. OF CONSTRUCTION APPROVAL
SAFETY REVIEW N/A	Q.A. ENGR. REVIEW	WELD ENGR. REVIEW
RAD CONTROL REVIEW RWP REQUIRED [X] yes [ ] no	CLIENT APPROVAL	PROJECT MGR. APPROV. H. C. Burton

: FIELD SUPT.
CLIENT REPRESENTATIVE
PROJECT MGR.
MGR., QUALITY ASSURANCE
SUPV., RAD CON
MGR., CONSTRUCTION

. ORIGINATOR
L. B. Rehtaugh 2/21/74

PLICABLE TO THIS WORK PACKAGE

SPECIAL REQUIREMENTS

CLEANLINESS GRADE	QAP-501F
WELDER QUALIFICATION	X
PIPE FREEZES REQUIRED	
SYSTEM CLASSIFICATION	
LAGGING (THERMAL INSUL.)	
PAINTING	

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES	
PREREQUISITES	X
NONPLANT CONT. WORK	X
PLANT CONT. WORK	
POST INSTALL TESTS	

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT	
REACTOR PLANT COOLDOWN	
REACTOR PLANT SHUTDOWN	X
COMPONENT ISOLATED	

QUALITY ASSURANCE RELEASE
FOR
MATERIAL WITHDRAWAL
AND
FABRICATION / INSTALLATION

FIELD Q. A. ENGINEER DATE

1. SUMMARY

1.1 TITLE Same as original work request

1.2 PURPOSE Add step 21.117 thru 21.154

1.3 AUTHORIZATION Same.

1.4 REFERENCES EDCN No. 11, SK-3, 4, 5, 6 & 7.

1.5 ENCLOSURES Same

0600760

*The person designated to sign for an action verifies ba on personal observation and certifies by his signature that the action has actually been performed in accordan

Consumers Power Company

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

~~FMMacri, EARP~~
~~JJZabritski, EARP~~
FMMacri, P-14-230, Last

CWO: 6248

DT-FPL-058

Plant: Big Rock Point

Date: 11/6/73

Description: Fuel Pool Liner - Design Change Notice

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	RBDeWitt/JSRang			X	WPCooke/RLWilson/MCPatel	
	X	WClark			X	CJHartman/CRiebel/JJZabritski	11/6/73

From: FMMacri

Comments Requested by: -

Documents: Suntac EDCN No. 2

Previous Review	
Rev	Date
-	-

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to F. M. Macri.

180970

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 11/5/73

Date Comments Transmitted to Originator:

Review Complete:

Date:

EXHIBIT NO. 5

DRAWING CLASSIFICATION

- Plot Plan ☐
- Process Flow Diagram ☐
- Engineering Flow Diagram ☐
- Architectural ☐
- Civil ☐
- Electrical ☐
- Heat, Vent. & Air Conditioning ☐
- Instrumentation ☐
- Mechanical ☐
- Piping ☐
- Pressure Vessel ☐
- Structural ☐
- Liner Plate ☒

SUNTAC NUCLEAR CORPORATION

Philadelphia, Pennsylvania 19102

ENGINEERING DESIGN CHANGE NOTICE

Drawing Title: Reactor Building Spent Fuel Pool Liner Plates Plans & Elevation

Drawing Number or Numbers: Bechtel C - 1 - R4

Contract Number: 34881

DATE: 10/17/73

EDCN Number: 2

Sheet ___ of ___

Rev. Number:

Change Hours:

Change Made By: [signature]

Check Made By:

Process Approval:

Project Approval: H. C. Bushkoff / R. E. Faibisoff

Client's Approval: [signature]

Change Description Or Sketch

Add 2½" x 3/16 - 304 SS bar to horizontal weld joint on west wall (section A) and east wall (section C) of liner plate and fillet weld bar. This is in lieu of using butt weld on the horizontal joint on west (section A) and east wall (section C) liner plate.

7809070

RECEIVED
OCT 23 1973
H. C. BUSHKOFF

...Mt, P-14-230
FMMacri, P-14-230, last

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

CVO: 6248

DT-FPL-070

Plant: Big Rock Point Plant

Date: January 22, 1974

Description: Fuel Pool Liner -- EDCN No 8

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
X		JSRang			X	WPCooke/RLWilson/	
	X	WClark				NCPatel	
X		CAWunt			X	CJHeffman/CBAbel	
						JJZabritski	

From: FMMacri

Comments Requested by: January 29, 1974

Documents: EDCN No 8 - Delete Existing Cinch Anchors

Previous Review	
Rev	Date

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri, P-14-230.

076077

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: _____

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

CRAbel, BRPP
JJZabritski, BRPP
FMMacri, P-14-230, last

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

DT-FPL-070

GMO: 6248

Date: January 22, 1974

Plant: Big Rock Point Plant

File: Review Records

Description: Fuel Pool Liner -- EDCN No 8

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
X		JSRaap			X	WPCooke/ELWilson/	
	X	WSClark				MCPatel	
X		CAHum			X	CJHartman/CRAbel/	
						JJZabritski	

From: FMMacri

Comments Requested by: January 29, 1974

Documents:	Previous Review Rev	Date
EDCN No 8 - Delete Existing Cinch Anchors		

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri, P-14-230.

070975

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: _____

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

EXHIBIT NO. 5

DRAWING CLASSIFICATION

- Plot Plan ☐
- Process Flow Diagram ☐
- Engineering Flow Diagram ☐
- Architectural ☐
- Civil ☐
- Electrical ☐
- Heat, Vent. & Air Conditioning ☐
- Instrumentation ☐
- Mechanical ☐
- Piping ☐
- Pressure Vessel ☐
- Structural ☐
- ☐

SUNTAC NUCLEAR CORPORATION

Philadelphia, Pennsylvania 19102

ENGINEERING DESIGN CHANGE NOTICE

DATE 12/31/73

EDCN Number 9

Sheet 1 of 1

Rev. Number

Change Hours

Change Made By

Check Made By

Process Approval

Project Approval

Client's Approval

Drawing Title

Drawing Number or Numbers: Bechtel C-2 Rev. 4

Contract Number: 34881

Change Description Or Sketch

Delete the requirements for installing two each bolts into existing cinch anchors, as shown in detail 11.

The bolts are not required because the stainless steel angle is welded to the spent fuel pool liner plate and the liner plate is secured to the pool on the centerline of the angle brackets with 5/8" weje bolts on 1'6" centers.

9709070

RECEIVED

07 JAN 1974

H. C. BUSHKOFF

EXHIBIT NO. 5

DRAWING CLASSIFICATION	SUNTAC NUCLEAR CORPORATION	DATE 12/31/73
Plot Plan ☐	Philadelphia, Pennsylvania 19102	EDCN Number 9 / Sheet 1 of 1
Process Flow Diagram ☐	ENGINEERING DESIGN CHANGE NOTICE	Rev. Number / Change Hours
Engineering Flow Diagram ☐		Change Made By K.F. Yu / Check Made By
Architectural ☐		Process Approval
Civil ☐	Drawing Title	Project Approval H. C. Bushkoff
Electrical ☐		Client's Approval
Heat, Vent. & Air Conditioning ☐		
Instrumentation ☐		
Mechanical ☐		
Piping ☐		
Pressure Vessel ☐		
Structural ☐		
☐		

Drawing Number or Numbers	Contract Number
Bechtel C-2 Rev. 4	34881

Change Description Or Sketch

Delete the requirements for installing two each bolts into existing cinch anchors, as shown in detail 11.

The bolts are not required because the stainless steel angle is welded to the spent fuel pool liner plate and the liner plate is secured to the pool on the centerline of the angle brackets with 5/8" weje bolts on 1'6" centers.

8107 076078

RECEIVED
07 JAN 1974
H. C. BUSHKOFF

Consumers Power Company

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

CJHartman, ERPP
CRAbel, ERPP
JJZabritski, ERPP
FMMacri, P-14-230, last

DT-FPL-072

GWO: 6248

Date: January 25, 1974

Plant: Big Rock Point Plant

File: Review Records

Description: Fuel Pool Liner - EDCN No 9

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSHaas			X	RLWilson/MCPatel	
	X	WClark			X	CJHartman/CRAbel/ JJZabritski	1/25/74

From: FMMacri

Comments Requested by: ---

Documents: EDCN No 9 - Eliminate lower anchors for R & D frame and cutouts in cast plate.

Previous Review Rev	Previous Review Date

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri, P-14-230.

0760 70

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 1/25/74

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

EXHIBIT NO. 5

DRAWING CLASSIFICATION

Plot Plan ☐
Process Flow Diagram ☐
Engineering Flow Diagram ☐
Architectural ☐
Civil ☐
Electrical ☐
Heat, Vent. & Air Conditioning ☐
Instrumentation ☐
Mechanical ☐
Piping ☐
Pressure Vessel ☐
Structural ☐
☐

SUNTAC NUCLEAR CORPORATION

Philadelphia, Pennsylvania 19102

EDCN

ENGINEERING DESIGN CHANGE NOTICE

Drawing Title: Spent Fuel Pool Liner Plate Sections & Details

Drawing Number or Numbers: Bechtel C-2 Rev. 4

Contract Number: 34881

DATE: 1/16/74

EDCN Number: 9

Sheet 1 of 1

Rev. Number:

Change Hours:

Change Made By:

Check Made By:

Process Approval: H. C. Bushkoff

Project Approval:

Client's Approval:

Change Description Or Sketch

Delete cut out, shim plates and bolts in detail 7.

These bolts are no longer needed to secure the R & D Frame to the wall because of a change in the design of the R & D Frame.

0760

RECEIVED
22 JAN 1974
H. C. BUSHKOFF

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

~~GHAbri, BNPP~~
~~JJZabritski, BNPP~~
FMMacri, P-14-230, last

DT-FPL-074

Date: February 20, 1974

File: Review Records

GWO: 6248

Plant: Big Rock Point Plant

Description: Fuel Pool Liner - EDCN 10

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSBane			X	HCPatel/RLWilson	RLA 2/21/74
	X	LClark			X	~~CJSchwarz/GHWebb~~ JJZabritski	JJZ 2/22/74

From: FMMacri

Comments Requested by: February 25, 1974

Documents: EDCN 10 - Skimmer Duct and Plate Change

	Previous Review Rev	Date

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri, P-14-230.

076055

To Be Filled in by Engineering Coordinator.

Date Document Received From Originator: ______

Date Comments Transmitted to Originator: ______

Review Complete: ______

Date: ______

EXHIBIT NO. 5

DRAWING CLASSIFICATION

Plot Plan ☐
Process Flow Diagram ☐
Engineering Flow Diagram ☐
Architectural ☐
Civil ☐
Electrical ☐
Heat.Vent.& Air Conditioning ☐
Instrumentation ☐
Mechanical ☐
Piping ☐
Pressure Vessel ☐
Structural ☐
☐

SUNTAC NUCLEAR CORPORATION
Philadelphia, Pennsylvania 19102

EDCN
ENGINEERING DESIGN CHANGE NOTICE

Drawing Title Reactor Building Spent Fuel Pool liner Plate Section & Details

Drawing Number or Numbers: Bechtel C-2 Rev. 4

Contract Number: 34881

DATE 2/7/74

EDCN Number: 10

Sheet 1 of 1

Rev. Number:

Change Hours:

Change Made By:

Check Made By:

Process Approval:

Project Approval: N. C. Rusbuldt

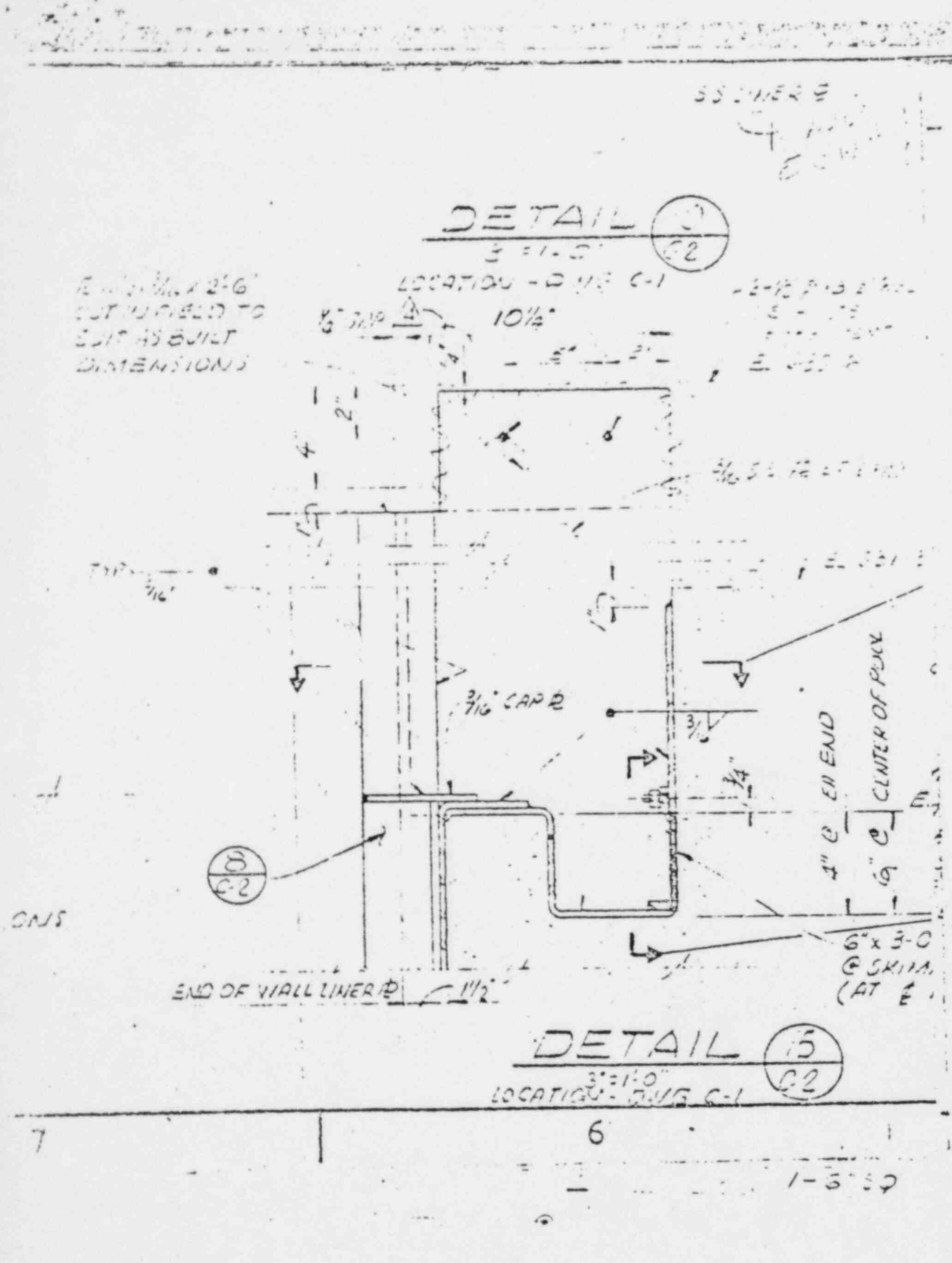
Client's Approval:

Change Description Or Sketch

Change 3/16" stainless steel plate each end of skimmer duct to match north and south wall liner plate elevation. Delete 2½ diameter wej-it bolts from each skimmer duct end plate. Fasten skimmer duct end plates with 3/16" fillet weld to embedded angle iron.

This change is necessary to allow fit up of end plate to existing conditions in the Spent Fuel Pool.

0760056


DETAIL
C2
LOCATION - DWG C-1
10¼"
CUT IN FIELD TO
SUIT AS BUILT
DIMENSIONS
3/16" CAP PL
4" ℄ EM END
6" ℄ CENTER OF PUCK
6" x 3-0
END OF WALL LINER PL
1½"
8
C-2
DETAIL
5
C2
3"=1'-0"
LOCATION - DWG C-1
7
6

0760057

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

08031-4702

ALTERATION NOTIFICATION

Contract No. 34881/GWO-6248 Job No. _____ Date 17 Dec. 1973

SUNTAC Alteration Order No. 34881-1

Client Alteration Order No. _____

Subject: Spent Fuel Pool Liner, Consumers Power Co., Charlevoix, Michigan

Scope of Work: A 4 inch fill line enters the pool near the west end of the north wall near the top. (See Bechtel Co. Drawing 10211-C-1, Rev. 4). Because this line is Aluminum, a weld between Aluminum and Stainless Steel as shown on Bechtel Co. Drawing 10211-C-2', Rev. 4, Detail 9 is not feasible. The flanged section of pipe that penetrates the north wall is being replaced with Stainless Steel.

Justification: Bill of Materials

8'-0" - 4" Sch.10 Welded ASTM A-312 TP304 S.S. Pipe
2 - 4" Sch.10 L.R. 90° Ell A403-WP-304
2 - 4" 150# R.F. Slip-on-flange A-182 F-304
1 - 3/4" 3000# Screwed Full C plg. 304 S.S.
1 - 3/4" 6000# Screwed Barstock Plug, S.S.

Estimated Material Cost	$280.00
Fabrication and Installation	400.00
Design & Procurement - 6 hrs.	90.00
Estimated Total -	$770.00

Since there is no practical method of welding aluminum to stainless steel, this is considered the preferred solution.

672042

_____
Project Manager

CLIENT APPROVAL _____ DATE _____ Page ____ of ____

EXHIBIT NO. 5

DRAWING CLASSIFICATION

Plot Plan ☐
Process Flow Diagram ☐
Engineering Flow Diagram ☐
Architectural ☐
Civil ☐
Electrical ☐
Heat, Vent & Air Conditioning ☐
Instrumentation ☐
Mechanical ☐
Piping ☒
Pressure Vessel ☐
Structural ☐
☐

SUNTAC NUCLEAR CORPORATION
Philadelphia, Pennsylvania 19102

E D C N
ENGINEERING DESIGN CHANGE NOTICE

DATE 17 December 1973

EDCN Number 5 | Sheet ___ of ___

Rev. Number | Change Hours

Change Made By J.M. Burghoffer | Check Made By

Process Approval

Project Approval

Client's Approval

Drawing Title: Fill line replacement spool

Drawing Number or Numbers: SK-1305

Contract Number: 34881

Change Description Or Sketch

Attached sketch (SK-1305) describes method of replacing Aluminum spool piece in 4 inch fill line to spent fuel pool. Aluminum replaced with Stainless Steel to allow welding seal between pipe and liner.

Material has been ordered.

CALCULATION SHEET

CATALYTIC, INC.
PHILADELPHIA, PA.

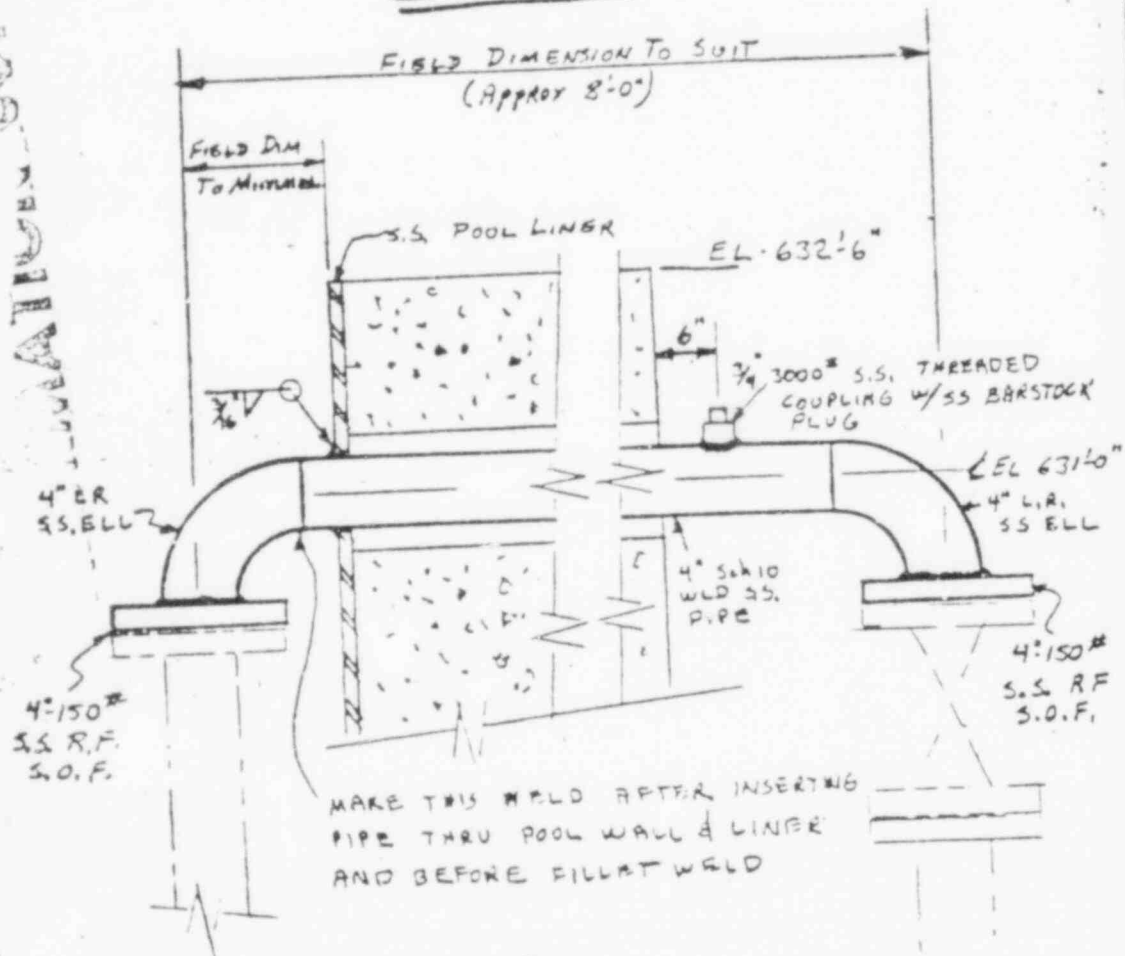
PAGE 1

JOB NO. 34881

TITLE FILL LINE REPLACEMENT SPOOL DATE 17 DEC 1973

CONSUMERS POWER CO. - SPENT FUEL POOL LINER

SK-7305



BILL OF MATERIAL

8'-0"	4" Sch 10	WELDED ASTM A-312 TP 304 S.S. PIPE
2	4" Sch 10 L.R. 90°	ELL A-403 - WP 304
2	4" 150# R.F.	SLIP-ON FLG. A-182 F-304
1	3/4" 3000#	SCREWED FULL CPLG 304 STAINLESS STEEL
1	3/4" 6000#	SCREWED BARSTOCK PLUG STAINLESS STEEL

672044

SDC File - St Reliance

Consumers Power Company — Jackson, Michigan, USA

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

GWO: 6248

DT-FPL-042

file under Q/A

Plant: Big Rock Point

Date: 9/17/73

Description: Fuel Pool Liner
Vendor Certification & Info

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSRang					
	X	WClark					
	X	CJ~~ha~~rtman (CRAbel)					

From: F. M. Macri

Comments Requested by: 9/25/73

Documents:	Previous Review Rev	Previous Review Date
✓ 34881-1800-2-1R1 (Nat'l Lead-Layout)		
✓ 34881-1720-7-1R1 (Bituminous Coating)		
34881-1308-4-1R1 (Weld Test Plates)		
✓ 34881-2801-17-1R1 (Strainers & Filter-Cert)		
✓ 34881-2801-17-2R1 (Strainers & Filter-Data)		
34881-2801-17-3R1 (Strainers & Filter-Inst)		
✓ 34881-2801-17-4R1 (Strainers & Filter-Dwg)		
✓ 34881-2006-22-1R1 (Flex Duct Cert)		

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to F. M. Macri.

07626

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 9/14/73

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

3486-1800-2-1A (A)

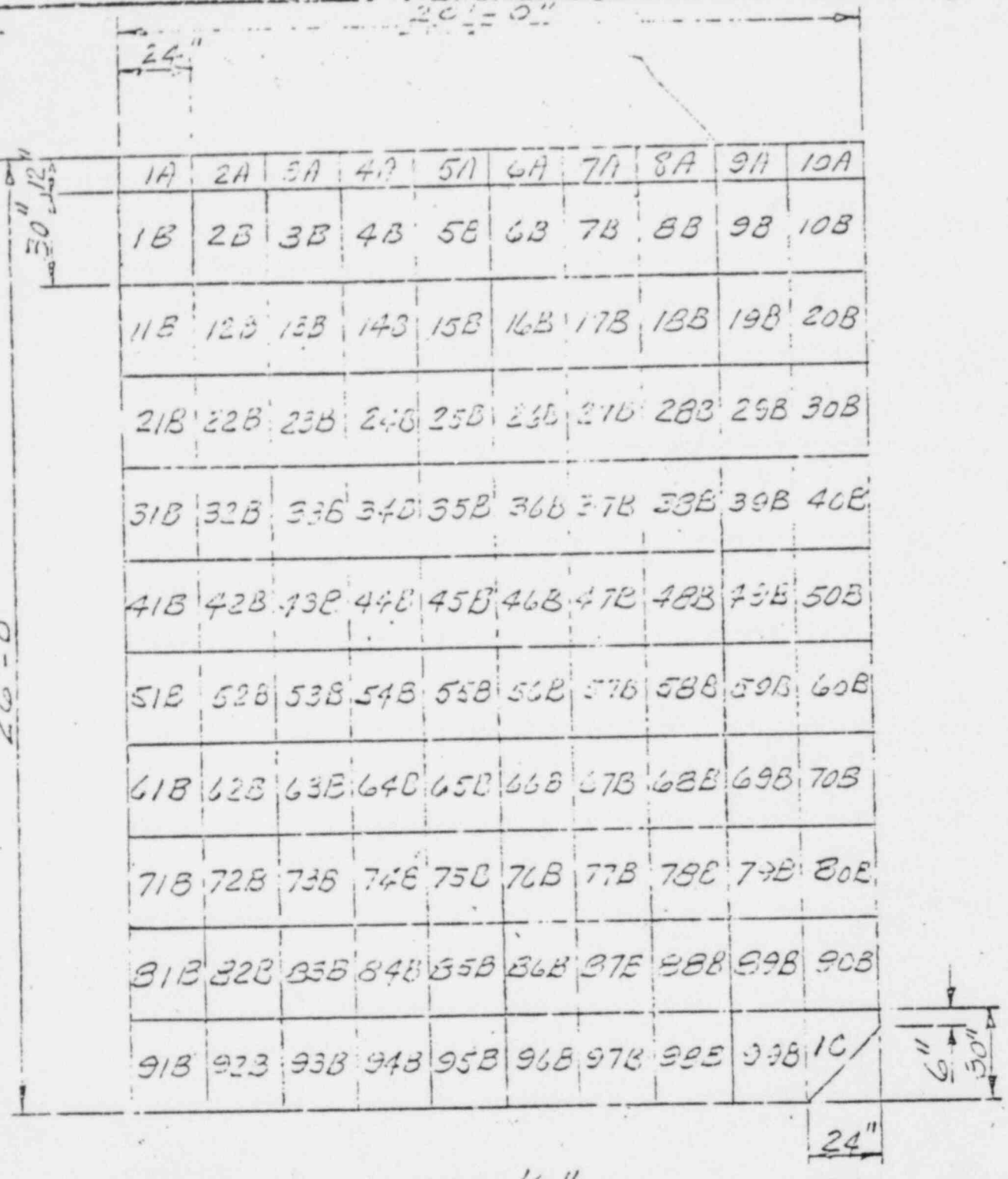


PLATE THICKNESS: 1/2"
"A" PLATES INTERCHANGEABLE.
"B" PLATES INTERCHANGEABLE.

0762655

REVISIONS	SECHTEL CO.	NATIONAL LEAD COMPANY
	POOL PLATE LAYOUT	ATLANTIC BRANCH
	BOTTOM RINSE	PERTH AMBOY, N. J.
	SCALE: 1/4" = 1'0"	DWN. CHKD. DATE 5-2-12 MS-432A

34881-1800-2-121

(B)

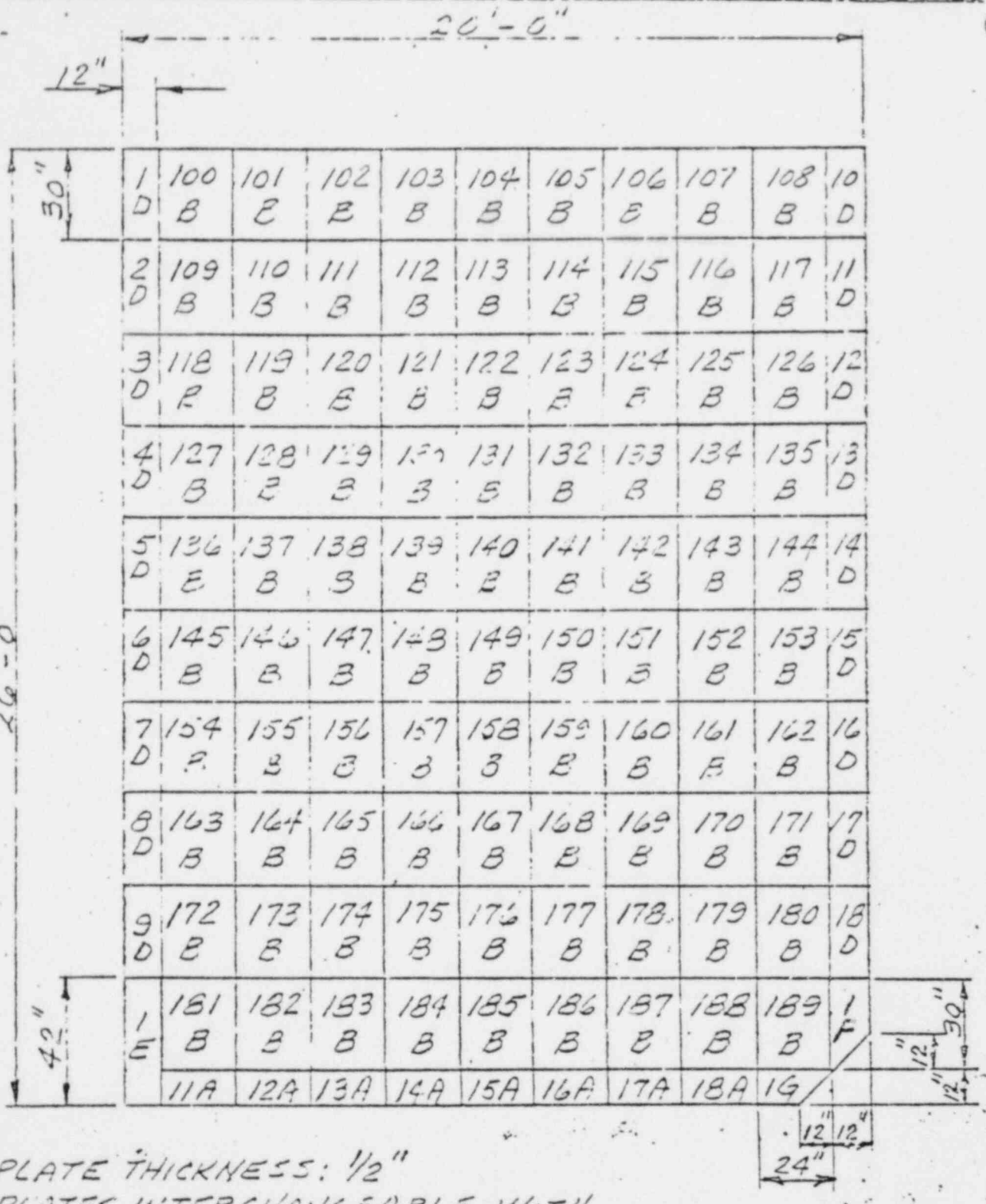


PLATE THICKNESS: 1/2"
PLATES INTERCHANGEABLE WITH PLATES OF SAME LETTER.

0762

REVISIONS			
		BECHTEL CO.	NATIONAL LEAD COMPANY
		POOL PLATE LAYOUT	ATLANTIC BRANCH
		TOP COURSE	PERTH AMBOY, N. J.
		SCALE: 1/4" = 12"	DWN. FWL / CHKD. / DATE 8-22-73 / M2-433A

34491-1720-7- 121

RECEIVED

CERTIFICATE OF COMPLIANCE AND ANALYSIS

CONSIGNED TO CONSUMERS POWER CO. CHARLEVOIX, MICHIGAN 49720	LOT NO. (A) 69 QUANTITY OF LOT (B) 90 PACKING OF LOT (D) 54 Gal Each	QUANTITY IN THIS SHIPMENT 1 (C)
ITEM (E) Pioneer 607 Black Bituminous Paint, MIL-C-450C Type 1	DWG. AND REV. (F)	SPEC. AND REV. (G)
SHIPPED VIA Rook (H)	CAR INITIALS AND NO. (I) Rook 172 CONTRACT OR P. O. NO. (K) 34491-1720-7	B/L NO. (J) PAP2108 DATE SHIPPED (L) 8-15-73

IT IS CERTIFIED THAT THE FOLLOWING IS AN ANALYSIS OF TESTS PRESCRIBED FOR THE ABOVE ITEM AS REQUIRED IN APPLICABLE SPECIFICATION.

(LIST SPEC. (M) MIL-C-450C Type 1

LIST APPLICABLE AUTHORIZED WAIVERS AND CHANGES. (N)

(O) TEST REQUIRED	SPEC. LIMITS OR REQUIREMENTS	NO. OF PCS. TESTED	TEST VALUES OBTAINED

QUALITY ASSURANCE REVIEWED

SEP 5 1973

ST. ED. COMPLIER

USE CONTINUATION SHEET WHEN NECESSARY

REMARKS
ATTACHED:
Examination and Test Reports

NAME OF COMPANY (P) Witco Chemical Corp.

NAME AND TITLE OF OFFICIAL (Q) A. L. Kwasny, Lab. Supervisor

DATE 8-15-73

19767

STATE OF Indiana

COUNTY OF Lake SS

SUBSCRIBED AND SWORN TO BEFORE ME, A NOTARY PUBLIC IN AND FOR THE STATE AND COUNTY AFORESAID, THIS THE 15th DAY OF August 19 73.

Marian Burzynski
NOTARY PUBLIC

NOTARY SEAL

MY COMMISSION EXPIRES 4-4-74

(R)

34981-1720-7 IM

RECEIVED
AUG 2[illegible]
R.J. KIEBLER

Witco Chemical

EXAMINATION AND TEST REPORT

PRODUCT: PIONEER #607 CONTRACT NO.

SPECIFICATION: MIL-C-450C TYPE I P.O. NO. 34491-1720-7

page 1 of 2

CLASSIFICATION: LOW SOLIDS, FOR SPRAY APPLICATION

DATE TESTED: 8-15-73 LOT NO. 69 AMT: 1 Drum

PARA. NO.	EXAM. OR TEST	REQUIREMENT:	RESULTS:
3.1	QUALIFICATION Q.P.L.	ABERDEEN PROVING GROUND #23.025 - 9/9/65	
3.2	COLOR	BLACK AT A DRY FILM THICKNESS PRODUCING COMPLETE HIDING-BROWN IN THINNER FILMS.	
3.3	COMPOSITION	CONSISTING OF NATURAL OR PETROLEUM GRADE ASPHALT AND ALIPHATIC NAPHTHA CONFORMING TO FED.SPEC.TT-N-95	
3.4	QUANTILATIVE:	TESTED AS PER PARA. 4.5	
	%Solids by wt.	36 to 40%	37.45
	%H2O by wt.	0.5% MAX.	Passes
	%Mineral matter by wt.	1.0% MAX.	Passes
	%Manganese by wt.	0.05% MAX.	Passes
	%Lead by wt.	0.02% MAX.	Passes
	%Insoluble in CS2 by wt.	0.05% MAX.	passes
	%Acidity by wt(H2S04)	0.01%MAX.	Passes
	%Alkalinity by wt (NaOH)	0.01% MAX.	Passes
	Viscosity #4 Ford cup	15 to 28 sec.	22
	DRYING TIME:		
	Dust Free	5 minutes max.	Passes
	Free from after tack	0.5 hrs. max.	Passes
3.5	QUALITATIVE:		
3.5.1	Storage properties	Tested as per para. 4.5.10 No livering, thickening or settling.	Passes

076268

QUALITY ASSURANCE REVIEWED

AUG 23 1973

R. D. CLEMENT

Witco Chemical Corporation
Pioneer Division, 4240 White Oak Avenue, Hammond, Indiana 46320
Chicago-Area Code 312-374-1600
Hammond-Area Code 219-931-4230

34871-1720-7 IM

RECEIVED

R. J. HERRING

page 2 of 2

Witco Chemical

PARA.NO	EXAM. OR TEST	REQUIREMENT	RESULTS
3.5			
3.5.4	Spraying properties	Tested as per para.4.4.13 Smooth glossy appearance	Passes
3.5.5	Water resistance	Tested as per para.4.4.14 Shall not blister, whiten, soften	Passes
3.5.6	Acid resistance	Tested as per para.4.4.15 Shall not dull or brown, no etching of metal panel	Passes
3.5.7	Heat resistance	Tested as per para.4.4.16 Shall not sag or flow	Passes
3.5.8	Flexibility	Tested as per para.4.4.17 Shall withstand bending without cracking or flaking	Passes

THE ABOVE TESTS LISTED WERE CONDUCTED IN ACCORDANCE WITH SPECIFICATION TEST REQUIREMENTS AND THE REPORTED TEST RESULTS ARE TRUE, VALID AND APPLICABLE TO THE MATERIAL TENDERED.

SIGNED A. L. Kwasny

A. L. Kwasny

TITLE Lab. Supervisor

DATE 8-15-73

QUALITY ASSURANCE RELEASED

R. D. CLONER

076269

Witco Chemical Corporation
Pioneer Division, 4240 White Oak Avenue, Hammond, Indiana 46320

Chicago-Area Code 312-374-1600
Hammond-Area Code 219-931-4230

34491-2801-17-1621

J.V.C. EQUIPMENT CO.

INCORPORATED

Subsidiary of J. V. CALHOUN CO.

August 20, 1973

Suntac Nuclear Corp.
1528 Walnut Street
Philadelphia, Pa. 19102

Attn: Mr. E.D. Baldi

Re: Suntac Nuclear Corp. Order 34491-2801-17
Certificate of conformance

Gentlemen:

This letter is to certify that we have supplied 30 filters Commercial Filters Model WY3S-10-1½ with 90 cartridges E10R10 (50 micron) constructed of iron and steel, and described in attached Bulletin 404F in conformance with the subject purchase order.

Please find enclosed 15 copies dimensioned outlined Dwgs. C17868, 15 copies Bulletin 404F, and 15 copies parts lists and operating instructions FN-404F.

Very truly yours,
J.V.C. EQUIPMENT CO.
Peter C. Ammon
Peter C. Ammon

PCA/dkg

cc - Suntac Nuclear Corp.
Big Rock Point Plt.
Generating Plt. Modification Dept.
Charlevoix, Mich.
Attn: Mr. Robert Fisher

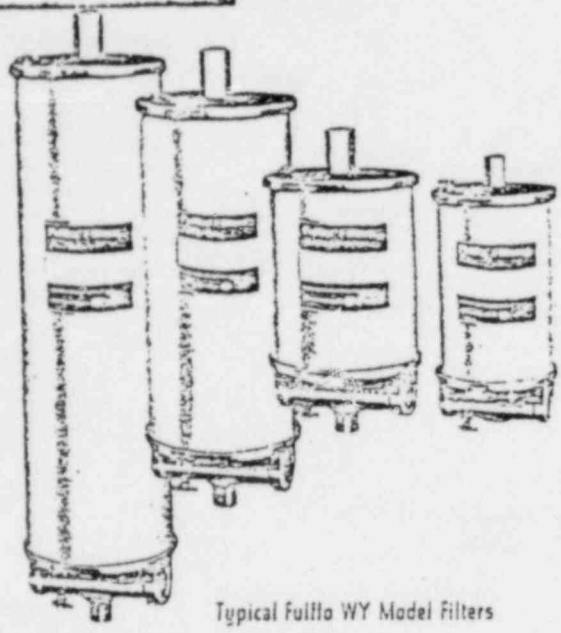
0762711

349 MONTGOMERY AVENUE ◘ BALA CYNWYD, PENNA. 19004 ◘ PHONE: 215-839-3000 TWX: 510-662-4944

WY Model Fulflo Filters

The Carborundum Company
Commercial Filters Division
Lebanon, Indiana 46052

Commercial Filters Canada Ltd.
1179 Caledonia Road
Toronto, Ontario, Canada



Typical Fulflo WY Model Filters

For liquids and gases, 15-90 gpm

- For compatibility with any process, Fulflo WY Model Filters are available in iron/steel, stainless steel and nickel-plated brass.
- Six standard sizes are available with Honeycomb Filter Tubes in 10", 20" or 30" lengths for quick, easy tube changes.
- In-line pipe connections for easy installation.
- Vents and drains standard on all models.

specifications

MODELS			Rated Capacity (gpm)*	No. of Honeycomb Filter Tubes	Tube Size	Overall height	Outside diameter	Pipe size (N.P.T)	Face-to-face dimension	Shipping weight
Iron and steel**	Stainless steel	Nickel-plated brass								
WY3S-10-1½	WY3SS-10-1½	WY3BR-10-1½	15	3	10"	20"	7⅞"	1½"	6⅜"	46 lb.
WY3DS-10-1½	WY3DSS-10-1½	WY3DBR-10-1½	30	6	10"	30"	7⅞"	1½"	6⅜"	62 lb.
WY3TS-10-1½	WY3TSS-10-1½	WY3TBR-10-1½	45	9	10"	40"	7⅞"	1½"	6⅜"	78 lb.
WYFS-10-1½	WYFSS-10-1½	WYFBR-10-1½	30	6	10"	22"	9⅜"	1½"	8"	68 lb.
WYFS-10-2	WYFSS-10-2	WYFBR-10-2	30	6	10"	22"	9⅜"	2"	8"	68 lb.
WYFDS-10-1½	WYFDSS-10-1½	WYFDBR-10-1½	60	12	10"	32"	9⅜"	1½"	8"	94 lb.
WYFDS-10-2	WYFDSS-10-2	WYFDBR-10-2	60	12	10"	32"	9⅜"	2"	8"	94 lb.
WYFTS-10-1½	WYFTSS-10-1½	WYFTBR-10-1½	90	18	10"	42"	9⅜"	1½"	8"	120 lb.
WYFTS-10-2	WYFTSS-10-2	WYFTBR-10-2	90	18	10"	42"	9⅜"	2"	8"	120 lb.

*Rated liquid capacity based on initial pressure drop of 3 psi with a 20-micron cotton Honeycomb Filter Tube and fluid viscosity equivalent to water.

Flow rates for other fluids vary according to nature of fluid, contaminant, degree of clarity desired, and operating conditions. Nomograph and Particle Removal Curves are available to help figure pressure drop and cleaning efficiency for every application. For assistance, contact your local Commercial Filters representative.

Supplemental data

Nipples and flanges can be supplied on filter to mate with flanged piping. Add F suffix.

Slip-on removable carbon steel steam jackets, 30 & 125 psi design, available. Covers shell only.

Standard models are for operating pressures up to 150 psi based upon use of resilient gaskets. Use of hard gasket material requires reduction in pressure rating.

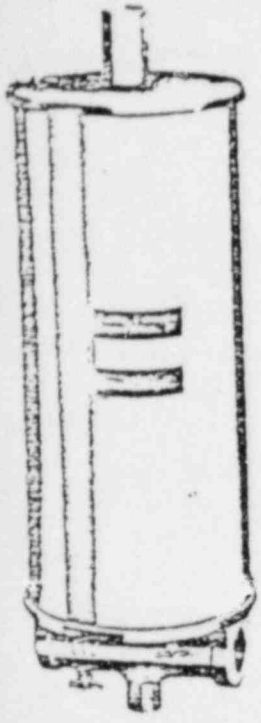
**Iron and Steel models are furnished as follows:

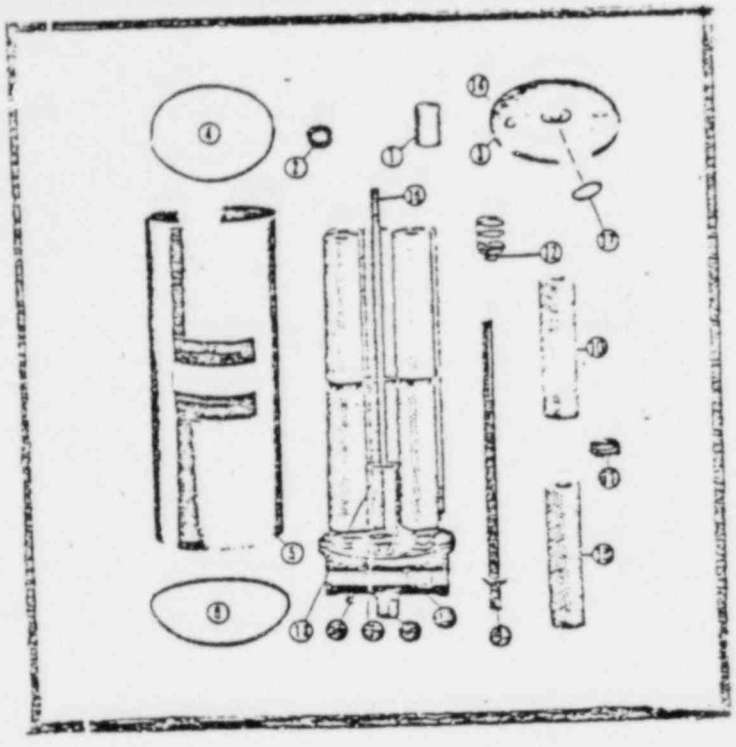
Suffix A—Zinc-plated inner parts—brass vent and drain cocks.

Suffix B—Plain steel inner parts—brass vent and drain cocks.

Suffix C—Plain steel inner parts—iron pipe plugs in vent and drain.

Standard gasket material is Buna-N. Other gasket materials available.

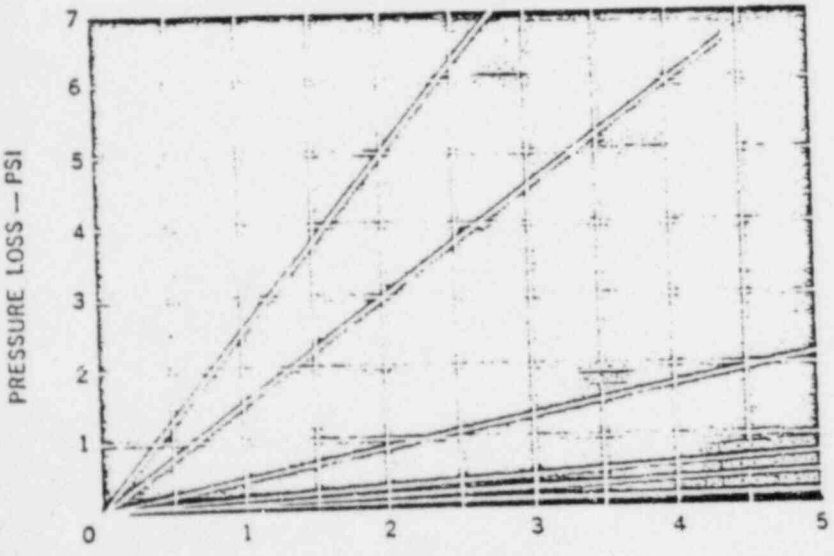




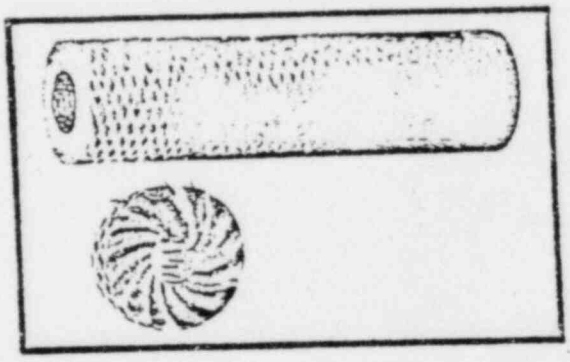
Assembly Details:

Typical Fulflo WY Model Filters

1 Cover nut
2 Cover nut gasket
3 Cover
4,6 Shell gaskets
5 Shell
7 Bottom seat plate (Part of base)
8 Base
9 Notched V-Post tube holder
10 Honeycomb Filter Tube (10")
11 Spacer (not required with 20" and 30" tubes)
12 Top seat plate and spring
13 Shell drain plug
14 Air vent plug
15 Inlet drain plug
16 Center post
17 Key washer w/screws
18 Inlet pipe (part of 8)



FLOW GPM
FLOW CHARACTERISTICS
HONEYCOMB FILTER TUBES



Media:

Standard Honeycomb Filter Tubes give efficient depth filtration. Available in a wide range of precisely controlled wind patterns to provide particle removal ratings down to 1 micron. Honeycomb Filter Tubes are made from a variety of different fibers for compatibility with any process.

Honeycomb Filter Tubes are available in 20" and 30" lengths for appropriate WY Model Filters.

Typical applications: Fulflo WY Model Filters

IRON AND STEEL MODELS	(With zinc-plated internals, brass vents and draincocks. Zinc plating omitted for foodstuff applications. For electroplating applications, iron plugs supplied instead of brass cocks.)	Paints & Coatings Liquid fuels	Hydraulic fluids Petro chemicals	Gases Plating solutions
316 STAINLESS STEEL MODELS (Internals also of 316 stainless)		Beverages Food products	Pharmaceuticals Liquid chemicals	Oils, (Mineral & Vegetable)
NICKEL-PLATED BRASS MODELS (Internals also of nickel-plated brass)		Beverages		Water

627 3

Commercial Filters Division

The Carborundum Company
Commercial Filters Division
Lebanon, Indiana 46052

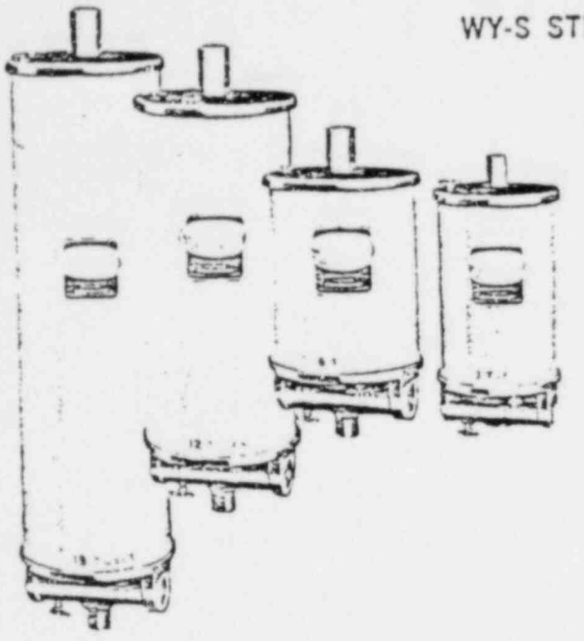
Commercial Filters Canada Ltd.
1179 Caledonia Road
Toronto, Ontario, Canada

WY Model
High flow
Fulflo Filters

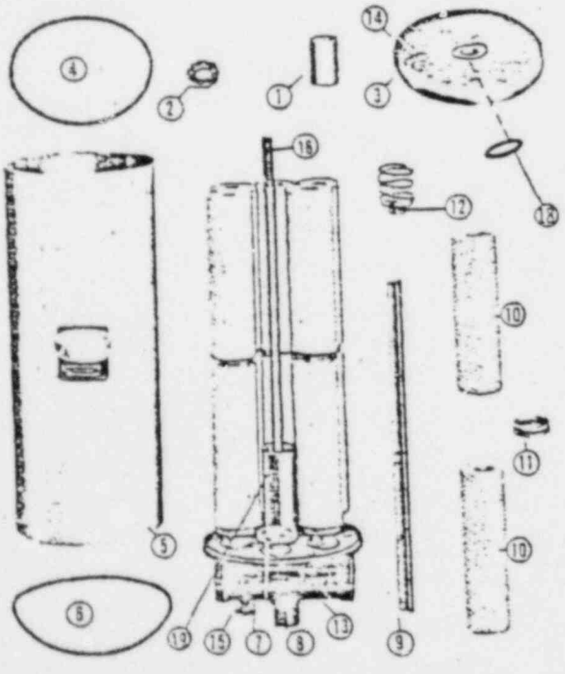
30981-201-17-3.21

WY-S STEEL AND IRON MULTI-TUBE FILTERS

Installation Instructions And Part Numbers



- For non-corrosive liquids and gases
- For pressures up to 150 PSI
- Incorporating up to 18 patented Honeycomb Filter Tubes for efficient depth filtration at high flow rates, minimum pressure drop.



TO ASSEMBLE FILTER

- Insert Air Vent Cock (14) and Shell and Inlet Drain Cocks (13 and 15). Insert Tube Holders (9) in Bottom Seat Plates (7).
- On each Tube Holder place unwrapped Honeycomb Filter Tube (10). On "D" or "T" models — double or triple tiered — place two or three filter tubes respectively and separate tubes with Tube Spacers (11).*
- Place Top Seat Plate Assembly (12) with spring upward in each central core opening of uppermost Honeycomb Filter Tubes.
- Insert Bottom Shell Gasket (6) in groove of base and s... Shell (5) firmly; insert Top Shell Gasket (4) in cover groove. Replace Cover (3) engaging its ke... with key-slot in Center Post (16). Press Cover firmly on compression springs (12). Tighten Cover Nut (1) and Gasket (2) making sure top and bottom edges of Shell are bearing only on Shell Gaskets.
- Close Shell Drain (18) and Inlet Drain (15). Open Air Vent (14). Open outlet and inlet valves. When liquid runs out from Air Vent, expelling trapped air, close Air Vent Cock tightly. Retighten Cover Nut if necessary after five minutes operation.

*Honeycomb Filter Tubes 20" and 30" long, ... spacers not required.

TO CHANGE HONEYCOMB FILTER TUBES

- Reverse assembly procedure, closing inlet and outlet valves and opening Air Vent Cock. Drain before removing Cover.
- Remove Shell and clean sludge at bottom of filter if necessary. Remove in order: Top Seat Plate Assembly, Honeycomb Filter Tubes, Tube Spacers and Holders.
- Wipe parts clean, replace gaskets if necessary and re-assemble with new Honeycomb Filter Tubes.

FULFLO WY FILTERS ARE ALSO STANDARD IN OTHER CONSTRUCTION MATERIALS: NICKEL-PLATED BRASS, STEEL AND IRON WITH BRASS INTERNALS, AND STAINLESS STEEL.

Bulletin PN-404F
Rev. 1

PART NUMBERS — WY STEEL AND IRON FILTERS

SUFFIX A MODELS

For general use, have Cadmium plated tube supporting parts, Brass vent and drain cocks and Steel plugs. (When Suffix letter is omitted it is assumed that reference is to Suffix A models)

SUFFIX B MODELS

For foodstuffs, have Plain Steel tube supporting parts, Brass vent and drain cocks and steel plugs.

SUFFIX C MODELS

For electroplating, have Plain Steel tube supporting parts, Steel vent and drain cocks and Steel plugs.

		SUFFIX	WY3-5 3, 6, 9 TUBE MODELS	WYF-5 6, 12, 18 TUBE MODELS
1	Cover Nut**	A, B, C	20044	20036
2	Cover Nut Gasket (Buna N)	A, B, C	32060	32016
3	Cover (includes No. 14)	A	07343	07350
	" (includes No. 14)	B	07354	07356
	" (includes No. 14 or 17, 18)	C	07355	07357
4, 6	Shell Gaskets	A, B, C	31608	31610
5	Shell — Single Deck	A, B, C	83014	83009
	Double Deck	A, B, C	83015	83010
	Triple Deck	A, B, C	83016	83011
7	Bottom Seat Plate (Part of 8)***	A	24334	24334
8	Base* (Includes Nos. 7, 13, 15, 19)	B, C	24333	24333
	1.5" connections	A	13557	13551
	" "	B	13558	13552
	" "	C	13559	13553
	2" connections	A	—	13554
	" "	B	—	13555
	" "	C	—	13556
9	Tube Holder — Single Deck	A	23435	23435
	" "	B, C	23434	23434
	Double Deck	A	23422	23422
	" "	B, C	23420	23420
	Triple Deck	A	23423	23423
	" "	B, C	23421	23421
10	Honeycomb Filter Tube (Variable)	A	30210	30210
11	Spacer "	B, C	30202	30202
12	Top Seat Plate and Spring	A	29204	29204
	" " " " "	B, C	29201	29201
13	Shell Drain Cock or Plug	A, B	62003	62004
	" " " " "	C	70095	70093
14	Air Vent Cock	A, B	62002	62002
	" " "	C	70043	70043
15	Inlet Drain Cock or Plug	A, B	62002	62002
	" " " " "	C	70043	70043
16	Center Post** — Single Deck	A, B, C	15416	15336
	Double Deck	A, B, C	15418	15338
	Triple Deck	A, B, C	15656	15340
17	Air Vent Plug	C only	70094	70094
18	Key Washer w/screws	A	68056	68035
	" " "	B, C	68016	68034
19	Inlet Pipe (Part of 8)***	A, B, C	42232	42227

* If filter serial number is under 4000 it is necessary also to order a Cover Nut (1) and Center Post (16) from tabulation above.

** If filter serial number is under 4000 use following part numbers when ordering these items alone:

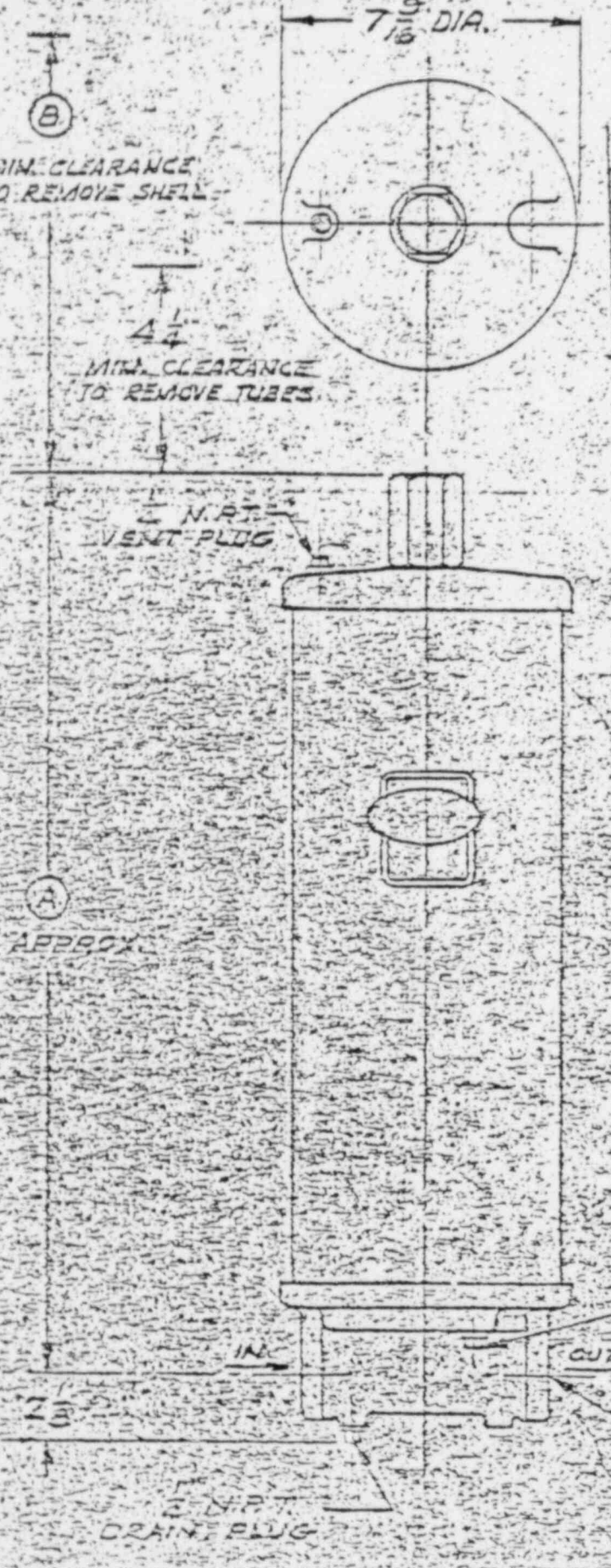
		WY3-5	WYF-5
Cover Nut		20045	20037
Center Post —	Single Deck	15608	15609
	Double Deck	—	15610
	Triple Deck	—	15611

*** Press fit into Base (Part 8). For old style with supporting shoulder order (A) 24217 or (B,C) 24206.

BE SURE TO SPECIFY ON YOUR ORDER THE CODE NUMBER OF FILTER AND REQUIRED HONEYCOMB FILTER TUBES

0762775

34931-2801-17-424



CERTIFIED CORRECT FOR ORDER NO.

ORDERED BY:

SIGNED:

DATE:

MODEL	B.M.	A	B	EST. WT.
WY3S-10-1 1/2	3270	17 5/8	4 1/2	46
WY3DS-10-1 1/2	3271	27 5/8	10 1/2	62
WY3TS-10-1 1/2	3272	37 3/4	16 1/2	78

DATE | REVISIONS | NO.

CODE

SPECIFICATIONS

EST. WGT. SEE TABLE

MAX. WORKING PRESS. 150 PSIG

MAX. DESIGN TEMP.

B.M. SEE TABLE

COMMERCIAL FILTERS CORP.

NOT TO SCALE	MATERIAL	FULFLO FILTER MODEL	DWG. NO.
DATE 5-7-63 | DRAWN EJA | CH'K'D RDP	CAST IRON / STEEL	WY3S THRU WY3TS MODELS	C-1784

H. BUSHKOFF

3488/-2006-22-1M

Goodall

August 22, 1973

Suntac Nuclear Corp.
1528 Walnut St.
Phila., Penna 19102

Subject: Suntac Order #3449/-2006-22 dated 8/15/73

Gentlemen:

This will certify that the material furnished by Goodall Rubber Company meets all the requirements of purchase order #3449/-2006-22 for shipment to Charlevoix, Michigan.

Very truly yours,

GOODALL RUBBER COMPANY

W. T. Windle (pl)

W.T. Windle
Branch Operations Manager

WTW/gr

CC: Mr. Robert Fisher

0762771

34881-2006-22-1R1

GOODALL RUBBER COMPANY COLUMBIA & HENDERSON DR. FOLCROFT INDUSTRIAL PARK FOLCROFT, PA. 19032
TEL. (215) 534-2100 TELEX NO. 83-1349

"C" Documents
Reviewed But Not Relied Upon

RELATED CORRESPONDENCE

Specification No. 10211-M-1

BECHTEL ASSOCIATES
PROFESSIONAL CORPORATION

TECHNICAL SPECIFICATION

REQUIREMENTS

FOR THE TEMPORARY VENTILATION

SYSTEM

FOR WELDING OF THE

FUEL POOL LINER PLATE

FOR

CONSUMERS POWER COMPANY

BIG ROCK POINT

CHARLEVOIX, MICHIGAN

NO.	DATE	REVISIONS	BY	CH'K	APP'D
		General revision/Issue for construction			
2	4-10-73	ISSUED FOR CLIENT APPROVAL			BNP

DESIGN		CONSUMERS POWER COMPANY	JOB No.	
			SPEC. DES. GUIDE No.	REV.
		BIG ROCK POINT PLANT	10211-M-1	1

TECHNICAL SPECIFICATION
REQUIREMENTS
FOR THE TEMPORARY VENTILATION
SYSTEM
FOR WELDING OF THE
FUEL POOL LINER PLATE
FOR
CONSUMERS POWER COMPANY
BIG ROCK POINT
CHARLEVOIX, MICHIGAN

CONTENTS

1.0 APPLICABLE DOCUMENTS

1.1 Specification 10211-M-2, Centrifugal Fan
1.2 Specification 10211-M-3, Prefilters
1.3 Specification 10211-M-4, Boxed HEPA Filters
1.4 Specification 10211-M-5, Ductwork
1.5 Drawing #10211-M-100, Big Rock Point, Temporary Fuel Pool Ventillation Exhaust System

2.0 SCOPE

2.1 Installation of complete exhaust system, ~~modification of system after completion of vertical welding of liner,~~ and removal of system after completion of all welding.

3.0 WORK INCLUDED

3.1 The sequence of this work shall be as directed by the client's Field Supervisor; generally, it shall be completed in the following sequence.

3.2 Fabrication and installation of sheet metal ductwork, flexible ductwork, balancing dampers, exhaust hoods, gages and plenums. Fabrication and installation of unistrut support structure for hood positioning during vertical welding at corners of fuel pool.

Fabrication and installation of plenums for prefilters, and flex-connects as indicated on Drawing 10211-M-100.

3.3 Furnishing and installation of pressure gages where and as indicated on DWG. 10211-M-100.

3.4 Installation of prefilters into sub-contractor furnished plenum, installation of boxed HEPA filters and fan; fabrication and installation of ductwork from fan and filter discharge per Drawing #10211-M-100.

3.5 Furnish necessary material and install fan motor, connection to junction box (provided by client). Material shall include required starter and thermal protection for fan motor.

3.6 Testing, balancing and adjustment of complete system to obtain design flow (±10%) shall be completed by sub-contractor.

3.7 ~~After completion of vertical welds in the fuel pool,~~ disconnect 8" x 7" ducting at points "A" and "B" (Drawing 10211-M-1) and move exhaust manifolds with flex connects and hoods to points A^1 and B^1 at the bottom of the fuel pool. Fabricate and install auxiliary duct sections between points A and A^1; B and B^1. The sequence of this work assumes that vertical welding of the fuel pool liner shall precede the horizontal welding. This work shall be accomplished under the direction ~~of the client or his representative.~~

3.8 Provide and install 2 air intake registers on fuel pool enclosure where indicated on dwg. #10211-M-100. ⚠1

3.9 After completion of fuel pool liner welding, completely remove temporary exhaust system. Disposition of this system shall be as directed by client or his representative.

4.0 WORK NOT INCLUDED

4.1 Provision of junction box and power supply to junction box.

4.2 Furnishing of prefilters, boxed HEPA filters and fan.

Consumers Power Company
Thermal Corporation

TECHNICAL SPECIFICATIONS

FOR

PURCHASE AND FIELD ERECTION

OF

TEMPORARY ENCLOSURE FOR SPENT FUEL POOL AREA

FOR THE

CONSUMERS POWER COMPANY

BIG ROCK POINT PLANT

CHARLEVOIX, MICHIGAN

NO.	DATE	REVISIONS	BY	CH'K	APP'D
2	6/23/73	Issued for Construction			
1	4/12/73	Issued for Client Review			

JOB NO. 10,211

SPEC. SHT. SUPPL. NO. | REV.

10,211-C1 | 0

SHEET ____ OF ____

TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS

FOR

PURCHASE AND FIELD ERECTION

OF

TEMPORARY ENCLOSURE FOR SPENT FUEL POOL AREA

FOR THE

CONSUMERS POWER COMPANY

BIG ROCK POINT PLANT

CHARLEVOIX, MICHIGAN

TECHNICAL SPECIFICATION
FOR
PURCHASE AND FIELD ERECTION
OF
TEMPORARY ENCLOSURE FOR SPENT FUEL POOL AREA

1.0 WORK INCLUDED

The work includes the furnishing of all labor, material complete with accessories, tools and equipment and the performance of all operations and incidentals necessary for furnishing, delivery, unloading and erection of temporary pool enclosure, and structural steel support for ventilation fan and filters.

2.0 RELATED WORK NOT INCLUDED

The following items of work are not included:

2.1 Spent Fuel Pool decontamination.

2.2 Purchase and field erection of liner plate.

3.0 MATERIAL

Roof and wall panels shall be new, Class I noncombustible, heavy duty corrugated, translucent fiberglass (Kelly Klosure) panels as manufactured by Kelly Klosure Systems, Box 443, Fremont, Nebraska, or equal. Panels shall be complete with steel angle frames, and necessary hardware.

Supporting wood base and frame shall be pressure impregnated with Non-Comm as manufactured by Koppers Co., Inc., Pittsburgh, Penn.

Structural Steel shall conform to "Standard Specification for Structural Steel" (ASTM A-36 70a).

Bolts and nuts shall conform to - "Standard Specification for Low-Carbon Steel Externally and Internally Threaded Standard Fastener's" (ASTM A307-68.

4.0 ERECTION

The enclosure shall be constructed as shown in accordance with

Specification No. 10211-M-5

BECHTEL ASSOCIATES
PROFESSIONAL CORPORATION

TECHNICAL SPECIFICATION

REQUIREMENTS

FOR THE SHEET-METAL WORK

FOR THE TEMPORARY VENTILATION

FOR WELDING OF THE

FUEL POOL LINER PLATE

FOR

CONSUMERS POWER COMPANY

BIG ROCK POINT

CHARLEVOIX, MICHIGAN

672431

NO	DATE	REVISIONS	BY	CHK	APPD
2	6-22-73	General revision/Issue for construction	BJR		BJR
1	4-10-73	Issued for Client Approval	BJR		BJR

ORIGIN

CONSUMERS POWER COMPANY

BIG ROCK PLANT

JOB No. 10211

SPEC DES GUIDE No. 10211-M-5

REV 1

"A" size

Specification No. [illegible]

TECHNICAL SPECIFICATION

REQUIREMENTS

FOR THE SHEET - METAL

WORK

FOR THE TEMPORARY VENTILATION

FOR WELDING OF FUEL

POOL LINER

FOR

CONSUMERS POWER COMPANY

BIG ROCK POINT

CHARLEVOIX, MICHIGAN

672432

CONTENTS:

ATTACHMENTS:

APPENDIX A*	TABLE 1	RECOMMENDED SHEET METAL THICKNESSES FOR ROUND DUCTS UNDER NEGATIVE PRESSURES.
APPENDIX B*	TABLE 2	RECOMMENDED ANGLE REINFORCEMENT FOR ROUND DUCTS UNDER NEGATIVE PRESSURE.
	TABLE 3	RECOMMENDED SHEET METAL THCINESS FOR RECTANGULAR DUCTS UNDER NEGATIVE PRESSURES.
	TABLE 4	RECOMMENDED ANGLE REINFORCEMENT FOR RECTANGULAR DUCTS UNDER NEGATIVE PRESSURES.
BECHTEL DWG. 10211-M-100		TEMPORARY FUEL POOL VENTILLATION EXHAUST SYSTEM

*The information above is extracted from the publication referenced in specification paragraph 2.1.5.

1.0 SCOPE OF DUCT WORK FOR TEMPORARY EXHAUST SYSTEM

Installation of duct work shall include but no be limited to the furnishing of all labor, supervision, materials, tools, instruments, equipment and the performance of all operations and incidentals necessary for furnishing, installing, testing and adjusting of:

Ducts Plenums, Access doors for Plenums, Apparatus Connections, Metal Hoods, Flexible Connections, Registers, Turning Vanes, Dampers (Balancing, Control), Testing and Adjusting, Test Connections (D.O.P. taps & Gage taps), and Pressure Indicators (including Differential and Velocity Pressure Indicators).

2.0 CODES AND STANDARDS

2.1 The work, equipment and materials shall conform to the requirements of governing local, State, and Federal laws and to codes, standards, and good practice recommendations of the following organizations and publications:

2.1.1 American Society of Heating, Refrigeration and Air Conditioning Engineers Guide latest revision (ASHRAE)

2.1.2 Air Moving and Conditioning Association, Inc., standards, definitions, terms and test codes for Centrifugal, Axial and Propeller fans (AMCA)

2.1.3 Sheet Metal & Air Conditioning Contractor's National Association (SMACNA)
a) High Velocity Duct Manual (Section 2)

2.1.4 Associated Air Balance Council (AABC) "Procedure for Air & Hydronic Testing & Balancing"

2.1.5 National Safety Information Center (NSIC), "Design Construction and Testing of High Efficiency Air Filtration Systems for Nuclear Applications".

3.0 GENERAL

Details of fabrication and workmanship shall be in accordance with the best practices of the trade, as defined in this Specification.

3.1 Correlation of Work

The Subcontractor shall work with other trades to avoid interferences in the installation of work covered by his contract. If conflicts should develop which the Subcontractor is not able to resolve, the decision of the Client's Field Supervisor shall be final. Work shall be installed so as not to delay progress of construction and shall be correlated with other trades. Any work done without regard to other crafts shall be moved at no extra charge.

3.2 Scaffolding

The Subcontractor shall provide all scaffolding for the installation of this branch of the work; and shall remove such scaffolding from the premises when its use is no longer required on the job. The Subcontractor shall schedule with the Client's Field Supervisor all use of plant hoists and elevators for the conduct of the Subcontractor's work. All scaffolding shall meet the standards of local and state safety codes.

3.3 Use of Explosives

Powder actuated fasteners shall not be used in any areas without permission from the client's Field Supervisor.

4.0 EQUIPMENT AND MATERIALS

4.1 Duct Construction

4.1.1 High Velocity Round Duct

The construction may generally be as shown in Fig 2-2 of SMACNA, reference para. 2.1.3 at this specification,

except in no case shall the gage of metal be less than 22 for 8" diameter round ducts. For round ducts of larger sizes see *Table 1 - Exhibit A and Table 2 - Exhibit B of this Specification.

4.1.2 High Velocity Rectangular Duct

The construction may generally be as shown in Fig 3-2 of SMACNA, reference para. 2.1.3a this Specification, except that the minimum gage thicknesses for the ducts shall comply with Tables 3 & 4, Exhibit B of this specification. Additional notes on high velocity duct construction are as follows:

a. Transitions

Transitions in the size of ducts shall be made by uniformly tapering sections having 1-inch increase in width for each 7 inches of run, unless construction limitations require a more abrupt transition. In no case shall the transition exceed 20 degrees on diverging flow, or 30 degrees on contracting flow.

b. Interferences

If it is found necessary to change the shape of any duct work due to interference of the other work, the dimensions shall be changed using rectangular equivalents for equal friction, without extra cost. All ducts shall be air tight and free of leakage.

c. Longitudinal joint locks: Pittsburg and Acme (Groove Seam). All joints and seams shall be sealed.

d. Cross breaking or beading shall not be used.

e. All angles to be galvanized mild steel.

f. Angles shall be bolted or welded to ducts on 8" C-C maximum.

g. Transverse reinforcing on all sides must be tied together at all corners by bolting or welding.

h. Transverse reinforcing on two sides must be tied together with tie rods or angles at the ends.

i. Transverse reinforcing size is determined by dimension of side to which reinforcing is applied.

j. Construct ducts in sections of not more than 10'.

k. Space reinforcing uniformly.

l. Tie rods minimum diameters: up to 36" long-1/4"; 37" and over-3/8".

m. Companion flanges shall be bolted together on 4" CC maximum with 5/16" bolts and 1/8" neoprene gasket.

n. Fittings shall have the same strength and construction as larger adjoining duct. Use Pittsburg lock at each corner.

o. Elbow inside radius shall equal duct width where practical.

p. When elbow radius must be less than 3/4 duct width, use square (mitered) ells with double turning vanes.

q. Sealants, mastics and tapes shall be non-flammable.

r. No screws permitted in any duct supports.

s. Vertical ducts shall be securely supported from floor and walls with angles and channels and structural steel brackets anchored to the structure and welded or bolted to the duct reinforcing.

t. Attachments to Building Structural steel - C-clamps with retaining clips; welded studs; beam clamp approved by client's Field Supervisor.

4.1.3 WELDING, BRAZING, AND SEALING OF JOINTS

a. All ducts and fittings must be provided with leak tight joints in their installation.

b. Welding and brazing are preferred for constructing a leak tight joint.

c. As many joints as possible shall be made in the shop. Continuous beads are preferred.

d. Each crew shall keep a UL2A-10BC rated FF-6MA fire extinguisher quickly available while they are using a torch.

e. Welding is preferred over brazing for field joints; and brazing will not be permitted where safety requirements make it preferable for a welder to have one hand free to hold on to his support. Welding shall be done using shielded metal arc process with E6013 or E6010 electrodes. Other welding processes and electrodes will be considered if the Subcontractor submits sample welds for evaluation by the Client prior to the start of fabrication.

f. Sealant shall be used on all field joints that are inaccessible to the welder, or which occur in locations where torch use would create a fire hazard. Use of a torch within 18 inches of electrical cables is strictly forbidden. Avoid in the vicinity of wood, other flammable materials, and of materials subject to damage.

g. Square elbows shall be vaned with double vanes. Elbows up to 20 inches in width shall have vanes with one-inch outside radius and two-inch inside radius, spaced two and one-eight inches apart as measured on the diagonal. Vanes shall be mounted on runners which are spot welded to the elbow. Vanes and runners shall be of the same gage material as the duct in which they occur - not to exceed 20 gage. Up to 30" the runner to which the vanes are crimpped shall be bolted thru the side of the elbow.

h. Inside slip joints shall have sealant inside the slip pocket, and shall be visually inspected after

assembly. If the bead of sealant is not continuous, the joint shall be disassembled, and more sealant shall be applied.

i. Double "S" slip joints shall be assembled and sealed to one end of each duct section in the shop, by welding or brazing. The corners of the slip shall be sealed by shop welding or brazing from both inside and outside. Sealant shall be applied inside the slip pocket, and shall be visually inspected after assembly. If the bead of sealant is not continuous, the joint shall be disassembled for reapplication of sealant.

j. Sealant shall be Hardcast, or equal, and shall contain no inflammable solvents.

k. The system shall not operated for 72 hours after sealer is applied, so that the sealant will have time to set.

4.2 FLEXIBLE CONNECTIONS

4.2.1 Flex. Duct

Where round flexible duct is required, it shall be U.L. listed as Air Duct Standard 181 quality. The flexible duct shall be the Wiremold Co.'s Wiremold Type "VT" or other manufacturers approved product cataloqued for a minimum of two years.

(Wiremold VT design pressures are listed as 10 psig positive and 9" Mercury negative for the 3" round duct.)

4.2.2 Flexible Connections-(Fan)

Flexible duct connections shall be installed at each point where a fan connects to a duct, and shall be of

double-layer, neoprene coated fiber glass cloth, UL listed, and weighing not less than 32 oz./sq./yard.

Metal-to-metal space shall be 6 inches. Metal shall be turned into the duct at least one thickness. The double thickness neoprene shall be folded to provide four thicknesses where it contacts the metal. A steel wire #6 galvanized, shall be laid in the fold to provide proper minimum bend radii of the neoprene. Neoprene shall be fastened to the metal duct by means of a 1 x 1/8-inch galvanized steel strap, and sheet metal screws lockwasher.

Flexible connectors shall not exceed 10" in length.

4.2.3 Flexible Connections - Boxed HEPA Filters

On the boxed HEPA Filters the duct connecting flex-duct connections shall be as above except a single layer of neoprene-coated fibreglass shall be attached with a worm-gear drive tension band (AERO-SEAL). Silicon-sealant shall be applied between neoprene-cloth and ductwork before tightening band.

4.3 CASING AND PLENUMS (Negative Pressures 0 to 12" w.g.)

In general casings in plenums shall be constructed in accordance with the refcrenced para. 2.1.3a of this specification as applicable. The Subcontractor should note that the components for this exhaust system will be under negative pressures and accordingly his construction shall satisfy the negative pressure requirements indicated.

4.3.1 Galvanized Apparatus Casings:

Galvanized apparatus connections and casings shall be made from zinc-coated carbon steel sheets of lockforming quality complying with a ASTM-A527 last issue.

4.3.2 Casing Access Doors

Galvanized doors shall be made from zinc-coated carbon steel sheets of lockforming quality complying with a ASTM-A527 last issue. Galvanizing shall be hot dip and comply with a ASTM-A525 - last issue and shall have 1.25 ounces per square foot of covering total for both sides of the sheet.

a. Construction

Details of fabrication and workmanship shall be in accordance with the best practices of the trade, as defined in this Specification. Doors shall be made of materials as shown in the following table:

Door Size Height/Width		Galv. Steel Gage	Handles/Hinges Quantity	
58	22	12	3	3
46	22	12	2	3
34	22	12	2	3
24	18	12	2	2

Opening in casing is nominal door size. Actual door opening is approximately 2" smaller in each direction. See Fig. 8-9 of reference specification para. 2.1.3a.

b. Notes

Hinges: Welded to Frame and Door.

Handles: Doors - Compression Latch w/2 Handles.

Gaskets: Neoprene continuous, ASTM D1056 Grade SCE 43. Notch or dovetail corners.

Doors: Should be single Panel and stiffened for 12" negative pressure.

Latches: Shall have sufficient strength for door size.

Doors shall open against air pressure. Push buttons shall be installed to stop fans where attention of personnel is required inside castings.

4.4 The Subcontractor shall fabricate the exhaust hoods (4 required) for the exhaust system in accordance with the details shown on drawing 10211-M-100 attached.

APPENDIX A

Table 1 Recommended Sheet-Metal Thicknesses for Round Duct Under Negative Pressure
Factor of safety = 3 for ducts with diameters up to 24 in. and 5 for ducts with diameters over 24 in. based on paragraph UG-28 in Sect. VIII of the *ASME Boiler and Pressure Vessel Code*.

Negative Pressure in Duct	Reinforcement Spacing (in.)	Sheet-Metal Thickness (U.S. Gage No.) for Duct Diameter of —								
		4 in.	8 in.	12 in.	18 in.	20 in.	24 in.	36 in.	48 in.	60 in.
4 in. H_2O	—	24	24	24	22	20	18	16	14	14
	96	24	24	24	24	24	22	20	18	16
	48	24	24	24	24	24	24	22	20	18
	24	24	24	24	24	24	24			
8 in. H_2O	—	24	22	18	16	14	12	8	4	
	96	24	22	22	18	18	18	14	12	12
	48	24	24	24	22	20	20	16	14	14
	24	24	24	24	24	22	22	18	16	16
12 in. H_2O	—	24	20	16	4	12	12	6	2	
	96	24	22	18	18	16	16	12	11	11
	48	24	22	22	20	18	18	14	14	12
	24	24	24	24	22	22	22	16	16	16
20 in. H_2O	—	24	18	14	12	11	8	4		
	96	24	20	16	16	14	14	11	11	8
	48	24	22	20	18	16	16	14	12	11
	24	24	24	22	20	18	18	16	14	12
1 psi	—	20	14	12	10	8	6	10	8	6
	96	24	18	16	14	12	12	12	11	11
	48	24	20	18	18	16	16	12	12	12
	24	24	24	22	20	18	18	14	16	14
2 psi	—	18	12	11	8	4	2			
	96	22	16	14	12	12	11	6	6	4
	48	24	18	16	14	14	12	10	8	6
	24	24	20	18	18	16	16	11	11	11
4 psi	—	16	12	8	4	2		14	12	12
	96	20	14	12	11	10	8	4	2	
	48	20	16	14	14	12	12	8	6	4
	24	22	18	16	16	14	14	11	10	8
	12					16	16	14	12	11

APPENDIX B

Table 2 Recommended ASTM A36 Angle Reinforcement for Round Duct Under Negative Pressure
Based on R. J. Roark, Formula 12, Table XV in *Formulas for Stress and Strain*, 4th ed., McGraw-Hill, 1965.

Negative Pressure in Duct	Angle Size[a] for Duct Diameter of –								
	4 in.	8 in.	12 in.	16 in.	20 in.	24 in.	36 in.	48 in.	60 in.
4 in. H_2O	A	A	A	B	B	B	B	C	C
8 in. H_2O	A	A	A	B	B	B	B	C	C
12 in. H_2O	A	A	A	B	B	B	B	C	C
20 in. H_2O	A	A	A	B	B	C	C	D	D
1 psi	A	A	A	B	B	C	C	D	D
2 psi	A	A	A	B	B	C	C	D	D
4 psi	A	A	A	B	B	C	C	D	D

[a]Symbol Angle Size (in.)
A = 1 x 1 x 1/16 B = 1 1/2 x 1 1/2 x 1/4 C = 2 x 2 x 1/4 D = 2 1/2 x 2 1/2 x 1/4

Table 3 Recommended Sheet-Metal Thickness for Rectangular Duct Under Negative Pressure
Based on R. J. Roark, p. 246 in *Formulas for Stress and Strain*, Flat Plate Formula for Edges Held but Not Fixed, 4th ed., McGraw-Hill, 1965.

Negative Pressure in Duct (in. H_2O)	Reinforcement Spacing (in.)	Sheet-Metal Thickness[a] (U.S. Gage No.) for Longest Side of Length –				
		12 in.	24 in.	36 in.	48 in.	60 in.
4	48	24	20	18	14	
4	24	24	22	18	20	20
4	12	24	24	24	24	24
8	48	22	14	12	12	
8	24	22	16	16	14	14
8	12	24	22	22	22	22
12	48	18	12	8	11	
12	24	18	16	12	12	12
12	12	22	18	18	18	18
20	48	14	11	6	6	
20	24	14	14	11	11	11
20	12	20	14	14	14	14

[a]For maximum deflection of 1/16 in. per foot in the shortest dimension.

Table 4 Recommended ASTM A36 Angle Reinforcement for Rectangular Ducts Under Negative Pressure
Based on uniformly loaded beam with 50% simple support, 50% fixed ends, and deflection of 1/8 in. per foot.

Negative Pressure in Duct (in. H_2O)	Angle Size[a] for Duct with Maximum Panel Size of –											
	12 in. by					24 in. by				36 in. by		
	12 in.	24 in.	36 in.	48 in.	60 in.	24 in.	36 in.	48 in.	60 in.	36 in.	48 in.	60 in.
4	E	E	E	F	F	E	G	G	G	H	H	H
8	E*	E	E	F	F	E	G	G	G	H	H	H
12	E	E	G	F	F	E	G	G	G	H	H	H

[a]Symbol Angle Size (in.)
E = 1 1/2 x 1 1/2 x 1/8 F = 1 1/4 x 1 1/4 x 1/8 G = 1 1/2 x 1 1/2 x 1/4 H = 2 x 2 x 1/4

Consumers Power Company

FMMacri, P-14-230, Last

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

GWO: 6248

DT-FPL-061

Plant: Big Rock Point

Date: 11/29/73

Description: Fuel Pool Liner Tracked Machine SS Weld Procedure (AFC)

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSRang					
	X	WClark					
	X	CJHartman/CRAbel					

From: FMMacri

Comments Requested by: -

Documents:	Previous Review Rev	Previous Review Date
Suntac Spec 34881-4200-307, Rev 0 (AFC)	B	10/24/73

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to F. M. Macri.

07634

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 11/28/73

Date Comments Transmitted to Originator:

Review Complete:

Date:

08022-R1-370P

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT PLANT — CATALYTIC CONTRACT NO. 34881
CLIENT: CONSUMERS POWER COMPANY — SPECIFICATION NO. 34881-4200-307
LOCATION CHARLEVOIX, MICHIGAN

SPECIFICATION

for

TRACKED MACHINE
WELDING STAINLESS STEEL

CONSISTING OF

SEE CONTENTS

I hereby certify that this plan, specifications or report was prepared by me or under my direct supervision and that I am a duly registered professional engineer under the Laws of the State of Michigan.

Date 11/21/73 Reg. No. 21117

APPROVED FOR CONSTRUCTION

APPROVED _____ DATE _____

APPROVED F. G. Macri /GA CLIENT DATE 21 Nov. 1973

APPROVED H. C. Rauch /GA CATALYTIC DATE 23 Oct. 1973

PREPARED BY R. J. Goyne CATALYTIC DATE 23 Oct 1973

AMENDMENT	APPROVED (CLIENT)	DATE	APPROVED (CLIENT)	DATE	APPROVED (CATALYTIC, INC.)	APPROVED (CATALYTIC, INC.)	APPROVED (CATALYTIC, INC.)	APPROVED (CATALYTIC, INC.)	DATE
								0 (AFC)	
								0 (AFC)	
								0 (AFC)	
0 (AFC)					[illegible]	EJJ	HCB	[illegible]	21 Nov 73
B F/A					[illegible]	EJJ	HCB	[illegible]	10/24/73
A F/A					[illegible]	EJJ	HCB		10/23/73

WELDING STAINLESS STEEL

1.0 SCOPE

1.1 This specification covers the welding of stainless steel plate using tracked Tungsten-inert-gas machine welding. It shall be used only for welding the Type 304 stainless steel lining for the Spent Fuel Pool at the Big Rock Point Plant.

2.0 QUALIFICATION

2.1 This procedure shall be qualified in accordance with the ASME Code Section IX. In addition, the procedure qualification test plates shall be radiographed before sectioning. A copy of the test records shall be sent to R. J. Goyne at the Phila. Office.

2.2 Welders using this procedure shall be qualified in accordance with the ASME Code Section IX.

2.3 Procedure and welders shall be qualified by welding plate in the 1G position as shown in the ASME Code Section IX Fig. Q-3.

2.4 Weld test plates shall be examined by a certified test laboratory.

3.0 GENERAL REQUIREMENTS

3.1 The edges or surfaces of the parts to be joined by welding may be prepared by sawing, machining or grinding as shown in Section 7.0. The edges shall be cleaned of all slag, oil, grease and dirt to present a clean and substantially smooth surface for welding.

3.2 Plates joined by welding shall be matched accurately and retained in position during welding operations. Misalignment in a flat plane across completed joints shall not exceed 1/16 inch.

3.3 Use of tack welds shall be optional and, if used, shall be spaced as required. Any tack welds that are used are made by tungsten inert gas process. Cracked or improper tacks shall be removed. Soumd tack welds shall be incorporated into the finished weld.

3.4 All layers of welding shall have a good, even appearance. The surface of each bead shall be cleaned and any visible cracks, porosity or slag removed by grinding. Undercuts, not exceeding 1/32 inch depth up to 3 inches in 12 inches of weld length, will be permitted.

3.5 Weld shall be cleaned by brushing with austenitic stainless steel brushes which have not been used on carbon or low alloy steels.

3.6 Grinding of welds, where required, shall be done with aluminum oxide or silicon carbide grinding wheels which have not been used on carbon or low alloy steels.

3.7 Injurious surface defects, such as caused by removal of temporary attachments, arc-strikes and mechanical damage shall be ground to sound metal. Any surface imperfection, the removal of which reduces the plate thickness by 1/32 inch or more, shall be repaired by welding.

3.8 Weld repairs shall be made using this specification or by the manual tungsten inert gas process of Specification 34491-4200-303.

3.9 One sample butt weld, 12 inches in length, shall be submitted to the owner before the start of production welding. This sample shall be indicative of the minimum acceptable weld surface appearance, and will be used to judge the acceptability of subsequent work.

3.10 The application of heat to correct distortion and dimensional deviations is prohibited.

3.11 The maximum preheat and interpass temperature for welding shall be 350°F - contact pyrometers only shall be used for determining temperature.

3.12 All welding shall be done in the flat (1G) position.

4.0 MATERIALS

4.1 The material to be welded shall be Type P-number 8 as listed in Table Q-11.1, ASME Code Section IX.

5.0 WELDING PROCEDURES

5.1 All welding shall be performed substantially as shown in Section 7.0 without filler wire, except as required for weld repairs (See Section 3.8).

5.2 The electrode shall be thoriated tungsten per AWS 5.12-69 with a ground finish and with direct current straight polarity.

5.3 Helium gas shall be used as the arc shield.

5.4 Plates shall be tightly butted together. See Section 7.0.

5.5 Weld shall be completed with one pass on each side of the plate to give complete penetration.

5.6 Special care shall be used to align the welding machine tracks so that the welding electrode will continuously follow the joint in the plates.

6.0 HEAT TREATMENT

6.1 None allowed.

6881-4200-307
3

3/16"

ELECTRODE

07638970

ATION ONLY.

TRAVEL SPEED*
1·5 - 2 FT./MIN.
1·5 - 2 FT./MIN.

18010-1264SP
(CC-533 81)

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

RECORD OF PROCEDURE AND PERFORMANCE QUALIFICATION TESTS

Record of PROCEDURE (Procedure or Performance) Qualification Test

Welding Specification No. SP-34881-4200-307 Date 10/29/73

Welding Process TIG Manual or Automatic Automatic

Material Spec. SA240-304 (ASTM) Welded to SA-240-304 (ASTM) of P-No. P-8 to P-No. P-8

Pipe Diameter and Wall Thickness .198" Plate (Qualified for 0.062" to 0.396" plate thickness)

Filler Metal Spec. Not Used (ASTM) Weld Metal Analysis (A-No. NA) Filler Metal F. No. NA

Flux Trade Name and Number (if submerged arc) NA

Composition of nonconsumable electrode, if used Tungsten 2% Thoriated

Inert Gas Shield, if used; Composition Helium Trade Name Helium Flow Rate 25 CFH

Preheat Temperature Range >32°F Stress Relieving Time and Temp. NA

Type of Backing Ring or Gas, if used NA

Single or Multiple Pass Welding Single Single or Multiple Arc Single

Joint Dimensions Accord with SP-34881-4200-307

Welders Name R. Paull Stamp No. BM-3 Test No. One

Test Conducted by W. L. Pike

Remarks Radiograph test plate prior to removing tensile and bend coupons.
Test position 1G

Reduced-Section-Tensile Test

Specimen No.	Dimensions Width	Dimensions Thickness	Area	Ultimate Total Load lb.	Ultimate Unit Stress lb. Per Sq. Inch	Character of Failure and Location
F-1	1½"	.198	.149	12,200	81,500	W2 - Weld
F-2	1½"	.198	.150	12,100	80,000	W2 - Weld

Face or Side Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen			
F-1	1G	Specimen Bent	180°	X Degrees in Jig	Passed
F-2	1G	Specimen Bent	180°	X Degrees in Jig	Passed

Root or Side Bend Test

Specimen No.	Position of Groove	Describe the Location, Nature, and Size of any Crack or Tearing of the Specimen			
R-1	1G	Specimen Bent	180°	X Degrees in Jig	Passed
R-2	1G	Specimen Bent	180°	X Degrees in Jig	Passed

The undersigned certifies that the statements made in this report are correct and that the test welds were prepared, welded and tested in accordance with the Requirements of Section 5, Chapter 4, ASA Code for Pressure Piping, and Section IX of the ASME Boiler and Pressure Vessel Code.

Accepted By Alexander Solomon

Representing Consumer Power Co.

Date Nov. 5, 1973

CATALYTIC, INC.

By R. J. Goyle Date 16 Nov. 1973

Appendix D to Section 6 "Code for Pressure Piping" ASA-B31.1-1955, Pages 117 & 118

SCHEDULING

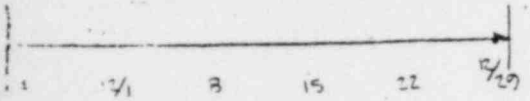
~~C J HARTMAN~~

~~C R H~~

File

RDS

Scheduling



D	REVISED	3-28-74
C	UPDATED	3-4-74
B	REVISED	2-22-74
A	SUMMARY - REVISED	2-1-74

SUNTAC NUCLEAR CORP

CONSUMERS POWER CO.

REACTOR DEPRESSURIZING SYS.

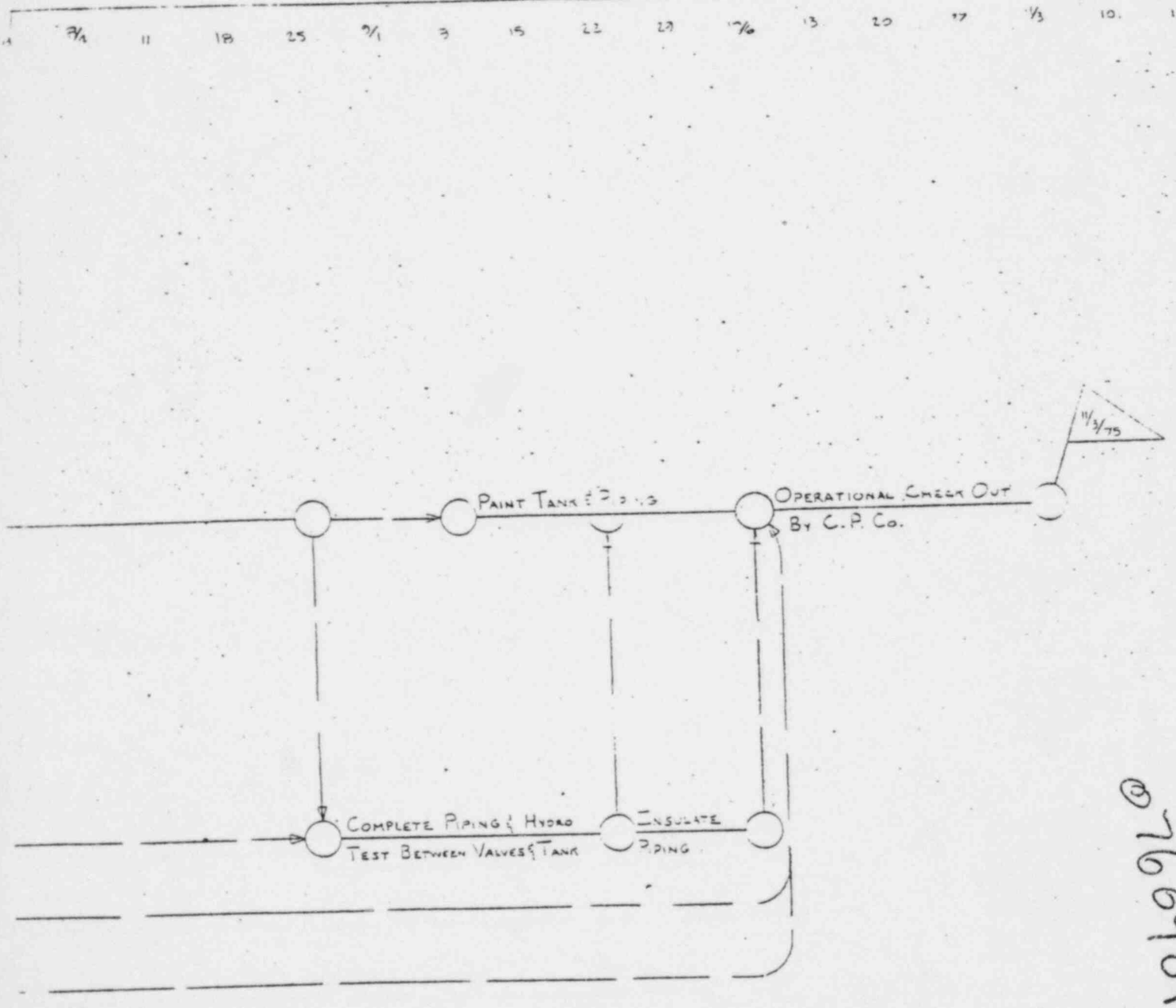
10150 (34490)

CHARLEVOIX MICH

R.D. WILDER

L.G. ROHRBAUGH

076090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PAINT TANK
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BY C.P. Co.
COMPLETE PIPING & HYDRO
TEST BETWEEN VALVES & TANK
INSULATE
PIPING

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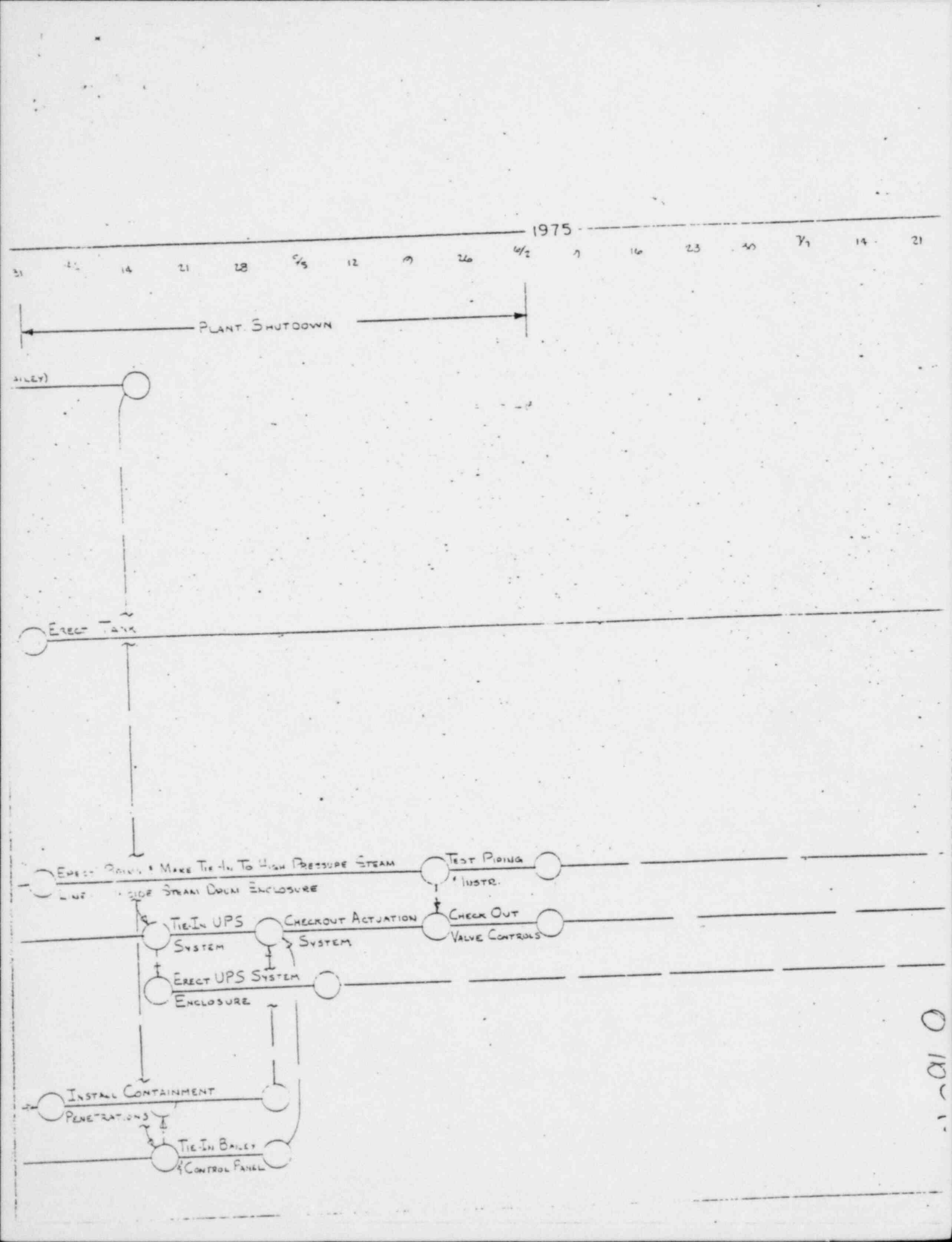
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PLANT SHUTDOWN
AILEY)
ERECT TANK
ENCLOSURE
TIE-IN UPS
SYSTEM
CHECKOUT ACTUATION
SYSTEM
TEST PIPING
& INSTR.
CHECK OUT
VALVE CONTROLS
ERECT UPS SYSTEM
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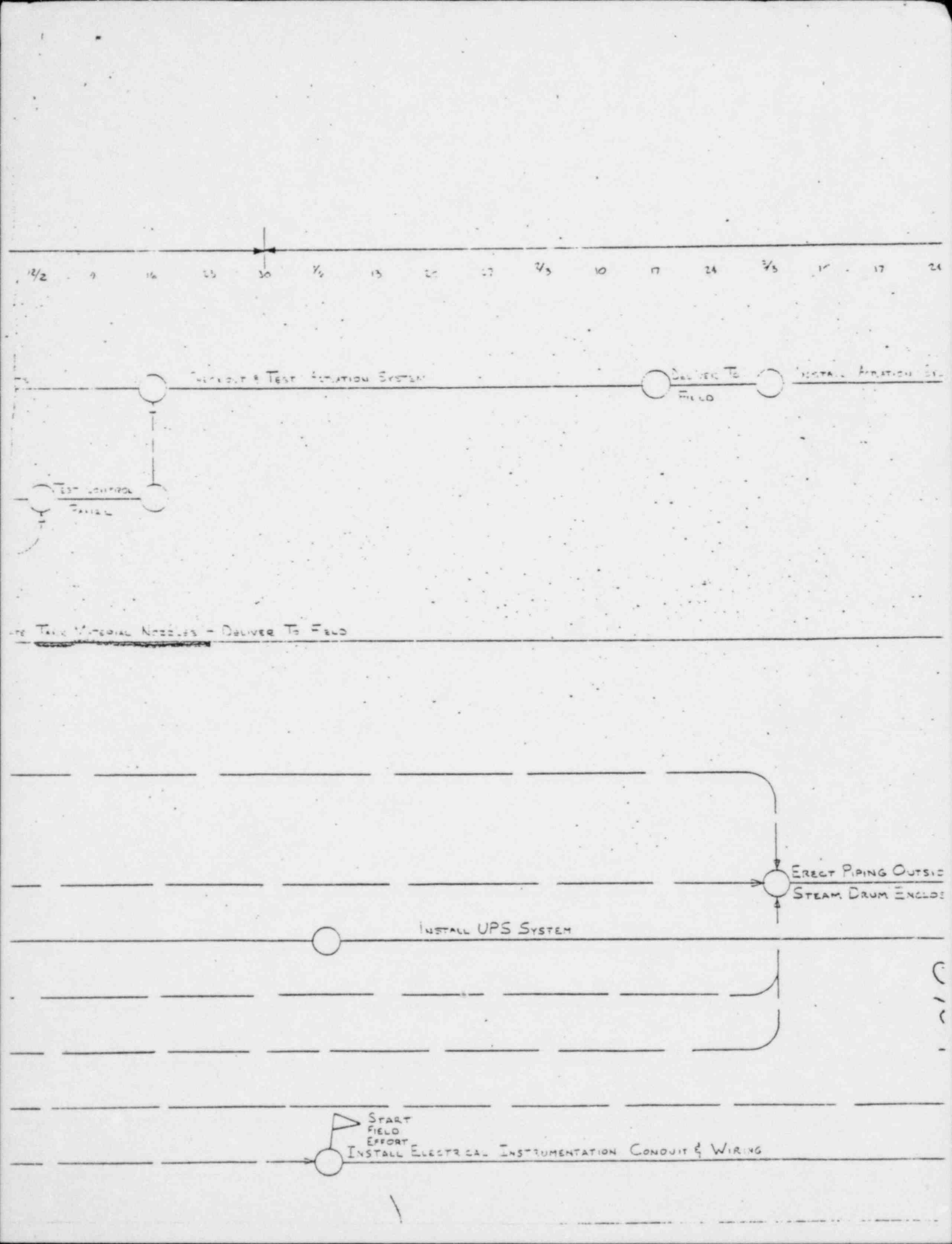
INSTALL CONTAINMENT
PENETRATIONS
TIE-IN BAILEY
& CONTROL PANEL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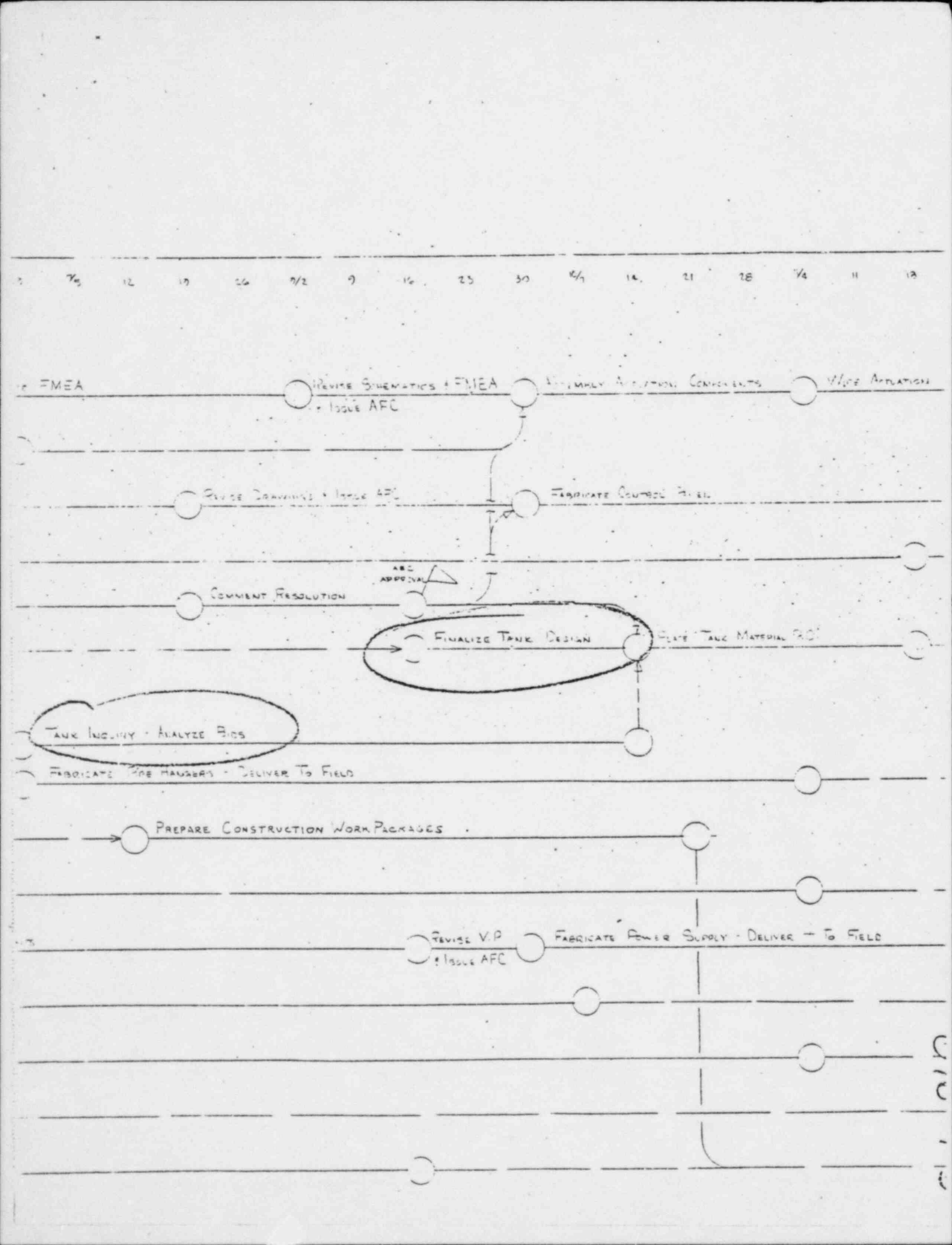
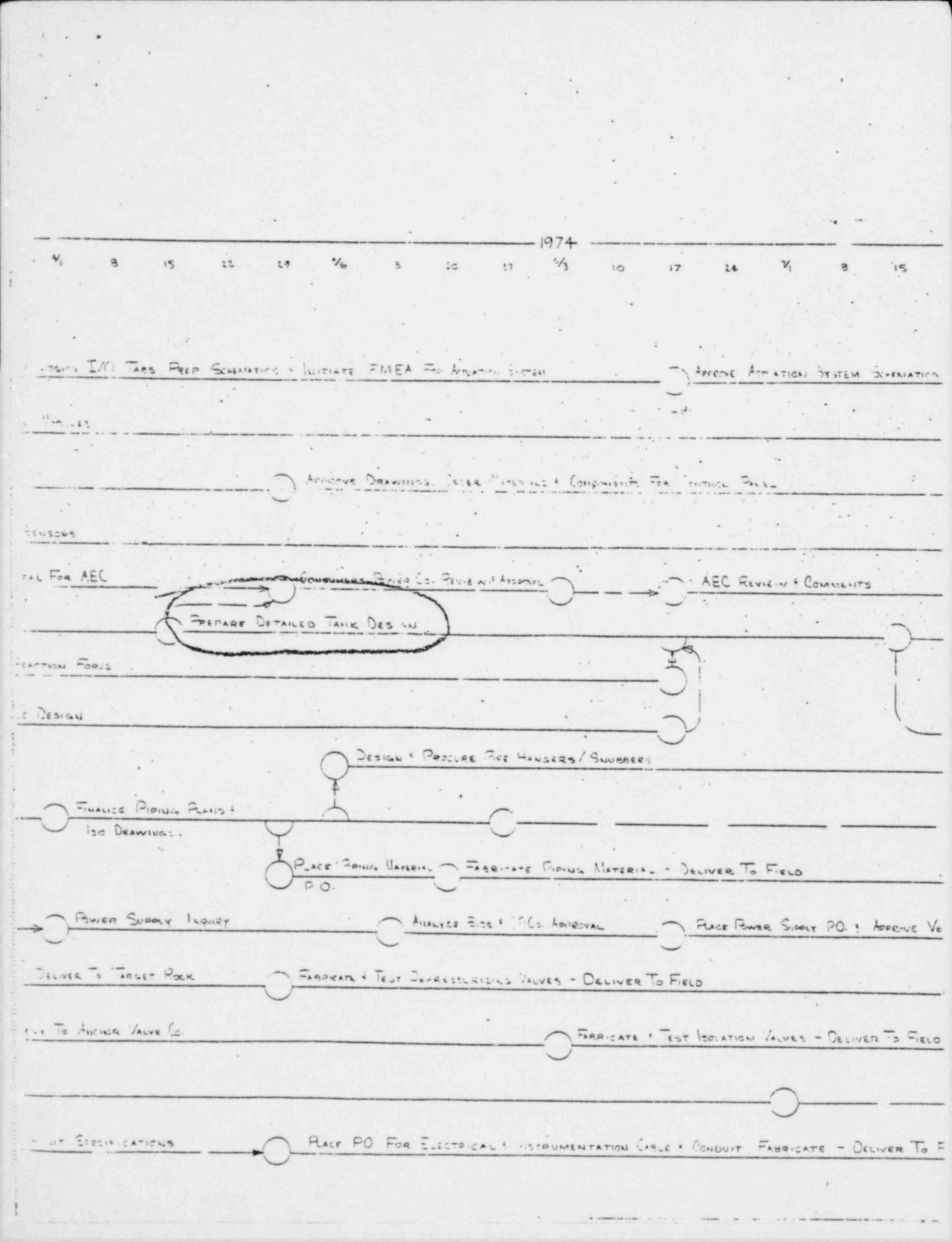
Steam Drum Enclos
Install UPS System
Start
Field
Effort
Install Electrical Instrumentation Conduit & Wiring


FMEA
Revise Schematics + FMEA + Issue AFC
Wire Actuation
Revise Drawings + Issue AFC
Fabricate Control Panel
ABC Approval
Comment Resolution
Finalize Tank Design
Tank Inquiry - Analyze Bids
Fabricate Fire Hangers - Deliver To Field
Prepare Construction Work Packages
Revise V.P + Issue AFC
Fabricate Power Supply - Deliver - To Field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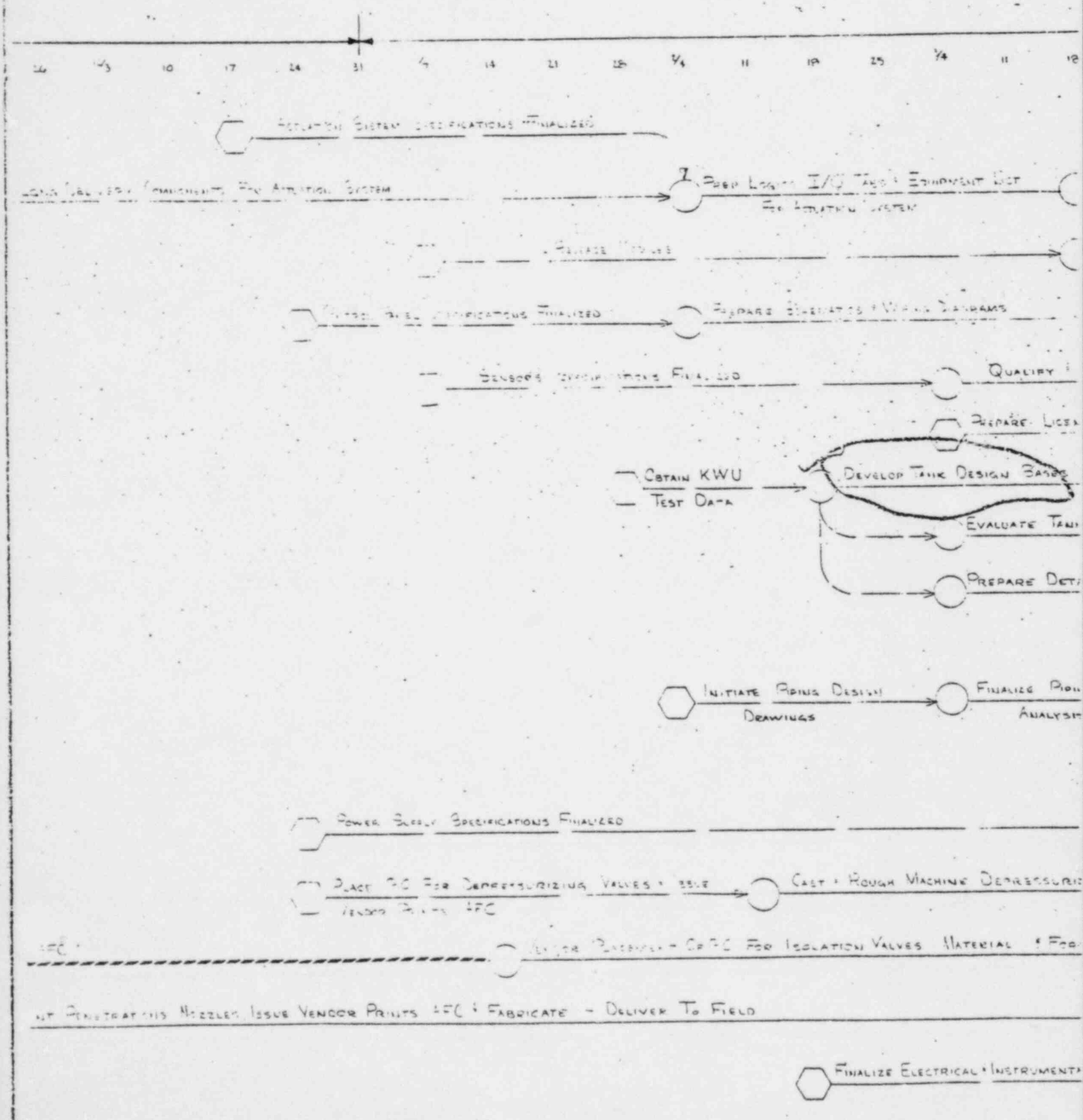
I/O Tabs Prep Schematics + Initiate FMEA For Actuation System
Approve Actuation System Schematics
Approve Drawings, Order Materials & Components For Control Panels
Consumers Power Co. Review & Approval
AEC Review & Comments
Prepare Detailed Tank Design
Design & Procure Pipe Hangers/Snubbers
Finalize Piping Plans & Iso Drawings
Place Piping Material P.O.
Fabricate Piping Material - Deliver To Field
Power Supply Inquiry
Analyze Bids & P.C. Approval
Place Power Supply P.O. & Approve Ve
Deliver To Target Rock
Fabricate & Test Depressurizing Valves - Deliver To Field
Fabricate & Test Isolation Valves - Deliver To Field
Place PO For Electrical & Instrumentation Cable & Conduit Fabricate - Deliver To F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Prepare Logic I/O Tags & Equipment List For Isolation System
Develop Task Design Bases
Obtain KWU Test Data
Evaluate Tasks
Prepare Details
Initiate Piping Design Drawings
Finalize Piping Analysis
Power Supply Specifications Finalized
Cast & Rough Machine Depressurization
Vendor Prints IFC
Fabricate - Deliver To Field
Finalize Electrical & Instrumentation

1973

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PLACE PO #

PLACE PO FOR ISOLATION VALVES & ISOLE VENDOR LINES

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8	UPDATE	1-7-74
7	UPDATE	12-10-73
6	UPDATE	11-8-73
5	UPDATE	10-24-73
4	UPDATE	[illegible]
3	UPDATE	9-17-73
2	REVISED LOGIC	8-28-73
REV.	CHANGE	

CRITICAL PATH NETWORK

CATALYTIC INC

[illegible]

CLIENT CONSUMERS POWER CO

PROJECT SPENT FUEL POOL LINER

CONTRACT NO. #34[illegible]1

LOCATION CHARLEVOIX, MICH.

PROJECT MANAGER H.C. BUSHKOFF

PROJECT ENGINEER T. HETLAND

LEGEND

WORK COMPLETE :

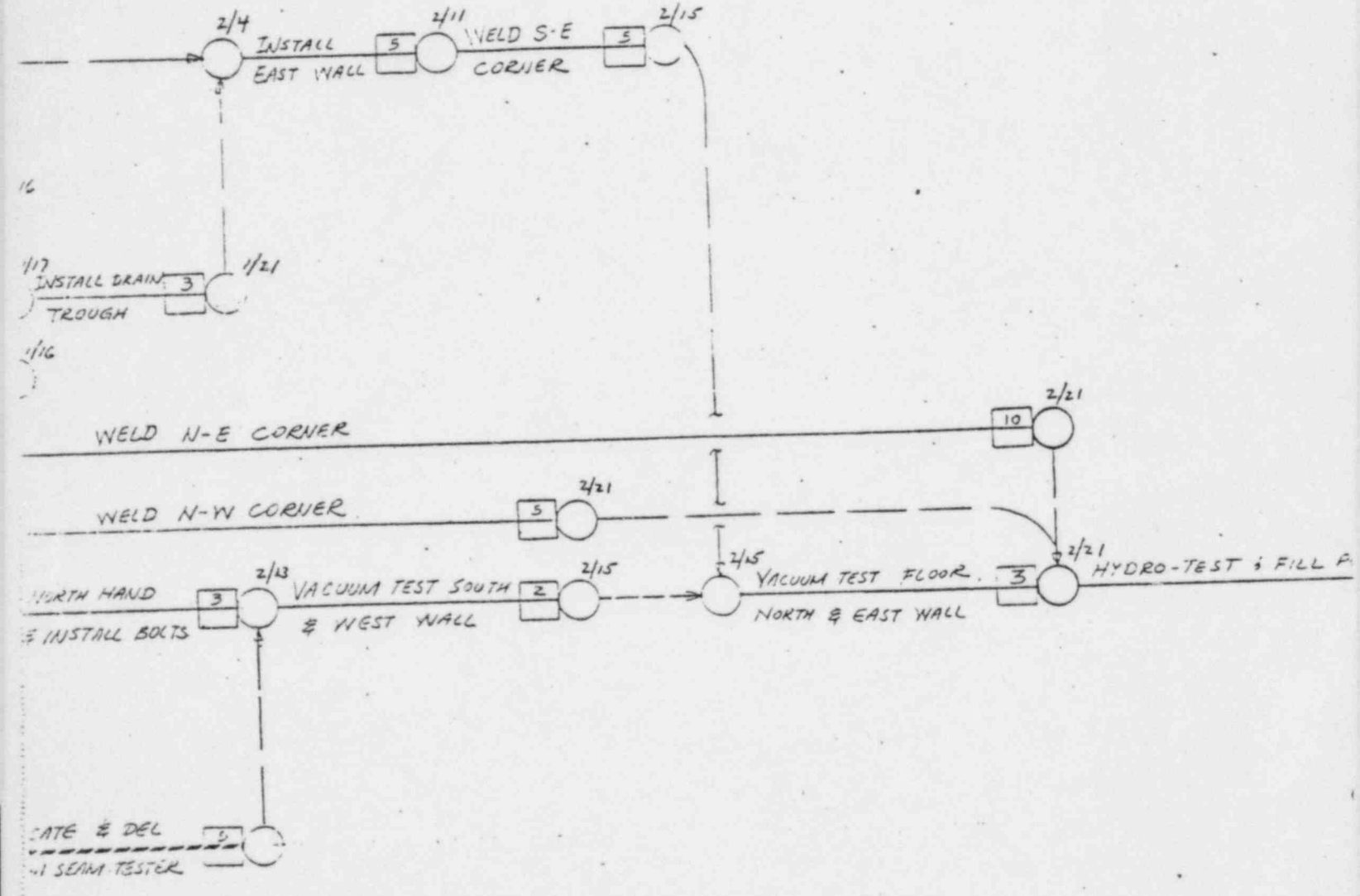
WORK IN PROGRESS :

WORK BEHIND SCHEDULE :

WORK WITH LESS THAN 10 DAYS FLOAT :

WORK WITH MORE THAN 10 DAYS FLOAT :

NOTE: DATES SHOWN ARE PROJECTED OR ACTUAL START & COMPLETE DATES.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INSTALL
EAST WALL
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WELD S-E
CORNER
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INSTALL DRAIN
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WELD N-E CORNER
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2/21
WELD N-W CORNER
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HYDRO-TEST & FILL P
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VACUUM TEST SOUTH
& WEST WALL
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VACUUM TEST FLOOR
NORTH & EAST WALL
NORTH HAND
INSTALL BOLTS
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SEAM TESTER
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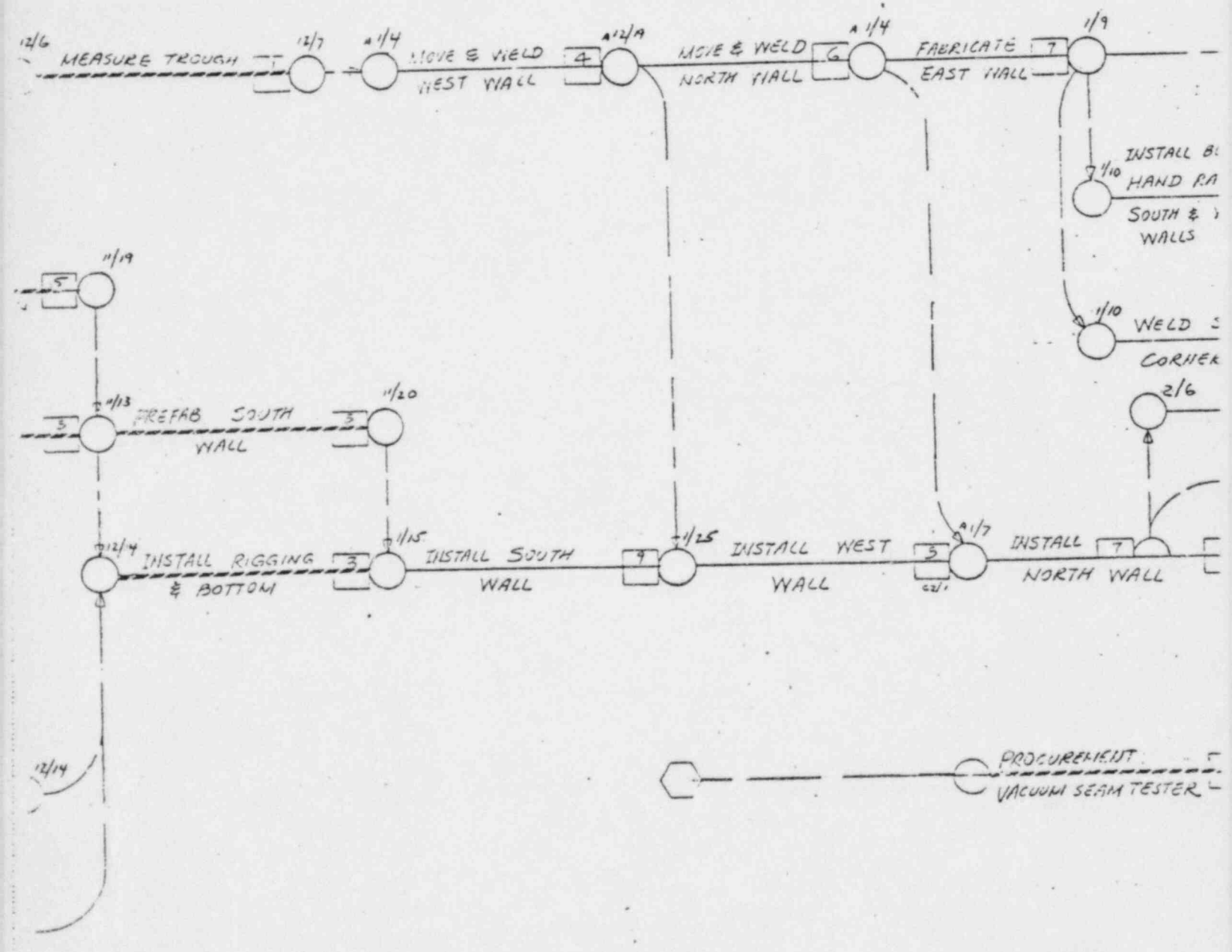
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MEASURE TROUGH
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INSTALL B
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PREFAB SOUTH
WALL
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INSTALL RIGGING
& BOTTOM
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INSTALL SOUTH
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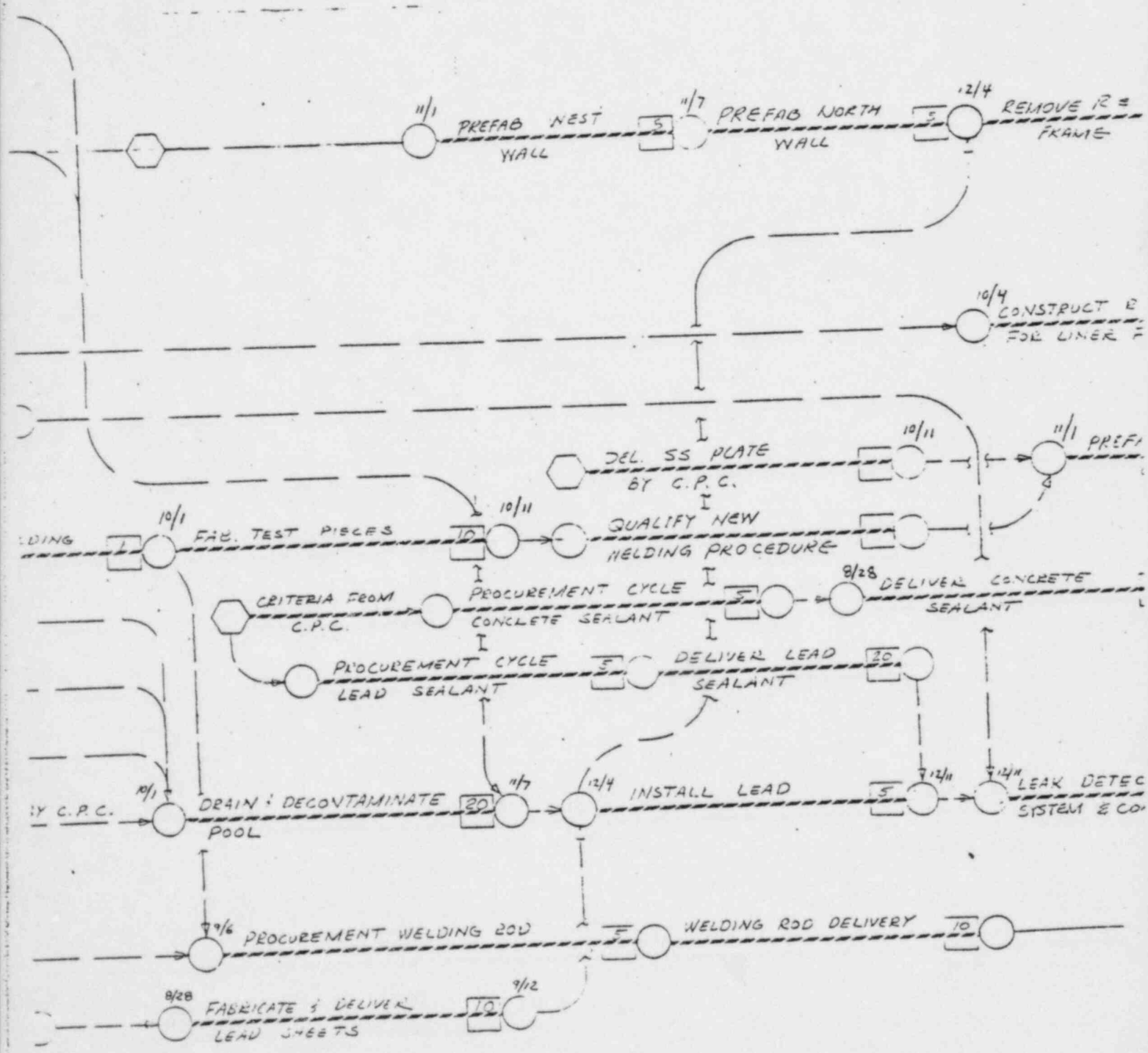
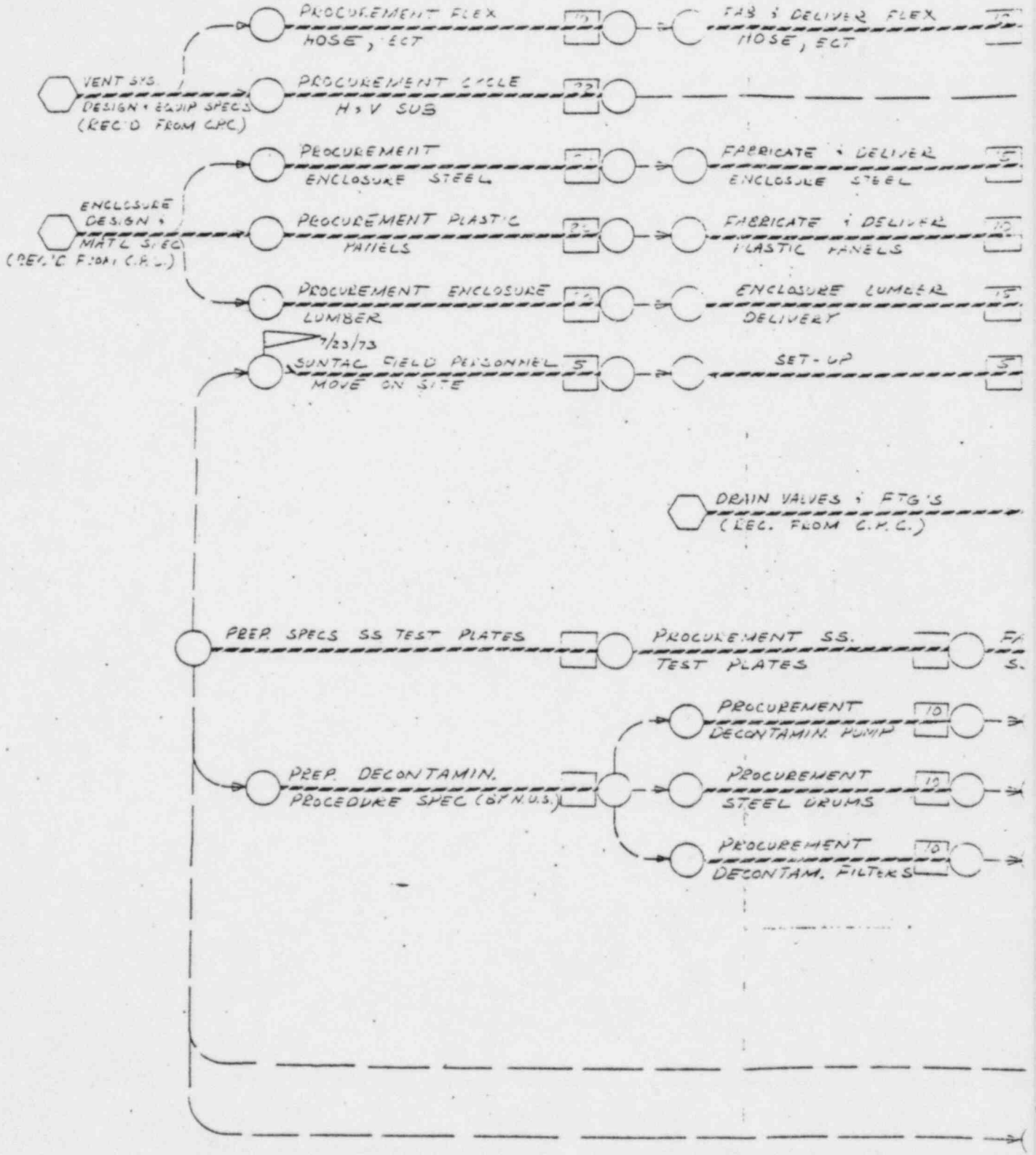
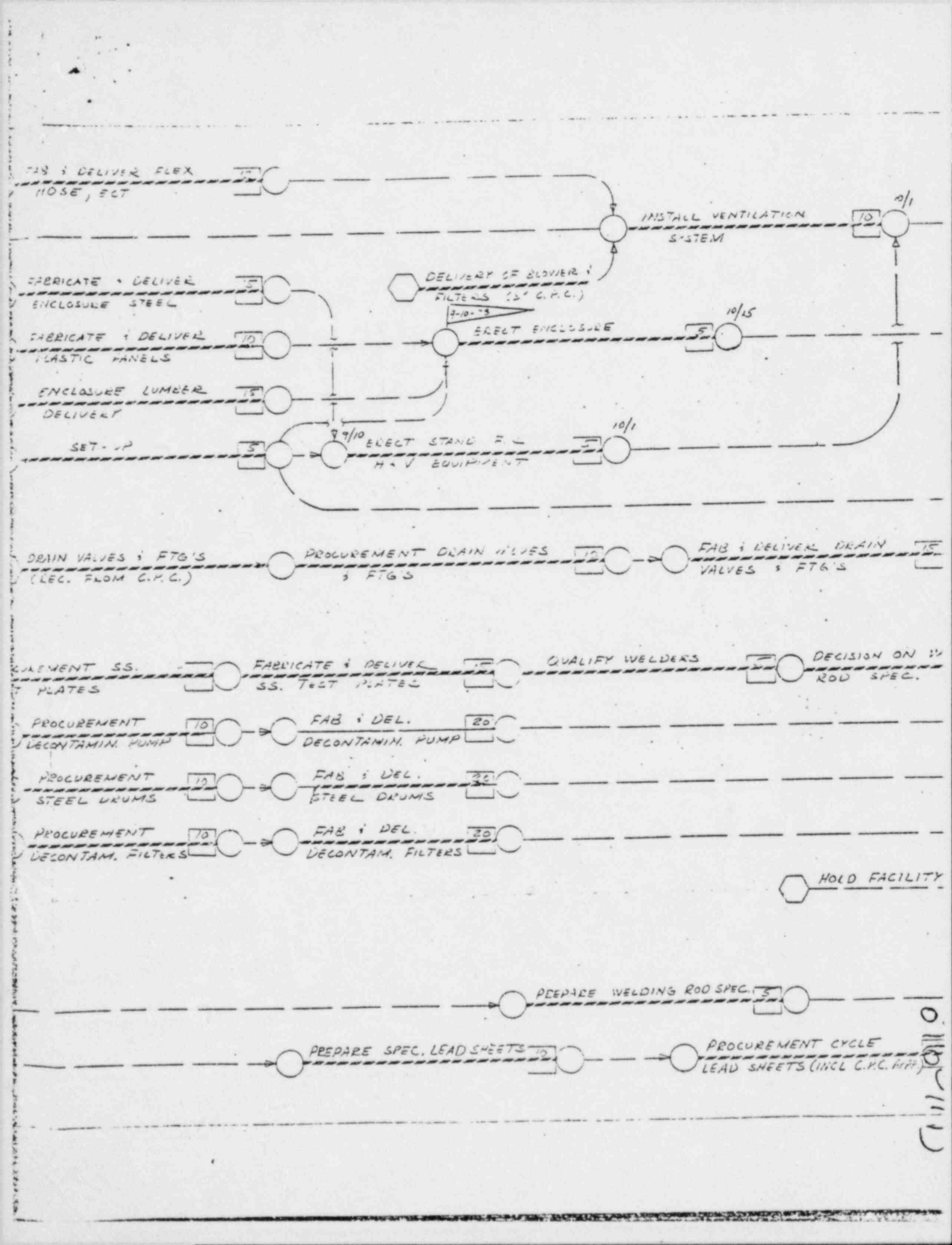
INSTALL WEST
WALL
3
A 1/7
INSTALL
NORTH WALL
7
12/14
PROCUREMENT
VACUUM SEAM TESTER


11/1
PREFAB NEST WALL
5
11/7
PREFAB NORTH WALL
5
12/4
REMOVE R = FRAME
10/4
CONSTRUCT E FOR LINER F
DEL. SS PLATE BY C.P.C.
10/11
11/1 PREFA
10/1
FAB. TEST PIECES
10
10/11
QUALIFY NEW WELDING PROCEDURE
CRITERIA FROM C.P.C.
PROCUREMENT CYCLE CONCLETE SEALANT
5
8/28
DELIVER CONCRETE SEALANT
PROCUREMENT CYCLE LEAD SEALANT
5
DELIVER LEAD SEALANT
20
10/1
DRAIN & DECONTAMINATE POOL
20
11/7
12/4
INSTALL LEAD
5
12/11
12/11 LEAK DETEC
SYSTEM & CO
9/6
PROCUREMENT WELDING ROD
5
WELDING ROD DELIVERY
10
8/28
FABRICATE & DELIVER LEAD SHEETS
10
9/12


PROCUREMENT FLEX HOSE, ECT
FAB & DELIVER FLEX HOSE, ECT
VENT SYS. DESIGN & EQUIP SPECS (REC'D FROM CMC.)
PROCUREMENT CYCLE H & V SUB
PROCUREMENT ENCLOSURE STEEL
FABRICATE & DELIVER ENCLOSURE STEEL
ENCLOSURE DESIGN & MAT'L SPEC (REC'D FROM C.M.C.)
PROCUREMENT PLASTIC PANELS
FABRICATE & DELIVER PLASTIC PANELS
PROCUREMENT ENCLOSURE LUMBER
ENCLOSURE LUMBER DELIVERY
7/23/73
SUNTAC FIELD PERSONNEL MOVE ON SITE
SET-UP
DRAIN VALVES & FTG'S (REC. FROM C.M.C.)
PREP. SPECS SS TEST PLATES
PROCUREMENT SS. TEST PLATES
PROCUREMENT DECONTAMIN. PUMP
PREP. DECONTAMIN. PROCEDURE SPEC (OFN.U.S.)
PROCUREMENT STEEL DRUMS
PROCUREMENT DECONTAM. FILTERS


FAB & DELIVER FLEX HOSE, ECT
INSTALL VENTILATION SYSTEM
10/1
FABRICATE & DELIVER ENCLOSURE STEEL
DELIVERY OF BLOWER & FILTERS (2 C.H.C.)
FABRICATE & DELIVER PLASTIC PANELS
ERECT ENCLOSURE
10/15
ENCLOSURE LUMBER DELIVERY
SET-UP
9/10
ERECT STAND F. H & V EQUIPMENT
10/1
DRAIN VALVES & FTG'S (DEL. FROM C.H.C.)
PROCUREMENT DRAIN VALVES & FTG'S
FAB & DELIVER DRAIN VALVES & FTG'S
PROCUREMENT SS. PLATES
FABRICATE & DELIVER SS. TEST PLATES
QUALIFY WELDERS
DECISION ON W ROD SPEC.
PROCUREMENT DECONTAMIN. PUMP
FAB & DEL. DECONTAMIN. PUMP
PROCUREMENT STEEL DRUMS
FAB & DEL. STEEL DRUMS
PROCUREMENT DECONTAM. FILTERS
FAB & DEL. DECONTAM. FILTERS
HOLD FACILITY
PREPARE WELDING ROD SPEC.
PREPARE SPEC. LEAD SHEETS
PROCUREMENT CYCLE LEAD SHEETS (INCL C.H.C. APP.)

To FMMacri, P-14-230

From JSRang, P-21-313

Date November 27, 1973

Subject BRP Spent Fuel Pool
Liner Installation Schedule

Consumers Power Company

Internal Correspondence
Rang 171-73

cc RALamley, P-26-336A
AVHume, P-11-110A
CJHartman, Charlevoix
OHKeeling, P-11-218
JMBrager, P-11-230
RBCherba, Traverse City
File
301GG
1974 Refueling Outage

The latest schedule projection for completion of the Big Rock Point spent fuel pool indicates that the completion date is behind approximately 15 8-hour working days or 3 weeks. This would extend the new completion date from January 15, 1974 to February 5, 1974.

Three solutions that exist are: (1) Utilizing a second shift, (2) extending the present shift to 6 10-hour days per week and (3) delaying the start of the refueling outage for three weeks.

Apparently, the use of a second shift is difficult to obtain because of the lack of qualified welders.

The additional cost of extending the present shift to 6 10-hour days per week will be on the order of $25,000.

Should the refueling outage be delayed for three weeks, the penalty for power replacement costs (the difference between operating at a 69 MWhe rate and an average of 58 MWhe assuming coastdown starts January 1, 1974 because of off gas limits) are approximately $26,000. In addition, because the work is being extended longer than originally anticipated, there are additional labor costs of about $10,000.

Assuming coastdown starts as indicated, there is an economic advantage of extending the workweek to 6 10-hour days over delaying the refueling outage. Because there are still approximately two months of construction work left, which is based on a very tight schedule, the possibility (and high probability) exists for additional delays. Therefore, since the second shift option has been ruled out, it is recommended that the construction work crews be placed immediately on a 6 10-hour workday schedule. Should further slippage occur, the flexibility would still exist to delay the refueling outage at that time.

OK per CJH (staff meeting), 12/3/73 except on a "spot" basis has not been authorized for the project. Bob Tasker was contacted and he has the same message from Wilder.

File - CFP - "Schedule"

~~C-J-H~~

C-J-HARTMAN

3 FEB. 74

REV	REMARKS	DATE
7	UPDATE	12-10-73
6	UPDATE	11-5-73
5	UPDATE	10-14-73
4	UPDATE	9-25-73
3	UPDATE	9-17-73
2	REVISED LOGIC	8-28-73

CRITICAL PATH NETWORK

PREPARED BY

CATALYTIC, INC.

PLANNING & SCHEDULING DEPARTMENT

PHILADELPHIA PENNSYLVANIA 19122

FOR

CLIENT CONSUMERS POWER CO

PROJECT SPENT FUEL POOL LINER

CONTRACT NO # 34881

LOCATION CHARLEVOIX, MICH.

PROJECT MANAGER H.C. BUSHKOFF

PLANNING ENGINEER T. HETLAND

LEGEND

WORK COMPLETE : ▬▬▬▬▬▬▬▬

WORK IN PROGRESS :

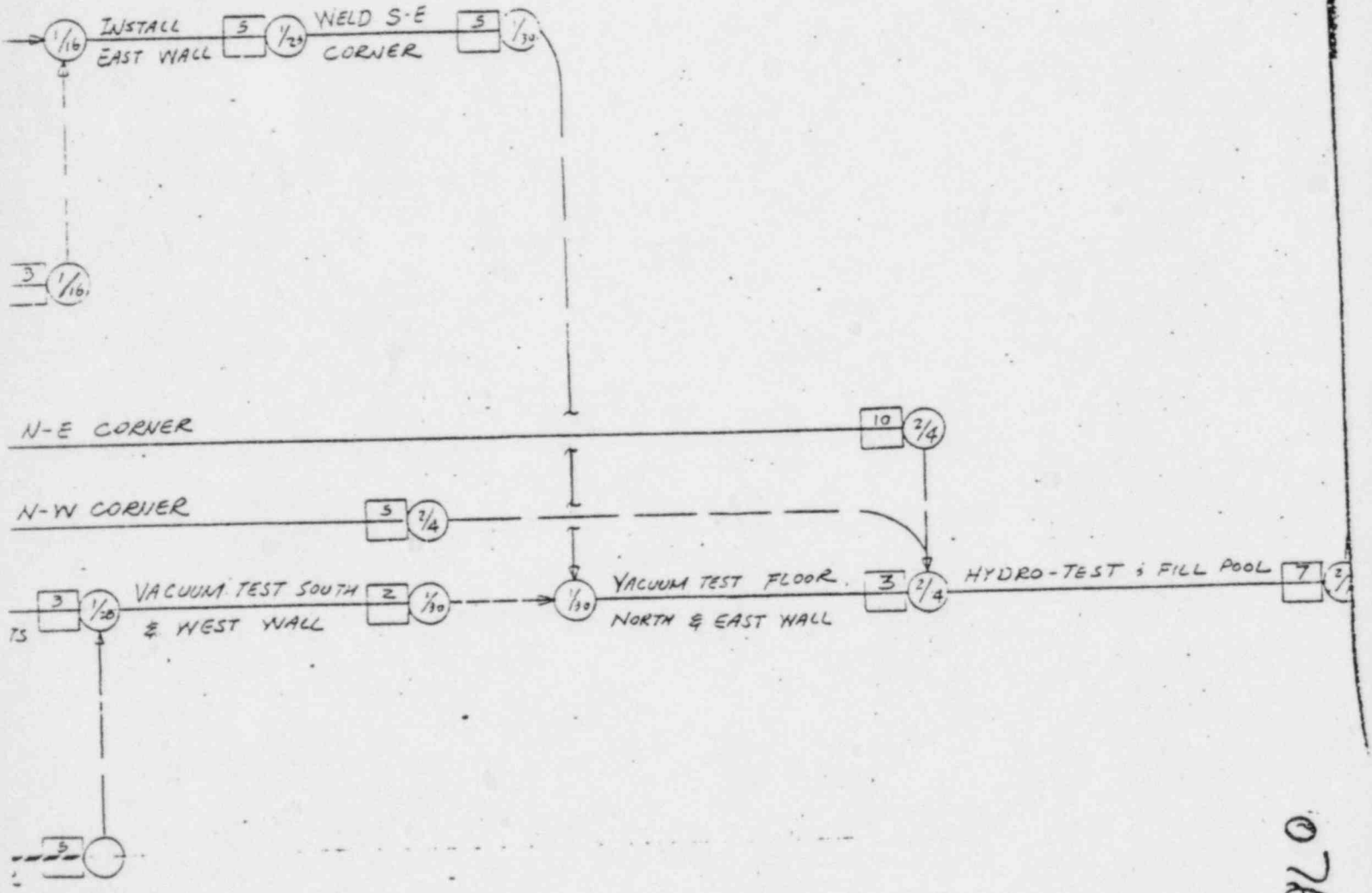
WORK BEHIND SCHEDULE :

WORK WITH LESS THAN 10 DAYS FLOAT :

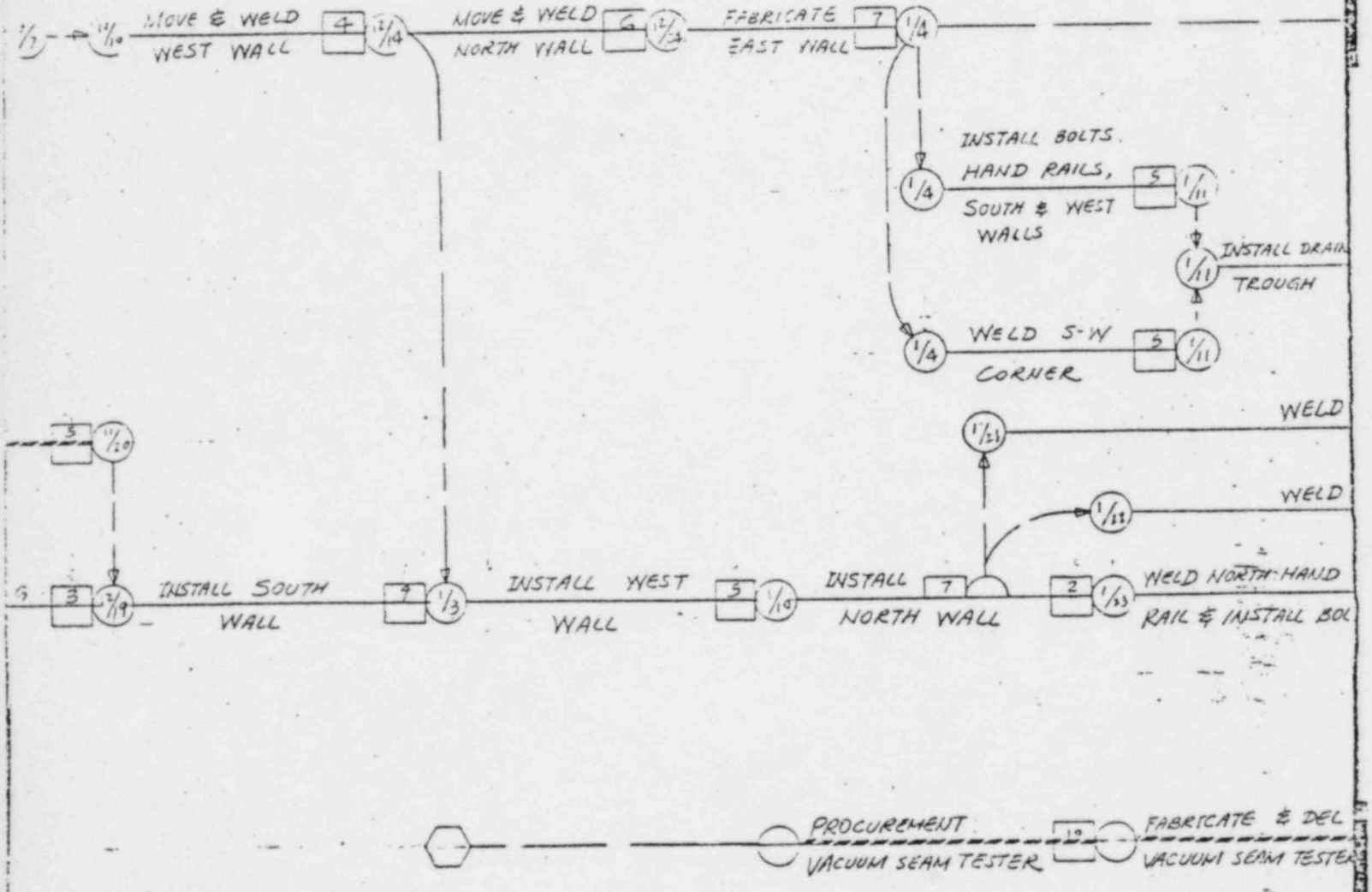
WORK WITH MORE THAN 10 DAYS FLOAT :

NOTE : DATES SHOWN ARE PROJECTED OR ACTUAL START & COMPLETE DATES.

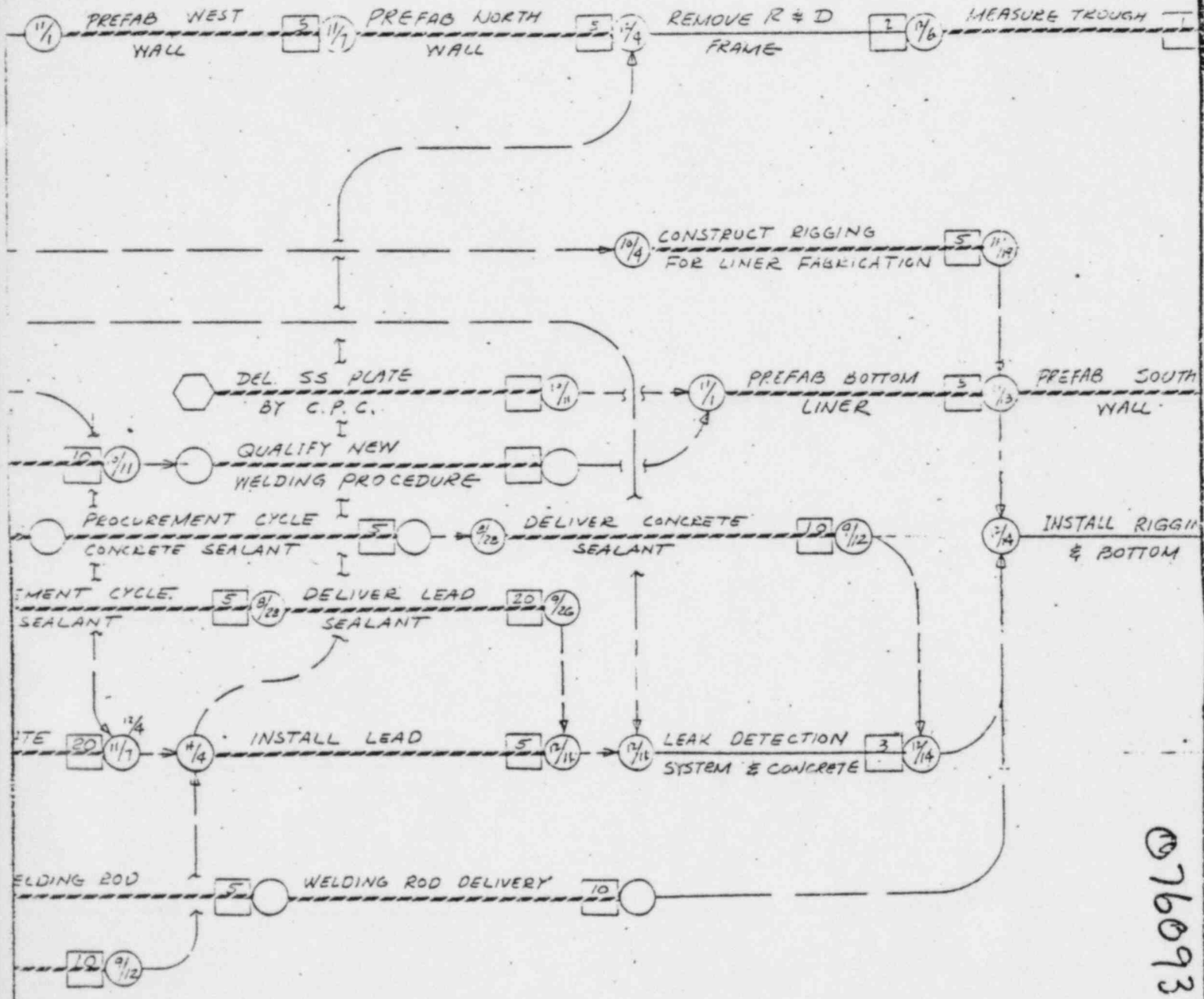
8003


INSTALL
EAST WALL
WELD S-E
CORNER
N-E CORNER
N-W CORNER
VACUUM TEST SOUTH
& WEST WALL
VACUUM TEST FLOOR
NORTH & EAST WALL
HYDRO-TEST & FILL POOL

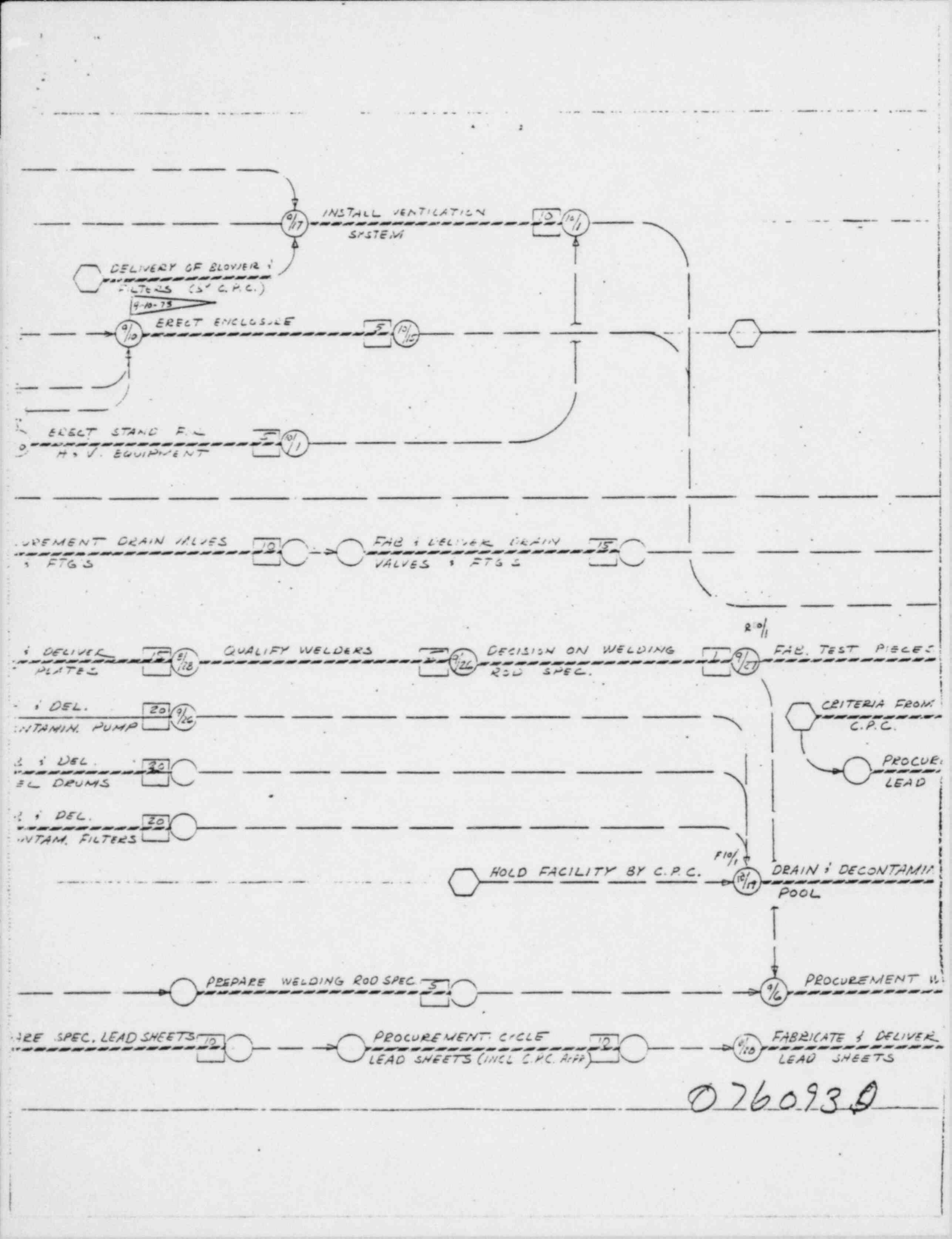
07093 A


MOVE & WELD
WEST WALL
MOVE & WELD
NORTH WALL
FABRICATE
EAST WALL
INSTALL BOLTS.
HAND RAILS,
SOUTH & WEST
WALLS
INSTALL DRAIN
TROUGH
WELD S-W
CORNER
WELD
WELD
INSTALL SOUTH
WALL
INSTALL WEST
WALL
INSTALL
NORTH WALL
WELD NORTH HAND
RAIL & INSTALL BOL
PROCUREMENT
VACUUM SEAM TESTER
FABRICATE & DEL
VACUUM SEAM TESTER

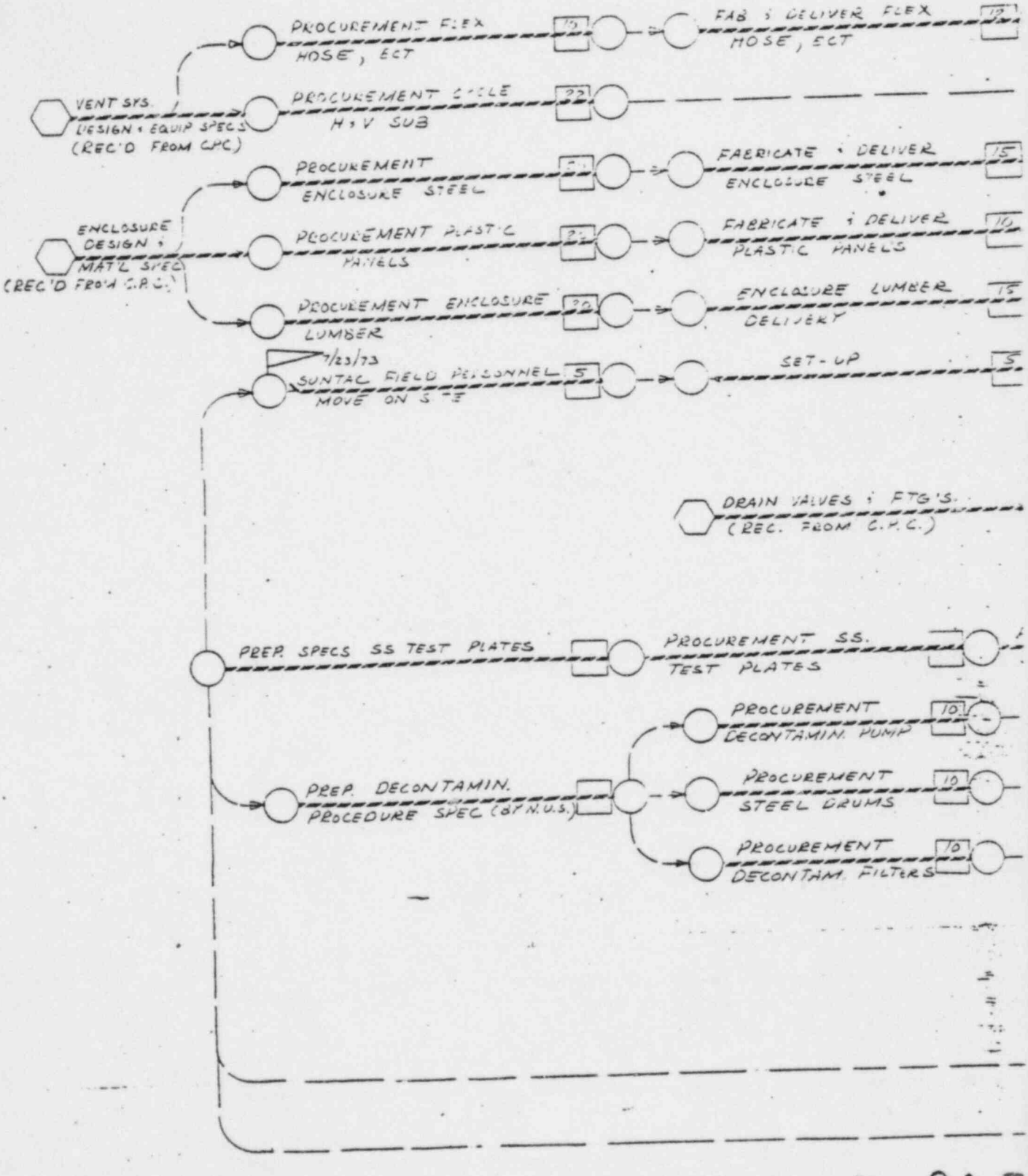
07609338


PREFAB WEST WALL
PREFAB NORTH WALL
REMOVE R & D FRAME
MEASURE TROUGH
CONSTRUCT RIGGING FOR LINER FABRICATION
DEL. SS PLATE BY C.P.C.
PREFAB BOTTOM LINER
PREFAB SOUTH WALL
QUALIFY NEW WELDING PROCEDURE
PROCUREMENT CYCLE
CONCRETE SEALANT
DELIVER CONCRETE SEALANT
INSTALL RIGGI
& BOTTOM
MENT CYCLE.
SEALANT
DELIVER LEAD SEALANT
INSTALL LEAD
LEAK DETECTION SYSTEM & CONCRETE
WELDING ROD DELIVERY

760930


INSTALL VENTILATION SYSTEM
DELIVERY OF BLOWER & FILTERS (3rd C.P.C.)
9-10-73
ERECT ENCLOSURE
ERECT STAND F.L. H & V. EQUIPMENT
QUALIFY WELDERS
DECISION ON WELDING ROD SPEC.
CRITERIA FROM C.P.C.
HOLD FACILITY BY C.P.C.
DRAIN & DECONTAMIN POOL
PREPARE WELDING ROD SPEC.
PROCUREMENT CYCLE LEAD SHEETS (INCL C.P.C. APP)
FABRICATE & DELIVER LEAD SHEETS

076093D


VENT SYS. DESIGN & EQUIP SPECS (REC'D FROM CPC)
PROCUREMENT FLEX HOSE, ECT
15
FAB & DELIVER FLEX HOSE, ECT
15
PROCUREMENT CYCLE H & V SUB
22
ENCLOSURE DESIGN & MAT'L SPEC (REC'D FROM C.P.C.)
PROCUREMENT ENCLOSURE STEEL
21
FABRICATE & DELIVER ENCLOSURE STEEL
15
PROCUREMENT PLASTIC PANELS
21
FABRICATE & DELIVER PLASTIC PANELS
10
PROCUREMENT ENCLOSURE LUMBER
20
ENCLOSURE LUMBER DELIVERY
15
7/23/73
SUNTAC FIELD PERSONNEL MOVE ON SITE
5
SET-UP
5
DRAIN VALVES & FTG'S. (REC. FROM C.P.C.)
PREP. SPECS SS TEST PLATES
PROCUREMENT SS. TEST PLATES
PROCUREMENT DECONTAMIN. PUMP
10
PREP. DECONTAMIN. PROCEDURE SPEC (BY N.U.S.)
PROCUREMENT STEEL DRUMS
10
PROCUREMENT DECONTAM. FILTERS
10

076093 E

CJHARTMAN
—C-KA—

File
SFP
Schedule

1 FEB. 74

7/1

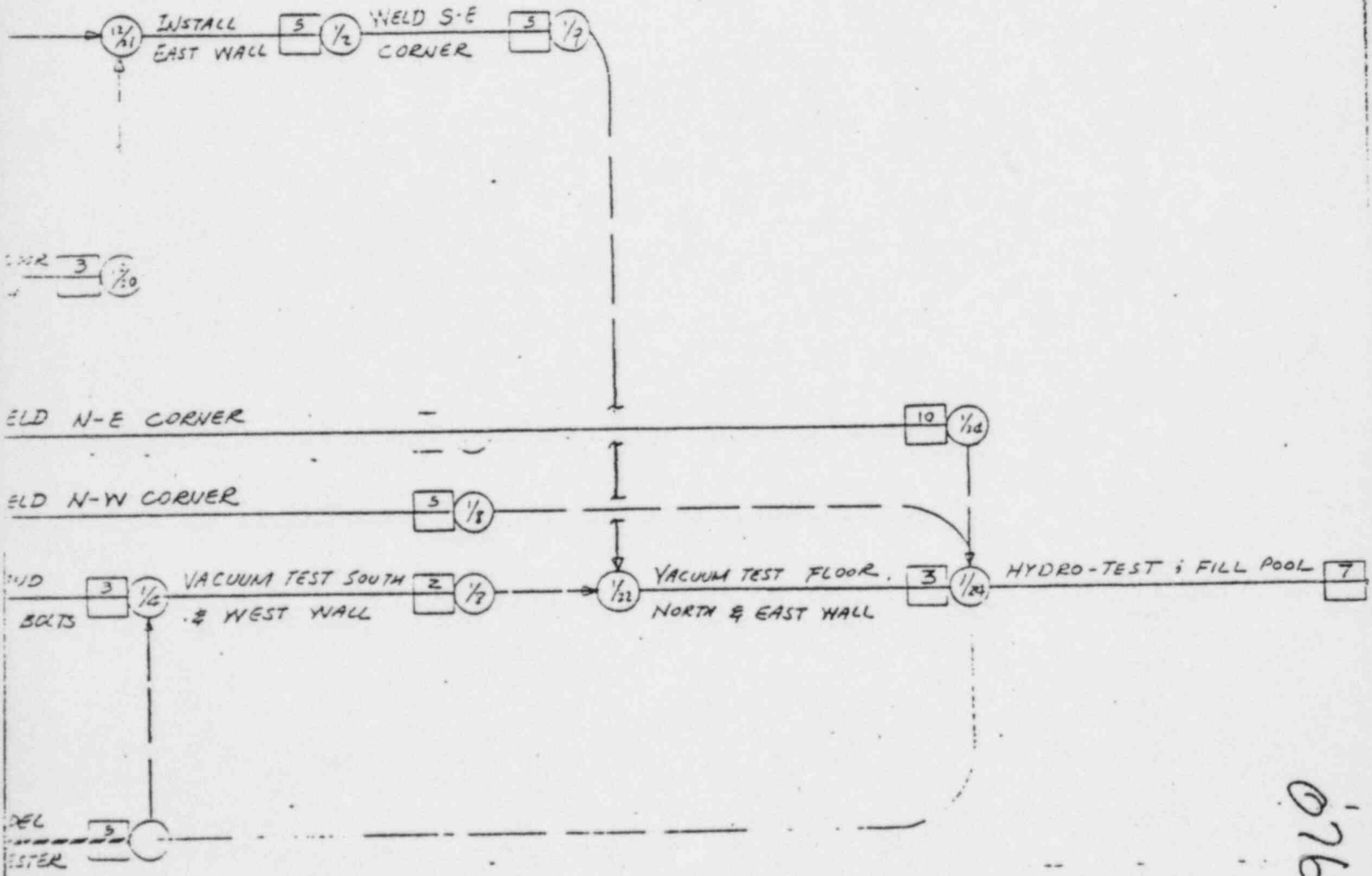
REV	REMARKS	DATE
7	UPDATE	11-28-73
6	UPDATE	11-8-73
5	UPDATE	10-24-73
4	UPDATE	10-5-73
3	UPDATE	9-17-73
2	REVISED LOGIC	8-28-73

CRITICAL PATH NETWORK
PREPARED BY
CATALYTIC, INC.
PLANNING & SCHEDULING DEPARTMENT
PHILADELPHIA PENNSYLVANIA 19102
FOR
CLIENT CONSUMERS POWER CO
PROJECT SPENT FUEL POOL LINER
CONTRACT NO #3488I
LOCATION CHARLEVOIX, MICH.
PROJECT MANAGER H.C. BUSHKOFF
PLANNING ENGINEER T. HETLAND

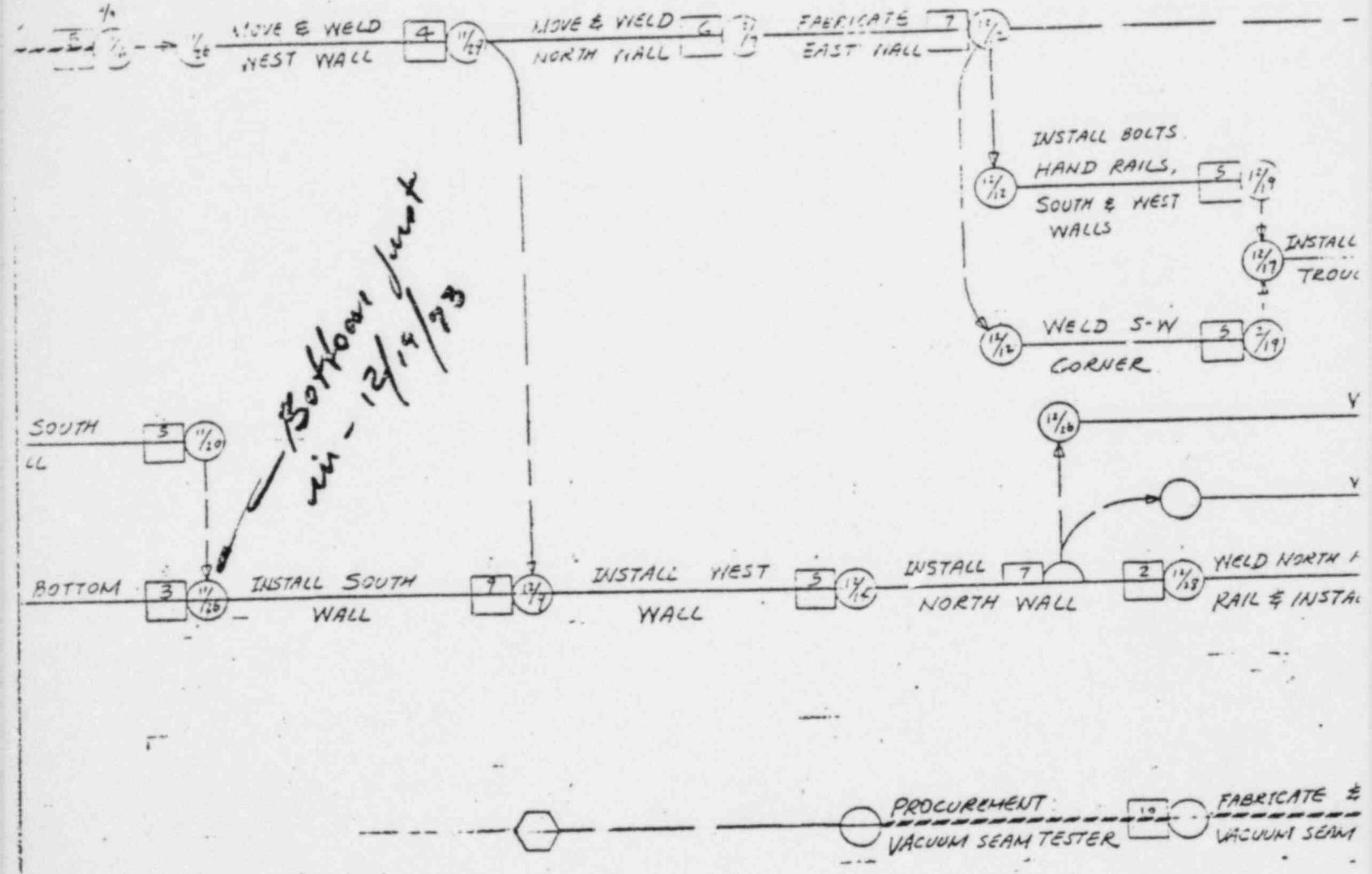
LEGEND

WORK COMPLETE : ——————
WORK IN PROGRESS :
WORK BEHIND SCHEDULE :
WORK WITH LESS THAN 10 DAYS FLOAT:
WORK WITH MORE THAN 10 DAYS FLOAT:

NOTE: DATES SHOWN ARE PROJECTED OR ACTUAL START & COMPLETE DATES.

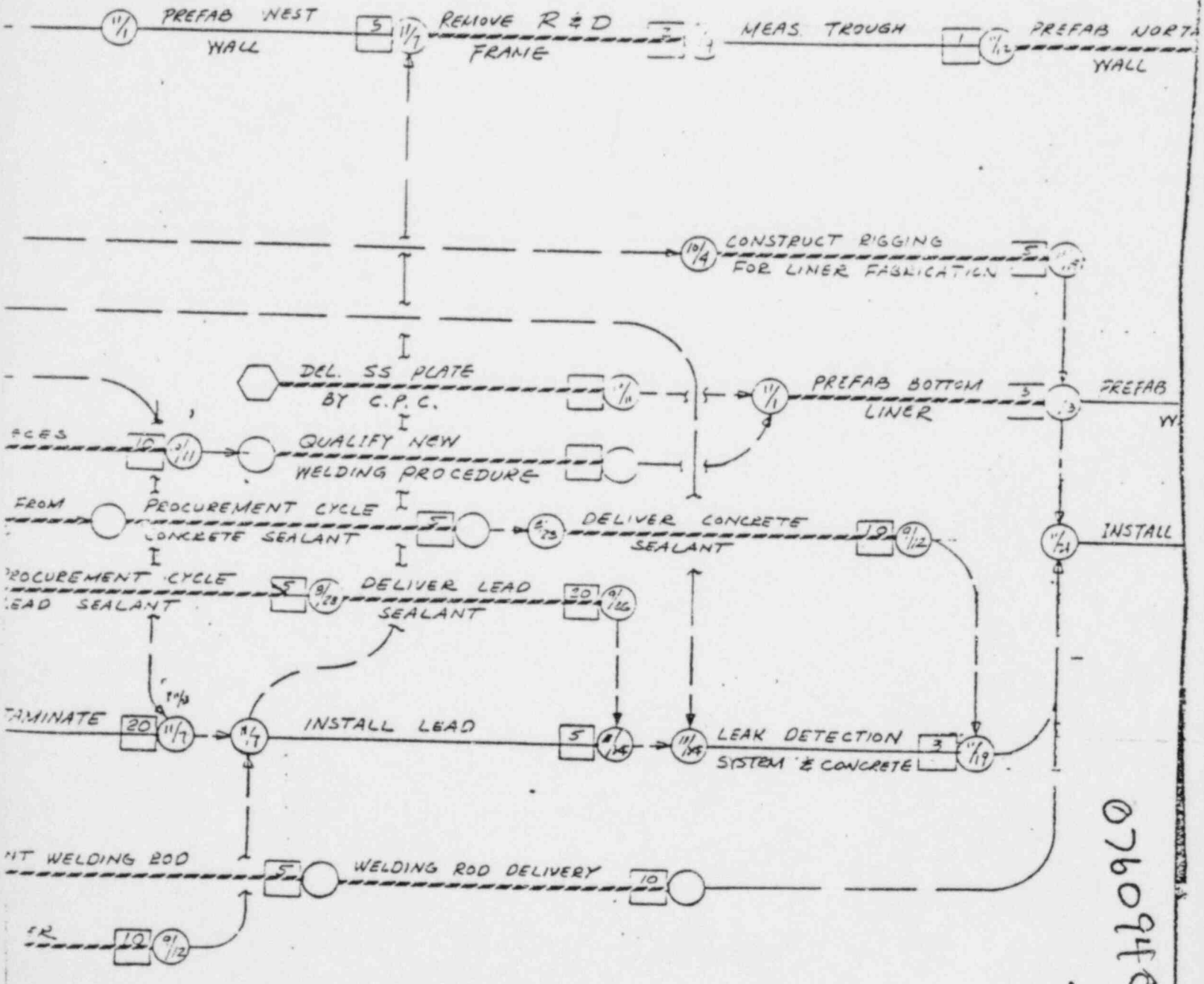

INSTALL
EAST WALL
WELD S-E
CORNER
ELD N-E CORNER
ELD N-W CORNER
VACUUM TEST SOUTH
& WEST WALL
VACUUM TEST FLOOR.
NORTH & EAST WALL
HYDRO-TEST & FILL POOL
BOLTS

07609A

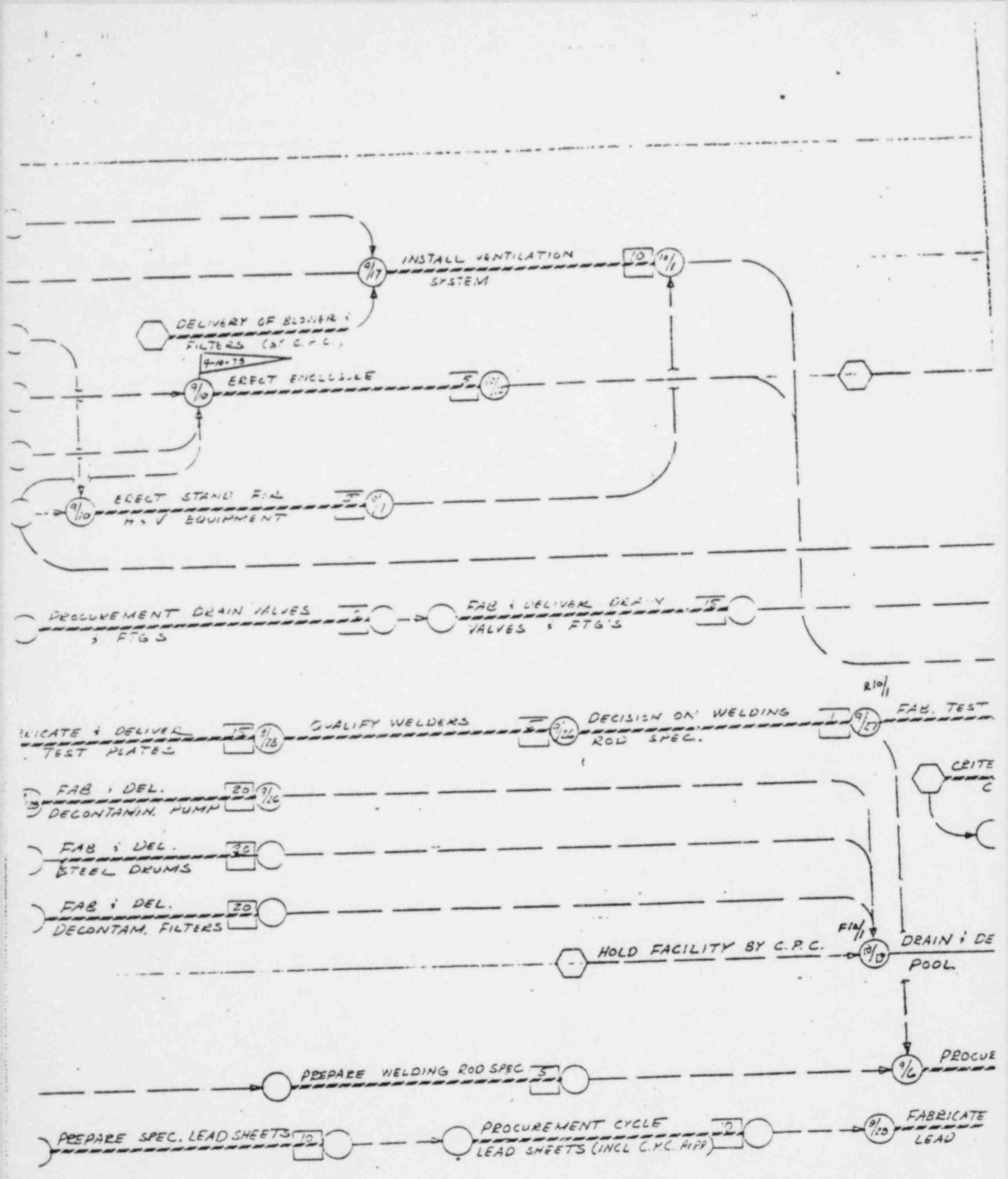

MOVE & WELD
WEST WALL
MOVE & WELD
NORTH WALL
FABRICATE
EAST WALL
INSTALL BOLTS
HAND RAILS,
SOUTH & WEST
WALLS
WELD S-W
CORNER
SOUTH
BOTTOM
INSTALL SOUTH
WALL
INSTALL WEST
WALL
INSTALL
NORTH WALL
Bottom Chunk
in - 12-4-93

PROCUREMENT
VACUUM SEAM TESTER
FABRICATE &
VACUUM SEAM

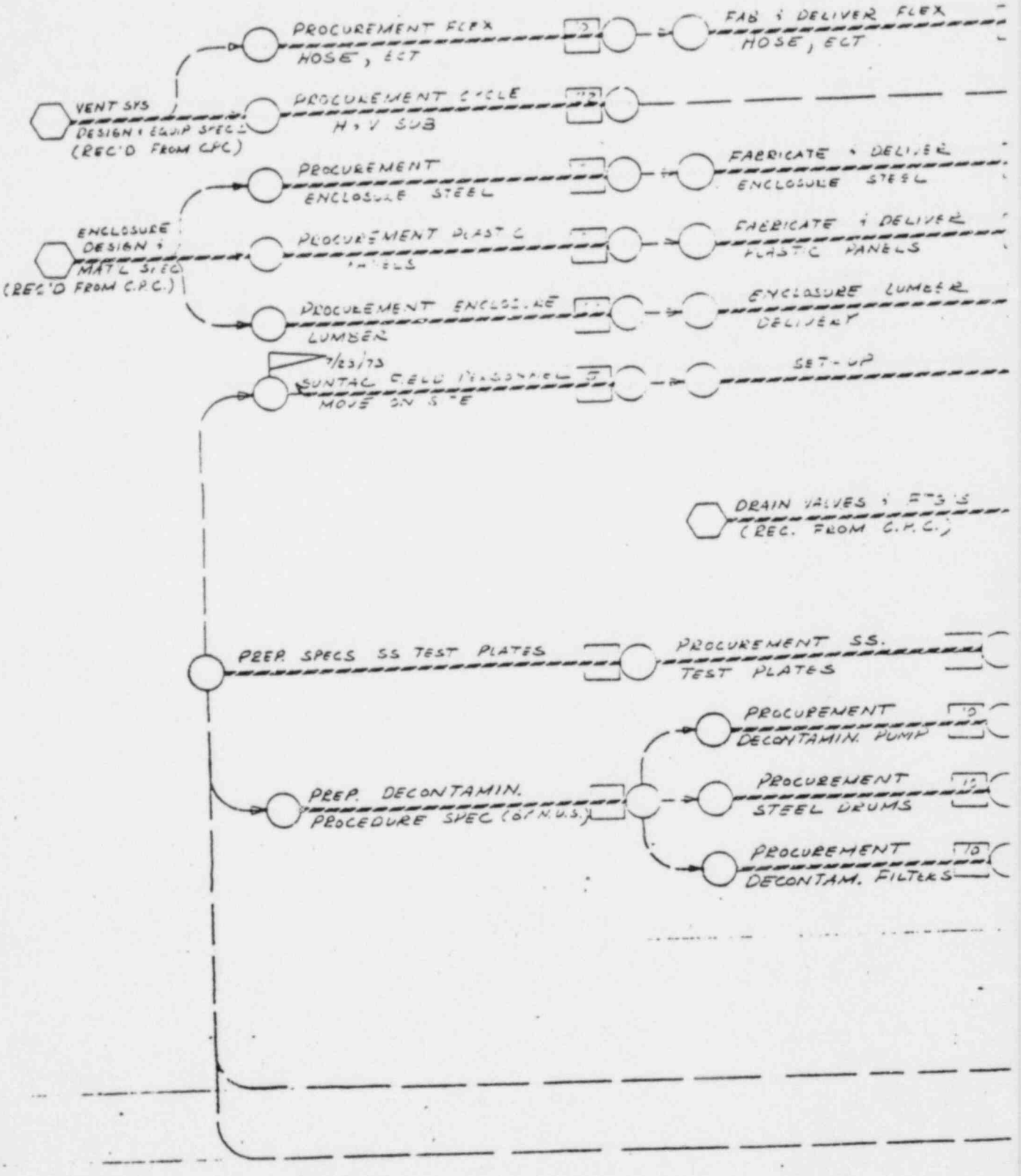
02604/13


PREFAB WEST WALL
RELIEVE R & D FRAME
MEAS. TROUGH
PREFAB NORTH WALL
CONSTRUCT RIGGING FOR LINER FABRICATION
DEL. SS PLATE BY C.P.C.
PREFAB BOTTOM LINER
PREFAB
QUALIFY NEW WELDING PROCEDURE
PROCUREMENT CYCLE CONCRETE SEALANT
DELIVER CONCRETE SEALANT
INSTALL
DELIVER LEAD SEALANT
INSTALL LEAD
LEAK DETECTION SYSTEM & CONCRETE
WELDING ROD DELIVERY

07094C


9/17
INSTALL VENTILATION SYSTEM
10
10/1
DELIVERY OF BLOWER & FILTERS (at C.P.C.)
9-10-73
9/10
ERECT ENCLOSURE
5
10/1
9/10
ERECT STAND FOR H & V EQUIPMENT
5
11/1
PROCUREMENT DRAIN VALVES & FTG'S
FAB & DELIVER DRAIN VALVES & FTG'S
15
R10/1
QUALIFY WELDERS
9/12A
DECISION ON WELDING ROD SPEC.
1
9/12
FAB. TEST
FAB & DEL. DECONTAMIN. PUMP
20
9/16
FAB & DEL. STEEL DRUMS
30
FAB & DEL. DECONTAM. FILTERS
20
F10/1
HOLD FACILITY BY C.P.C.
10/1
DRAIN & DE
POOL
PREPARE WELDING ROD SPEC
5
9/6
PROCUR
PREPARE SPEC. LEAD SHEETS
10
PROCUREMENT CYCLE LEAD SHEETS (INCL C.Y.C. HIPP)
12
9/20
FABRICATE LEAD

076094D


PROCUREMENT FLEX HOSE, ECT
FAB & DELIVER FLEX HOSE, ECT
VENT SYS DESIGN & EQUIP SPECS (REC'D FROM CPC)
PROCUREMENT CYCLE H & V SUB
PROCUREMENT ENCLOSURE STEEL
FABRICATE & DELIVER ENCLOSURE STEEL
ENCLOSURE DESIGN & MAT'L SPEC (REC'D FROM C.P.C.)
PROCUREMENT PLASTIC PANELS
FABRICATE & DELIVER PLASTIC PANELS
PROCUREMENT ENCLOSURE LUMBER
ENCLOSURE LUMBER DELIVERY
7/23/73
CONTRACTOR PERSONNEL MOVE ON SITE
SET-UP
DRAIN VALVES & FITTINGS (REC. FROM C.P.C.)
PREP. SPECS SS TEST PLATES
PROCUREMENT SS. TEST PLATES
PROCUREMENT DECONTAMIN. PUMP
PREP. DECONTAMIN. PROCEDURE SPEC (BY N.U.S.)
PROCUREMENT STEEL DRUMS
PROCUREMENT DECONTAM. FILTERS

076094

CKH
GJH. ARTMAN

JAN 74

5	UPDATE	10-24-73
4	UPDATE	9-15-73
3	UPDATE	9-17-73
2	REVISED LOGIC	8-28-73

CRITICAL PATH NETWORK

CATALYTIC INC
PLANNING & SCHEDULING DEPARTMENT

CONSUMERS POWER CO
SPENT FUEL POOL LINER
3488
CHARLEVOIX, MICH.
H.C. BUSHKOFF
T. HEDLAND

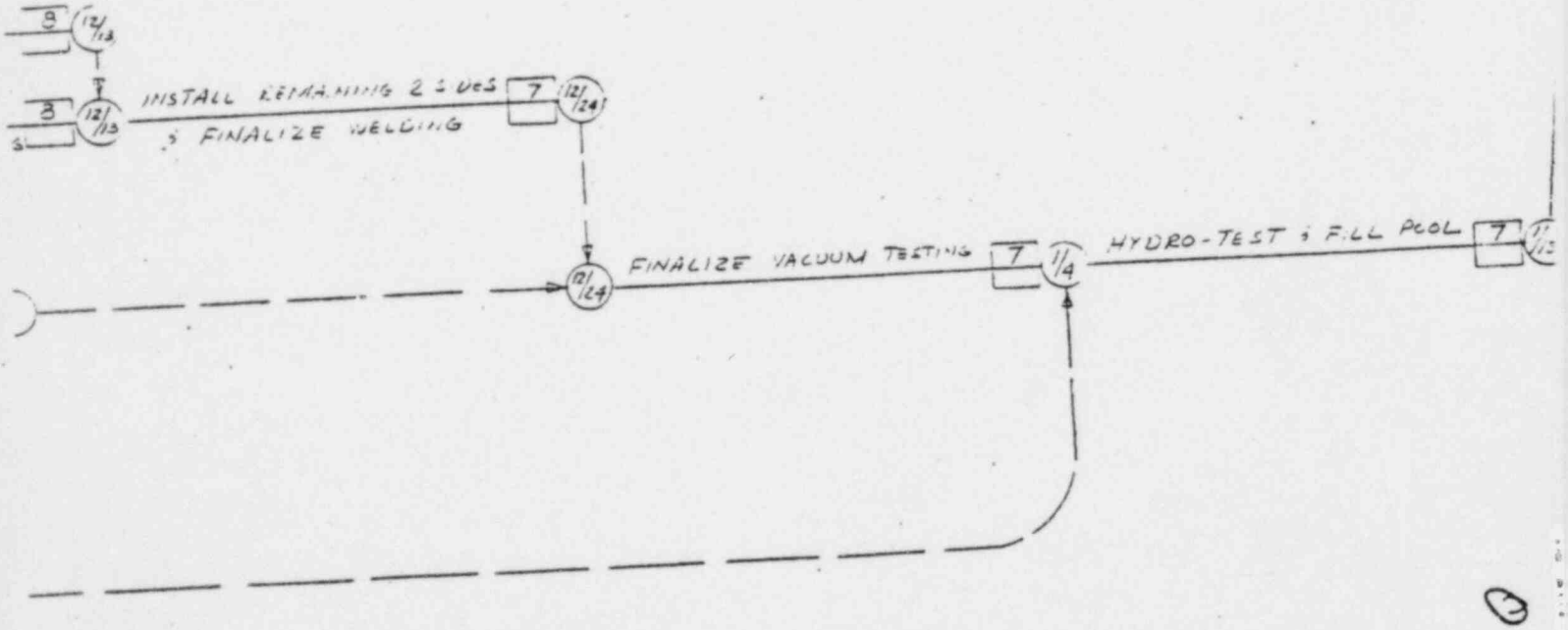
5

LEGEND

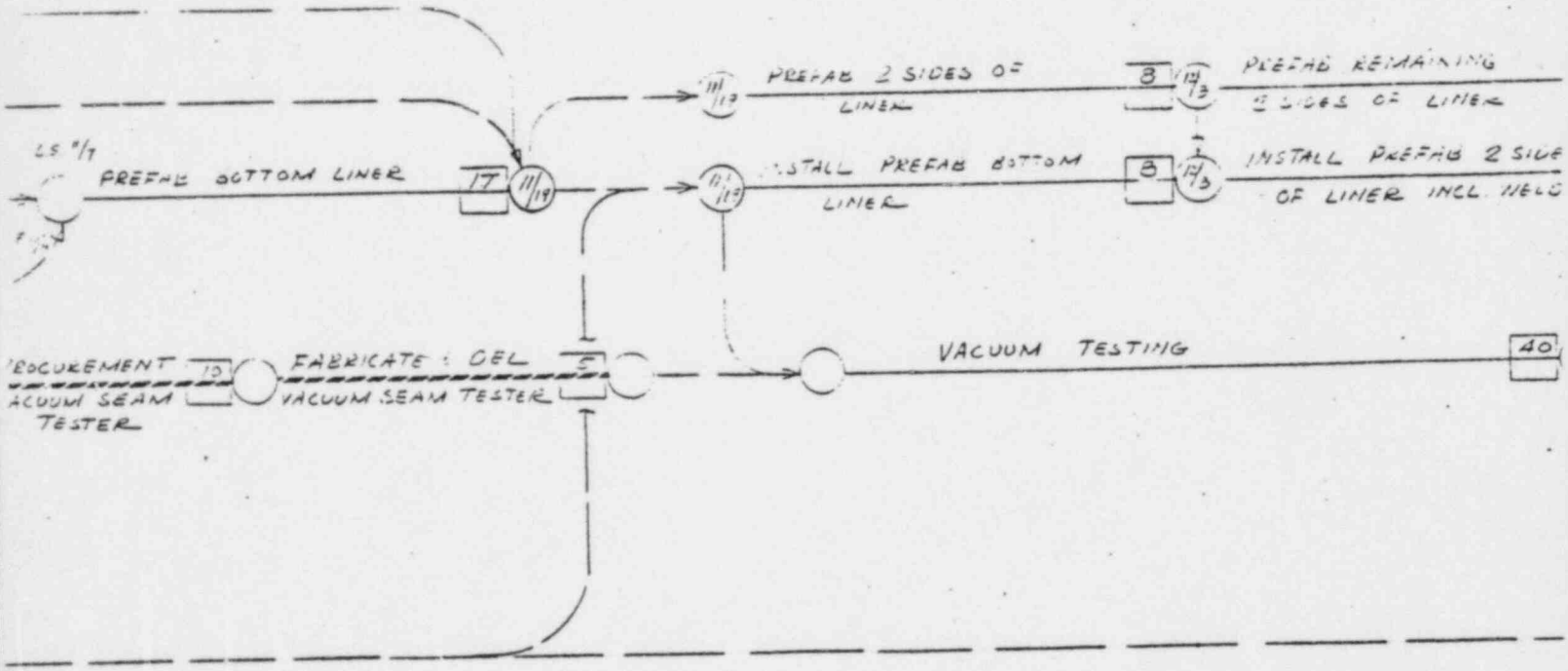
WORK COMPLETE : ----------
WORK IN PROGRESS :
WORK BEHIND SCHEDULE :
WORK WITH LESS THAN 10 DAYS FLOAT:
WORK WITH MORE THAN 10 DAYS FLOAT:

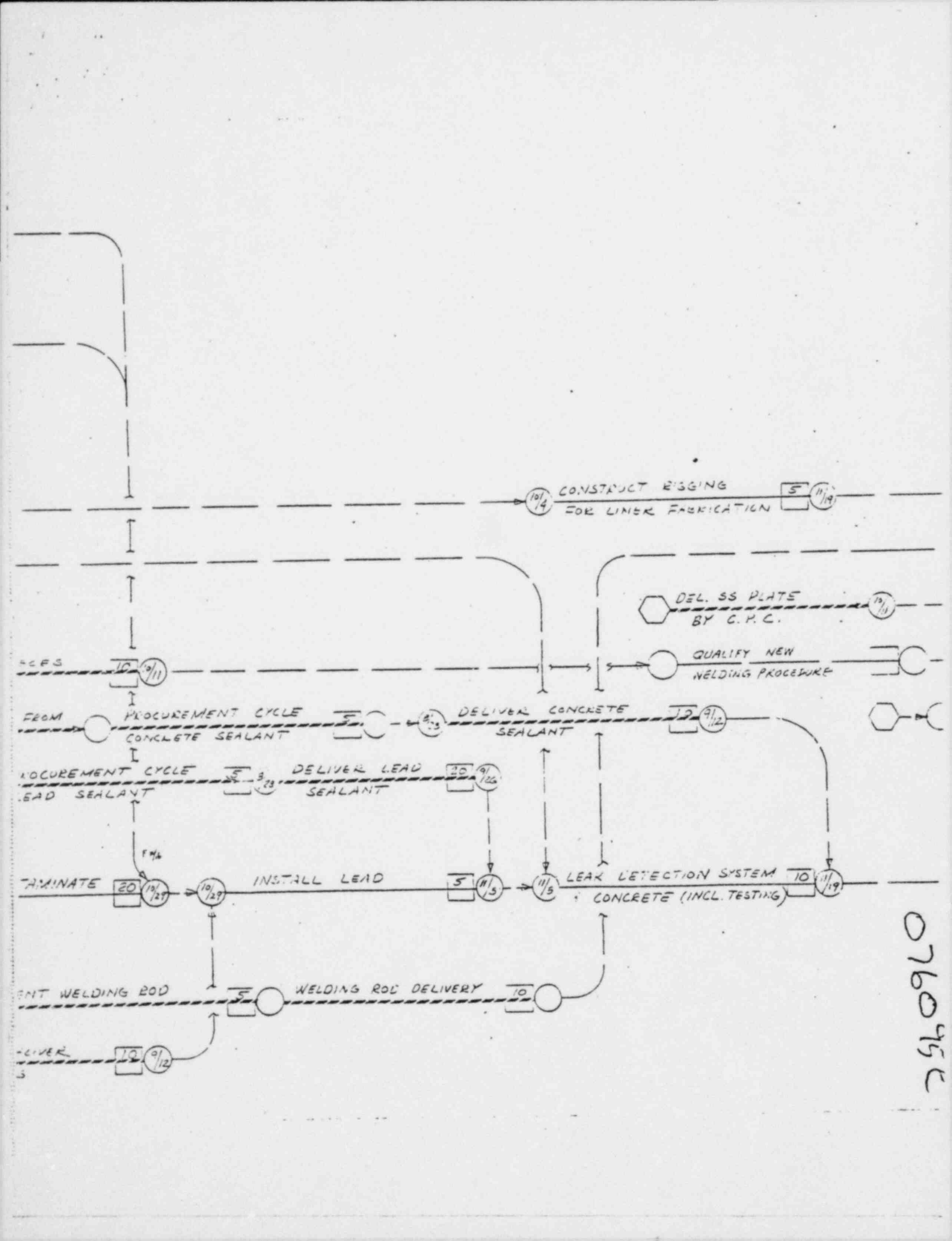
NOTE: DATES SHOWN ARE PROJECTED OR ACTUAL START & COMPLETE DATES.

File SFP allocation calculation

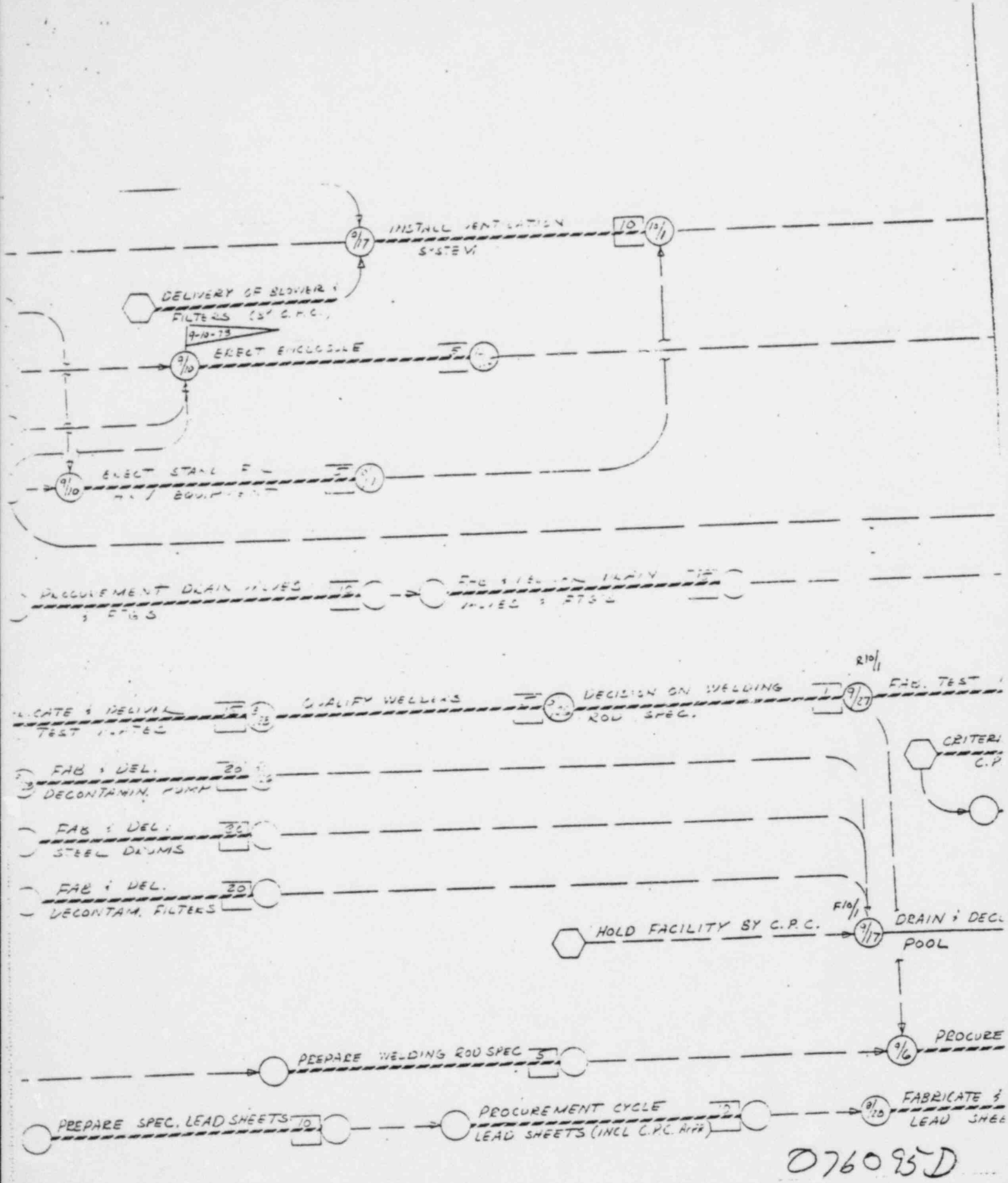

3
12/13
3
12/13
INSTALL REMAINING 2 VDS
& FINALIZE WELDING
7
12/24
12/24
FINALIZE VACUUM TESTING
7
1/4
HYDRO-TEST & FILL POOL
7

0769451

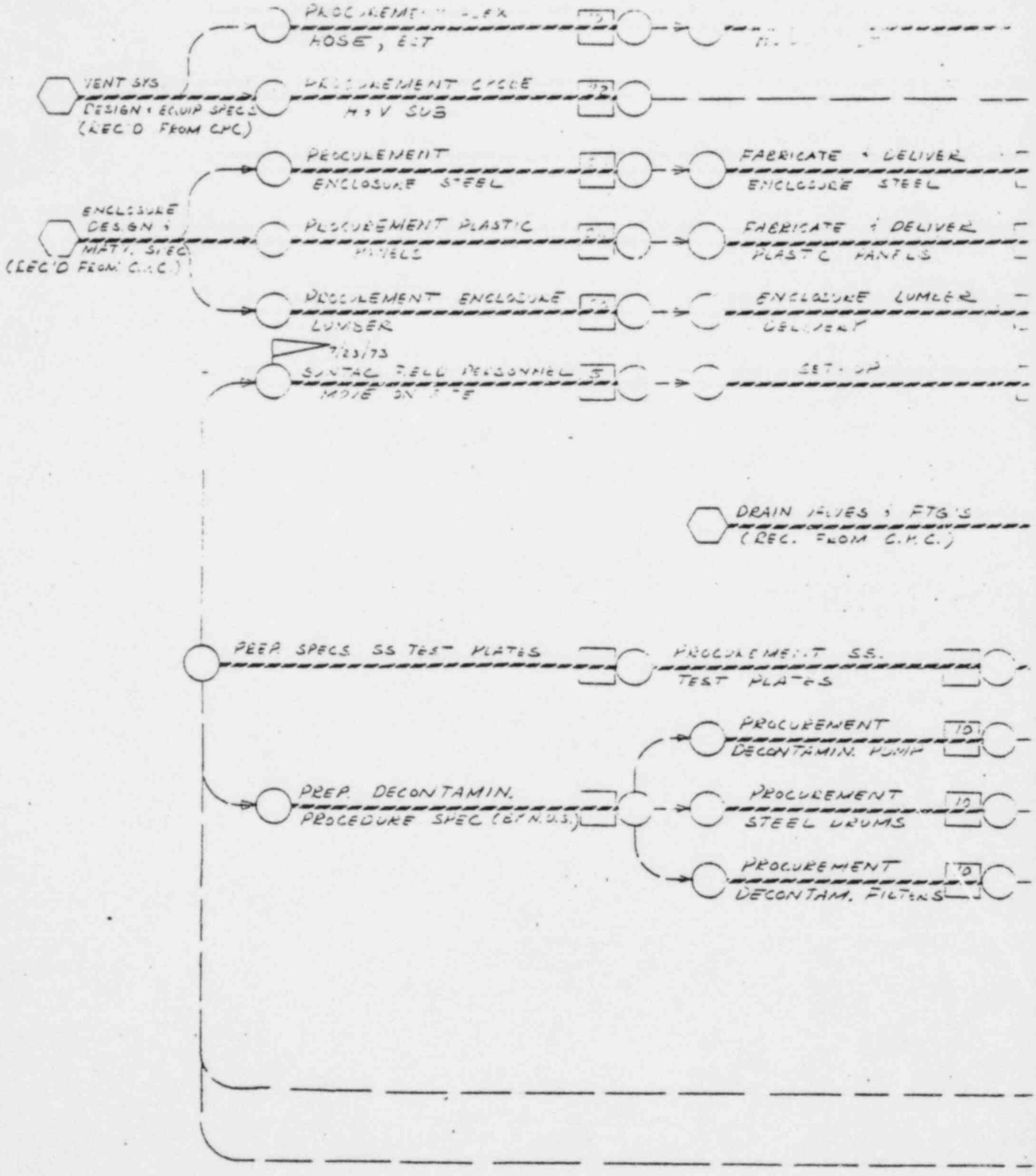

PREFAB 2 SIDES OF LINER
PREFAB REMAINING 2 SIDES OF LINER
PREFAB BOTTOM LINER
INSTALL PREFAB BOTTOM LINER
INSTALL PREFAB 2 SIDE OF LINER INCL WELD
PROCUREMENT VACUUM SEAM TESTER
FABRICATE : CEL VACUUM SEAM TESTER
VACUUM TESTING
40


CONSTRUCT EGGING
FOR LINER FABRICATION
DEL. SS PLATE
BY C.H.C.
QUALIFY NEW
WELDING PROCEDURE
FROM
PROCUREMENT CYCLE
CONCRETE SEALANT
DELIVER CONCRETE
SEALANT
PROCUREMENT CYCLE
LEAD SEALANT
DELIVER LEAD
SEALANT
INSTALL LEAD
LEAK DETECTION SYSTEM
CONCRETE (INCL. TESTING)
WELDING ROD DELIVERY

0760 95C


INSTALL VENTILATION SYSTEM
DELIVERY OF BLOWER & FILTERS (2nd C.P.C.)
9-10-79
ERECT ENCLOSURE
ERECT STAIR
PROCUREMENT DRAIN VALVES & PIPING
QUALIFY WELDERS
DECISION ON WELDING ROD SPEC.
FAB. TEST
CRITERI
C.P
FAB & DEL. DECONTAMIN. PUMP
FAB & DEL. STEEL DRUMS
FAB & DEL. DECONTAM. FILTERS
HOLD FACILITY BY C.P.C.
DRAIN & DECL
POOL
PROCURE
PREPARE WELDING ROD SPEC
PREPARE SPEC. LEAD SHEETS
PROCUREMENT CYCLE LEAD SHEETS (INCL C.P.C. APP)
FABRICATE & LEAD SHEE

076095D


PROCUREMENT FLEX HOSE, ECT
VENT SYS DESIGN & EQUIP SPECS (REC'D FROM CMC)
PROCUREMENT CYCLE H & V SUS
PROCUREMENT ENCLOSURE STEEL
FABRICATE & DELIVER ENCLOSURE STEEL
ENCLOSURE DESIGN & MATL. SPEC (REC'D FROM C.M.C.)
PROCUREMENT PLASTIC PANELS
FABRICATE & DELIVER PLASTIC PANELS
PROCUREMENT ENCLOSURE LUMBER
ENCLOSURE LUMBER DELIVERY
7/23/73
SYNTAC FIELD PERSONNEL MOVE ON SITE
SET-UP
DRAIN VALVES & FTG'S (REC. FROM C.M.C.)
PREP SPECS SS TEST PLATES
PROCUREMENT S.S. TEST PLATES
PROCUREMENT DECONTAMIN. PUMP
PREP. DECONTAMIN. PROCEDURE SPEC (BY N.U.S.)
PROCUREMENT STEEL DRUMS
PROCUREMENT DECONTAM. FILTERS

076095E

LWPC

C. J. HALTMAN

File

Schedules

4		9-25-73
3	UPDATE	9-17-73
2	REVISED LOGIC	8-28-73

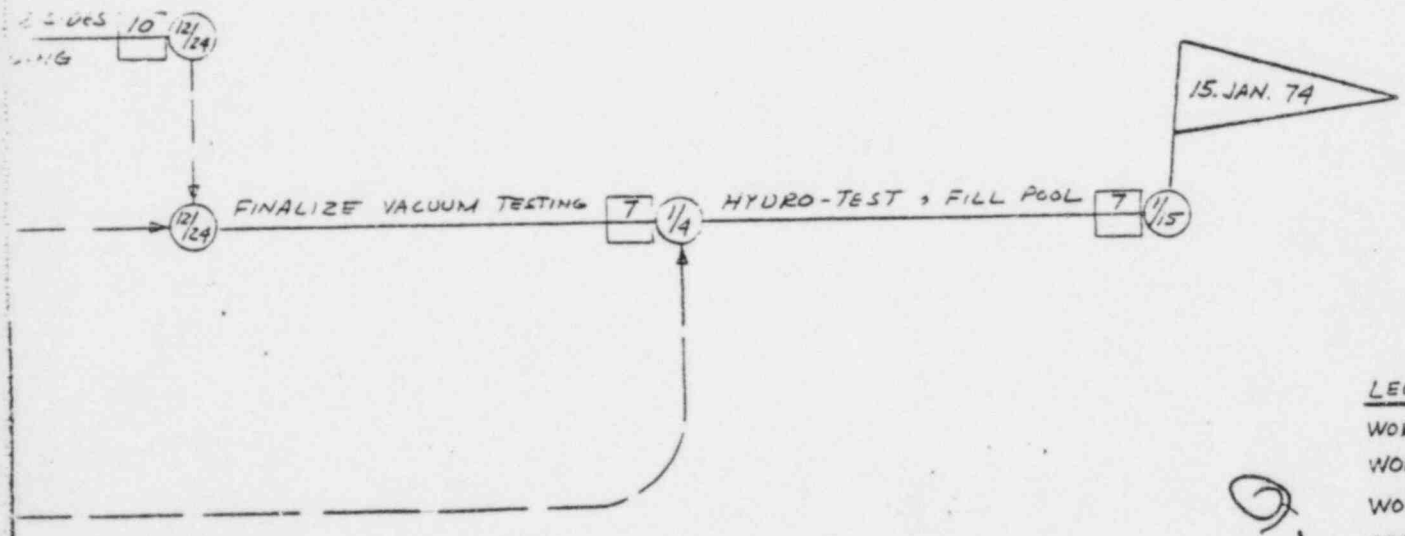
CRITICAL PATH NETWORK
UPDATED BY
CATALYTIC INC
PLANNING & SCHEDULING DEPARTMENT
PHILADELPHIA PENNSYLVANIA

CONSUMERS POWER CO
SPENT FUEL POOL LINER
34001
CHARLEVOIX MICH
H.C. BUSHKOFF
T. HETLAND

960

MPLETE :
PROGRESS :
HIND SCHEDULE :
TH LESS THAN 10 DAYS FLOAT:
-H MORE THAN 10 DAYS FLOAT:

TATES SHOWN ARE PROJECTED
OR ACTUAL START & COMPLETE
DATES.



LEGEND

WORK C

WORK I

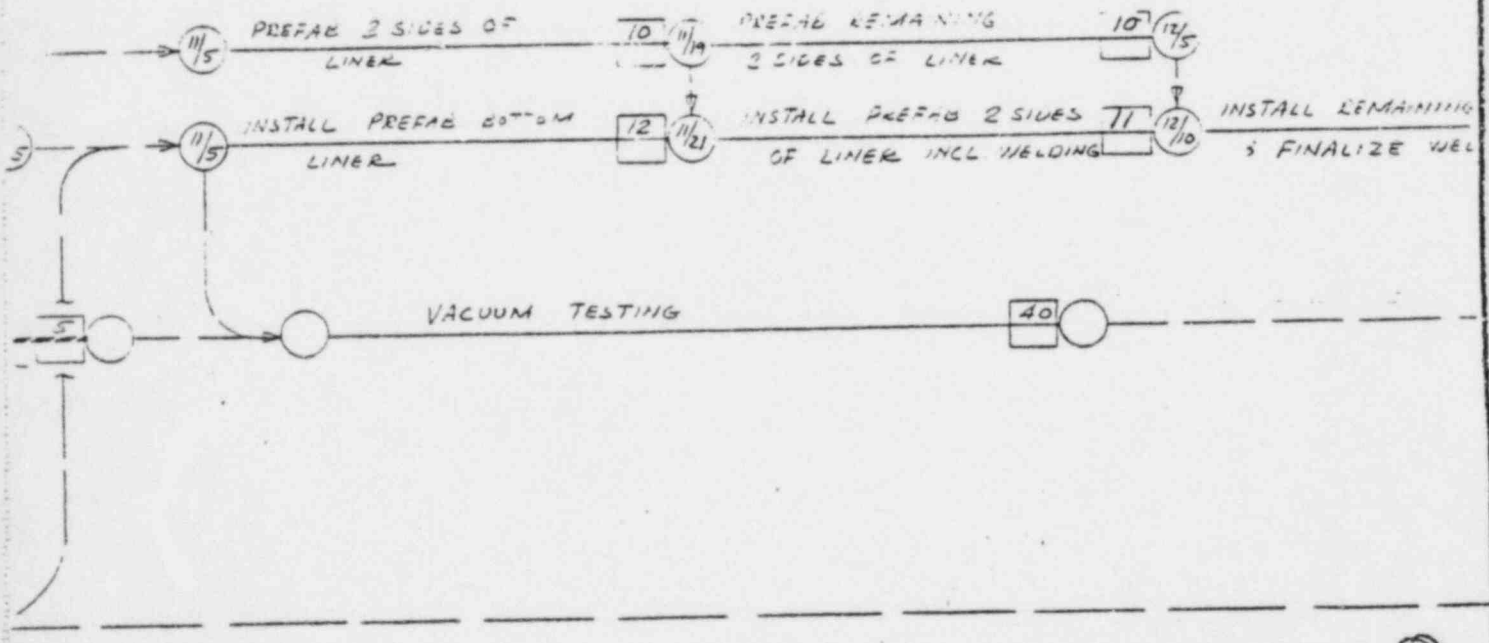
WORK B

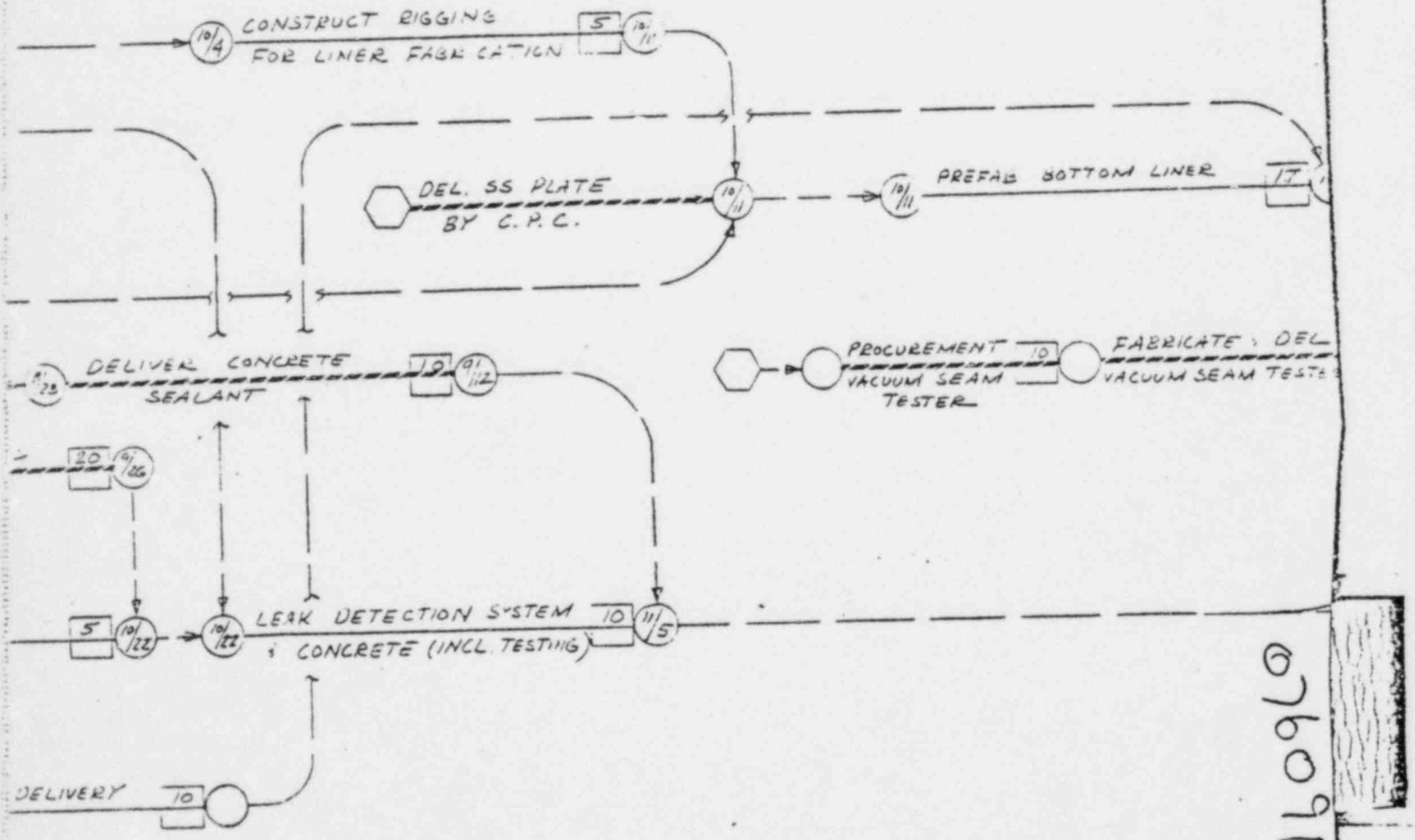
WORK W

WORK W

NOTE:

A96076


11/5
PREFAB 2 SIDES OF LINER
10
11/19
PREFAB REMAINING 2 SIDES OF LINER
10
12/5
11/5
INSTALL PREFAB BOTTOM LINER
12
11/21
INSTALL PREFAB 2 SIDES OF LINER INCL WELDING
11
12/10
INSTALL REMAINING & FINALIZE WEL
5
VACUUM TESTING
40
5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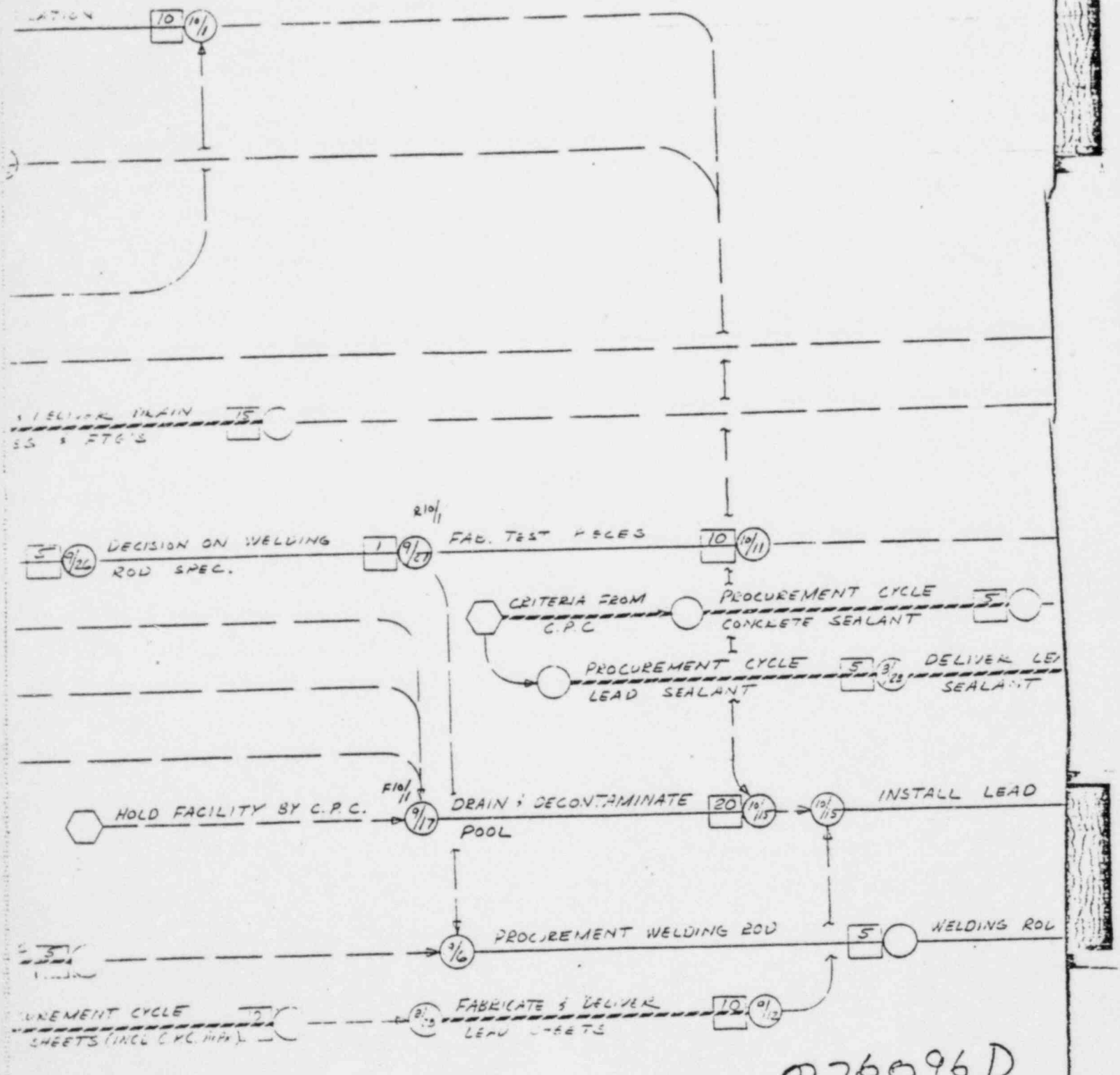
FOR LINER FABRICATION
DEL. SS PLATE
BY C.P.C.
PREFAB BOTTOM LINER
DELIVER CONCRETE
SEALANT
PROCUREMENT
VACUUM SEAM
TESTER
FABRICATE ; DEL
VACUUM SEAM TESTE
LEAK DETECTION SYSTEM
; CONCRETE (INCL. TESTING)
DELIVERY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10/1
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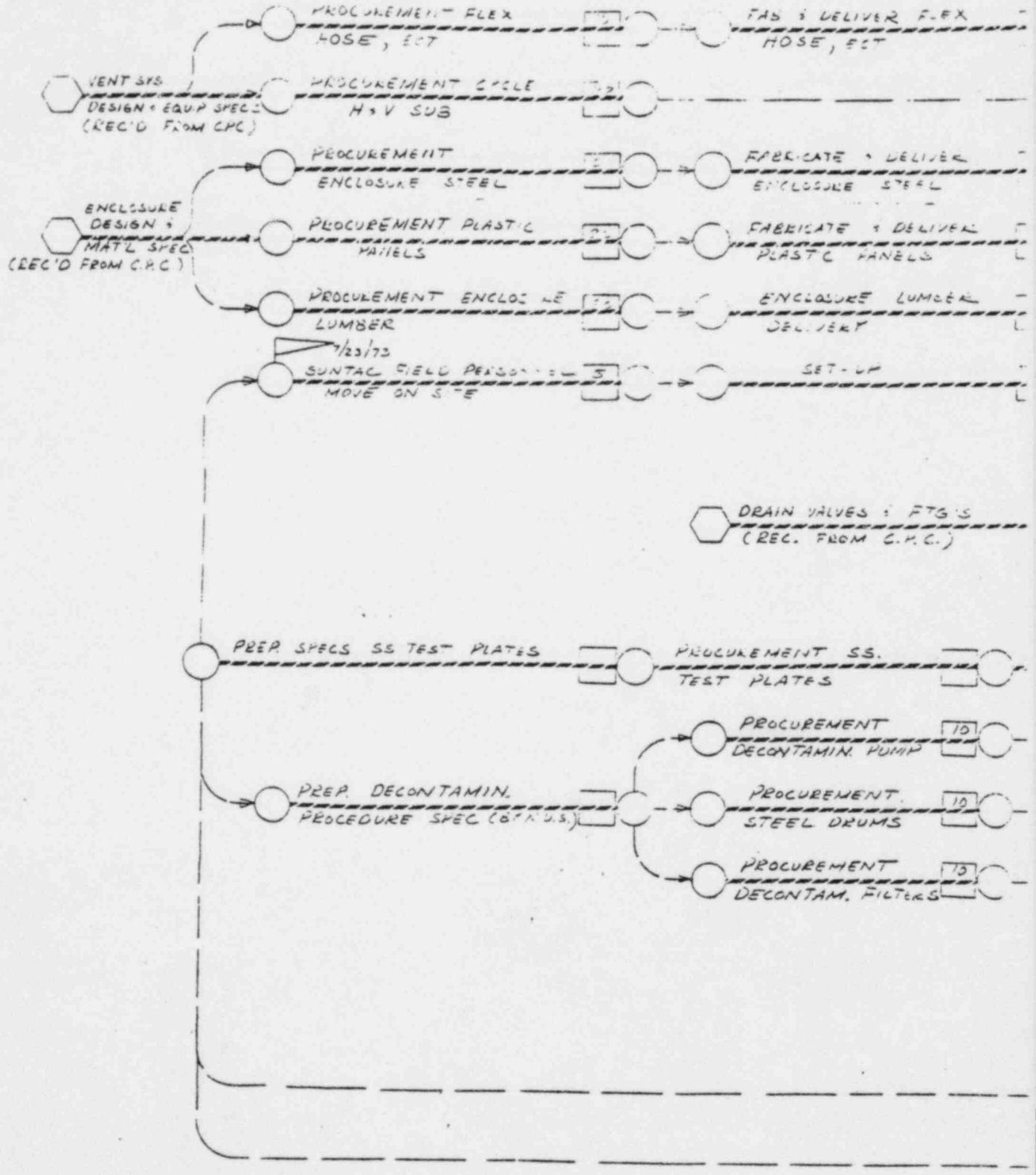
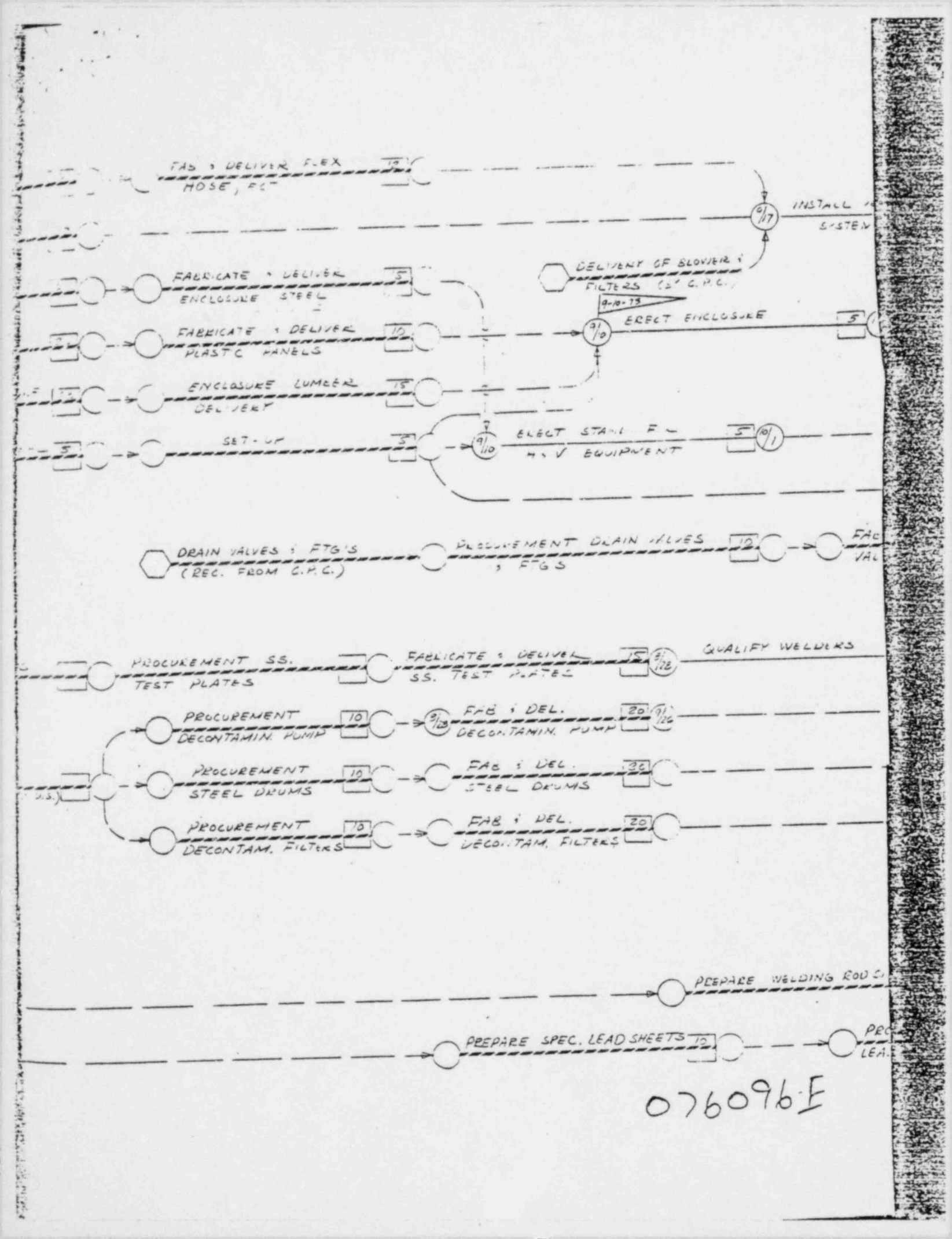
DECISION ON WELDING ROD SPEC.
1
9/27
FAB. TEST PIECES
10
10/11
CRITERIA FROM C.P.C
PROCUREMENT CYCLE CONCRETE SEALANT
5
PROCUREMENT CYCLE LEAD SEALANT
5
3/28
DELIVER LEAD SEALANT
HOLD FACILITY BY C.P.C.
9/17
DRAIN & DECONTAMINATE POOL
20
10/15
INSTALL LEAD
PROCUREMENT WELDING ROD
3/6
5
WELDING ROD
FABRICATE & DELIVER LEAD SHEETS
10
10/12
2

0760960


VENT SYS DESIGN + EQUIP SPEC'S (REC'D FROM CPC)
PROCUREMENT FLEX HOSE, ECT
FAB + DELIVER FLEX HOSE, ECT
PROCUREMENT CYCLE H+V SUB
ENCLOSURE DESIGN + MAT'L SPEC (REC'D FROM C.P.C.)
PROCUREMENT ENCLOSURE STEEL
FABRICATE + DELIVER ENCLOSURE STEEL
PROCUREMENT PLASTIC PANELS
FABRICATE + DELIVER PLASTIC PANELS
PROCUREMENT ENCLOSURE LUMBER
ENCLOSURE LUMBER DELIVERY
7/23/73
SUNTAC FIELD PERSONNEL MOVE ON SITE
SET-UP
DRAIN VALVES + FTG'S (REC. FROM C.P.C.)
PREP SPECS SS TEST PLATES
PROCUREMENT SS. TEST PLATES
PROCUREMENT DECONTAMIN. PUMP
PREP. DECONTAMIN. PROCEDURE SPEC (C.P.C.U.S.)
PROCUREMENT STEEL DRUMS
PROCUREMENT DECONTAM. FILTERS


FAB & DELIVER FLEX HOSE, ETC
INSTALL
SYSTEM
DELIVERY OF BLOWER & FILTERS (2 C.P.C.)
FABRICATE & DELIVER ENCLOSURE STEEL
9-10-73
ERECT ENCLOSURE
FABRICATE & DELIVER PLASTIC PANELS
ENCLOSURE LUMBER DELIVERY
SET-UP
ELECT STATIC & H & V EQUIPMENT
DRAIN VALVES & FTG'S (REC. FROM C.P.C.)
PROCUREMENT DRAIN VALVES & FTGS
FAB
VAL
PROCUREMENT SS. TEST PLATES
FABRICATE & DELIVER SS. TEST PLATES
QUALIFY WELDERS
PROCUREMENT DECONTAMIN. PUMP
FAB & DEL. DECONTAMIN. PUMP
PROCUREMENT STEEL DRUMS
FAB & DEL. STEEL DRUMS
PROCUREMENT DECONTAM. FILTERS
FAB & DEL. DECONTAM. FILTERS
PREPARE WELDING ROD
PREPARE SPEC. LEAD SHEETS
PRO
LEA

076096-E

Machine

SKIPPED

07609?

RECORD REMOVED

Please refer to 35 mm aperture card number 0096

Document Number 016098

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT PLANT
CLIENT: Consumers Power Company
LOCATION: Charlevoix, Michigan

SUNTAC CONTRACT NO. 34881
SPECIFICATION NO. 34881-RC P-403

SPECIFICATION
for

SPENT FUEL POOL LINER INSTALLATION

CONSISTING OF

PROCEDURE FOR SETUP AND CALIBRATION OF

MODEL AM-3D CONSTANT AIR MONITOR

APPROVED FOR CONSTRUCTION

APPROVED _____ DATE 8/28/73
CONSUMERS POWER COMPANY

APPROVED _____ DATE 8/2/73
SUNTAC Project Manager

APPROVED _____ DATE 8/2/73
Manager, Mechanical Engineering

PREPARED BY _____ DATE 8/2/73

AMENDMENT	CLIENT APPROVED	CLIENT DATE	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION DATE				
					EZJ		LCB	11/6/73
0 (AFC)							RLW	9/1/73
A - For Approval								

672006

SUNTAC Nuclear Corp.
Setup and Calibration of AM-3D
Constant Air Monitor

1.0 Setup of Monitor

1.1 Add oil to blower.

a) Remove fill-cap.

b) Open side plug.

c) Add #40 motor oil (MS rating) using a paper cup or funnel until oil just flows out of side of drain plug. (Approximately 1 cup).

d) Close side drain plug and replace fill cap.

1.2 Service Recorder

a) Place paper in recorder if no paper is installed.

b) Place ink in pen reservoirs.

1.3 Install filter paper (if none is installed).

a) Tilt the front shield section forward until it rests on the rubber bumper.

b) Reach behind the capstan platen and lift the spring loaded idler wheel until it locks into a captive position.

c) Place the new roll of paper on the supply spindle (the left hand spindle).

d) Unwind approximately two feet of paper.

e) Slide the filter paper past the face of the detector and close the shield assembly.

f) Grasp the filter paper on either side of the shield assembly slit and move the filter paper until it slides freely in the slot.

g) Slide the paper between the capstan and idler roller and release the idler arm so it moves in against the paper.

h) Tape the filter paper to the take up spindle.

i) Turn blower switch (mounted on top of the box under the lid of the monitor) on. (Blower circuit also operates tape drive circuit.)

j) Place switch on front of filter paper drive box to the "continuous" position. A pilot lamp should be illuminated when tape advance is in the continuous advance mode.

k) Push the rapid-advance push button and check to see that the filter paper advances through the slit and that the take-up mechanism removes the slack from the filter paper and preserves a tight smooth feed to the take-up spindle.

2.0 Checkout of Monitor

2.1 Filter paper advance.

a) Mark filter paper at point where it leaves shield.

b) Turn blower switch on.

c) Check to see that filter advance switch is in the continuous position.

d) Press rapid-advance button.

e) Check to see that filter paper moves approximately 2" in about 15 seconds.

f) Mark filter paper at point where it leaves shield.

g) Let monitor run for 30 minutes.

h) Measure distance filter paper has moved. It should be 0.5 inches. (If it moves only 1/8 of an inch, filter advance gears are installed improperly. Change gears on top of the filter transport gear case by lifting up on the gears. Place small gear in front and then install the rear gear.)

i) Place switch on front of filter paper drive box to "step advance".

j) Set up tabs on timer so that step advance is programed to occur in about one hour.

k) Mark filter paper at point where it leaves shield.

l) Observe mark on filter paper shortly before step advance is programed to take place to assure that tape has not moved.

m) Observe operation as timer gets to programed point to see that filter paper does step advance as programed.

n) Turn switch on front of filter paper drive box back to the continuous position.

2.2 Blower Flow rate control.

a) Adjust flow rate to approximately 7.0 cfm by adjusting screw recessed in the face of the magnehelic gauge on the right hand end of the cart. (clockwise increases flow rate)

b) Once flow rate stabilizes (yellow and red lights near magnehelic gauge are unlit), place hand partially over air inlet to monitor. Check to see that:

1) The yellow light on magnehelic gauge comes on;

2) Bypass valve closes to return flow to 7.0 cfm.

c) Remove hand from air inlet and check to see that:

1) The red light on magnehelic gauge comes on;

2) Bypass valve opens to return flow to 7.0 cfm.

2.3 Detector Circuits.

a) Turn on master switch on Count Rate Meter.

b) Place input mode switch in the "test" position and check to see that:

1) CRM indicates 3600 c/m

2) Recorder indicates 3600 c/min

(Make adjustments as necessary to get recorder to agree with meter at 3600 and at low end of scale).

c) Turn on high voltage switch on CRM. (A red indicating lamp should come on).

d) Remove snapout plastic panel on front of CRM to expose alarm level controls. Check to see that:

1) Down scale trip (amber light) functions when CRM is below 100 cpm. (It may be desirable to reset this low level trip to 50 cpm by adjusting the "C" level control.

2) Upscale trip (red light and alarm) functions when upscale check source is in place (switch near shield is moved to "up" position and then allowed to return to the center position. Source is in place when indicating light near up scale check switch goes out). High level alarm point will be set later (Upscale check source is withdrawn by moving source switch to the "down" position and allowing it to return to the center position. Source is withdrawn when indicating light goes out.)

3.0 Calibration of Monitor

3.1 Warmup.

672010

Allow monitor to warm up with the master and high voltage switches on overnight before calibration is attempted. Allow blower to run overnight to be able to check flow rate after an extended run.

3.2 Calibration.

a) Check flow rate and record actual flow rate on data sheet.

b) Turn blower off.

c) Open shield and remove filter paper.

d) Place lowest activity source in the shield so that the active area (2" circle) is centered over detector.

e) Close the shield. Record both the CRM and recorder readings on data sheet.

f) Divide μCi value of source by the recorder reading to get a multiplying factor. Record factor on data sheet.

g) Open shield and remove source.

h) Reset the CRM and alarm if necessary.

i) Repeat steps c) through g) with intermediate activity source.

j) Repeat steps c) through g) with highest activity source.

k) Compare the three multiplying factors obtained. They should be within 15% of one another. Determine the average multiplying factor F), and record it on data sheet.

l) Determine monitor constant "K" by using the following relationship.

$$K = \frac{F}{R \times T \times 5.95 \times 10^{5}}$$

where:

F = multiplying Factor

R = flow rate in cfm

T = filter paper transit time in hours = $\frac{2"}{V}$

V = tape speed in inches/hr

5.95×10^5 is a factor which includes:

$28,317$ cc/ft^3
60 min/hr
0.35 for effective collecting time
(see page 2 of SA-34)

For a filter paper speed of 1 inch/hour, this formula simplifies to:

$$K = \frac{F}{R} \times 8.40 \times 10^{-7}$$

m) A label should be placed on the recorder which states: "For a sample flow rate of _____ cfm, the recorder reading in cpm should be multiplied by _____ to obtain μCi/cc." The actual flow rate should be inserted in the first blank and the value determined for K should be inserted in the second blank.

n) Using "K", the high level alarm should be set at the MPC for the radionuclides being measured. The high alarm is set by adjusting the "A" level control behind the plastic snapout panel and by driving the CRM upscale with the upscale check source.

672012

SUNTAC Nuclear
Constant Air Monitor
Data Sheet

1. Blower switch, Master switch, and High Voltage switch turned on for warm up period.

_____ (Date) _____ (Time) _____ (Completed by)

2. Actual calibration begun.

_____ (Date) _____ (Time) _____ (Completed by)

3. Air flow (R) = _____ cfm.

4. Low activity source: CRM = _____ cpm Recorder = _____ cpm

Multiplying Factor = $\frac{\text{_____ μCi}}{\text{_____ cpm}}$ =

5. Medium activity source: CRM = _____ cpm Recorder = _____ cpm

Multiplying Factor = $\frac{\text{_____ μCi}}{\text{_____ cpm}}$ =

6. High activity source: CRM = _____ cpm Recorder = _____ cpm

Multiplying Factor = $\frac{\text{_____ μCi}}{\text{_____ cpm}}$ =

7. Average Multiplying Factor (F) = _____

8. Tape speed (V) = _____ inches/hour

$T = \frac{2"}{V} = \frac{2"}{\quad} = \text{_____ hr}^{-1}$

$K = \frac{\text{_____ (F)}}{\text{_____ (R)} \times \text{_____ (T)} \times 5.95 \times 10^5}$

K =

672013

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

PROCEDURE FOR SETUP AND CALIBRATION OF MODEL AM-3D CONSTANT AIR MONITOR

SPEC NO. 34881 -RCP-403
Page 8 of 8

9. Alarms set at:

low level : _____ cpm

high level: _____ cpm = _____ $\frac{\mu Ci}{cc}$

10. Calibration Completed.

_____ (Date) _____ (Time) _____ (Completed by)

672014

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT PLANT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: Charlevoix, Michigan
SUNTAC CONTRACT NO. #34491
SPECIFICATION NO. 34491-RCP-402

SPECIFICATION
for
SPENT FUEL POOL LINER INSTALLATION

CONSISTING OF

DECONTAMINATION PROCEDURE
for
SPENT FUEL POOL

APPROVED _____ DATE _____
Consumers Power Company

APPROVED R. W. Wilson DATE 7/19/73
SUNTAC Project Manager

APPROVED E. J. Ratkus DATE 7/16/73
Manager, Mechanical Engineering

PREPARED BY A J Foster DATE July 16, 1973

0619 070

AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED
A	E/A						7/17/73

SUNTAC NUCLEAR

1.0 Scope

1.1 The purpose for this procedure is to give the details for decontaminating the walls and the bottom of the spent fuel pool in preparation for installing the liner. The purpose for the pool decontamination is to minimize airborne activity during the liner installation and to minimize radiation exposure to SUNTAC personnel during the installation of the pool liner.

2.0 System Description

2.1 Vacuum and Filter System

The decontamination system for the spent fuel pool is a turbine pump, coarse strainer and two 50 micron filters. The strainer is in the pump suction to remove large particles which also protects the pump and extends filter life. The pump discharges through two 50 micron filters in parallel flow to minimize the probability of exceeding the radiation limit of 3 R/hr drum. The filter and strainers are encased in concrete in 55 gallon 17C drums. Flow schematic for system is Fig I.

The filters discharge into a common line and into the pool. The return flow is in the 1 inch conduit through the 1/2 inch jet nozzle, as required. The jet flow is directed along the pool bottom and sweeps the loose material into the pump suction line.

Following the vacuum cleaning, a radiation survey is made over the entire pool bottom for mapping hot spots. The radiation survey is also to be used to estimate the adequacy of the filter inventory.

The turbine pump is also to provide suction flow for the transfer pump which has inadequate NPSH to empty the pool.

2.2 Wall Decontamination

The walls are decontaminated using a 45° blade jet of water directed at the wall at an angle of approximately 45°. The source of water for the jet is the filter discharge, with the turbine pump taking suction from the demineralizer system.

2.3 Pool Bottom Decontamination

The pool bottom decontamination is accomplished by vacuum cleaning and mechanical chipping away hot spots which have been identified by the radiation survey. The second radiation survey for hot spots is

made after the water in the pool is lowered to a depth of approximately 15 inches.

3.0 Materials, Equipment and Services for the Decontamination

3.1 The materials, equipment and services for the decontamination are to be furnished by Consumers Power and SUNTAC as follows:

3.1.1 Items furnished by Consumers Power

a. Demineralized water supply to the side of the pool.

b. 110 vac electric power supply for the 1 hp turbine pump motor and general use.

c. 5 ton crane to service the pool and work platform.

d. Health Physics for radiation monitoring and control over tools and equipment.

e. All training for SUNTAC Personnel.

f. Shipment of all radioactive material.

g. Disposal of spent fuel pool water.

h. Radiation surveys of the pool walls and bottom as required before, after and during the decontamination.

i. Supply breathing and ventilating air for anti-c clothing suit.

j. Underwater lighting for viewing the bottom clean up operation.

k. Platform scales for weighing the filter drum.

l. Protective clothing, i.e., anti-c, shoe covers, etc. to prevent personnel contamination.

m. 17H drums for radwaste other than filters and strainers.

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3.1.2 Items furnished by SUNTAC

a. Manpower for the decontamination.

ok. *b. Constant air monitor for monitoring airborne radioactivity in the temporary pool enclosure.

*c. Vacuum cleaner which is a turbine pump (item g) with hose, nozzles and clamps.

*d. Fifty micron filters imbedded in concrete in 55 gallon 17C drums. Quantity of 30 filter units are required.

**e. Mechanical chippers with star drill tips.

**f. Hand chippers, scrapers, natural bristle brushes and lint free cleaning cloths.

*g. Turbine pump with 75 ft head at 30 gpm. 1½HP 110 volt ac motor, Worthington TC type, 1¼ TC1-B or equal with mechanical shaft seal. Pump and motor are mounted on common baseplate.

**h. Culvert pipe, 36 inch diameter, 30 inches high.

**i. Buna N rubber gasket for sealing the culvert-to-floor joint.

**j. Rope slings for lowering the mechanical chipper, handling the culvert, etc.

**k. Work platform with rope similar to a window washers rig for the workers to position themselves in the pool.

l. Preparation of the radwaste for shipment.

*m. The pipe and fittings to connect the turbine pump to the transfer pump suction pipe.

n. Ninety feet of 1 inch diameter conduit with couples. One coupled length of conduit is for the turbine pump to take suction from the bottom of the pool. A second coupled length of conduit is fitted with 1/2 inch jet nozzle mounted 90°.

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*Furnished by SUNTAC Home Office.

**Furnished from construction tool inventory.

4.0 Procedure for Decontamination of Spent Fuel Pool

4.1 The spent fuel pool surfaces are to be decontaminated sequentially using the procedures described. The entire fuel pool bottom is to be radiation surveyed immediately following the removal of the fuel racks to determine the adequacy of the filter inventory.

Note: Wall surfaces are to be kept wet at all times using demineralized water to prevent airborne activity until the wall decontamination is completed.

4.1.1 Decontamination by Vacuum Cleaning the Bottom

The entire pool bottom is vacuum cleaned initially using a water jet sweeper to move the loose material into the turbine pump suction. The bottom is then radiation surveyed for mapping the hot spots for subsequent removal. Vacuum cleaner flow passes through the coarse filter in the pump suction, discharges through the filter and returns to the pool. The filters are expected to become radioactive rapidly and will require close attention to avoid exceeding the limit of 3 R/hr at the drum surface. Changing to a clean filter is required when 3 R/hr is indicated on the meter.

4.1.2 Decontamination of the Walls

Decontamination of the walls is accomplished by blasting the wall with a water jet 3 to 6 inches below the water surface. The blasting of the wall with the water jet is to be equal to continuously blasting a band around the entire pool. Repeated blasting of bands around the pool are to overlap to assure the walls are decontaminated.

The nozzle for the water jet is a blade type with a 45° spread.

The pool water level is to be lowered in approximately 2 foot increments as the walls are decontaminated.

An alternate method for decontaminating is by scrubbing a small area manually using brushes with natural bristles. The area being scrubbed is flushed with demineralized water to flush away the loosened radioactive material. The flush water is allowed to flow into the pool and the radioactive material will be subsequently removed by the 50 micron filter.

Possible Side Cleaning?

A second alternate method for decontaminating the walls is to manually wipe an area using new lint free cloths. Cloths are to be discarded frequently into the contaminated container.

The acceptance criteria for the walls being decontaminated is based on a comparison of before and after radiation measurements and is by direction of the SUNTAC Job Superintendent.

The scrapers and chippers are used to remove paint blisters and cracked paint areas manually.

4.1.3 Decontamination of Radiation Hot Spots on the Pool Bottom

The method for removing radiation hot spots is by chipping away paint and concrete. The hot spot is prepared for removal by placing the culvert and gasket over it. The water is pumped out using the turbine pump. The paint and approximately 1/2 inch of concrete are chipped away using the mechanical chipper with star drill tip. Any chips too large for the vacuum cleaner to pick up are to be crushed by dropping a flat-ended iron bar on it. The culvert is flooded and the loosened material vacuumed into a filter. The amount of chipping is to be determined by the post-chipping radiation survey and by the direction of the SUNTAC Job Superintendent.

5.0 Filters

Small enough?

5.1 The filter is a 50 micron disposable type with cast iron housing imbedded in concrete in 55 gallon drum and the 1½ inch NPT connections being accesible with the cover removed. FIG II shows drum assembly.

The filter encasement in concrete is made in three steps. The first step is to add 7 inches of concrete "mix" to an empty drum and allow to set-up. The filter is then centered in the drum resting on the hardened concrete and additional concrete mix is added around the filter for a total depth of 26 inches. The top of the filter housing is covered with plastic for protection of the connections.

Each female filter connection (1½ inch NPT) is fitted with one inch nipple and an elbow ready for connecting to the vacuum system.

The on-stream filter is removed from service when the monitoring meter reaches 3 R/hr. The spent filter is dried out using a hair dryer. After drying the filter, the connections are plugged using female cap with the

8/76

threads coated with regular pipe dope.

After plugging the filter connection, additional concrete mix is added to complete the encasement. The gross weight of the drum is not to exceed 880 pounds.

6.0 Radiation Control

6.1 The handling and disposal of radioactive materials will be controlled by Consumers Power Company Radwaste Procedures. The contaminated materials generated and collected during the decontamination of the spent fuel pool are to be placed in drums provided by SUNTAC.

6.2 SUNTAC's Procedure for Radiation Protection Control for Spent Fuel Pool Decontamination and Liner Installation is applicable.

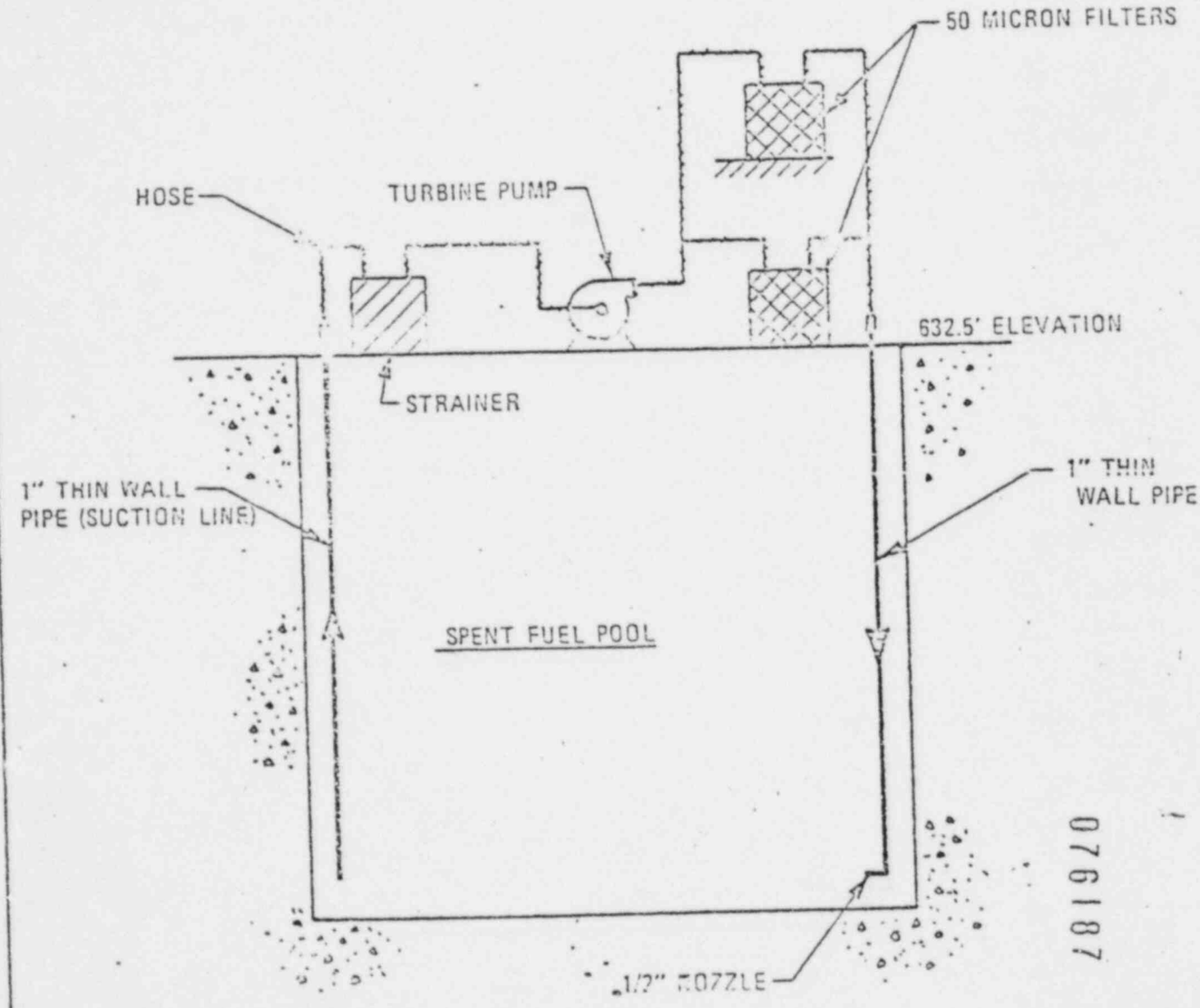
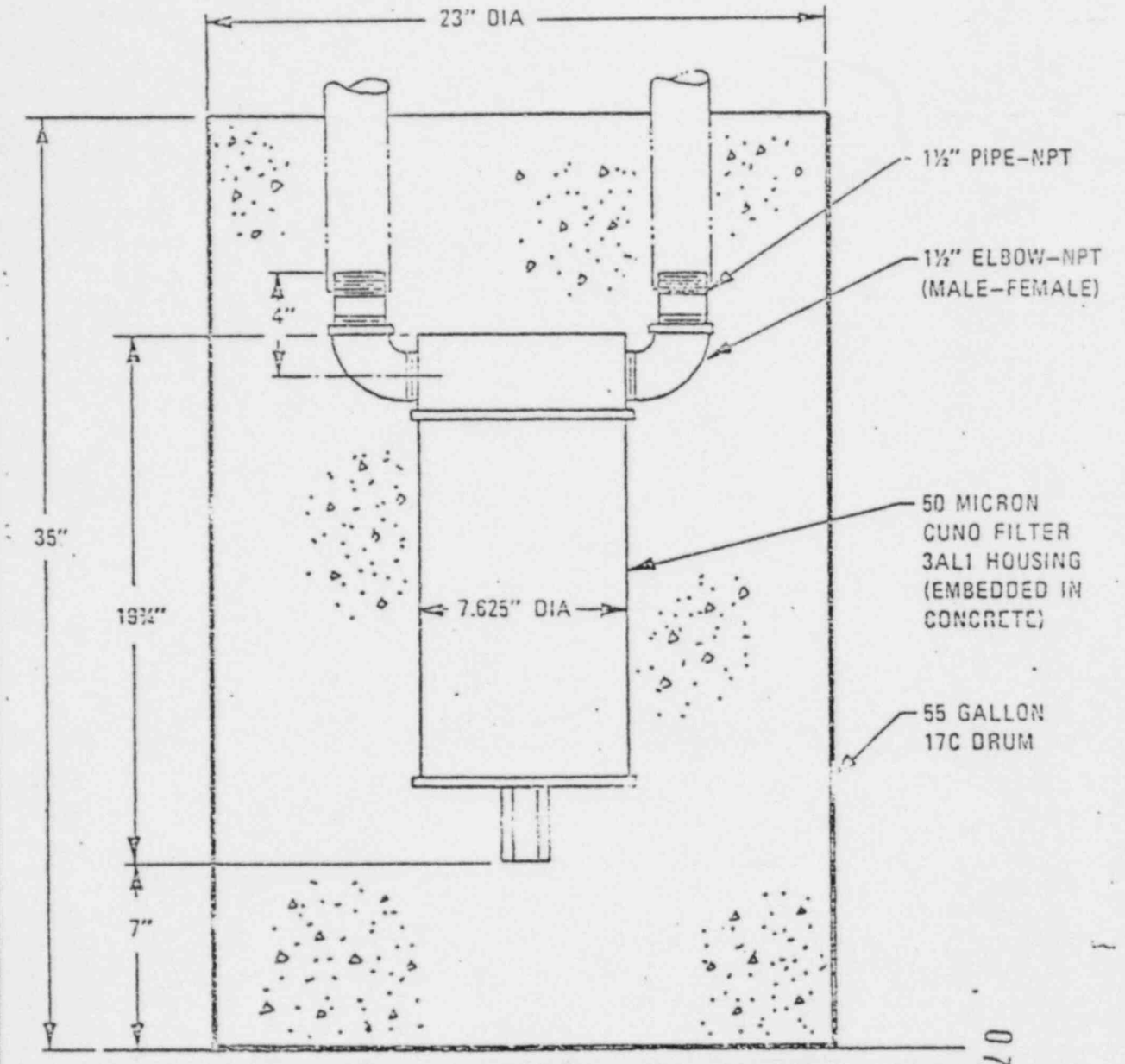


FIGURE 1

FLOW SCHEMATIC OF VACUUM SYSTEM
FOR SPENT FUEL POOL DECONTAMINATION



NOTE: STRAINER IS A FIELD MODIFICATION
USING THE HOUSING & ELEMENT

8809070188

FIGURE II
FILTER FOR SPENT FUEL POOL DECONTAMINATION

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT PLANT
CLIENT: CONSUMERS POWER COMPANY
LOCATION: Charlevoix, Michigan

SUNTAC CONTRACT NO. #34881
SPECIFICATION NO. 34881-RCP-402

SPECIFICATION
for
SPENT FUEL POOL LINER INSTALLATION

CONSISTING OF

DECONTAMINATION PROCEDURE
for
SPENT FUEL POOL

FOR INFORMATION ONLY

671997

APPROVED FOR CONSTRUCTION

APPROVED F. H. Mooij/EJO DATE 8/28/73
Consumers Power Company

APPROVED [signature] DATE 7/19/73
SUNTAC Project Manager

APPROVED [signature] DATE 7/16/73
Manager, Mechanical Engineering

PREPARED BY A. J. Foster DATE July 16, 1973

AMENDMENT	CLIENT APPROVED	CLIENT DATE	CLIENT APPROVED	CLIENT DATE	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION DATE
					EJJ	HCB		10/11/73
1 (AFC)					EJF	NDB		9/10/73
0 (AFC)							[illegible]	7/19/73
A (FA)								

1.0 Scope

1.1 The purpose for this procedure is to give the details for decontaminating the walls and the bottom of the spent fuel pool in preparation for installing the liner. The purpose for the pool decontamination is to minimize airborne activity during the liner installation and to minimize radiation exposure to SUNTAC personnel during the installation of the pool liner.

2.0 System Description

2.1 Vacuum and Filter System

The decontamination system for the spent fuel pool is a turbine pump, coarse strainer and two 50 micron filters. The strainer is in the pump suction to remove large particles which also protects the pump and extends filter life. The pump discharges through two 50 micron filters in parallel flow to minimize the probability of exceeding the radiation limit of 3 R/hr drum. The filter and strainers are encased in concrete in 55 gallon 17C drums. Flow schematic for system is Fig I.

The filters discharge into a common line and into the pool. The return flow is in the 1 inch conduit through the 1/2 inch jet nozzle, as required. The jet flow is directed along the pool bottom and sweeps the loose material into the pump suction line.

Following the vacuum cleaning, a radiation survey is made over the entire pool bottom for mapping hot spots. The radiation survey is also to be used to estimate the adequacy of the filter inventory.

The turbine pump is also to provide suction flow for the transfer pump which has inadequate NPSH to empty the pool.

2.2 Wall Decontamination

The walls are decontaminated using a 45° blade jet of water directed at the wall at an angle of approximately 45°. The source of water for the jet is the filter discharge, with the turbine pump taking suction from the demineralizer system.

2.3 Pool Bottom Decontamination

The pool bottom decontamination is accomplished by vacuum cleaning and mechanical chipping away hot spots which have been identified by the radiation survey. The second radiation survey for hot spots is

made after the water in the pool is lowered to a depth of approximately 15 inches.

3.0 Materials, Equipment and Services for the Decontamination

3.1 The materials, equipment and services for the decontamination are to be furnished by Consumers Power and SUNTAC as follows:

3.1.1 Items furnished by Consumers Power

a. Demineralized water supply to the side of the pool.

b. 460 volt, 60 cycle, 3 phase electric power supply for the 5 hp turbine pump motor and general use.

c. 5 ton crane to service the pool and work platform.

d. Health Physics for radiation monitoring and control over tools and equipment.

e. All training for SUNTAC Personnel.

f. Shipment of all radioactive material.

g. Disposal of spent fuel pool water.

h. Radiation surveys of the pool walls and bottom as required before, after and during the decontamination.

i. Supply breathing and ventilating air for anti-c clothing suit.

j. Underwater lighting for viewing the bottom clean up operation.

k. Platform scales for weighing the filter drum.

l. Protective clothing, i.e., anti-c, shoe covers, etc. to prevent personnel contamination.

m. 17H drums for radwaste other than filters and strainers.

3.1.2 Items furnished by SUNTAC

a. Manpower for the decontamination.

*b. Constant air monitor for monitoring airborne radioactivity in the temporary pool enclosure.

*c. Vacuum cleaner which is a turbine pump (item g) with hose, nozzles and clamps.

*d. Fifty micron filters imbedded in concrete in 55 gallon 17C drums. Quantity of 30 filter units are required. Filter size will be modified if required.

**e. Mechanical chippers with star drill tips.

**f. Hand chippers, scrapers, bristle brushes and lint free cleaning cloths.

g. Turbine pump with 130 ft. TDH at 30 gpm. 5 hp, 460 volt, 60 cps, 3 phase motor, Aurora J5, single stage, bronze fitted turbine type pump with self priming features. Pump and motor are mounted on common baseplate.

**h. Culvert pipe, 36 inch diameter, 30 inches high.

**i. Buna N rubber gasket for sealing the culvert-to-floor joint.

**j. Rope slings for lowering the mechanical chipper, handling the culvert, etc.

**k. Work platform with rope similar to a window washers rig for the workers to position themselves in the pool.

l. Preparation of the radwaste for shipment.

*m. The pipe, fittings, and hose to connect the turbine pump to the transfer pump suction pipe.

n. Ninety feet of 1 inch diameter conduit with couples. One coupled length of conduit is for the turbine pump to take suction from the bottom of the pool. A second coupled length of conduit is fitted with 1/2 inch jet nozzle mounted 90°.

*o. Basket strainers equipped with 40 mesh and/or 100 mesh strainers to be imbedded in concrete in 55 gallon 17C drums. Six units are required.

*p. Quick-opening pipe couplers and caps connection to filters and strainers.

*Furnished by SUNTAC Home Office.
**Furnished from construction tool inventory.

672000

4.0 Procedure for Decontamination of Spent Fuel Pool

4.1 The spent fuel pool surfaces are to be decontaminated sequentially using the procedures described. The entire fuel pool bottom is to be radiation surveyed immediately following the removal of the fuel racks to determine the adequacy of the filter inventory.

Note: Wall surfaces are to be kept wet at all times using demineralized water to prevent airborne activity until the wall decontamination is completed.

4.1.1 Decontamination by Vacuum Cleaning the Bottom

The entire pool bottom is vacuum cleaned initially using a water jet sweeper to move the loose material into the turbine pump suction. The bottom is then radiation surveyed for mapping the hot spots for subsequent removal. Vacuum cleaner flow passes through the coarse filter in the pump suction, discharges through the filter and returns to the pool. The filters are expected to become radioactive rapidly and will require close attention to avoid exceeding the limit of 3 R/hr at the drum surface. Changing to a clean filter is required when 3 R/hr is indicated on the meter.

4.1.2 Decontamination of the Walls

Decontamination of the walls is accomplished by blasting the wall with a water jet 3 to 6 inches below the water surface. The blasting of the wall with the water jet is to be equal to continuously blasting a band around the entire pool. Repeated blasting of bands around the pool are to overlap to assure the walls are decontaminated.

The nozzle for the water jet is a blade type with a 45° spread.

The pool water level is to be lowered in approximately 2 foot increments as the walls are decontaminated.

An alternate method for decontaminating is by scrubbing a small area manually using bristle brushes. The area being scrubbed is flushed with demineralized water to flush away the loosened radioactive material. The flush water is allowed to flow into the pool and the radioactive material will be subsequently removed by the 50 micron filter.

A second alternate method for decontaminating the walls is to manually wipe an area using new lint free cloths. Cloths are to be discarded frequently into the contaminated container.

The acceptance criteria for the walls being decontamined is based on a comparison of before and after radiation measurements and is by direction of the SUNTAC Job Superintendent.

The scrapers and chippers are used to remove paint blisters and cracked paint areas manually.

4.1.3 Decontamination of Radiation Hot Spots on the Pool Bottom

The method for removing radiation hot spots is by chipping away paint and concrete. The hot spot is prepared for removal by placing the culvert and gasket over it. The water is pumped out using the turbine pump. The paint and approximately 1/2 inch of concrete are chipped away using the mechanical chipper with star drill tip. Any chips too large for the vacuum cleaner to pick up are to be crushed by dropping a flat-ended iron bar on it. The culvert is flooded and the loosened material vacuumed into a filter. The amount of chipping is to be determined by the post-chipping radiation survey and by the direction of the SUNTAC Job Superintendent.

5.0 Filters

5.1 The filter is a 50 micron disposable type with housing imbedded in concrete in 55 gallon drum and the 1½ inch quick coupler connections being accessible with the cover removed. Fig. II shows drum assembly.

In the event the 50 micron cartridges prove to be too coarse, either finer cartridges will be used or two units will be connected in series with discharge to the plant radiation waste system.

The filter encasement in concrete is made in three steps. The first step is to add 7 inches of concrete "mix" to an empty drum and allow to set-up. The filter is then centered in the drum resting on the hardened concrete and additional concrete mix is added around the filter for a total depth of 26 inches. The top of the filter housing is covered with plastic for protection of the connections.

Each female filter connection (1½ inch NPT) is fitted with one 1½ inch male-female elbow and a quick coupler, ready for connecting to the vacuum system.

The on-stream filter is removed from service when the monitoring meter reaches 3 R/hr. The spent filter is blown out with air. After drying the filter, the connections are filled with concrete and plugged with quick coupler caps.

672002

After plugging the filter connection, additional concrete mix is added to complete the encasement. ⚠

5.2 The basket strainers which are also imbedded in concrete in 55 gallon drums are connected and handled in the same manner as the filters. The basket strainers are located on the suction side of the pump and are used to remove larger particles that might damage the pump.

6.0 Radiation Control

6.1 The handling and disposal of radioactive materials will be controlled by Consumers Power Company Radwaste Procedures. The contaminated materials generated and collected during the decontamination of the spent fuel pool are to be placed in drums provided by SUNTAC.

6.2 SUNTAC's Procedure for Radiation Protection Control for Spent Fuel Pool Decontamination and Liner Installation is applicable.

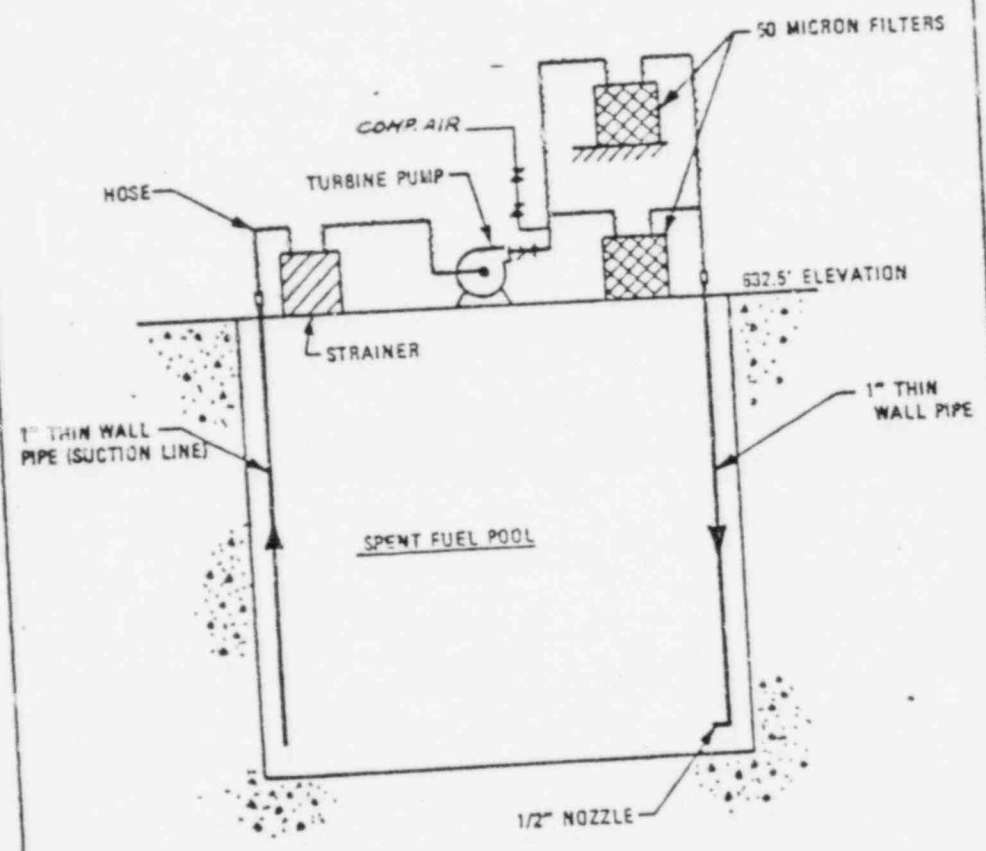


FIGURE 1
FLOW SCHEMATIC OF VACUUM SYSTEM
FOR SPENT FUEL POOL DECONTAMINATION

672004

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19132

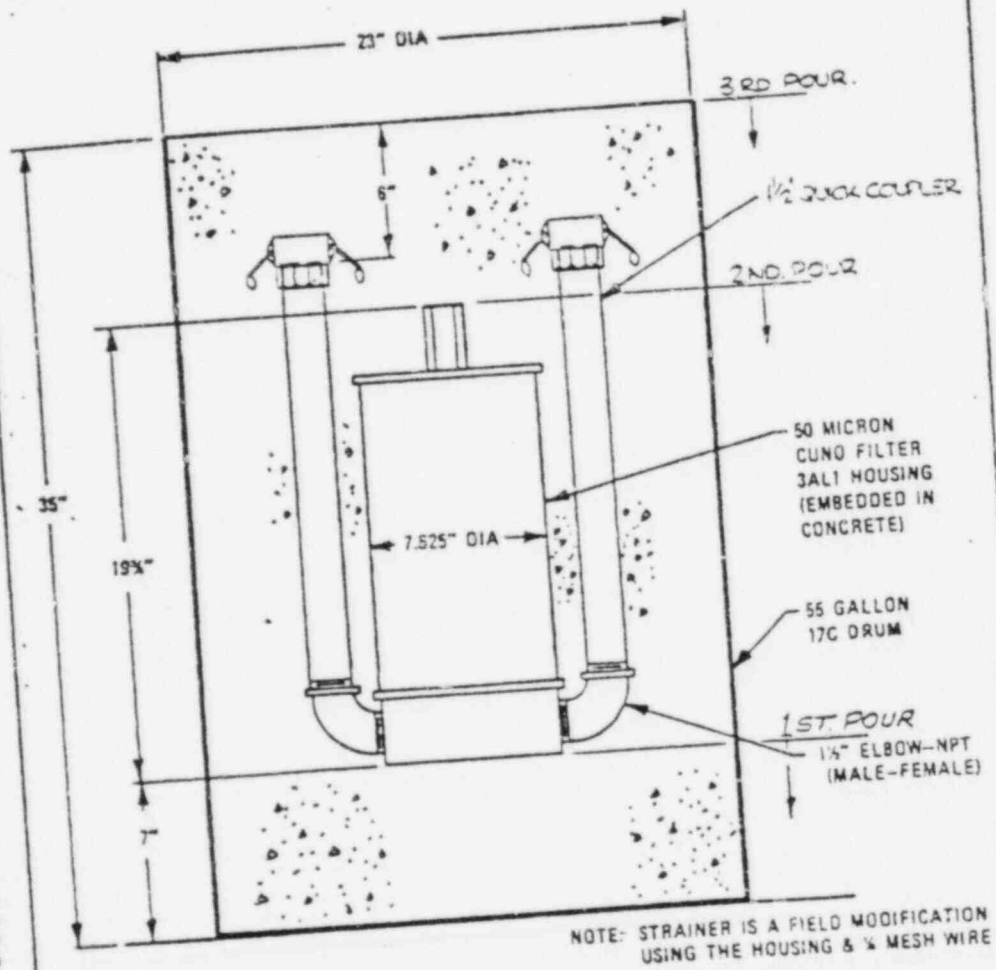


FIGURE II
FILTER FOR SPENT FUEL POOL DECONTAMINATION

672005

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT PLANT
CLIENT: Consumers Power Company
LOCATION: Charlevoix, Michigan

SUNTAC CONTRACT NO. 34881
SPECIFICATION NO. 34881-2A00-111

SPECIFICATION
for

SPENT FUEL POOL LINER INSTALLATION

CONSISTING OF

RADIATION PROTECTION CONTROL
FOR
SPENT FUEL POOL DECONTAMINATION
AND
LINER INSTALLATION

APPROVED FOR CONSTRUCTION

672076

APPROVED F. H. Harris/ERD Consumers Power Company DATE 8/28/73

APPROVED R. D. Wilson Jr. SUNTAC Project Manager DATE 7/5/73

APPROVED B. L. Vietzke Manager, Mechanical Eng. DATE 6/26/73

PREPARED BY J. T. Foster DATE 6/26/73

AMENDMENT	CLIENT APPROVED	CLIENT DATE	CLIENT APPROVED	CLIENT DATE	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION APPROVED	SUNTAC NUCLEAR CORPORATION DATE
0 (AFC)					ERD	N.E.R.		9/14/73
A (F/A)					J. E. BARROW			7/5/73

INFORMATION COPY

PHILADELPHIA, PENNSYLVANIA 19102

1.0 Scope

1.1 The purpose of this Radiation Protection Control document is to set forth specific procedures pertaining to the decontamination of and the installation of a liner in the spent fuel pool of the Big Rock Point Plant. The SUNTAC General Radiation Protection Standards and Procedures are incorporated as part of this document. Those specific procedures include those modifications to the General Procedures that are necessary to make them compatible with the work to be done at the Big Rock Point Plant.

2.0 Training

2.1 Consumers Power will supply all training to SUNTAC personnel. The training will assure that each SUNTAC employee working in a Controlled Area follows all Big Rock Point Health Physics Procedures.

This training will include the items shown in the SUNTAC General Procedures Manual.

3.0 Access Control

3.1 Site

3.1.1 All SUNTAC personnel will park vehicles outside the fence and enter the Main Gate. At the end of each work day, the SUNTAC Job Superintendent will provide Consumers Power Company with a list of the work force personnel for the next day. The Guard will check off each person as he enters or leaves the Site. Personnel will not be required to sign in and out.

3.2 In Plant

3.2.1 SUNTAC personnel will proceed directly to the Field Office/Crafts Change Room to don normal working clothes. Each employee will obtain the required personnel monitoring devices specified in Section 4.0 when leaving the Field Office and proceeding to the temporary change area inside containment. Each SUNTAC employee is responsible for the donning and removal of protective clothing and personal monitoring in accordance with Consumers Power Company procedures while in containment.

4.0 Personnel Monitoring

672077

4.1 Suntac TLD

4.1.1 Each SUNTAC employee will be issued a SUNTAC TLD dosimeter when he first reports to work. Personnel must wear this TLD in the chest area from the time they arrive at the SUNTAC Field Office each day until they are ready to leave the site each evening. The TLD's will be stored in the SUNTAC Field Office and should be picked up and returned to the storage area.

4.2 Consumers Power Company Film Badge and Dosimeter

4.2.1 Each SUNTAC employee who enters the Containment will be issued a Consumers Power Company film badge and self-reading dosimeter. When leaving the containment, the film badge and dosimeter should be left in the rack at the access control point.

NOTE: All three monitoring devices, (Consumers Power Company's film badge and dosimeter, and the SUNTAC TLD) must be moved from personal clothes to the protective clothing worn in the containment if personal clothing is removed. Similarly, caution must be taken to assure that all three devices are moved back to personal clothes when the protective clothing is removed upon exit from the containment.

4.3 Extremity Dosimeters

4.3.1 For certain portions of the work which may involve higher radiation exposure of the extremities than of the whole body, CPC will issue extremity dosimeters. Finger rings should be removed to wash hands and extremity dosimeters should be returned to the Consumers Power Company Health Physics Group at the access control point.

5.0 Radiation Exposure Controls

5.1 SUNTAC employees with a Radiation History on file will be limited to a quarterly exposure of 2400 mR for work at Big Rock Point. If this exposure is spread out over a period of days, Consumers Power Company will change the film when the estimated exposure is 1000 mR. If the exposure is received all in one day, the film will not be changed until the end of the day.

SUNTAC employees without a Radiation History (Form AEC-4) on file will be limited to 1000 mR per quarter for work at Big Rock Point.

6.0 Contamination Control

6.1 Consumers Power Company Health Physics personnel will be responsible for all contamination control at the work site.

If any SUNTAC personnel become contaminated, Consumers Power Company Health Physics personnel will direct all decontamination efforts.

If respiratory equipment is required, Consumers Power Company personnel will instruct each wearer on the proper use of the respirator.

7.0 Radiation Work Permits

672078

7.1 SUNTAC Radiation Work Permit

7.1.1 SUNTAC Radiation Work Permits will be filled out for each day's work. SUNTAC personnel will sign in and out on the permit each time they enter the containment. Operator sign-in and sign-out

out may be required for personnel working in high fields of radiation. Consumers Power Company Health Physics personnel will list clothing requirements and dose rates on the SUNTAC RWP. SUNTAC Radiation Work Permits must include any special instructions listed on the Consumers Power Company Radiation Work Permit.

7.2 Consumers Power Radiation Work Permits

7.2.1 Consumers Power Radiation Work Permits will be issued for the duration of the job. One permit will be required for decontamination and a second permit for liner installation.

8.0 <u>Surveys</u>

8.1 All radiation, contamination and airborne activity surveys will be performed by Consumers Power Health Physics personnel.

9.0 <u>Tool And Equipment Control</u>

9.1 Consumers Power Company Health Physics personnel will be responsible for tool and equipment control. No tools or equipment may be removed from the Controlled Area without being surveyed and released by Consumers Power Company Health Physics personnel.

10.0 <u>Emergency Plans</u>

10.1 Consumers Power Company is responsible for seeing that all SUNTAC personnel are trained to take the proper action in the event of any emergency.

11.0 <u>Medical Examinations</u>

11.1 No medical examinations will be required for working on the spent fuel pit decontamination.

12.0 <u>Transportation Of Radioactive Material</u>

12.1 All contaminated material will be transported, under Consumers Power Company license. All shipments will be checked by Consumers Power Company Health Physics personnel before they leave the Big Rock Point facility.

672079

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK POINT PLANT
CLIENT: Consumers Power Company
LOCATION: Charlevoix, Michigan
SUNTAC CONTRACT NO. 34491
SPECIFICATION NO. 34491-2400-111

SPECIFICATION
for

SPENT FUEL POOL LINER INSTALLATION

CONSISTING OF

RADIATION PROTECTION CONTROL
FOR
SPENT FUEL POOL DECONTAMINATION
AND
LINER INSTALLATION

APPROVED _____ DATE _____
Consumers Power Company

APPROVED R. D. Wilder DATE 7/5/73
SUNTAC Project Manager

APPROVED B. J. Perkins DATE 6/20/73
Manager, Mechanical Eng.

PREPARED BY J. J. Foster DATE 6/26/73

7617

A (F/A)					J. E. BRADY			7-12
AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION			

1.0 Scope

1.1 The purpose of this Radiation Protection Control document is to set forth specific procedures pertaining to the decontamination of and the installation of a liner in the spent fuel pool of the Big Rock Point Plant. The SUNTAC General Radiation Protection Standards and Procedures are incorporated as part of this document. These specific procedures include those modifications to the General Procedures that are necessary to make them compatible with the work to be done at the Big Rock Point Plant.

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2.1 Consumers Power will supply all training to SUNTAC personnel. The training will assure that each SUNTAC employee working in a Controlled Area follows all Big Rock Point Health Physics Procedures.

This training will include the items shown in the SUNTAC General Procedures Manual.

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7611 77

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Note: All three monitoring devices must be moved from personal clothes to the protective clothing worn in the containment if personal clothing is removed Similarly, caution must be taken to assure that all three devices are moved back to personal clothes when the protective clothing is removed upon exit from the containment.

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4.3.1 For certain portions of the work which may involve higher radiation exposure of the extremities than of the whole body, SUNTAC will issue extremity dosimeters. Finger rings should be removed to wash hands and should be returned to the SUNTAC Field Office.

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7.1 SUNTAC Radiation Work Permit

7.1.1 SUNTAC Radiation Work Permits will be filled out for each day's work. SUNTAC personnel will sign in and out on the perm each time they enter the containment. Special sign in and sign

Special Radiation Area Work Sheets

out may be required for personnel working in high fields of radiation. Consumers Power Company Health Physics personnel will list clothing requirements and dose rates on the SUNTAC RWP. SUNTAC Radiation Work Permits must include any special instructions listed on the Consumers Power Company Radiation Work Permit.

7.2 Consumers Power Radiation Work Permits

7.2.1 Consumers Power Radiation Work Permits will be issued for the duration of the job. One permit will be required for decontamination and a second permit for liner installation. ok

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9.0 Tool And Equipment Control

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10.0 Emergency Plans

10.1 Consumers Power Company is responsible for seeing that all SUNTAC personnel are trained to take the proper action in the event of any emergency. Video Tape.

11.0 Medical Examinations

11.1 No medical examinations will be required for working on the spent fuel pit decontamination.

12.0 Transportation Of Radioactive Material

12.1 All contaminated material will be transported, under Consumers Power Company license. All shipments will be checked by Consumers Power Company Health Physics personnel before they leave the Big Rock Point facility.

0761179

...STAINLESS STEEL ... 304

SA-240 TP 304 ... A-5

... 5-5

... DOUBLE

... 2-3-1 ... NO

... 417

... ROOTER CORPORATION ... J-4170 & 0-473A

...WELDED COMPLETELY BY THE MANUAL METALLIC ARC METHOD.

...NO HEAT TREATMENT

... 5-5 (PLATE) ... (See Para. Q-1 & Q-2)

Specimen No.	Dimensions Width	Dimensions Thk.	Area	Ultimate Total Load — Lbs.	Ultimate Unit Stress — psi	Character of Failure & Location

Bend Test Results — (Para. Q-3.1, Q-3.2 (a) & Q-4)

Type of Bend	SIDE BEND	Type of Bend	2 MACROS
Result	ACCEPTABLE	Result	ACCEPTABLE
Type of Bend	DYE PENETRANT	Type of Bend	
Result	ACCEPTABLE	Result	

We hereby certify that the statements made in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Date MAY 2, 1977 ... Signed ROOTER CORPORATION

By ...

(Records of tests of welds are illustrative only and may be modified to conform to the type and number of tests required by the Code)

INFORMATION COPY

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

TO: FIELD SUPT. CLIENT REPRESENTATIVE PROJECT MGR. MGR., QUALITY ASSURANCE SUPV., RAD CON MGR., CONSTRUCTION ORIGINATOR	MATERIAL REQUIRED AS LISTED	SHOP ORDER NUMBER CWP-153
CHARGE 34881	DEPARTMENT CONSTRUCTION	REQUISITIONER R.J. Fuchs
SAFETY REVIEW N/A	Q.A. ENGR. REVIEW W.S. Bibl	WELD ENGR. REVIEW R.J. Goyne
RAD CONTROL REVIEW RWP REQUIRED [X] yes [ ] no	CLIENT APPROVAL J.M. Mann 8-29-73	PROJECT MGR. APPROVAL H.C. Buchroth 7/4/73

APPLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

CLEANLINESS GRADE	QAP-401F
WELDER QUALIFICATION	QAP-401A
PIPE FREEZES REQUIRED	
SYSTEM CLASSIFICATION	
LAGGING (THERMAL INSUL.)	
PAINTING	X

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES	X
PREREQUISITES	X
NONPLANT CONST. WORK	X
PLANT CONST. WORK	
POST INSTALL TESTS	

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT	
REACTOR PLANT COOLDOWN	
REACTOR PLANT SHUTDOWN	
COMPONENT ISOLATED	X

QUALITY ASSURANCE RELEASE FOR MATERIAL WITHDRAWAL AND FABRICATION, INSTALLATION

HELD Q.A. SIGNATURE — DATE

INFORMATION COPY

1. SUMMARY

1.1 TITLE — Spent fuel pool shielding and monitoring system installation.

1.2 PURPOSE — To install lead shielding and a monitoring system in the bottom of spent fuel pool.

1.3 AUTHORIZATION — Consumers Power Company P. O. #34481

1.4 REFERENCES — Suntac Welding Specification No. 34481-4200-301.

1.5 ENCLOSURES — Bechtel drawing No. 10211-C-1 Rev. 4 and C-2 Rev. 4 Nooter drawings JN-D-41701 and JN-D-41707.

Exhibits Nos. 14, 15, 18, 24, 25, 32

APPROVED FOR CONSTRUCTION

671801

The person designated to sign for an action verifies his on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

APPROVED FO
CONSTRUCTIO

WORK REQUEST

TO: FIELD SUPT.
CLIENT REPRESENTATIVE
PROJECT MGR.
MGR., QUALITY ASSURANCE
SUPV., RAD CON
MGR., CONSTRUCTION

ORIGINATOR J.W. Lawrence

MATERIAL REQUIRED		SHOP ORDER NUMBER
AS LISTED		CWP-152
CHARGE	DEPARTMENT	REQUISITIONER
34881	CONSTRUCTION	R.J. Fisher
SAFETY REVIEW	Q.A. ENGR. REVIEW	WELD ENGR. REVIEW
N/A	W.F. Pike	N/A
RAD CONTROL REVIEW RWP REQUIRED [X] yes [ ] no	CLIENT APPROVAL H. H. Hacke /ETT 10/12/73	PROJECT MGR. APPROVAL H.C. Burkhardt /ETT 9/6/73

APPLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

CLEANLINESS GRADE	X
WELDER QUALIFICATION	
PIPE FREEZES REQUIRED	
SYSTEM CLASSIFICATION	
LAGGING (THERMAL INSUL.)	
PAINTING	

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES	X
PREREQUISITES	X
NONPLANT CONT. WORK	X
PLANT CONT. WORK	
POST INSTALL TESTS	

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT	
REACTOR PLANT COOLDOWN	
REACTOR PLANT SHUTDOWN	
COMPONENT ISOLATED	

QUALITY ASSURANCE RELEASE FOR MATERIAL WITHDRAWAL AND FABRICATION / INSTALLATION

FIELD Q. A. ENGINEER _____ DATE _____

1. SUMMARY

1.1 TITLE Decontaminate spent fuel pool walls and floor.

1.2 PURPOSE To install spent fuel pool liner.

1.3 AUTHORIZATION Consumers Power Company

1.4 REFERENCES Suntac specification No. 34881-RCP-402

1.5 ENCLOSURES Suntac specification No. 34881-RCP-402

0759211

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

SHOP ORDER NUMBER
CWP-152 Page 1

2.1 Material

2.1.1 12 each Safety shields No. 0742-000-AIRCO

2.1.2 24 each Replacement shields No. 0754-0029-AIRCO

2.1.3 36 each Scrub brushes No. 421-54066-OSBORN

2.1.4 36 each Scrub brushes No. 430-54071-OSBORN

2.1.5 36 each Scrub brushes No. 433-54074-OSBORN

2.1.6 1 each 8' adjustable scaffold

2.1.7 12 each 3" putty knife

2.1.8 40 each 55 gallon ICC-17-C open head, flat bottom steel drums bolt locking ring

2.1.9 30 each 50 micron filters

2.1.10 1 each Turbine pump and connections

2.1.11 1 each Culvert pipe: 36" diameter, 30" high

2.1.12 1 each Buna N rubber gasket for culvert seal

2.1.13 1 each Roll of 3/8" nylon rope

2.1.14 90 feet 1" diameter conduit with couples

2.2 Prerequisites

2.2.1 Radiation control to survey work area and establish requirements, if any, for an RWP.
Performance, RC_____ Date_____
Signature

2.2.2 Draining spent fuel pool to be accomplished by Consumers Power.

2.3 Plant Controlling Work

2.3.1 Initial conditions

2.3.1.1 Non-plant controlling:
Performance, OPA_____ Date_____
Signature

75922

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

JJZ
File

Consumers Power Company

CJHartman/CRAbel, Big Rock Point
FMMacri, P-14-230, Last

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

GWO: 6248

DT-FPL-040

Plant: Big Rock Point

Date: 9/12/73

Description: Fuel Pool Liner ~~Fuel Decontamination~~ Work Package

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
X		RBDeWitt/JSRang		X		MCPatel	
X		CSKeeley		X		RLWilson	
X		~~CJHartman~~/CRAbel		X		WPCooke	
X		WClark					

From: FMMacri

Comments Requested by: 9/20/73

Documents:	Previous Review Rev	Previous Review Date
CWP-152 - Work Request		

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri.

7907260

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 9/10/73

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

TO: FIELD SUPT.
CLIENT REPRESENTATIVE
PROJECT MGR.
MGR., QUALITY ASSURANCE
SUPV., RAD CON
MGR., CONSTRUCTION

ORIGINATOR

MATERIAL REQUIRED		SHOP ORDER NUMBER
AS LISTED		CWP-152
CHARGE 34881	DEPARTMENT CONSTRUCTION	REQUISITIONER
SAFETY REVIEW N/A	Q.A. ENGR. REVIEW	WELD ENGR. REVIEW N/A
RAD CONTROL REVIEW RWP REQUIRED [X] yes [ ] no	CLIENT APPROVAL	PROJECT MGR. APPROVAL

APPLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

CLEANLINESS GRADE	X
WELDER QUALIFICATION	
PIPE FREEZES REQUIRED	
SYSTEM CLASSIFICATION	
LAGGING (THERMAL INSUL.)	
PAINTING	

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES	X
PREREQUISITES	X
NONPLANT CONT. WORK	X
PLANT CONT. WORK	
POST INSTALL TESTS	

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT	
REACTOR PLANT COOLDOWN	
REACTOR PLANT SHUTDOWN	
COMPONENT ISOLATED	

1. SUMMARY

1.1 TITLE Decontaminate spent fuel pool walls and floor.

1.2 PURPOSE To install spent fuel pool liner.

1.3 AUTHORIZATION Consumers Power Company

1.4 REFERENCES Suntac specification No. 34881-RCP-402

1.5 ENCLOSURES Suntac specification No. 34881-RCP-402

0769261

QUALITY ASSURANCE RELEASE FOR MATERIAL WITHDRAWAL AND FABRICATION / INSTALLATION

FIELD Q. A. ENGINEER DATE

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

SHOP ORDER NUMBER
CWP-152 Page 1

2.1 Material

2.1.1 12 each Safety shields No. 0742-000-AIRCO

2.1.2 24 each Replacement shields No. 0754-0029-AIRCO

2.1.3 36 each Scrub brushes No. 421-54066-OSBORN

2.1.4 36 each Scrub brushes No. 430-54071-OSBORN

2.1.5 36 each Scrub brushes No. 433-54074-OSBORN

2.1.6 1 each 6' adjustable scaffold

2.1.7 12 each 3" putty knife

2.1.8 40 each 55 gallon ICC-17-C open head, flat bottom steel drums bolt locking ring

2.1.9 30 each 50 micron filters

2.1.10 1 each Turbine pump and connections

2.1.11 1 each Culvert pipe: 36" diameter, 30" high

2.1.12 1 each Buna N rubber gasket for culvert seal

2.1.13 1 each Roll of 3/8" nylon rope

2.1.14 90 feet 1" diameter conduit with couples

2.2 Prerequisites

2.2.1 Radiation control to survey work area and establish requirements, if any, for an RWP.
Performance, RC* _____ Date _____
Signature

2.2.2 Draining spent fuel pool to be accomplished by Consumers Power.

2.3 Plant Controlling Work

2.3.1 Initial conditions

2.3.1.1 Non-plant controlling:
Performance, OPA* _____ Date _____
Signature

0762 62

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

2.4 Work to Be Accomplished

2.4.1 Assemble and set up the turbine pump as described in SUNTAC specification 34881 RCP 402.
Performance, WG _____ Date _____
Signature

2.4.2 Decontaminate the walls and bottom of the Spent Fuel Pool in preparation for installing the liner.

2.4.3 After preliminary vacuum cleaning by Consumers Power Co., decontaminate the entire bottom by vacuum cleaning, initially using a water jet sweeper as specified in SUNTAC specification 34881-RCP-402, Section 4.1.1 & 4.1.3.
Performance, WG_____ Date_____
Signature

2.4.4 Survey bottom of fuel pool and map hot spots for subsequent removal.
Performance, RC _____ Date_____
Signature

2.4.5 Decontaminate the walls of fuel pool by scrubbing a small area with a bristle brush. The area being scrubbed is flushed with demineralized water to flush away the loosened radioactive materials. The active material will be subsequently removed by the 50 micron filters or as specified in paragraph 1 of section 4.1.2., RCP-402.
Performance, WG_____ Date_____
Signature

2.4.6 The used 50 Micron filters will be imbeded in concrete in 55 gallon drums as described in section 5.0 and Fig. II of SUNTAC Specification 34881-RCP-402.
Performance, WG_____ Date_____
Signature

2.4.7 Decontamination of Spent Fuel Pool complete and acceptable to WG Superintendent.
Performance, WG Supt._____ Date_____
Signature

0762263

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

Consumers Power Company

FMMacri, P-14-230 last

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

DT-FPL-064

CWO: 6248

Date: December 27, 1973

Plant: Big Rock Plant

File: Review Records.

Description: Fuel Pool Liner
Addendum to work package CWP-152

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSRang			X	CJHartman/CRVogel	12/1 1/2/74
	X	WClark				JJZabritski	1/3 1/7/74

From: FMMacri

Comments Requested by: 01/10/74

Documents:	Previous Review Rev	Previous Review Date
Addendum to CWP-152 (Fuel Pool Decontamination)	0	10/17/73

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri

7607295

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: December 26, 1973

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

Exhibit No. 101

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

O: FIELD SUPT. CLIENT REPRESENTATIVE PROJECT MGR. MGR., QUALITY ASSURANCE SUPV., RAD CON MGR., CONSTRUCTION . ORIGINATOR	MATERIAL REQUIRED	SHOP ORDER NUMBER CWP-152
	CHARGE 24281	DEPARTMENT CONSTRUCTION
	SAFETY REVIEW	Q.A. ENGR. REVIEW
	RAD CONTROL REVIEW RWP REQUIRED [X] yes [ ] no	CLIENT APPROVAL
		REQUISITIONER PROJECT MGR. APPROVAL H. C. Bradshaw

PPLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

MAJOR FCN'S	
MINOR FCN'S	
CLEANLINESS GRADE	
WELDER QUALIFICATION	
PIPE FREEZES REQUIRED	
SYSTEM CLASSIFICATION	
LAGGING (THERMAL INSUL.)	
PAINTING	

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES	
PREREQUISITES	
NONPLANT CONT. WORK	
PLANT CONT. WORK	
POST INSTALL TESTS	

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT	
REACTOR PLANT COOLDOWN	
REACTOR PLANT SHUTDOWN	
COMPONENT ISOLATED	

QUALITY ASSURANCE RELEASE FOR MATERIAL WITHDRAWAL AND FABRICATION / INSTALLATION

FIELD Q. A. ENGINEER — DATE

FIELD CHANGE NOTICE

1. SUMMARY

1.1 TITLE Same as original.

1.2 PURPOSE Same as original

1.3 AUTHORIZATION Same as original

1.4 REFERENCES Same as original

1.5 ENCLOSURES Add SK-1

9629706

*SIGNATURE — DATE

*The person designated to sign for an action verifies ba on personal observation and certifies by his signature that the action has actually been performed in accordan with the specified requirements.

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19101

WORK REQUEST

SHOP ORDER NUMBER CWP-152

Add Step 2.4.5.1

Install filtering system on the existing Spent Fuel Pool drain system as shown on sketch SK-1

Performance, WG _____ Date _____

Add Step 2.4.5.2

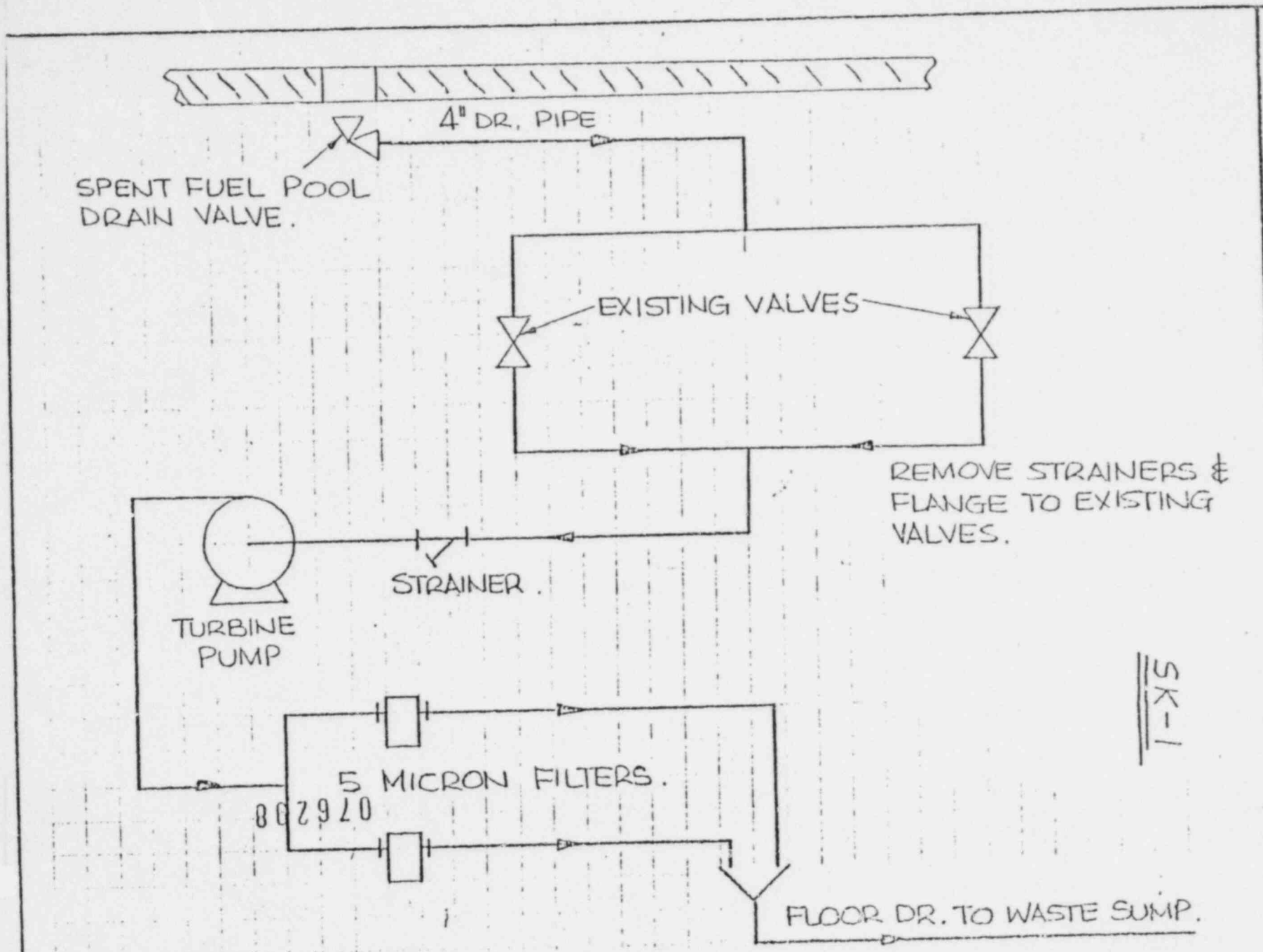
Decontaminate the Spent Fuel Pool floor by vacuuming up as much of the debris as possible with a submersible pump.

Performance, WG _____ Date _____

Add Step 2.4.5.3

After completion of steps 2.4.5.1 and 2.4.5.2, open the Spent Fuel Pool drain valve and slowly drain the water from the pool. At the same time, sweep and wash all remaining debris toward the pool drain. Continue this operation until the floor of the Spent Fuel Pool is clean and dry.

Performance, WG _____ Date _____



SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

SHOP ORDER NUMBER
CWP-152

SK-1

8002920

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

APPROVED FOR CONSTRUCTION

TO: FIELD SUPT.
CLIENT REPRESENTATIVE
PROJECT MGR.
MGR., QUALITY ASSURANCE
SUPV., RAD CON
MGR., CONSTRUCTION

ORIGINATOR J. W. Cannon

MATERIAL REQUIRED		SHOP ORDER NUMBER
As listed		CWP-151
CHARGE 34881	DEPARTMENT CONSTRUCTION	REQUISITIONER (C. J. Fredrickson) R. J. Fisher
SAFETY REVIEW N/A	Q.A. ENGR. REVIEW W. L. Pipe	WELD ENGR. REVIEW R. J. Gaul
RAD CONTROL REVIEW RWP REQUIRED [X] yes [ ] no	CLIENT APPROVAL F. M. Hart/CTJ 8/29/73	PROJECT MGR. APPROVAL H. L. Burkhalter 7/24/73

APPLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

CLEANLINESS GRADE	
WELDER QUALIFICATION	
PIPE FREEZES REQUIRED	
SYSTEM CLASSIFICATION	
LAGGING (THERMAL INSUL.)	
PAINTING	

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES	X
PREQUISITES	X
NONPLANT CONT. WORK	X
PLANT CONT. WORK	
POST INSTALL TESTS	

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT	
REACTOR PLANT COOLDOWN	
REACTOR PLANT SHUTDOWN	
COMPONENT ISOLATED	

QUALITY ASSURANCE RELEASE FOR MATERIAL WITHDRAWAL AND FABRICATION / INSTALLATION

FIELD Q. A. ENGINEER _____ DATE _____

1. SUMMARY

1.1 TITLE Temporary enclosure for spent fuel pool area.

1.2 PURPOSE To install temporary enclosure over spent fuel pool areaa

1.3 AUTHORIZATION Consumers Power Company

1.4 REFERENCES Consumers Power Company
Technical Specification
No. 10211-C1 (Bechtel)
Catalytic welding specification
No. 34881-4200-306

1.5 ENCLOSURES Consumers Power Company
Drawing No. 10211-C3 (Bechtel)

Kelly Klosure System Erection Manual.

0762

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

2.1 **Material**

2.1.1 Prefabricated roof and wall panels, Class I, noncombustible, heavy duty corrugated, translucent fiberglass (Kelly Klosure) panels as manufactured by Kelley Klosure System, Box 443, Fremont, Nebraska, or equal. Panels shall be complete with steel angle frames and necessary hardware for enclosure 24'3" X 40'3" X 12'.

2.1.2 20 each 2" X 8" X 16' wood, pressure impregnated with Non-Comm as manufactured by Koppers Company, Inc., Pittsburgh, Pennsylvania.

2.1.3 21 each 2" X 4" X 12' wood, pressure impregnated with Non-Comm as manufactured by Koppers Company, Inc., Pittsburgh, Pennsylvania.

2.1.4 50 lbs. 16 penney .128 dia. double headed nails.

2.1.5 50 each 5/8" ø exp'n anchors.

2.1.6 80 each 3/8"-16 UNC X 5" bolts.

2.1.7 80 each 3/8"-16 UNC hexagon head nuts.

2.1.8 160 each 3/8" large area washers.

2.2 Prerequisities

2.2.1 Rad control to survey work area and establish requirements, if any, for an RWP.

Performance, RC _____ Date _____
*Signature

2.2.2 Welder shall be qualified for the specification and parameters as listed in 1.4.

Verification, Suntac Q.A. _____ Date _____
*Signature

2.3 Plant Controlling Work

2.3.1 Initial Conditions

2.3.1.1 Non-plant controlling.

Performance, OPA _____ Date _____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

2.4 Work to be Accomplished (See Note #1)

2.4.1 Assemble and erect enclosure over the spent fuel pool in accordance with erection manual provided by the manufacturer, Kally Klosure Systems, Box 443, Fremont, Nebraska.

2.4.2 Install 2" X 4" wood support for enclosure around spent fuel pool area per Bechtel drawing No. 10211-C-3.

Performance, WG _____ Date _____
*Signature

2.4.3 Erect north wall 40'3" per Bechtel drawing No. 10211-C-3.

Performance, WG _____ Date _____
*Signature

2.4.4 Erect east wall 24'3" per Bechtel drawing No. 10211-C-3.

Performance, WG _____ Date _____
*Signature

2.4.5 Erect west wall 24'3" per Bechtel drawing No. 10211-C-3.

Performance _____ Date _____
*Signature

2.4.6 Erect south wall 40'3" per Bechtel drawing No. 10211-C-3.

Performance, WG _____ Date _____
*Signature

2.4.7 Assemble and erect roof to enclosure per Bechtel drawing No. 10211-C-3.

Performance, WG _____ Date _____
*Signature

Note #1: Erection sequence of enclosure walls may be changed to accommodate any plant operations that may be required in and around the fuel pool during erection.

7925 59

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

~~JJB — for your info~~

Vera - Pete

CJHartman/CRAbel, Big Rock

FMMacri, P-14-232, last

Consumers Power Company

DOCUMENT TRANSMITTAL

Generating Plant Modification Department

Catalytic maintains two signed copies
1) work copy
2) QA copy
Both will be signed off.

GWO: 6248

DT-FPL-045

Plant: Big Rock Point

Date: 9/20/73

Description: Fuel Pool Liner Work Request

File: Review Records

QA

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	RBDeWitt/JGRang			X	WRCooke	
	X	CJHartman/CRAbel			X	RLWilson	
	X	MClark/mB					

From: FMMacri

Comments Requested by: ____________

Documents:	Previous Review Rev	Previous Review Date
CWP-155-Work Request - Approved for Construction		

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri.

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 9/19/73

Date Comments Transmitted to Originator: ____________

Review Complete: ____________

0759265

CATALYTIC, INC.
PHILADELPHIA, PENNSYLVANIA 19102

WORK REQUEST

APPROVED FOR CONSTRUCTION
REV-0 9-17-75

TO: FIELD SUPT.
CLIENT REPRESENTATIVE
PROJECT MGR.
MGR., QUALITY ASSURANCE
SUPV., RAD CON
MGR., CONSTRUCTION

ORIGINATOR J J Lacey/ETJ

MATERIAL REQUIRED		SHOP ORDER NUMBER
As listed		CWP-155
CHARGE	DEPARTMENT	REQUISITIONER
34481	CONSTRUCTION	
SAFETY REVIEW	Q.A. ENGR. REVIEW	WELD ENGR. REVIEW
N/A	W. F. Pike	E. J. Boyne
RAD CONTROL REVIEW RWP REQUIRED [X] yes [ ] no	CLIENT APPROVAL F. H. Mazzi/ETJ 9/12/75	PROJECT MGR. APPROVAL W. C. Burdick/ETJ

APPLICABLE TO THIS WORK REQUEST

SPECIAL REQUIREMENTS

CLEANLINESS GRADE	QAP-501F
WELDER QUALIFICATION	X
PIPE FREEZES REQUIRED	
SYSTEM CLASSIFICATION	
LAGGING (THERMAL INSUL.)	
PAINTING	

JOB DESCRIPTION

MATERIAL & SPECIAL SERVICES	
PREREQUISITE	X
NONPLANT CONT. WORK	X
PLANT CONT. WORK	
POST INSTALL TESTS	

EFFECT ON PLANT CONDITIONS

STEAM OUT-OF-PLANT	
REACTOR PLANT COOLDOWN	
REACTOR PLANT SHUTDOWN	
COMPONENT ISOLATED	X

QUALITY ASSURANCE RELEASE FOR MATERIAL WITHDRAWAL AND FABRICATION; INSTALLATION

FIELD Q. A. ENGINEER _____ DATE _____

1. SUMMARY

1.1 TITLE Prefabricate and installation of the spent fuel pool stainless steel liner.

1.2 PURPOSE To line the spent fuel pool with stainless steel.

1.3 AUTHORIZATION Consumers Power Company P/O

1.4 REFERENCES Consumers Power specification 10,211-C171 (Bechtel)weld specificatic 34481-4200-301 and 302.

1.5 ENCLOSURES Bechtel Drawing C-1 Rev. 4 and C-2 Rev. 4, Nooter Drawings JND-41701 Rev. 2, 41702 Rev.3, 41703 Rev.3, 41704 Rev.3, 41705 Rev.3, 41706 Rev.2, 41707 Rev.5, 41708 Rev. 3.

1.6 Welders shall be qualified for the specification and parameters as listed herein per Reference 1.4.

Verification, Cat. Q.A. _____ Date 10-7-75
*Signature 0927

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

2.0 Material

2.1 3/16" 304 S/S plate piece numbers, as shown on Nooter drawing JN-D-41706, WP-1 through WP-36.

2.2 3/16" 304 S/S plate piece number, as shown on Nooter drawing JN-D-41706, FP-1 through FP-5.

2.3 3/16" 304 S/S plate corner sections piece numbers, as shown on Nooter drawing JN-D-41707, WPC-5 through WPC-12, WPC-14 through WPC-18, and WPC-21 through WPC-25.

2.4 3/16" X 2-1/2" 304 S/S flat bar piece numbers, as shown on Nooter drawing JN-D-41707, WBU-1 through WBU-4.

2.5 3/16" 304 S/S reinforcing plate as shown on Nooter drawing JN-D-41707 detail 9.

2.6 3/16" 304 S/S reinforcing plate as shown on Nooter drawing JN-D-41707 detail 10.

2.7 2 each Skimmer duct 304 S/S as shown on Nooter drawing JN-D-41705 detail 5.

2.8 20 each Piper Hanger brackets 304 S/S as shown on Nooter drawing JN-D-41705 detail 11.

2.9 1 each S/S trash screen cover as shown on Nooter drawing JN-D-41705 detail 17.

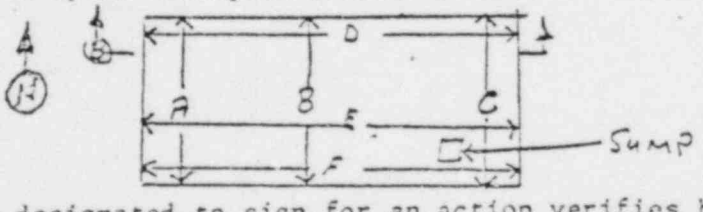
2.10 2 each (1-RH and 1-LH) 3/16" X 2-7/8 X 2-1/4 304 S/S cap plates as shown on Nooter drawing JN-D-41705.

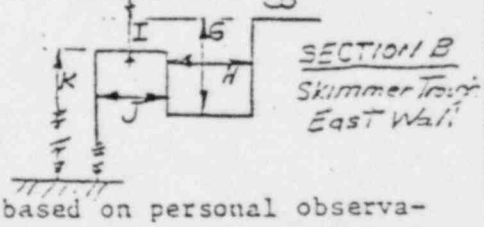
2.11 2 each (1-RH and 1-LH) 3/16" X 3" X 5" 304 S/S cap plate as shown on Nooter drawing JN-D-41705

2.12 2 each (1-RH and L-LH) 3/16" X 3" X 3" 304 S/S filler end plates as shown on Nooter drawing JN-D-41705.

3.0 Prerequisite Before Starting Prefabrication of Spent Fuel Pool Liner Plate

3.1 Take spent fuel pool measurements and record the measurement.





*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

3.1.2 The measurements at the bottom of the spent fuel pool are:

A. _____ D. _____

B. _____ E. _____

C. _____ F. _____

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

3.1.3 The measurements at the top of the spent fuel pool are:

A. _____ D. _____

B. _____ E. _____

C. _____ F. _____

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

3.1.4 The measurements of the skimmer trough at the North end of the East wall are:

G. _____ J. _____

H. _____ K. _____

I. _____

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

3.1.5 The measurements of the skimmer trough at the South end of the East wall are:

G. _____ J. _____

H. _____ K. _____

I. _____

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

3.2.1 CWP-151, CWP-152, CWP-153 and CWP-154.

WG Supt._____ Date_____
*Signature

3.3 Rad control survey is to be made of the area and establish requirements, if any, for an RWP.

Performance, RC_____ Date_____
*Signature

4.0 Initial Conditions

4.1 Non-Plant Controlling

5.0 Description

The work described in this work package is the fabrication and installation of the stainless steel liner for the spent fuel pool.

6.0 Prefabrication of Spent Fuel Pool Liner

6.1 Fabricate the spent fuel pool floor plate using piece MK FP-1 through FP-5 as shown on Nooter drawing JN-D-41701.

6.2 Weld FW-1 - Fit up plate FP-1 with plate FP-2, allow 1/16" weld, gap and tack weld 1/4" on 6" centers using weld procedure -34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

6.2.1 Weld joint FW-1 using weld procedure 34481-4200-301

Performance, WG_____ Date_____
*Signature

6.2.2. Liquid penetrant inspection and of weld joint FW-1.

Acceptance, Cat. Q.A._____ Date_____
*Signature

6.2.3 Vacuum box test of weld joint FW-1 after installation of floor plate.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

6.3 Weld FW-2 - Fit up plate FP-2 with FP-3, allow 1/16" weld gap and tack weld 1/4" on 6" centers using weld procedure 34481-4200-301.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

6.3.1 Weld joint FW-2 using weld procedure 34481-4200-301.

Performance, WG _____ Date _____
*Signature

6.3.2 Liquid penetrant inspection of weld joint FW-2.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

6.3.3 Vacuum box test of weld joint FW-2 after installation of floor plate.

Acceptance, Cat. _____ Date _____
*Signature

6.4 Weld FW-3 - Fit up plate FP-3 with FP-4, allow 1/16" weld gap and tack weld 1/4" on 6" centers using weld procedure 34481-4200-301.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

6.4.1 Weld joint FW-3 using weld procedure 34481-4200-301.

Performance, WG _____ Date _____
*Signature

6.4.2 Liquid penetrant inspection of weld joint FW-3.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

6.4.3 Vacuum box test of weld joint FW-3 after installation of floor plate.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

6.5 Weld FW-4 - Fit up plate FP-4 with plate FP-5 allow 1/16" weld gap and tack weld 1/4" on 6" centers using weld procedure 34481-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

6.5.1 Weld joint FW-4 using weld procedure 34481-4200-301.

Performance, WG_____ Date_____
*Signature

6.5.2 Liquid penetrant inspection of weld FW-4.

Acceptance, Cat. Q.A._____ Date_____
*Signature

6.5.3 Vacuum box test of weld joint FW-4 after installation of floor plate.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.0 Prefabricate Spent Fuel Pool Wall Plate Liners

7.1 Prefabricate west wall liner for spent fuel pool as shown on Nooter drawing JN-D-41702 Section A.

7.1.1 Fit up wall plate piece MK WP-1 with piece MK WP-2 allowing 1/16" weld gap between plate and tack weld plates 1/4" on 6" centers using weld procedure 34481-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.2 Weld joint WPW-1 using weld procedure 34481-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.3 Liquid penetrant inspection of weld joint WPW-1.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

7.1.4 Vacuum box test of weld joint WPW-1 after installation of liner into spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.5 Fit up wall plate piece MK WP-3 with piece MK WP-2 allowing 1/16" weld gap between plates tack weld plates 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.6 Weld joint WPW-2 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.7 Liquid penetrant inspect weld joint WPW-2.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.8 Vacuum box test weld joint WPW-2 after liner is installed in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.9 Fit up wall plate piece MK WP-3 with piece MK WP-4 allowing 1/16" weld gap between plates tack weld on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date 10/5/93
*Signature

7.1.10 Weld joint WPW-3 using weld procedure 34881-4200-301.

Performance, WG_____ Date 10/5/93
*Signature

7.1.11 Liquid penetrant inspect weld joint WPW-3.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

7.1.12 Vacuum box test weld joint WPW-3 after is installed in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.13 Fit up piece MK WP-19 with piece MK WP-20 allowing 1/16" weld gap between plates and tack weld 1/4"on 6" centers using weld procedure 34481-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat Q.A._____ Date_____
*Signature

7.1.14 Weld joint WPW-4 using weld procedure 34481-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.15 Liquid penetrant inspection of weld joint WPW-4.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.16 Vacuum box test weld joint WPW-4 after installing liner into spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.17 Fit up piece MK WP-21 with piece MK WP-20 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34481-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.18 Weld joint WPW-5 using weld procedure 34481-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.19 Liquid penetrant inspect weld joint WPW-5.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

7.1.20 Vacuum box test weld joint WPW-5 after liner is installed in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.21 Fit up piece MK WP-22 with piece MK WP-21 allowing 1/16" weld gap between plates and tack 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.22 Weld joint WPW-6 using weld procedure 34481-4200-301.

Performance WG_____ Date_____
*Signature

7.1.23 Liquid penetrant inspect weld joint WPW-6.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.24 Vacuum box test weld joint WPW-6 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.25 Fit up the welded assembly, consisting of plates WP-1, WP-2, WP-3 and WP-4, with the welded assembly, consisting of plates WP-19, WP-22, WP-20 and WP-21, as shown on Nooter drawing JN-D-41702 allowing 1/16" weld gap between assemblies, tack weld assemblies together using a 1/4" tack weld every 6" with welding procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

7.1.26 Weld joint WPW-7 using weld procedure 34481-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.27 Liquid penetrant inspect weld joint WPW-7.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.28 Vacuum box test weld joint WPW-7 after installing liner in Spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.29 Weld joint WPW-8 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.30 Liquid penetrant inspect weld joint WPW-8.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.31 Vacuum box test weld joint WPW-8 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.32 Weld joint WPW-9 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.33 Liquid penetrant inspect weld joint WPW-9.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.34 Vacuum box test weld joint WPW-9 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

7.1.35 Weld joint WPW-10 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

7.1.36 Liquid penetrant inspect weld joint WPW-10.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7.1.37 Vacuum box test weld joint WPW-10 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.0 Prefabricate Spent Fuel Pool Wall Plate Liners

8.1 Prefabricate north wall liner for spent fuel pool as shown on Nooter drawing JN-D-41702 Section B.

8.1.1 Fit up wall plate piece MK-WP-5 with MK-WP-6 allowing 1/16" weld gap between plates and tack weld plates 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.2 Weld joint WPW-11 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.3 Liquid penetrant inspect weld joint WPW-11.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.4 Vacuum box test weld joint WPW-11 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

8.1.5 Fit up wall plate piece MK-WP-6 with MK-WP-7 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
* Signature

8.1.6 Weld joint WPW-12 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.7 Liquid penetrant inspect weld joint WPW-12.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.8 Vacuum box test weld joint WPW-12 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.9 Fit up wall plate piece MK-WP-7 with MK-WP-8 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.10 Weld joint WPW-13 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.11 Liquid penetrant inspect weld joint WPW-13.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.12 Vacuum box test weld joint WPW-13 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

8.1.13 Fit up wall plate MK-WP-8 with MK-WP-9 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.14 Weld joint WPW-14 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.15 Liquid penetrant inspect weld joint WPW-14.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.16 Vacuum box test weld joint WPW-14 after installing in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.17 Fit up wall plate MK-WP-23 with MK-WP24 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.18 Weld joint WPW-15 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.19 Liquid penetrant inspect weld joint WPW-15.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.20 Vacuum box test weld joint WPW-15 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

8.1.21 Fit up wall plate MK-WP-24 with MK-WP-25 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.22 Weld joint WPW-16 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.23 Liquid penetrant inspect weld joint WPW-16.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.24 Vacuum box test weld joint WPW-16 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.25 Fit up wall plate MK-WP-25 with MK-WP-26 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.26 Weld joint WPW-17 using weld procedure 34881-4200-301.

Performance_____ Date_____
*Signature

8.1.27 Liquid penetrant inspect weld joint WPW-17.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.28 Vacuum box test weld joint WPW-17 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.29 Fit up wall plate MK-WP-26 with MK-WP-27 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance WG_____ Date_____
*Signature

*The person designated to sign for an action signifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

8.1.30 Weld joint WPW-18 using weld procedure 34881-4200-301.

Performance WG_____ Date_____
*Signature

8.1.31 Liquid penetrant inspect weld joint WPW-18.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.32 Vacuum box test weld joint WPW-18 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A. _____ Date_____
*Signature

8.1.33 Fit up wall plates MK-WP-5, WP-6, WP-7, WP-8 and WP-9 with MK-WBU-1 and MK-WBU-2 overlap to center of backing strap. Tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.34 Weld joint WPW-19 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

8.1.35 Liquid penetrant inspect weld joint WPW-19.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.36 Weld joint WPW-20 using weld procedure 34881-4200-301.

Performance WG_____ Date_____
*Signature

8.1.37 Liquid penetrant inspect weld joint WPW-20.

Acceptance, Cat. Q.A._____ Date_____
*Signature

8.1.38 Weld joint WPW-21 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

8.1.39 Liquid penetrant inspect weld joint WPW-21.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.0 Prefabricate Spent Fuel Pool Wall Plate Liners.

9.1 Prefabricate east wall liner for spent fuel pool as shown on Nooter drawing JN-D-41703 Section "C".

9.1.1 Fit up wall plate piece MK-WP-10 with MK-WP-11 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

9.1.2 Weld joint WPW-22 using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

9.1.3 Liquid penetrant inspect weld joint WPW-22.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.4 Vacuum box test weld joint WPW-22 after installing liner in spent fuel tank.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.5 Fit up wall plate piece MK-WP-11 with MK-WP-12 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

9.1.6 Weld joint WPW-23 using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

9.1.7 Liquid penetrant inspect weld joint WPW-23.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.8 Vacuum box test weld joint WPW-23 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.9 Fit up wall plate piece MK-WP-12 with MK-WP-13 allowing 1/16" weld gap between plates and thick weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

9.1.10 Weld joint WPW-24 using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

9.1.11 Liquid penetrant inspect weld joint WPW-24.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.12 Vacuum box test weld joint WPW-24 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.13 Fit up wall plate piece MK-WP-28 with MK-WP-29 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

9.1.14 Weld joint WPW-25 using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

1.1.15 Liquid penetrant inspect weld joint WPW-25.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.16 Vacuum box test weld joint WPW-25 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.17 Fit up wall plate MK-WP-29 with MK-WP-30 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance WG_____ Date_____
*Signature

9.1.18 Weld joint WPW-26 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

9.1.19 Liquid penetrant inspect weld joint WPW-26.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.20 Vacuum box test weld joint WPW-26 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.21 Fit up wall plate MK-WP-30 with MK-WP-31 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

9.1.22 Weld joint WPW-27 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

9.1.23 Liquid penetrant inspect weld joint WPW-27.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.24 Vacuum box test weld joint WPW-27 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.25 Fit up the welded assembly consisting of plates WP-10, WP-11, WP-12 and WP-13 with the welded assembly consisting of plates WP-28, WP-29, WP-30 and WP-31 as shown on Nooter drawing JN-D-41703 allowing 1/16" weld gap between assemblies, tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

9.1.26 Weld joint WPW-29 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

9.1.27 Liquid penetrant inspect weld joint WPW-29.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.28 Vacuum box test weld joint WPW-29 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

9.1.29 Weld joint WPW-31 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

9.1.30 Liquid penetrant inspect weld joint WPW-31.

Acceptance, Cat. Q.A._____ Date_____
*Signature

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

9.1.31 Vacuum box test weld joint WPW-31 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.32 Weld joint WPW-30 using weld procedure 34881-4200-301.

Performance, WG._____Date_____
*Signature

9.1.33 Liquid penetrant inspect weld joint WPW-30.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.34 Vacuum box test weld joint WPW-30 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.35 Weld joint WPW-28 using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

9.1.36 Liquid penetrant inspect weld joint WPW-28.

Acceptance, Cat. Q.A._____Date_____
*Signature

9.1.37 Vacuum box test weld joint WPW-28 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____Date_____
*Signature

10.0 Prefabricate Spent Fuel Pool Wall Plate Liners

10.1 Prefabricate south wall liner for spent fuel pool as shown on Nooter drawing JN-D-41703 Section "D".

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

10.1.1 Fit up wall plate piece MK-WP-14 with piece MK-WP-15 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.2 Weld joint WPW-32 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.3 Liquid penetrant inspect weld joint WPW-32.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.4 Vacuum box test weld joint WPW-32 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.5 Fit up wall plate piece MK-WP-15 with MK-WP-16 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.6 Weld joint WPW-33 using weld procedure 34881-4200-301.

Performance. WG_____ Date_____
*Signature

10.1.7 Liquid penetrant inspect weld joint WPW-33.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.8 Vacuum box test weld joint WPW-33 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

10.1.9 Fit up wall plate piece MK-WP-16 with MK-WP-17 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.10 Weld joint WPW-34 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.11 Liquid penetrant inspect weld joint WPW-34.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.12 Vacuum box test weld joint WPW-34 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.13 Fit up wall plate piece MK-WP-17 with MK-WP-18 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.14 Weld joint WPW-35 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.15 Liquid penetrant inspect weld joint WPW-35.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.16 Vacuum box test weld joint WPW-35 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

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*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

10.1.17 Fit up wall plate piece MK-WP-32 with MK-WP-33 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.18 Weld joint WPW-36 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.19 Liquid penetrant inspect weld joint WPW-36.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.20 Vacuum box test weld joint WPW-36 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.21 Fit up wall plate piece MK-WP-33 with MK-WP-34 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.22 Weld joint WPW-37 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.23 Liquid penetrant inspect weld joint WPW-37.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.24 Vacuum box test weld joint WPW-37 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

10.1.25 Fit up wall plate piece MK-WP-34 with MK-WP-35 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.26 Weld joint WPW-38 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.27 Liquid penetrant inspect weld joint WPW-38.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.28 Vacuum box test weld joint WPW-38 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.29 Fit up wall plate piece MK-WP-35 with MK-WP-36 allowing 1/16" weld gap between plates and tack weld 1/4" on 6" centers using weld procedure 34231-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.30 Weld joint WPW-39 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.31 Liquid penetrant inspect weld joint WPW-39.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.32 Vacuum box test weld joint WPW-39 after installing liner in spent fuel pool.

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

10.1.33 Fit up wall plates MK-WP-14, WP-15, WP-16, WP-17 and WP-18 with MK-WBU-3 and WBU-4 overlap to center of backing strap. Tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.34 Weld joint WPW-40 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.35 Liquid penetrant inspect weld joint WPW-40.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.36 Weld joint WPW-41 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.37 Liquid penetrant inspect weld joint WPW-41.

Acceptance, Cat. Q.A._____ Date_____
*Signature

10.1.38 Weld joint WPW-42 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

10.1.39 Liquid penetrant inspect weld joint WPW-42.

Acceptance, Cat. Q.A._____ Date_____
*Signature

11.0 Install prefabricated floor consisting of panels FP-1, FP-2, FP-3, FP-4 and FP-5 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

12.0 Install prefabricated west wall consisting of panels WP-1, WP-2, WP-3, WP-4, WP-19, WP-20, WP-21 and WP-22 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

13.0 Install prefabricated north wall consisting of panels WP-5, WP-6, WP-7, WP-8 and WP-9 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

14.0 Install prefabricated east wall consisting of panels WP-10, WP-11, WP-12, WP-13, WP-28, WP-29, WP-30 and WP-31 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG _____ Date _____
*Signature

Acceptance, Q.A. _____ Date _____
*Signature

15.0 Install prefabricated south wall consisting of panels WP-14, WP-15, WP-16, WP-17 and WP-18 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

7552

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

16.0 Install prefabricated upper section of south wall consisting of panels WP-32, WP-33, WP-34, WP-35 and WP-36 fit to lower panels allowing 3/16" gap and tack weld 1/4" on 6" centers to pieces WBU-3 and WBU-4 per Bechtel drawing No. 10211-C-1 and C-2.

Performance, WG_____ Date_____
* Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

16.1 Weld upper south wall panels to bottom panels.

16.1.1 Weld joint WPW-43 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

16.1.2 Liquid penetrant inspect weld joint WPW-43.

Acceptance, Cat. Q.A._____ Date_____
*Signature

16.1.3 Weld joint WPW-44 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

16.1.4 Liquid penetrant inspect weld joint WPW-44.

Acceptance, Cat. Q.A._____ Date_____
*Signature

17.0 Install prefabricated upper section of north wall consisting of panels WP-23, WP-24, WP-25, WP-26 and WP-27 fit to lower panels allowing 3/16" gap and tack weld 1/4" on 6" centers to pieces WBU-1 and WBU-2 per Bechtel drawing No. 10211-C-1 and C-2.

Performance WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

17.1 Weld upper north wall panels to bottom panels.

17.1.1 Weld joint WPW-45 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

17.1.2 Liquid penetrant inspect weld joint WPW-45.

Acceptance, Cat. Q.A._____ Date_____
*Signature

17.1.3 Weld joint WPW-46 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

17.1.4 Liquid penetrant inspect weld joint WPW-46.

Acceptance, Cat. Q.A._____ Date_____
*Signature

17.1.5 Weld joint WPW-47 using weld procedure 34881-4200-302. This covers panels WP-23, WP-24, WP-25, WP-26 and WP-27 to existing carbon steel angle around spent fuel pool.

Performance, WG_____ Date_____
*Signature

17.1.6 Liquid penetrant inspect weld joint WPW-47.

Acceptance, Cat. Q.A._____ Date_____
*Signature

18.0 Weld joint WPW-48 using weld procedure 34881-4200-302. This covers attaching west wall panel to carbon steel angle top of pool.

Performance, WG_____ Date_____
*Signature

18.1 Liquid penetrant inspect weld joint WPW-48.

Acceptance, Cat. Q.A._____ Date_____
*Signature

0790954

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

19.0 Weld joint WPW-49 using weld procedure 34881-4200-302. This covers welding upper section of south wall panels WP-32, WP-33, WP-34, WP-35 and WP-36 to the carbon steel angle at top of spent fuel pool.

Performance, WG_____ Date_____
*Signature

19.1 Liquid penetrant inspect weld joint WPW-49.

Acceptance, Cat. Q.A._____ Date_____
*Signature

20.0 Weld joint WPW-50 using weld procedure 34881-4200-302. This covers welding upper section of east wall panels WP-28, WP-29, WP-30 and WP-31 to the carbon steel angle at top of spent fuel pool.

Performance, WG_____ Date_____
*Signature

20.1 Liquid penetrant inspect weld joint WPW-50.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.0 Install and fit up corner panels on east wall.

21.1 Fit up panel WPC-13, WPC-7, WPC-8 and WPC-2 to panels WP-10, WP-11, WP-12 and WP-13 tack weld, tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.2 Weld joint WPW-51 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.3 Liquid penetrant inspect weld joint WPW-51.

Acceptance, Cat. Q.A._____ Date_____
*Signature

0175955

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.4 Weld joint WPW-52 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.5 Liquid penetrant inspect weld joint WPW-52.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.6 Weld joint WPW-53 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.7 Liquid penetrant inspect weld joint WPW-53.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.8 Weld joint WPW-54 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.9 Liquid penetrant inspect weld joint WPW-54.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.10 To install and fit up corner panels WPC-22, WPC-23, WCP-20E, WCP-4 and WCP-21 to panels WP-10 and WP-28 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.11 Weld joint WPW-55 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

0755956

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.12 Liquid penetrant inspect weld joint WPW-55.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.13 Weld joint WPW-56 using weld procedure 34881-4200-301

Performance, WG_____ Date_____
*Signature

21.14 Liquid penetrant inspect weld joint WPW-56.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.15 Weld joint WPW-57 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.16 Liquid penetrant inspect weld joint WPW-57.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.17 Weld joint WPW-58 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.18 Liquid penetrant inspect weld joint WPW-58.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.19 Weld joint WPW-59 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.20 Liquid penetrant inspect weld joint WPW-59.

Acceptance, Cat. Q.A._____ Date_____
*Signature

7595 37

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.21 Install and fit up corner panels WPC-24 and WPC-25 to panels WP-13 and WP-31 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG _____ DATE _____
*Signature

Acceptance, Cat. Q.A. _____ DATE _____
*Signature

21.22 Weld joint WPW-60 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.23 Liquid penetrant inspect weld joint WPW-60.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.24 Weld joint WPW-100 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.25 Liquid penetrant inspect weld joint WPW-100.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.26 Install and fit up corner panels WPC-2, WPC-9 WPC-10 and WPC-3 to panels WP-14, WP-15, WP-16, WP-17, and WP-18 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.27 Weld joint WPW-61 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.28 Liquid penetrant inspect weld joint WPS-61.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.29 Weld joint WPS-62 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.30 Liquid penetrant inspect weld joint WPW-62.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.31 Weld joint WPW-63 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.32 Liquid penetrant inspect weld joint WPW-63.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.33 Weld joint WPW-64 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.34 Liquid penetrant inspect weld joint WPW-64.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.35 Install and fit up corner panels WPC-24 and WPC-25 to WP-14 and WP-32 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.36 Weld joint WPW-65 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.37 Liquid penetrant inspect weld joint WPW-65.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.38 Weld joint WPW-66 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.39 Liquid penetrant inspect weld joint WPW-66.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.40 Install and fit up corner panels WPC-14 and WPC-15 to WP-18 and WP-36 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.41 Weld joint WPW-67 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.42 Liquid penetrant inspect weld joint WPW-67.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.43 Weld joint WPW-68 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.44 Liquid penetrant inspect weld joint WPS-68.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.45 Install and fit up corner panels WPC-3, WPC-11, WPC-12 and WPC-1 to WP-1, WP-2, WP-3 and WP-4 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

0796

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.46 Weld joint WPW-69 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.47 Liquid penetrant inspect weld joint WPW-69.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.48 Weld joint WPW-70 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.49 Liquid penetrant inspect weld joint WPW-70.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.50 Weld joint WPW-71 using weld procedure34881 -4200-301.

Performance, WG_____ Date_____
*Signature

21.51 Liquid penetrant inspect weld joint WPW-71.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.52 Weld joint WPW-72 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.53 Liquid penetrant inspect weld joint WPW-72.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.54 Install and fit up corner panels WPC-14 and WPC-15 to panels WP-1 and WP-19 and tack weld 1/4" on 6" centers using weld procedure 34881--4200-301.

Performance, WG_____ Date_____
*Signature

07-96-1

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.55 Weld joint WPW-73 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.56 Liquid penetrant inspect weld joint WPW-73.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.57 Weld joint WPW-74 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.58 VOID

21.59 Liquid penetrant inspect weld joint WPW-74.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.60 Install and fit up corner panels WPC-16 and WPC-17 to panels WP-4 and WP-22 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.61 Weld joint WPW-75 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.62 Liquid penetrant inspect weld joint WPW-75.

Acceptance, Cat. Q.A._____ Date_____
*Signature

0 75962

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.63 Weld joint WPW-76 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.64 Liquid penetrant inspect weld joint WPW-76.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.65 Install and fit up corner panels WCP-1, WCP-5, WPC-6 and WPC-13 to WP-5, WP-6, WP-7, WP-8 and WP-9 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.66 Weld joint WPW-77 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.67 Liquid penetrant inspect weld joint WPW-77.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.68 Weld joint WPW-78 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.69 Liquid penetrant inspect weld joint WPW-78.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.70 Weld joint WPW-79 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

0753 93

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.71 Liquid penetrant inspect weld joint WPW-79.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.72 Weld joint WPW-80 using weld procedure 34881--4200-301.

Performance, WG_____ Date_____
*Signature

21.73 Liquid penetrant inspect weld joint WPW-80.

Acceptance, Cat. Q.A_____ Date_____
*Signature

21.74 Install and fit up corner panels WPC-16 and WPC-17 to panels WP-5 and WP-23 and tack weld 1/4" on 6" corners using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.75 Weld joint WPW-81 using weld procedure 34881 -4200-301.

Performance, WG_____ Date_____
*Signature

21.76 Liquid penetrant inspect weld joint WPW-81.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.77 Weld joint WPW-82 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.78 Liquid penetrant inspect weld joint WPW-82.

Acceptance, Cat. Q.A._____ Date_____
*Signature

4965 0

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.79 Install and fit up corner panels WPC-18, WPC-19, WPC-20N, WPC-4 and WPC-21 to panels WP-9 and WP-27 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.80 Weld joint WPW-83 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.81 Liquid penetrant inspect weld joint WPW-83.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.82 Weld joint WPW-84 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.83 Liquid penetrant inspect weld joint WPW-84.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.84 Weld joint WPW-85 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

21.85 Liquid penetrant inspect weld joint WPW-85.

Acceptance, Cat. Q.A. _____ Date _____
*Signature

21.86 Weld joint WPW-86 using weld procedure 34881-4200-301.

Performance, WG _____ Date _____
*Signature

07596S

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.87 Liquid penetrant inspect weld joint WPW-86.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.88 Weld joint WPW-87 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.89 Liquid penetrant inspect weld joint WPW-87.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.90 Vacuum box test all corner fillet weld seams, if feasible.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.91 Fit up bottom corner panels WPC-2, WPC-8, WPC-7, WPC-13, WPC-6, WPC-5, WPC-1, WPC-12, WPC-11, WPC-3, WCP-10 and WCP-9 to bottom panels FP-1, FP2, FP-3, FP-4 and FP-5 and tack weld 1/4" on 6" centers using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.92 Weld joint WPW-88 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.93 Liquid penetrant inspect weld joint WPW-88.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.94 Weld joint WPW-89 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

0759

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.95 Liquid penetrant inspect weld joint WPW-89.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.96 Weld joint WPW-90 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.97 Liquid penetrant inspect weld joint WPW-90.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.98 Weld joint WPW-91 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.99 Liquid Penetrant inspect weld joint WPW-91.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.100 Weld joint WPW-92 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.101 Liquid penetrant inspect weld joint WPW-92.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.102 Weld joint WPW-93 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.103 Liquid penetrant inspect weld joint WPW-93.

Acceptance, Cat. Q.A._____ Date_____
*Signature

07597

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.104 Weld joint WPW-94 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.105 Liquid penetrant inspect weld joint WPW-94.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.106 Weld joint WPW-95 using weld procedure 34881 4200-301.

Performance, WG_____ Date_____
*Signature

21.107 Liquid penetrant inspect weld joint WPW-95.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.108 Weld joint WPW-96 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

21.109 Liquid penetrant inspect weld joint WPW-96.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.110 Weld joint WPW-97 using weld procedure 34881 -4200-301.

Performance, WG_____ Date_____
*Signature

21.111 Liquid penetrant inspect weld joint WPW-97.

Acceptance, Cat. Q.A._____ Date_____
*Signature

21.112 Weld joint WPW-98 using weld procedure 34881-4200-301.

Performance, WG_____ Date_____
*Signature

07598

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

21.113 Liquid penetrant inspect weld joint WPW-98.

Acceptance, Cat. Q.A._____Date_____
*Signature

21.114 Weld joint WPW-99 using weld procedure 34881-4200-301.

Performance, WG_____Date_____
*Signature

21.115 Liquid penetrant inspect weld joint WPW-99.

Acceptance, Cat. Q.A._____Date_____
*Signature

21.116 Vacuum box text bottom corner panel fillet weld seams, if feasible.

Acceptance, Cat. Q.A._____Date_____
*Signature

0759969

*The person designated to sign for an action verifies based on personal observation and certifies by his signature that the action has actually been performed in accordance with the specified requirements.

Consumers Power Company

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

CRAbel, BRPP
JJZabritski, BRPP
FWMacri, P-14-230, last

COVER SHEET TO:

GMO: 5908

DT-ECS-050

Date: January 22, 1974

Plant: Big Rock Point Plant

Description: ECCS - Packaging and Shipping Specification W/EDCN No 7

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	JSRang			X	WPCooke/RLWilson/	
	X	WClark				MCPatel	
					X	CJHartman/CRAbel/	RM 1/25/74
						JJZabritski	JJZ 2/5/74.

From: FWMacri

Comments Requested by: --

Documents:	Previous Review Rev	Previous Review Date
EDCN No 7 to Spec 34990-2400-107		
Spec 34990-2400-107, Rev 1 (type D)	0	10/27/73

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FWMacri, P-14-230.

0761100

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: _____

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

EXHIBIT NO. 5

DRAWING CLASSIFICATION

- Plot Plan ☐
- Process Flow Diagram ☐
- Engineering Flow Diagram ☐
- Architectural ☐
- Civil ☐
- Electrical ☐
- Heat, Vent & Air Conditioning ☐
- Instrumentation ☐
- Mechanical ☐
- Piping ☐
- Pressure Vessel ☐
- Structural ☐
- Specification ☒

SUNTAC NUCLEAR CORPORATION

Philadelphia, Pennsylvania 19132

EDCN

ENGINEERING DESIGN CHANGE NOTICE

DATE 15 January 1974

EDCN Number 7 | Sheet ___ of ___

Rev. Number | Change Hours

Change Made By E.F. Turner | Check Made By

Process Approval

Project Approval H. C. Rutledge III

Client's Approval

Drawing Title: Specification #34490-2400-107 (Rev. 1) - "Requirements for Type D Packaging and Shipping"

Drawing Number or Numbers: 34490-2400-107 (Rev 1)

Contract Number: 34490

Change Description Or Sketch

This EDCN is issued to revise SUNTAC Specification No. 34490-2400-107 (Rev.0) as follows:

Page 8, Paragraph 6.3 - "Tapes and Adhesives", lines 6-8 - "requiring contrasting colors and prohibiting silver and gray."

101970

Specs.

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

PLANT: BIG ROCK PLANT
CLIENT: CONSUMERS POWER COMPANY
LOCATION CHARLEVOIX, MICHIGAN.

SUNTAC CONTRACT NO. 34490
SPECIFICATION NO. 34490-2400-107

SPECIFICATION

for

REACTOR DEPRESSURIZATION SYSTEM

CONSISTING OF

REQUIREMENTS FOR TYPE D PACKAGING AND SHIPPING

SEE CONTENTS

APPROVED FOR CONSTRUCTION

APPROVED	F. M. Mancuso (CPCo) CLIENT	DATE	10/12/73
APPROVED	H. C. Burkhardt SUNTAC	DATE	9/27/73
APPROVED	John C. Rund, QA SUNTAC	DATE	7/20/73
PREPARED BY	SUNTAC	DATE	7-20-73

0796

AMENDMENT	APPROVED	DATE	APPROVED	DATE	APPROVED	APPROVED	APPROVED	APPROVED	DATE
	CLIENT				SUNTAC NUCLEAR CORPORATION				
								02	
1 (AFC)									11-21-73
0 (AFC)									10-29-73
A (F/A)									7-20-73

CONTENTS

1.0 Scope

1.1 This specification sets forth the minimum requirements which shall be observed in Type D packaging and shipping of materials, equipment and components.

1.2 Type D typically includes, but is not necessarily limited to, the following types and classes of equipment:

a. Tanks

b. Heat exchangers and parts

c. Accumulators

d. Demineralizers

e. Reactor vessel

f. Evaporators

g. Steam generators

h. Pressurizer

i. Piping

j. Electrical cable

k. Structural items

l. Reinforcing steel

1.3 The requirements of the parent specification, 34490-2400-103, to which this Specification 34490-2400-107 is attached take precedence over above subitems a through l which are included for guidance only.

2.0 Packaging

2.1 Packaging shall provide protection against corrosion, contamination, physical damage, or any effect which would lower the quality or cause the item to deteriorate during the time it is shipped, handled and stored. The requirements are intended to be in addition to the Uniform Freight Classification and other regulatory agency rules already established in the transportation industry, and in no way are intended to reduce the minimum standards established by these regulatory agency rules.

2.2 Type D items require protection from physical and mechanical damage. Type D packaging requirements shall conform to the following criteria:

a. Items shall be inspected for cleanliness immediately before packaging, and any dirt, oil residue, metal chips, or other form of contamination shall be removed by approved cleaning methods. Any entrapped water shall be removed.

b. Items subject to detrimental corrosion, internal or external, shall be suitably protected. (See para. 4.0 of this specification).

c. Items such as aggregate and reinforcing steel shall be protected against detrimental contamination or corrosion.

d. All openings into items shall be capped, plugged or sealed. (See para. 6.0 of this specification). Weld end preparations shall be protected against corrosion and physical damage.

e. Items packed in containers shall be blocked, anchored, braced and/or cushioned (see para. 8.0 of this specification) to prevent physical damage to the item or barrier.

f. Items and their containers shall be identified by marking. (See para. 9.0 of this specification).

3.0 Cleaning

3.1 Cleaning shall include the preparation of items for preservation and/or packaging. Items shall be inspected for cleanliness immediately before packaging, according to the cleaning requirements specified in the parent Specification No. 34490-2400-103. Dirt, oil residue, metal chips or other forms of contamination shall be removed by documented cleaning methods. Any entrapped water shall be removed. Items which are not immediately packaged after cleanliness inspection shall be protected from further contamination.

3.2 The specific cleaning procedure is considered to be part of the parent Specification No. 34490-2400-103. The following general criteria for this procedure shall apply:

a. The cleaning process, including cleaning compounds chosen shall not damage the item during cleaning or in subsequent service when considering the composition, surface finish, complexity or other inherent features.

b. The cleaning process or processes chosen shall remove loose mill and heat scale, oil, rust, grease, paint, welding fluxes, chalk, abrasives, carbon deposits, coatings used for nondestructive testing processes, and other contaminants which would render ineffective the method of preservation and packaging or other specified requirements.

c. After cleaning, item surfaces shall be free of cleaning media, such as aluminum oxide, silica, grit, lint, chemical cleaning residue, petroleum solvent residue, etc.

d. After cleaning, the item shall be protected from contamination until preservation or packaging is complete.

4.0 Preservatives

4.1 Methods of Preservation

Items subject to deleterious corrosion shall be protected by either using contact preservatives, inert gas blankets or vaporproof barriers with desiccants. (See para. 5.0 of this specification for vaporproof barriers and desiccants).

4.2 Contact Preservatives

Contact preservatives are compounds applied to bare metal surfaces to prevent surface corrosion during shipping and storage, and generally require removal prior to installation. The following criteria shall be used when considering the type of contact preservatives to be used:

a. The contact preservative shall be compatible with the material on which it is applied,

b. Contact preservatives which are nondrying shall have a neutral-grease-proof protective wrap when packaged.

c. The procedure for applying and/or removing contact preservatives shall not require disassembly of the item.

d. The method of contact preservative removal shall be accomplished with solvents and wiping cloths, or by flushing internal cavities with solvents. The solvents shall not be harmful to the item or other interconnecting material. Preservatives for inside surfaces of pumps, valves and pipe for systems containing reactor coolant water shall be the water flushable type, unless otherwise specified in the parent Specification No. 34490-2400-103. The procedure for contact preservative removal shall be forwarded to Suntac Engineering by the Contractor/Supplier prior to shipment of the item.

e. The name of the preservative used shall be indicated to facilitate touch-up.

f. When motors, pumps, turbines, etc., are shipped with oil reservoirs and bearing cavities filled with preservative oil, the item shall be so tagged and instructions as to draining, flushing, refilling and periodic rotation shall be included with the item.

g. When it is anticipated that the item might require an extended storage period (six (6) months or longer), a preservative needed for the long term protection of the item shall be applied or arrangements shall be made to periodically reapply the preservatives.

4.3 Inert Gas Blankets

Purging and pressuring the interior of an item or its container, or both, with a dry inert gas provides a means of preventing moisture or corrosive atmospheres from acting on sensitive bare metal surfaces or other materials. If this method is used, the component shall be either evacuated prior to filling with the inert gas or adequately purges with the same gas prior to applying the gas blanket. When inert gas blankets are used, the following criteria shall apply:

a. Inert gas blankets shall be used only when the exterior shell of the item can be tightly sealed to form a leak-proof barrier.

b. Only a commercial grade dry, oil-free, inert gas shall be used.

c. A permanent method for measuring and replenishing the blanket pressure shall be installed on the pressurized item. Closures and seals shall be tight enough so that the absolute (by mass) pressure after final sealing can be maintained for 24 hours without adding gas, prior to shipping the item from the contractor's/supplier's plant.

d. As a safety precaution, the item shall be marked in bold letters indicating that an inert gas blanket has been used.

5.0 Barrier and Wrap Materials, and Desiccants

5.1 General

The barrier generally shall be a flexible material designed to withstand the penetration of water, water vapor, grease or harmful gases. The wrap shall be a flexible material, formed around the item or package to exclude dirt and to facilitate handling, marking or labeling. Material thickness shall be selected on the basis of the type, size and weight of equipment or item to be protected, such that the barrier or wrap will not be damaged by puncture, abrasion, weathering, cracking, temperature extremes, wind conditions, etc. Barrier and wrap materials shall be non-halogenated when used in direct contact with austenitic stainless steels, shall be noncorrosive, shall not readily support combustion, and shall not be harmful to the item packaged. Vaporproof barrier materials used with desiccants are the third type of preservation system (see para. 4.0 of this specification) and protect against potential damage by water vapor condensate.

5.2 Waterproof Barrier Material

Waterproof barrier material shall be resistant to grease and water, and it shall protect items from airborne and windblown soils.

5.3 Vapor Barrier Material

Vaporproof barrier materials shall be sealable, and the edge of the barrier which normally will be opened at destination shall be of sufficient area to permit at least two (2) subsequent sealing operations. When maximum vapor protection is required, barrier material shall meet the maximum water vapor transmission rate of 0.05 gram, per 100 sq. inc., per 24 hr, per ASTM E 96-66 "Tests for Water Vapor Transmission of Materials in Sheet Form", Procedure E, and shall be packaged with an approved desiccant.

5.4 Desiccants

Desiccants shall be used within a vaporproof barrier when condensation or high humidity conditiions would damage an item by corrosion, mold, or mildew. Desiccants shall consist of non-deliquescent, nondusting, chemically inert, dehydrating agents. The following criteria shall apply when desiccants are used:

a. When used with austenitic stainless steels, the desiccant and the bag material shall not be over 0.25% halogen content. The desiccant bag shall be made of puncture, tear and burst resistant material.

b. The reactivation temperature and time shall be marked on the desiccant container.

c. Canisters used to contain desiccants shall be placed so as to cause no deleterious effects such as galvanic corrosion, even when the desiccant has reached its absorptive capacity for water vapor.

d. Desiccant bags and canisters, when used, shall be secured to prevent movement, rupture of the bags or damage to the item being protected.

e. Water-vaporproof flexible barriers shall be used to seal items containing desiccants. The air volume included within the flexible barrier shall be kept to a minimum.

f. Items which contain desiccant shall have all openings securely sealed. When flange connections are a part of the barriers, O-rings or gaskets shall be used with all bolts in place and tightened sufficiently to ensure a water-vaporproof seal. Weld end preparations after capping shall be covered with a water-vaporproof seal.

g. Packages and items containing desiccant shall be so marked. The total number of separate bags or containers in the package shall be indicated.

h. The minimum quantity of desiccant for use in each package shall be determined in accordance with Formula I or Formula II (as applicable) and as specified below:

1. Formula I

To determine minimum of desiccant for use with other than sealed rigid metal barrier:

U = 1.6A plus XD.

2. Formula II

To determine minimum units of desiccant for use within sealed rigid metal barrier:

U = KV plus XD.

Where:

A = Areas of barrier in square feet

U = Number of units* of desiccant to be used

*A desiccant unit is that quantity of desiccant, as received, which will absorb at equilibrium with air at 25°C at least the following quantities of water vapor: 3.00 grams at 20% relative humidity and 6.00 grams at 40% relative humidity.

D = Pounds of dunnage (other than metal) within barrier

K = 0.0007 when volume is given in cubic inches

K = 1.2 when volume is given in cubic feet

V = Volume within barrier in cubic inches or cubic feet

X = 8 for hair felt, cellulosic material (including wood) and other material not categorized below:

X = 6 for bound fibers (animal hair, synthetic fiber or vegetable fiber bound with rubber)

X = 2 for glass fiber

X = 0.5 for synthetic foams and rubber

i. A humidity indicator with the proper range and accuracy shall be included in every water-vaporproof envelope containing desiccant. As applicable, the indicator shall be located behind inspection windows or immediately within the closing edge, face, or cover of the barrier, and as far as practical from the nearest unit of desiccant.

6.0 Caps, Plugs, Tapes and Adhesives

6.1 General

These materials shall be of such quality as to adequately perform their intended function without causing harmful effects on items or systems operation.

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6.2 Caps and Plugs

Caps and plugs shall be used to seal openings in items having critical internal surfaces and to protect threads and weld end preparation. Caps and plugs shall conform to the following criteria:

a. Nonmetallic plugs and caps shall be brightly colored. Clear plastic closures shall not be used except when specified for a special purpose; for example, as a window for humidity indicator cards. Special attention shall be given in the control of these closures.

b. Metallic plugs and caps contacting metal surfaces shall not cause galvanic corrosion at the contact areas. Gasketing or other nonmetallic materials used in conjunction with metallic caps or plugs shall not exhibit corrosive effect on the material.

c. Caps and plugs shall be designed such that installation, inspection and removal can be performed without damage to the item.

d. Provisions shall be made to preclude the plug or cap from falling into or being pushed into the opening after installation.

e. Plugs or caps shall be secured with tape (see para. 6.3 of this specification) or other means to prevent accidental removal.

f. All plugs and caps shall be clean and free of visible contamination such as, but not limited to dust, dirt, stains, rust, discoloration or scale.

g. Plugs and caps used in contact with austenitic stainless steel shall be made from nonhalogenated materials.

6.3 Tapes and Adhesives

Pressure sensitive, removal tapes shall be used in lieu of adhesives on bare metal surfaces. Neither tapes nor adhesives shall have any deleterious effects on the item or system, and shall be completely removed immediately prior to performing a weld or closure. Tapes used for identification rather than sealing and which are near a weld operation may remain until system testing. Where adhesive tape is used for marking, color shall contrast with equipment supplied; silver and gray are prohibited. Tapes and adhesives shall conform to the following criteria;

a. When contacting austenitic stainless steel and nickel alloy surfaces:

1. The halogen and sulphur contents of tapes shall not be in excess of 0.10% by weight. Paperbacked (masking) tape shall not be used.

2. Upon removal of tape, all residual adhesive shall be removed by wiping with a nonhalogenated solvent (acetone alcohol or EQUAL).

3. Starch, silicone, and epoxy type material may be used for tape adhesives.

b. When contacting other surfaces and containers:

1. Tapes and adhesives used to seal nonaustenitc materials or containers are not subject to the above restrictions.

2. Tape shall be impervious to water and not subject to cracking or drying out if exposed to sunlight, heat or cold.

7.0 Containers, Crates and Skids

7.1 Containers

Containers shall be used when maximum protection for the item or its barrier is required. Domestic types used shall be limited to:

a. Cleated, sheathed boxes (500 lbs. maximum net weight).

b. Nailed wood boxes.

c. Wood-cleated solid fiberboard boxes.

d. Fiberboard boxes (120 lbs. maximum net weight). The following criteria for fiberboard boxes as exterior containers shall apply:

1. Boxes shall be weather-resistant fiberboard, preferably from the following grade types (or compliance symbol): V2 s, V3 s, or V3 c. (Federal Specification PPP-B-636).

2. Box style shall be RSC - Regular slotted box. (Outer flaps meet, inner flaps and outer flaps shall be of equal length).

3. Fiberboard boxes shall be securely closed with a water resistant adhesive applied to the entire area of contact between the flaps. All seams and joints shall be further sealed with not less than two-inch wide, water-resistant tape.

4. Boxes shall be strapped with pressure-sensitive reinforced tape, lengthwise (top, bottom and ends), girthwise (top, bottom and sides), and horizontal sides and ends.

5. Wood cleated fiberboard boxes shall be fabricated from sound, well seasoned lumber.

e. Metal or fiber drums.

f. Crates (see para. 7.2).

g. Other specially designed containers for special equipment (pressure vessels, vessel internals, etc.).

h. Cleated boxes in excess of 50 lbs. shall be bound with steel strapping, or EQUAL, around the container at not less than two (2) places.

7.2 Crates and Skids

Crates and skids shall be used for equipment over 500 lbs. in weight. Skids and runners shall be used on boxes with a gross weight of 100 lbs. or more, allowing a 4 inch minimum floor clearance for forklift tines.

8.0 Cushioning, Blocking, Bracing and Anchoring

8.1 Cushioning

Cushioning shall be used where protection from shock and vibration is required. The cushioning materials shall have sufficient strength to perform this function. Selection of cushioning materials shall be based on the following:

a. It shall exhibit no corrosive effect when in contact with the item being cushioned.

b. It shall have low moisture content and exhibit low moisture absorption properties or, if the item is cushioned with the material having some moisture absorbing capacity, it shall be protected with a water-vaporproof barrier.

c. It shall have non-dusting characteristics.

d. It shall not be combustible.

8.2 Blocking and Bracing

Blocking and bracing used for protection shall be compatible with the load to be supported, the size, the shape and the strength of bearing areas of the shipment. The blocking and bracing used shall withstand the thrust and impact applied in any direction to prevent item movement. Blocking and bracing used in contact with the item being blocked shall exhibit no corrosive effect [illegible] item.

8.3 Anchoring

a. The item in the crate or on the skid shall be anchored in a fashion to prevent damage during shipment. Bolts are preferred for anchors. Temporary cushioning, blocking, bracing or anchoring placed within an item for shipping protection that must be removed prior to operation of the item shall be identified in a conspicuous manner to effect proper removal of the packing material.

b. When bolts are used for anchoring the following criteria shall apply:

1. If precision bolt holes in the item are used for anchoring, precaution shall be taken to ensure that properly fitted bolts of the correct dimension and characteristics are used to prevent marring or elongation.

2. Holes bored through containers or mounting bases shall be such a size as to provide a snug fit.

3. When mounting items to container bases equipped with skids, bolts shall be extended through the skids whenever practical. In such instances the bolts in the outer surface of the skid shall be countersunk.

4. Washers shall be used under the nuts to decrease the possibility of the bolt pulling through the wood.

5. Nuts shall be properly torqued. To prevent their loosening during shipment, lock nuts, lock washers, cotter pins or stacking shall be employed.

9.0 Marking

9.1 To maintain proper identification and instructions, or both, during shipping, receiving and storage, and to provide for identification after the outside of the container has been moved, the item and the outside of containers shall be marked as specified below:

9.2 All items shall be marked to preserve identity in accordance with the following criteria:

a. The identification shall be stamped, etched, stenciled or otherwise marked on the item or on tags to be affixed securely to the item in plain, unobstructed view. When metal stamps are employed, low stress rounded bottom type shall be used when the item proper is marked. Etching shall not be used on nickel alloys or on welded or sensitized stainless steel.

b. The marking shall not be harmful to the material nor violate any other section of this specification.

c. When tags are employed, they shall be of a material which will retain the marking, withstand weathering deterioration and other normal shipping and handling effects, and shall not be detrimental to the item.

9.3 Markings on the outside container shall be in accordance with the following criteria:

a. Container markings shall appear on a minimum of (2) sides of the container, preferably one (1) side and one (1) end.

b. Container markings shall be applied with waterproof ink or paint in characters no less than 3/4 inch high.

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c. Where tags or labels are used, they shall be affixed to the container using a waterproof adhesive, tacks where practical, or a corrosive resistant wire.

d. Container marking shall include the following information:

1. Destination.

2. Return address.

3. Package numbers showing the purchase order number, followed by the package number and the total number of packages.

4. Item description.

5. Material identification number.

6. Handling Instructions: Fragile, Center of Gravity, Keep Dry, This Side Up, Sling Here, Do Not Freeze, Stacking Limitations, etc.

7. Weight of Package.

8. Special instructions: Desiccant Inside, Special Inspection, Storage, Unpacking Restrictions, etc.

9.4 Marking of items not within a container, such as pipe, tanks, heat exchangers, etc., shall exhibit the above information in a location which is in plain unobstructed view, but not directly applied to bare austeniti metal surfaces of the item.

10.0 Shipping

10.1 Transportation

The mode of transportation shall normally be selected by the contractor/ supplier. However, Suntac may upgrade the mode of transportation when the integrity of critical equipment or materials is involved. The follo ing requirements shall be followed, as applicable:

a. Open Carriers

For shipment on open transit carriers the following shall apply:

1. Items shall be protected from environmental conditions. Tarpaulins used shall be fire retardant and shall be installed to provide drainage and to ensure air circulation to prevent condensation.

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2. Barrier and wrapping materials subject to transportation damage shall be covered with waterproof shrouds such as tarpaulins so that they are not exposed directly to the environment.

b. Closed Carriers

For shipment on closed transit carriers the following shall

1. When items cannot be adequately protected from weather or environment on open transit carriers, closed carriers shall be used.

2. Use of fully enclosed vans is recommended when shipping large, delicate items such as control panels and cabinets.

10.2 Precautions During Loading and Transit

a. The weight, lifting points or center of gravity indicated on the crate, skid or package by the contractor/supplier shall be utilized to ensure proper handling during loading, transfer between carriers and unloading.

b. To avoid surface damage, carbon steel rigging equipment shall not come in direct contact with stainless steel except with lifting lugs, eyes, or pads.

c. All austenitic stainless steel and nickel base alloy material shall be handled in such a manner that they do not come in contact with lead, zinc, copper, mercury and other low melting elements, alloys or halogenated material.

d. Packages and/or preservative coatings shall be visually inspected after loading and damaged areas shall be repaired prior to shipment. Equipment shipped with desiccants shall be inspected after loading to ensure that sealed areas are intact.

e. Sealed openings shall be visually inspected after loading to ensure closures are intact. Materials used for resealing shall be in accordance with Para. 6.0 of this specification.

f. The contractor/supplier shall supply specific written instructions covering the location and stacking limits of the crates or boxes on the transport vehicle.

11.0 Handling

Detailed preparation and procedures shall be developed in accordance with the following requirements:

a. Specifications and/or drawings will be supplied by the contractor/supplier for the handling of all material that warrants special handling instructions because of weight, size, susceptibility to shock damage or any other reason that in the judgment of Suntac or contractor/supplier warrants special instructions. Such specifications and/or drawings will be made available to Suntac prior to the time the material is to be handled and shall show sling locations, balance points, methods of attachments, maximum hoist line speeds and other pertinent features to be considered

b. Material not specifically covered alone shall be handled in accordance with sound practices. It shall be the responsibility of the contractor/supplier to clearly identify lifting locations on the material as necessary for safe handling.

12.0 Hoisting and Rigging Equipment

All equipment for handling material shall be used and maintained in accordance with the following requirements:

a. Hoisting equipment used for handling shall be certified by the manufacturer for at least 100% of the load to be lifted. These ratings shall not be exceeded.

b. Rigging equipment such as wire rope, manila rope, slings, straps, hooks and shackles shall not be loaded in excess of the manufacturers' specified safe working loads. Rigging personnel shall have available for use tables, charts and other data giving manufacturers' ratings for rigging to be used. These ratings shall not be exceeded.

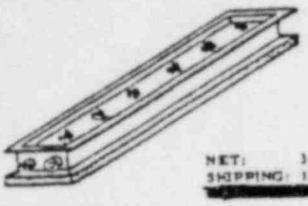
c. Carbon steel rigging equipment shall not come in direct contact with stainless steel material.

13.0 Information Required with Proposals

The Bidder shall include in his Proposal a brief description of his preservation methods and procedure for removal. The description shall also explain how his preservation methods meet the intent of this specification.

AMERICAN *Vacuum* SEAM TESTER

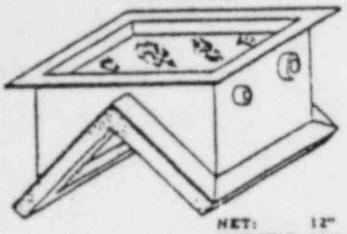
FOR THE LOCATION OF LEAKS IN ANY SEAM



SERIES A 100

FOR STRAIGHT SEAMS

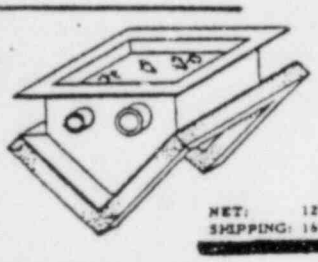
NET:	31 1/2"	x 8"	x 5 1/2"	--16 lbs.
SHIPPING:	33"	x 9 1/2"	x 8"	--16 lbs.



SERIES A 200

FOR OUTSIDE STRAIGHT SEAMS

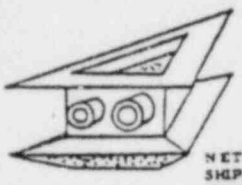
NET:	12"	x 12"	x 9"	--14 lbs.
SHIPPING:	16"	x 14"	x 12"	--30 lbs.



SERIES A 300

FOR INSIDE STRAIGHT SEAMS

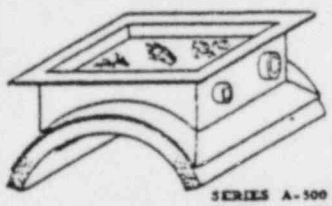
NET:	12"	x 12"	x 9"	--14 lbs.
SHIPPING:	16"	x 16"	x 12"	--30 lbs.



SERIES A 400

FOR INSIDE CORNER INTERSECTIONS

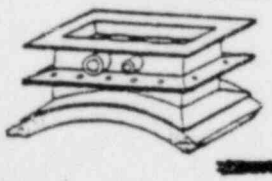
NET:	12"	x 12"	x 12"	--16 lbs.
SHIPPING:	16"	x 18"	x 10 1/2"	--24 lbs.



SERIES A 500

FOR CIRCUMFERENTIAL PIPE SEAMS

SERIES A-500 and SERIES A-600 Inspection Boxes are individually designed and manufactured to the customer's specifications, based upon the diameter of the pipe or tank seam to be tested.

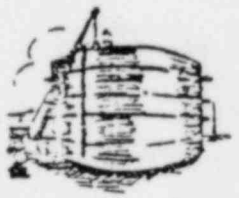


SERIES A 600

FOR CIRCUMFERENTIAL TANK SEAMS

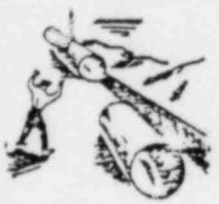
POWER PLANT AND PUMP ASSEMBLY

GASOLINE				
NET:	14 1/4"	x 21 1/4"	x 17"	--55 lbs.
SHIPPING:	16"	x 19"	x 24"	--90 lbs.
ELECTRIC				
NET:	14 1/4"	x 21 1/2"	x 9 1/2"	--46 lbs.
SHIPPING:	16"	x 14"	x 24"	--76 lbs.



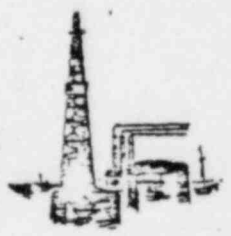
FOR TANK MANUFACTURERS AND STEEL FABRICATORS . . .

The American Vacuum Seam Tester displaces older, more costly methods of testing. It enables instant detection of all seam leaks (welded, bolted, wooden). Men can work faster and more effectively when assured that imperfections will be located quickly by this simple, efficient, non-destructive tester.



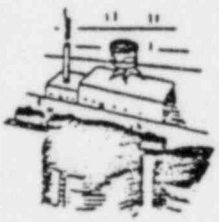
FOR PIPE MANUFACTURERS AND PIPE LINE CONTRACTORS . . .

This inexpensive, time-saving device can pin-point both longitudinal and circumferential pipe seams. Its use for preliminary testing on high-pressure lines saves time and money. The unit is light and portable, for easy handling in field operations. Every pipe line maintenance truck should carry an American Vacuum Seam Tester as standard equipment.



FOR TANK FARM OWNERS AND OIL PRODUCERS . . .

Leaky vapor recovery equipment cannot operate economically. Tank bottoms that permit seepage, or decks which allow valuable gases to escape are costly. Although not reflected on gauges or in inventories, loss of several barrels of oil or gasoline a day by leakage is common, and before long amounts to a lot of money. Test tanks "in place" with the American Vacuum Seam Tester.



FOR MINE OPERATORS AND CHEMICAL PLANTS . . .

Accurate testing, to quickly locate and stop storage container leaks, prevents costly escape of precious liquids and gases. Mine operators and chemical plants should find the American Vacuum Seam Tester "worth its weight in gold."

FOR GASOLINE BULK PLANTS AND REFINERIES . . .

Tanks that have been in service more than three years should be retested for pin-hole leaks. When water cushions are carried in bulk plant tanks with bottoms of doubtful condition, the lives of the bottoms are shortened drastically; continual moisture seepage through pin holes swiftly accelerates rust. Refinery processes subject tanks to much more severe conditions than those in bulk storage tank farms. Every maintenance crew should be equipped with an American Vacuum Seam Tester.

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DON'T let valuable oil, gas, vapors, chemicals escape through leaky pipe lines or tank decks, bottoms, or side seams! The American Vacuum Seam Tester can pay for itself many times over by the savings it effects through positive detection of unsuspected leaks, no matter how small . . . on every inch of seams, no matter how they are assembled.

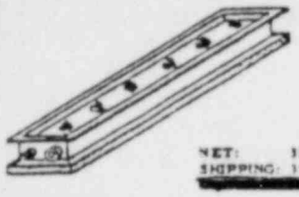
DON'T let equipment leaks create fire and personal injury hazards which can cause great grief and exorbitant expense. BE SAFE . . . with an American Vacuum Seam Tester!

AN ECONOMICAL TIME-SAVING DEVICE

AMERICAN

AMERICAN *Vacuum* SEAM TESTER

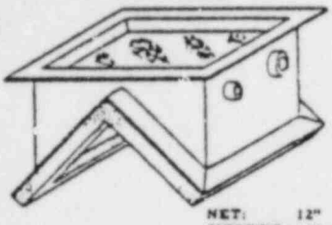
FOR THE LOCATION OF LEAKS IN ANY SEAM



SERIES A 100

FOR STRAIGHT SEAMS

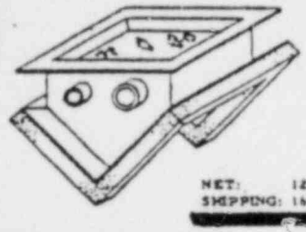
NET: 11 1/2" x 8" x 5 1/2"--16 lbs.
SHIPPING: 15" x 9 1/2" x 6" --16 lbs.



SERIES A 200

FOR OUTSIDE STRAIGHT SEAMS

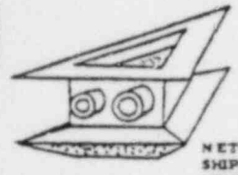
NET: 12" x 12" x 9" --14 lbs.
SHIPPING: 16" x 14" x 12" --10 lbs.



SERIES A 300

FOR INSIDE STRAIGHT SEAMS

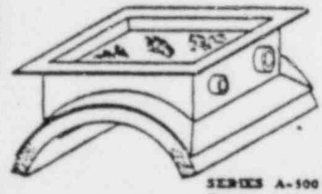
NET: 12" x 12" x 9" --14 lbs.
SHIPPING: 16" x 16" x 12" --10 lbs.



SERIES A 400

FOR INSIDE CORNER INTERSECTIONS

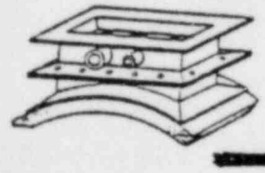
NET: 12" x 12" x 12" --16 lbs.
SHIPPING: 16" x 18" x 10 1/2"--24 lbs.



SERIES A 500

FOR CIRCUMFERENTIAL PIPE SEAMS

SERIES A-500 and SERIES A-400 Inspection Boxes are individually designed and manufactured to the customer's specifications, based upon the diameter of the pipe or tank seam to be tested.



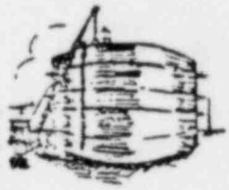
SERIES A 600

FOR CIRCUMFERENTIAL TANK SEAMS

POWER PLANT AND PUMP ASSEMBLY

GASOLINE
NET: 14 1/4" x 21 1/4" x 17" --55 lbs.
SHIPPING: 16" x 19" x 24" --90 lbs.

ELECTRIC
NET: 14 1/4" x 21 1/2" x 9 1/2"--46 lbs.
SHIPPING: 16" x 14" x 24" --76 lbs.

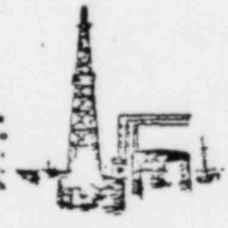


FOR TANK MANUFACTURERS AND STEEL FABRICATORS . . .

The American Vacuum Seam Tester displaces older, more costly methods of testing. It enables instant detection of all seam leaks (welded, bolted, wooden). Men can work faster and more effectively when assured that imperfections will be located quickly by this simple, efficient, non-destructive tester.

FOR PIPE MANUFACTURERS AND PIPE LINE CONTRACTORS . . .

This inexpensive, time-saving device can pin-point both longitudinal and circumferential pipe seams. Its use for preliminary testing on high-pressure lines saves time and money. The unit is light and portable, for easy handling in field operations. Every pipe line maintenance truck should carry an American Vacuum Seam Tester as standard equipment.



FOR TANK FARM OWNERS AND OIL PRODUCERS . . .

Leaky vapor recovery equipment cannot operate economically. Tank bottoms that permit seepage, or decks which allow valuable gases to escape are costly. Although not reflected on gauges or in inventories, loss of several barrels of oil or gasoline a day by leakage is common, and before long amounts to a lot of money. Test tanks "in place" with the American Vacuum Seam Tester.

FOR MINE OPERATORS AND CHEMICAL PLANTS . . .

Accurate testing, to quickly locate and stop storage container leaks, prevents costly escape of precious liquids and gases. Mine operators and chemical plants should find the American Vacuum Seam Tester "worth its weight in gold."

FOR GASOLINE BULK PLANTS AND REFINERIES . . .

Tanks that have been in service more than three years should be retested for pin-hole leaks. When water cushions are carried in bulk plant tanks with bottoms of doubtful condition, the lives of the bottoms are shortened drastically; continual moisture seepage through pin holes swiftly accelerates rust. Refinery processes subject tanks to much more severe conditions than those in bulk storage tank farms. Every maintenance crew should be equipped with an American Vacuum Seam Tester.

30

DON'T let valuable oil, gas, vapors, chemicals escape through leaky pipe lines or tank decks, bottoms, or side seams! The American Vacuum Seam Tester can pay for itself many times over by the savings it effects through positive detection of unsuspected leaks, no matter how small . . . on every inch of seams, no matter how they are assembled.

DON'T let equipment leaks create fire and personal injury hazards which can cause great grief and exorbitant expense. BE SAFE . . . with an American Vacuum Seam Tester!

AN ECONOMICAL TIME-SAVING DEVICE

AMERICAN

FOUNDED 1903

AMERICAN *Vacuum* SEAM TESTER

AMERICAN PIPE & STEEL CORPORATIC
2201 W. COMMONWEALTH AVE.
ALHAMBRA, CALIFORNIA
TELEPHONE ATlantic 9-4383
TELEPHONE CUmberland 3-219

OPERATING INSTRUCTIONS

Date: Jan. 2, 1963

Electric motor drive units operate on 110 volts, A.C. or D.C., and can be attached to any ordinary light socket. For gasoline motor drive units, follow instructions on plate attached to engine.

Vacuum pump and power plant are shipped without oil in reservoirs. Before using, fill pump and gasoline motor crank cases or electric motor oil reservoirs with S.A.E. 20, 100% Pennsylvania oil. Keep vacuum pump and driving mechanism properly lubricated.

1. Paint seams generously with heavy suds of good grade soap chips and water, using wide paint brush.

2. Place inspection box over soaped seam section and turn 3-way cock to apply vacuum.

3. If vacuum gauge does not show that a vacuum has been obtained, immediately apply pressure to Inspection Box to allow gasket to seal any slight irregularities in surface of seam being tested. One pound of vacuum will promptly show bubbles over any leaks present.

4. Turn 3-way cock to admit air. Pick up Inspection Box and move it to next section to be tested. Do not slide Inspection Box; this will damage connection between sponge rubber gasket and metal frame of Inspection Box.

5. Mark leak with chalk.

6. If gasket should be torn loose from metal frame, repair by applying high-grade rubber bonding cement. If glass in Inspection Box is broken, replace with plate glass of same thickness, using ~~1/16" rubber gasket and rubber bonding cement~~ silicone sealant to form a gasket.

A 2-man crew is most efficient for testing operations: one to soap seams; and one to operate Inspection Box. The testing operation usually can cover 5 or 6 feet of seam per minute.

Replacement parts can be obtained from American Pipe & Steel Corporation.

0 7 6 1 3 1

OPERATING and MAINTENANCE INSTRUCTIONS

CONSTRUCTION: Your rotary pump is a precision product, there being only .001" at the top and .003" on each end of the rotor. The vanes take up their own wear and should last 5,000 to 15,000 hours operation depending upon the application. Remember that it is designed for pumping dry air being built of cast iron and steel. Protect it against the entrance of dirt and excessive moisture lubricate it, and you will receive years of trouble free service.

INSTALLATION–Location: The pumps should be mounted on a solid base plate, preferably of metal, which in turn should be anchored to a shelf, the floor, or to other machinery. To save time and inconvenience position the pump to provide easy access to the bearing oilers and glass oiler.

CONNECTIONS: Pump openings are standard pipe thread. Care should be taken to use lines the same size as pump openings or larger if pumping distances are great. Restrictions such as undersized valves, street elbows, or extra elbows should be eliminated. Give the line a uniform slope to or away from pump (depending on whether vacuum or pressure) and place a drain cock at the low point. For ease of servicing use a union or hose with clamps near the pump. Using a hose rather than metal piping or tubing helps eliminate noise and vibration. Fittings and lines should be thoroughly cleaned before attaching to pump and for protection against scale and corrosion galvanized or brass fittings are recommended.

EXTRAS: A gauge and relief valve can be very useful. A gauge will show any loss in efficiency and help test for leaks. Where moderate vacuum or pressure is required, a relief valve will unload the pump so it will run cooler. In extremely dirty applications or on applications where the vapors in the surrounding atmosphere are destructive to the lubricating oil or are corrosive, provide an "oil bath" filter or cleaner.

LUBRICATION

Use of the correct oil and the proper amount of oil is important. Excessive lubrication rarely does as much harm as inadequate lubrication.

Gast AD220 Oil is available in convenient quart containers from the factory or through Gast stocking representatives. Order by part #AD220.

For installations in warm climates or where room temperatures are high, increase the viscosity equivalent to SAE 20. For installations below freezing, dilute oil with one-fourth or less kerosene. Reusing oil is not recommended.

Recommended Lubricating Oils

	SAE #10 For Ambients Below 100°F	SAE #20 For Ambients Above 100°F
GAST	AD220	
CITGO	C-310	C-320
GULF	Gulflube HD 10	Gulflube HD 20
HUMBLE	Encolube HDX 10	Encolube HDX 20
MOBIL	Delvac 1110	Delvac 1120
SHELL	Rotella 10	Rotella 20
*ARCO	Arco Fleet HD 10	Arco Fleet HD 20
*AMERICAN	Amoco 100 10	Amoco 100 20
*SUN	Sunfleet HP 10	Sunfleet HP 20
*TEXACO	URSA ED-10	URSA ED-20

*Changed since last printing.

These oils meet the MIL-L-2104B high detergent specifications.

OILER OPERATION: The AA930 siphon oiler does not pass all incoming air but rather just enough to create siphoning effect. This will cause a loss of about 1 inch Hg. at top vacuum but it will not affect the output of the pump when used as a compressor. Should the oil feed too fast or slow contact the factory giving explanation. This oiler is available with various siphon hole openings for different rates of oil feed. The bearings may be flushed with 5 - 10 drops of oil in bearing oilers at the time siphon oiler is refilled. Do not replace bearing oilers with grease cups or use grease in the pump.

SERVICING: Most failures to build up pressure or produce vacuum are due to leaks in connecting lines, a dirty filter or sluggish vanes. See "Cleaning" for care of filter and vanes which may stick in rotor slots due to lack of oil, too much oil or too heavy oil. If foreign particles are present in pump chamber, an experienced mechanic may remove the end plate opposite to the drive shaft end. This will permit the removal of the 4 sliding vanes for a thorough cleaning in a solvent and also provide accessibility to any particles which must be removed. The original body gaskets are onion skin being only .001" - .004" thick therefore replace accordingly. If thicker gaskets are used the pump efficiency will be greatly reduced.

CLEANING: Most pump trouble can be corrected by flushing rather than by taking apart. A noisy or inefficient pump is frequently nothing more serious than a vane(s) stuck in rotor slot due to excessive oiling or heavy oil. Remove inlet and outlet accessories and add a tablespoon of solvent slowly at the intake while unit is running. Recommended commercial solvents for air motors and lubricated pumps are "Loctite Safety Solvent, Inhibisol Safety Solvent, Dow Chemical Chlorothane, or Kerosene."

INSPECTION: Regular inspection may prevent expensive repairs. Occasionally examine shaft for side or end "play" by moving it manually while pump is idle. Do not be alarmed if pump temperature reaches 150-250°F. when running continuously. If pump or motor shows evidence of overheating or excessive noise, stop immediately for repairs. It is quickest and cheapest to remove pump from base and return it to the factory for repair. Try to have a spare pump on hand at all times for emergencies.

REF. NO.	DESCRIPTION	PART NO.	VACUUM PUMPS			COMPRESSORS		
			0240-V2B	0440-V2B	0740-V2	0240-P10B	0440-P11B	0740-P13
1	BODY	B2321B	1			1		
1	BODY	B1321C		1			1	
1	BODY	B1321D			1			1
2	END PLATE, DRIVE END	*AC690A	1	1		1	1	
2	END PLATE, DRIVE END	*AA502C			1			1
2A	END PLATE, DRIVE END	AC690	1	1		1	1	
2A	END PLATE, DRIVE END	AA502			1			1
3	END PLATE, DEAD END	AC690	1	1		1	1	
3	END PLATE, DEAD END	AA502			1			1
4	ROTOR AND SHAFT ASSEMBLY	AC686	1			1		
4	ROTOR AND SHAFT ASSEMBLY	AC689		1			1	
4	ROTOR AND SHAFT ASSEMBLY	AA506D			1			1
5	VANE	B2335	4			4		
5	VANE	B335G		4			4	
5	VANE	AA510C			4			4
6	BALL BEARING	AA37	2	2	2	2	2	2
7	SHAFT SEAL	*AA517A	1	1	1	1	1	1
7A	SHAFT SEAL	AA966B	1	1	1	1	1	1
8	BODY (SPACER) GASKET	B330	1	1	1	1	1	1
9	END CAP, DRIVE END	*AA519	1	1	1	1	1	1
10	END CAP, DEAD END	*AM307		1	1	1	1	1
10A	END CAP, DEAD END	AE790	1	1	1	1	1	1
11	END CAP GASKET	*AA46	2	2	2	2	2	2
11A	END CAP, GASKET	AE791	1	1	1	1	1	1
12	BEARING OILER BODY	AA10	2	2	2	2	2	2
13	BEARING OILER CAP	AA11B	2	2	2	2	2	2
14	SIPHON OILER ASSEMBLY	AA930B	1	1				
14	SIPHON OILER ASSEMBLY	AA930C			1			
14	SIPHON OILER ASSEMBLY	AA930F				1	1	1
15	COVER	AD100A	1	1	1	1	1	1
16	GASKET	AA932	1	1	1	1	1	1
17	WICK	AA934	1	1	1	1	1	1
18	GLASS JAR	AA935A	1	1	1	1	1	1
19	CONNECTOR	AA936B	1	1				
19	CONNECTOR	AA936C			1			
19	CONNECTOR	AA936F				1	1	1
20	COUPLING (½ x ½)	AE541A	1	1	1	1	1	1
23	INTAKE FILTER ASSEMBLY	B343B				1	1	1
24	BODY	B397				2	2	2
25	FILTER FELT	B344A				1	1	1
26	END CAP	AA730				1	1	1
26A	RIVET STUD	B378						
27	MUFFLER AND OIL TRAP ASSEMBLY	V425C	1	1				
28	COVER	AV427	1	1				
27	MUFFLER AND OIL TRAP ASSEMBLY	V525			1			
28	COVER AND ELBOW ASSEMBLY	AV528			1			
29	COVER GASKET	B62A	1	1	1			
30	SILENCING TUBE	B346A	1	1	2			
31	JAR	AA125	1	1	1			
32	FELT SUPPORT	B345A	1	1	1			
25	FILTER FELT	B344A	2	2	2			

OPTIONAL ACCESSORIES (NOT ILLUSTRATED)

	INTAKE FILTER	V400C	1	1	
	COVER	AV402C	1	1	
	INTAKE FILTER	V500D			1
	COVER	AV502D			1
	COVER GASKET	B62A	1	1	1
	JAR	AA125	1	1	1
	INSTRUCTION LABEL	A8678	1	1	1
	INNER FILTER ASSEMBLY	B343B	1	1	1
	BODY	B355B	1	1	1
	FILTER FELTS	B344A	2	2	2
	END CAPS	AA730	1	1	1
	RIVET STUD	B378	1	1	1

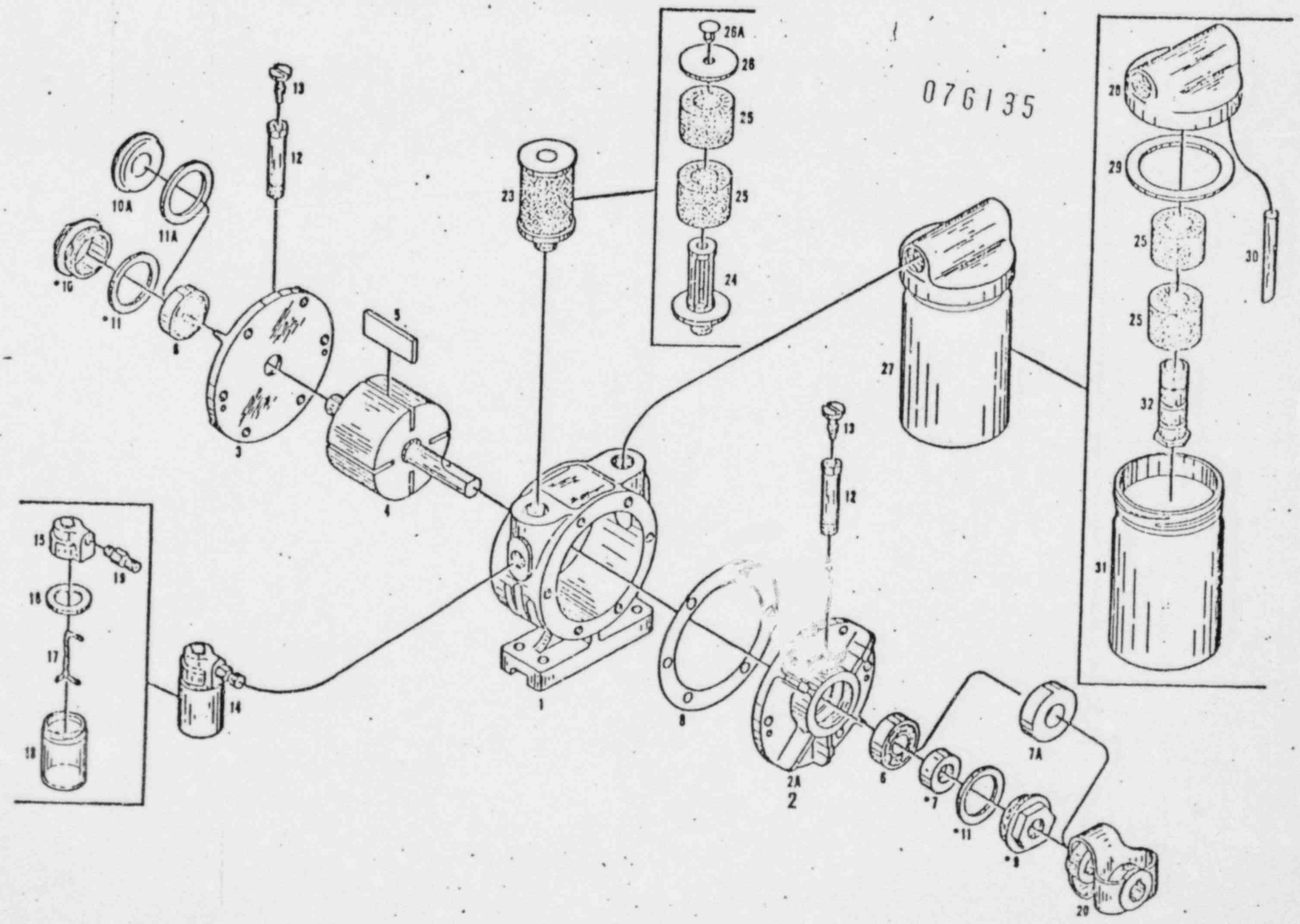
TO REPAIR 0240 PUMP, ORDER REPAIR KIT CONSISTS OF ITEMS 5, 6, 7, 7A, 8, 11, 11A, 16, 17 & 25	K224
TO REPAIR 0440 PUMP, ORDER REPAIR KIT CONSISTS OF ITEMS 5, 6, 7, 7A, 8, 11, 11A, 16, 17 & 25	K226
TO REPAIR 0740 PUMPS, ORDER REPAIR KIT CONSISTS OF ITEMS 5, 6, 7, 7A, 8, 11, 11A, 16, 17 & 25	K228

*Used only in units prior to serial 71-140357.

076133

PRICE LIST VACUUM PUMP # 0440 - 4-18-73

Ref. No.	Part Name	Quantity Required	Net Prices
1	Body	1	$17.83
2	End Plate, drive end	1	8.09
3	End Plate, dead end	1	8.09
4	Rotor & Shaft Assembly	1	18.19
*5	Vane	4	.91 ea.
*6	Ball Bearing	2	4.65 ea.
*7A & 7	Shaft Seal	1	1.61
*8	Body, Spacer Gasket	1	.09
9	End Cap, drive end	1	1.61
10	End Cap, dead end	1	1.02
*11A&11	End Cap Gasket	2	1.09 ea.
12	Bearing Oiler Body	2	1.05 ea.
13	Bearing Oiler Cap	2	.71 ea.
14	Siphon Oiler Assembly	1	5.06
15	Cover	1	3.85
*16	Gasket	1	.09
*17	Wick	1	.09
18	Glass Jar	1	.41
19	Connector	1	1.22
20	Coupling, 1/2 X 1/2	1	8.09
--	Coupling, 1/2 X 5/8	1	8.09
*25	Filter Felt	2	.20 ea.
27	Muffler, Oil Trap Assembly	1	9.11
28	Cover	1	5.65
29	Cover Gasket	1	.19
30	Silencing Tube	1	.81
31	Jar	1	.56
32	Felt Support	1	2.02
* --	Repair Kit, contains parts marked with *		15.61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AMERICAN *Vacuum* SEAM TESTER

AMERICAN PIPE & STEEL CORPORATION
2201 W. COMMONWEALTH AVE.
ALHAMBRA, CALIFORNIA
TELEPHONE ATlantic 9-4383
TELEPHONE CUmberland 3-2181

PRICES

Sheet No.: 1226-4
Date: Nov. 15, 1971

FOB: Alhambra, California

Terms: Net 30 days

UNIT COMPLETE (shipped in 2 hinged carrying cases) INCLUDING:

1 Power Plant (either gasoline or electric motor)
1 Vacuum Pump
1 Base for Power Plant and Vacuum Pump
6 ft. Hose
1 Standard Inspection Box, including all necessary valves and guages (specify model desired)

Gasoline motor driven unit, complete	$ 386.00
Electric motor driven unit, complete(110V)	386.00

INSPECTION BOX ONLY:

Series A-100 to A-400, inclusive	$ 80.00
Series A-500 and A-600 (special)	Quotation on request

REPLACEMENT PARTS:

Rubber Hose	$ .75 ~~.70~~ per ft.
Hose Fittings	1.00 ea.
Sponge Rubber Gaskets	
A-100, A-200, A-300	10.53
A-400	~~10.00~~ 25.13
Vacuum Pump	126.00
Pressure Guage, 0-15 psi, 2" dial	8.53
Glass	
A-100	7.33
A-200, A-300, A-400	5.75
3-way Cock with Handle	7.50
Contact Cement	3.44 per pt.
Silicone Sealant	9.12 a tube

EXPORT SHIPMENTS: Add $15.00 service charge to total order.
Shipping classification - 2

DELIVERY: A-100 thru A-400 Inspection Box..... from stock
Special Inspection Box (A-500 and A-600)one week
Complete Tester ..... one week

Orders subject to American Pipe & Steel Terms and Conditions of Sale
Prices subject to change without notice

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Complete Tester ..... one week

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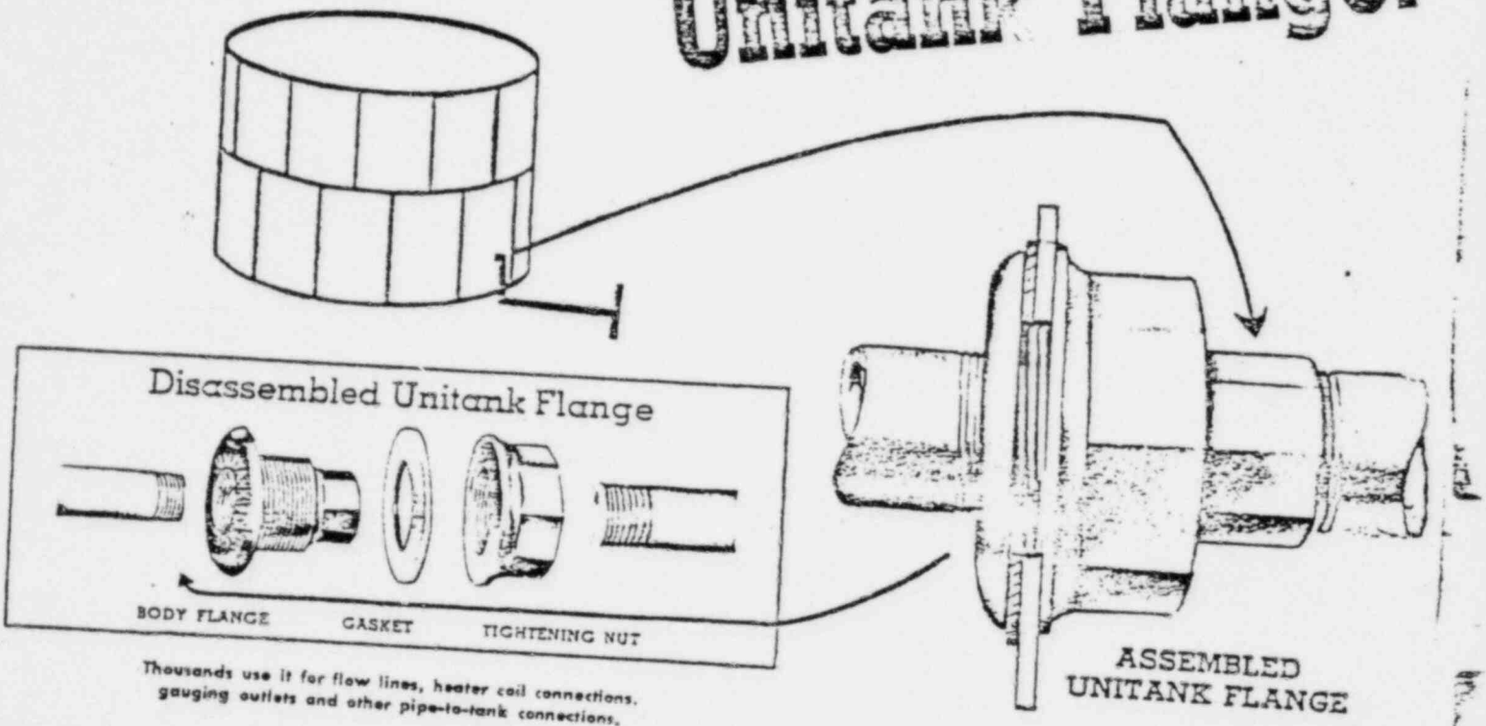
NOW - a dependable

Pipe-to-Tank Connection in Minutes

AMERICAN Unitank Flange!



Thousands use it for flow lines, heater coil connections, gauging outlets and other pipe-to-tank connections.

Easy to install! A 6" flange can be installed in three minutes after the hole is cut. Simply insert the flange from inside the tank and tighten the locking nut on the outside.

Safe! The American Unitank Flange is a machined, malleable casting with a tensile strength in excess of 50,000 pounds. It withstands shock, and won't crack or break when tightened or struck. Its strength provides exceptional safety in case of accident or fire.

Pipe can fit inside and outside the tank! Since the American Unitank Flange is threaded inside both ends, you can attach pipe to the one fitting inside and outside the tank.

Use as a Union! When you leave the nut loose on the pipe, you can attach a pipe or a nipple to the flange by rotating the body until the pipe is tight and then tightening the nut. Reverse this process to loosen pipe.

Leak-proof! Because you place a single gasket on the body against the cellar and inside the tank, you get a perfect seal that is leak proof and cannot blow out. The tightening nut (or outside piece) has a left hand thread. Thus when you tighten the pipe in the flange, you also tend to tighten the flange in the tank.

Long-lasting! Guaranteed! Dependably constructed to last a lifetime, American Unitank Flanges are fully guaranteed by the American Pipe & Steel Corporation.

CONVENIENT SIZES									
Pipe Size	½"	¾"	1"	1½"	2"	3"	4"	6"	8"
Wt.	1 lb.	1½ lb.	1¾ lb.	4 lb.	5 lb.	8½ lb.	12¾ lb.	21 lb.	37 lb.

Order AMERICAN Unitank Flanges Today!

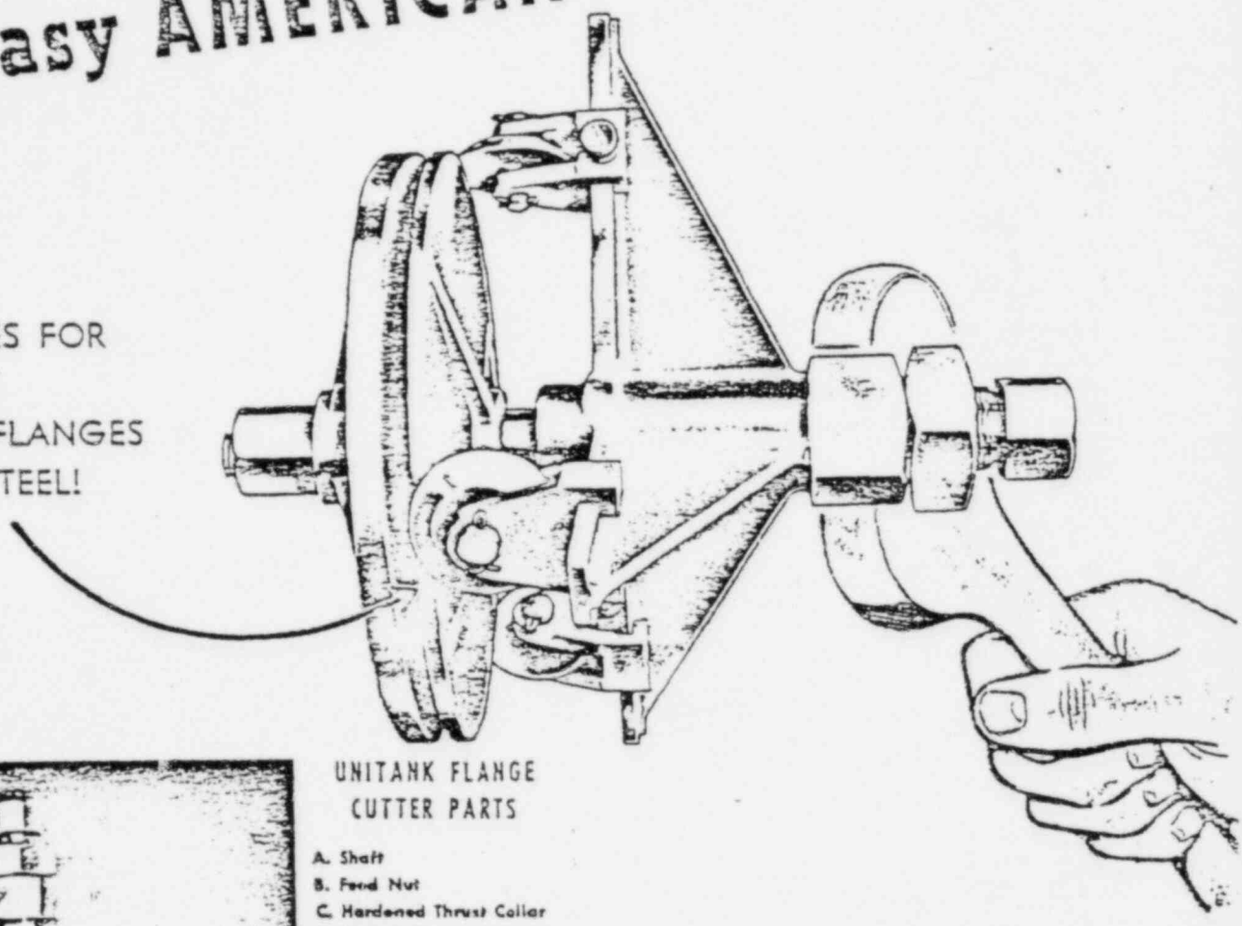
AMERICAN PIPE & STEEL CORPORATION

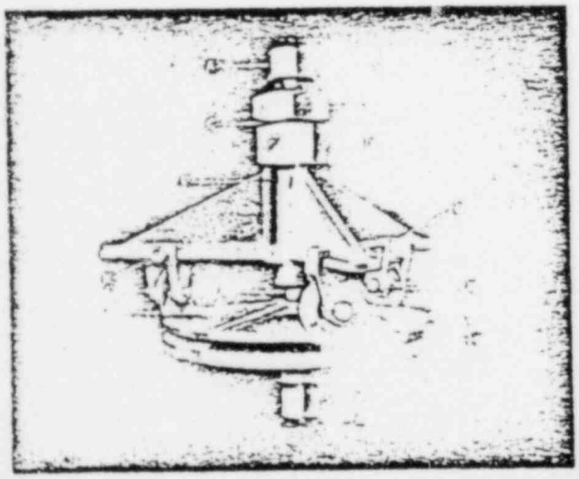
2201 W. COMMONWEALTH AVENUE, ALHAMBRA, CALIF.

ALHAMBRA PHONE ATlantic 9-4383 • LOS ANGELES PHONE CUmberland 3-2181

CUT A HOLE IN STEEL SHEETS like you'd open a tin can . . . with fast, easy AMERICAN UNITANK FLANGE CUTTER!

CUTS HOLES FOR
2", 3", 4", 6"
DIAMETER FLANGES
IN SHEET STEEL!





UNITANK FLANGE
CUTTER PARTS

A. Shaft
B. Feed Nut
C. Hardened Thrust Collar
D. Wrench Grip
E. Cutter Body
F. Housing Track
G. Cutter Wheel Housing
H. Set Screw
I. Cutter Wheel Pin
J. Cutter Wheel
K. Cotter Pin
L. Guide Disc
M. Backing Disc
N. Clamping Nut

American Unitank Flange Cutter cuts openings in tanks for Unitank Flanges or other purposes easily, quickly, safely, efficiently.

The American Unitank Flange Cutter operates on a simple shearing can-opener principle. It cuts tank walls (or sheet steel). Guide and backing plates for discs are provided for each size of flange from 2" to 6". You can change them quickly and easily.

How to Use the AMERICAN Unitank Flange Cutter

First, drill or punch in the tank (or sheet steel) a small hole large enough to accommodate cutter shaft (A). Threaded cutter shaft is inserted and backing disc (M) is bolted onto shaft from inside the tank. Outside cutter wheels (J), guided by outside guide disc (L), shear accurate hole of desired diameter when motivated by wrench applied to outside cutting shaft wrench grip (D). IMPORTANT: Wrench must be turned CLOCKWISE ONLY.

Note: To insure the long, efficient service built into every unit, be sure to have all working parts of the cutter tight, in proper contact and well lubricated. The finished face of the discs must be kept clean when in use to insure a tight grip on the tank sheet.

AMERICAN Unitank Flange PRICES

AMERICAN PIPE & STEEL CORPORATION
2201 W. COMMONWEALTH AVE.
ALHAMBRA, CALIFORNIA
TELEPHONE ATlantic 9-4383
TELEPHONE CUmberland 3-2181

Sheet No.: 1201-6
Date: Jan. 2, 1963

FOB: Alhambra, California

Terms: net 30 days

Size	Weight in Pounds	Price	Additional for Gasket	Additional for Galvanizing
1/2"	1	$ 2.80	$0.13	$0.40
3/4"	1-1/2	3.47	.14	.40
1"	1-3/4	4.13	.16	.40
~~1-1/2"~~	~~4~~	~~7.00~~	~~.20~~	~~.60~~
2"	5	9.06	.40	.60
3"	8-1/2	12.56	.46	1.00
4"	12-3/4	21.06	.54	1.50
6"	21	29.58	.80	2.00
8"	37	128.66	2.00	3.33

EXPORT SHIPMENTS: Add $15.00 service charge to total of order

Shipping Classification: 4

Delivery: Immediate, from stock

Orders subject to American Pipe & Steel Terms and Conditions of Sale

Prices subject to change without notice

06-139

AMERICAN

UNITANK
FLANGE

AMERICAN PIPE & STEEL CORPORATION
2201 W. COMMONWEALTH AVE.
ALHAMBRA, CALIFORNIA
TELEPHONE ATlantic 9-4383
TELEPHONE CUmberland 3-2181

CUTTER PRICES

Sheet No.: 1202-2
Date: Jan. 2, 1963

FOB: Alhambra, California

Terms: net 30 days

CUTTER COMPLETE	Price Each
For 2" to 6" flanges (weight 38 lbs.)	$275.00

CUTTER PARTS			
Part Name	Part Number	Quantity Required	Price Each
Shaft	A	1	$ 23.00
Feed Nut	B	1	5.50
Hardened Thrust Collar	C	1	5.50
Cutter Body	E	1	59.00
Cutter Wheel Housing	G	3	16.00
Set Screw	H	3	.55
Cutter Wheel Pin	I	3	1.75
Cutter Wheel	J	3	10.00
Cotter Pin	K	6	.10
2" Guide Disc	L-2	1	9.00
3" Guide Disc	L-3	1	11.25
4" Guide Disc	L-4	1	12.25
6" Guide Disc	L-6	1	13.25
2" Backing Disc	M-2	1	9.75
3" Backing Disc	M-3	1	11.75
4" Backing Disc	M-4	1	13.50
6" Backing Disc	M-6	1	15.00
Clamping Nut	N	1	4.50

EXPORT SHIPMENTS: Add $15.00 service charge to total of order

Shipping Classification: 3

Delivery: from stock

Orders subject to American Pipe & Steel Terms and Conditions of Sale

Prices subject to change without notice

07640

FMMacri, P-14-230, Last

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

File SFP

GWO: 5208

DT-FPL-053

Plant: Big Rock Point

Date: 10/8/73

Description: Fuel Pool Liner - Decontamination Procedure Revision

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
X		RRDeWitt/JSRang			X	WECooke	
X		CJHaygard/GHMatheney			X	RIWilson	
	X	~~CJHartman~~/CPAbel			X	MCPatel	
	X	NClark					

From: FMMacri

Comments Requested by: 10/15/73

Documents:	Previous Review Rev	Date
Suntac Memo CUTP-6		
Spec 34481-BCP.402, Revision 1	0	9/10/73

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to F. M. Macri.

Is this change to a Type A container in compliance with DOT regulations?
Is the max surface radiation dose rate specified in Paragraph 4.11 consistent with Type A container?

7610151

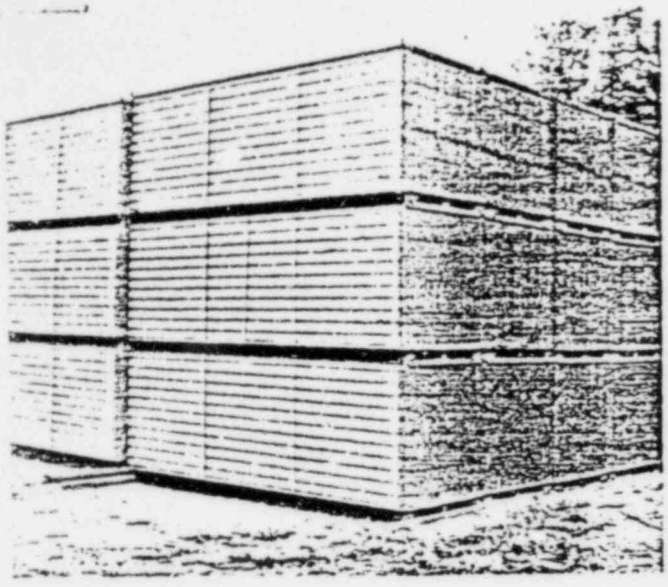
To Be Filled in by Engineering Coordinator

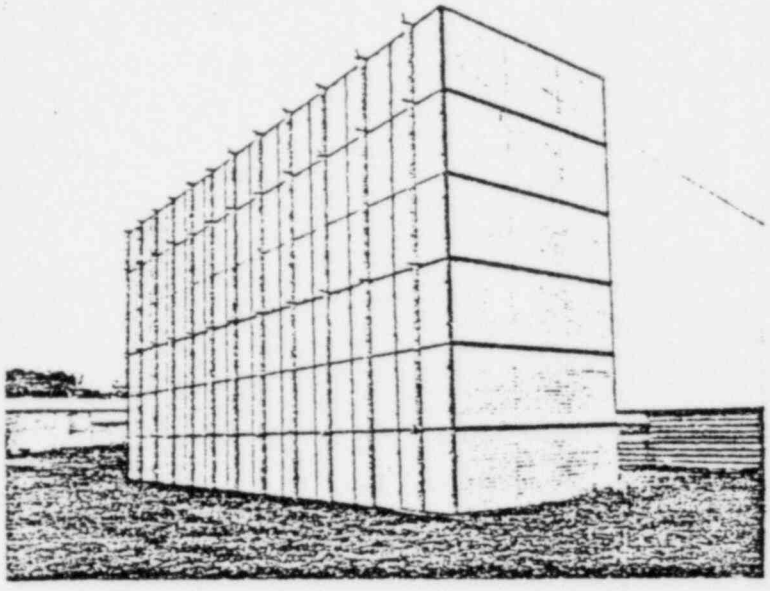
Date Document Received From Originator: 10/5/73

Date Comments Transmitted to Originator: ________

Review Complete: ________

Date: ________



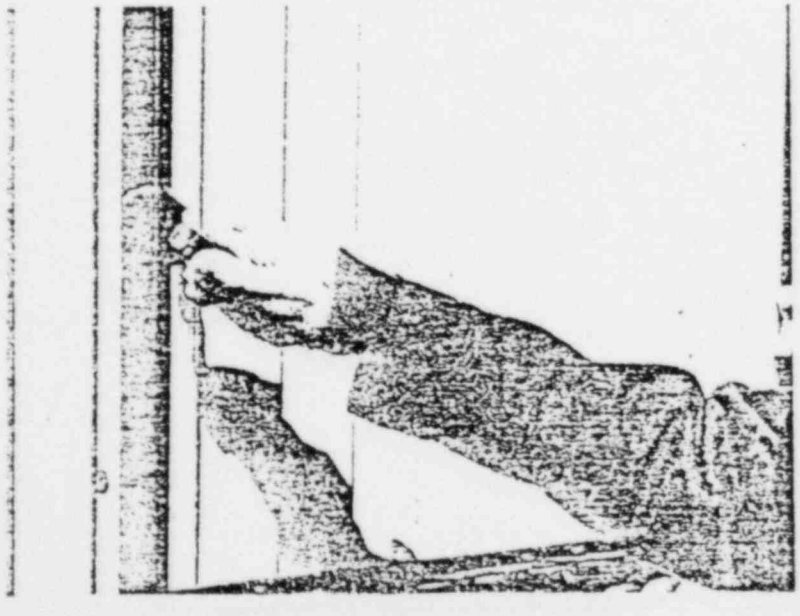


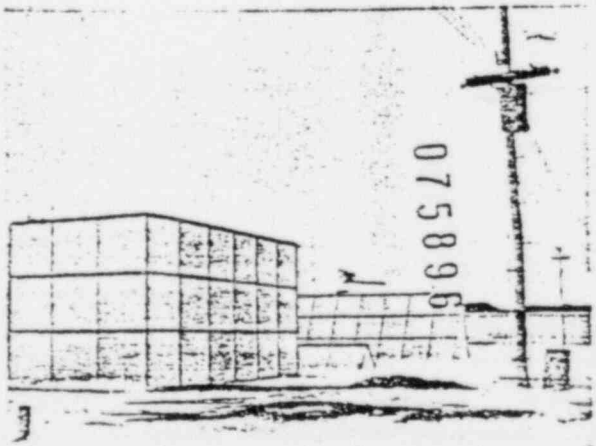
Kelly Klosure Systems

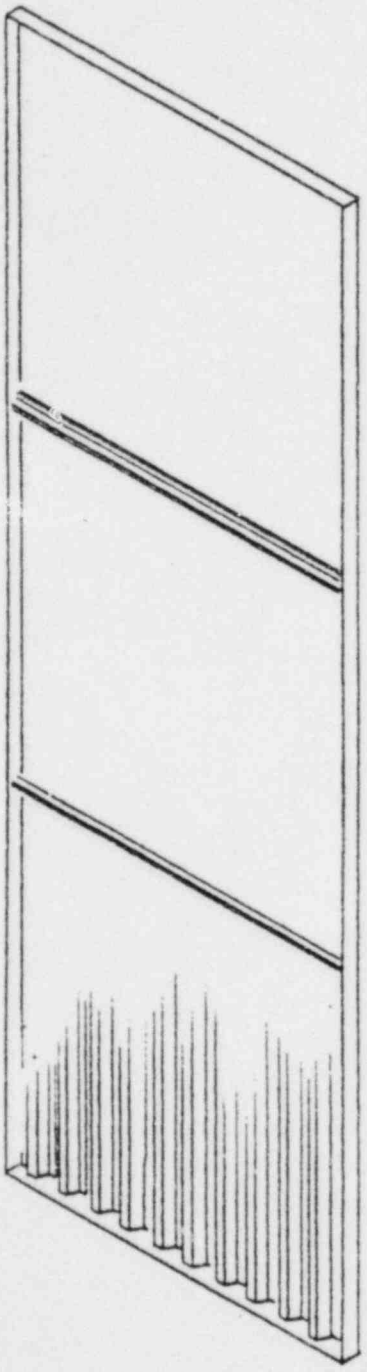
Box 443 402-727-1344

FREMONT, NEBRASKA 68025

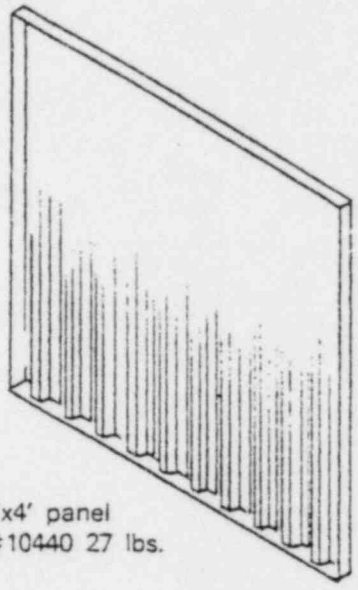
PARTS LIST



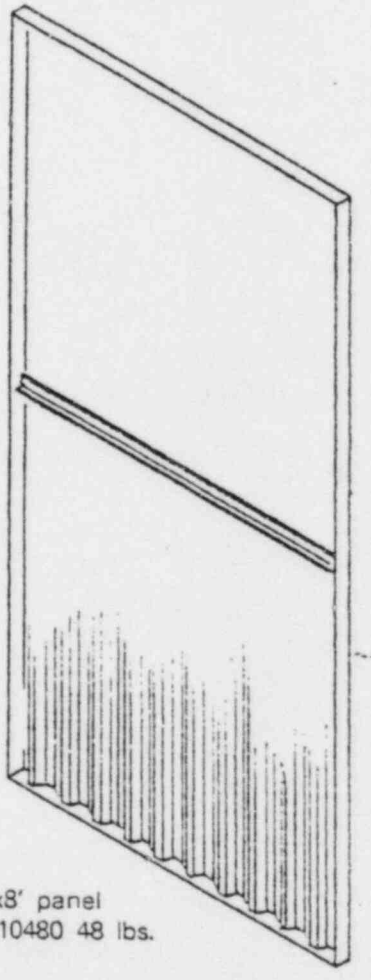




4'x12' panel
#14120 65 lbs.



4'x4' panel
#10440 27 lbs.



4'x8' panel
#10480 48 lbs.

Kelly Klosure panels are made up of a 1½" x 1½" x 1/8" angle iron frame with a 7 oz. highly translucent fiberglass filler. The glass is fastened to the frame with up to 54 cushioned rivets. All Kelly Klosure panels are completely interchangeable and used in structures as side walls or roof sections. Noncombustible panels are also available; for Part No. insert numeral 8 in front of Part No.

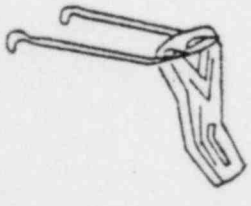
#44120

120° angle when attached to panels develops an A frame type closure. When using this 120° angle with different combinations of panels irregular shapes can be made to fit your needs.

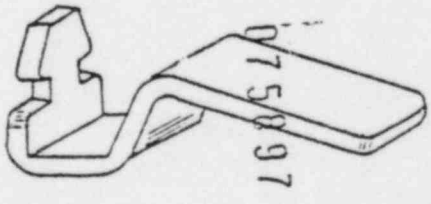
Angle made of 1 ½" x 1 ½" x 1/8" angle iron which permits making of all 90° turns; and adaption of roof section to side wall. Angle available in 4' lengths (#20490) and 12' lengths (#21290).

#22000

Stakes made of high carbon steel to prevent bending and breakage. Stakes to be used to anchor 2x4 plate that system should set on and serve as guy wire anchors giving necessary rigidity to withstand high winds.

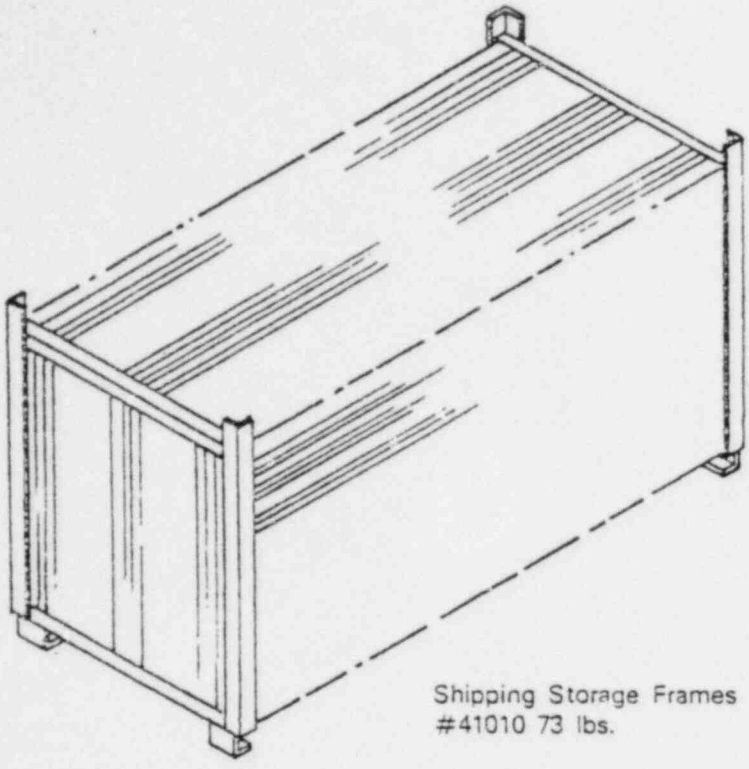


A one piece waler clamp used for attaching lumber to panels where spans and heights exceed 12'. Available for 2"x6" (#42600) and 2"x8" (#42800) nominal lumber.



#22010

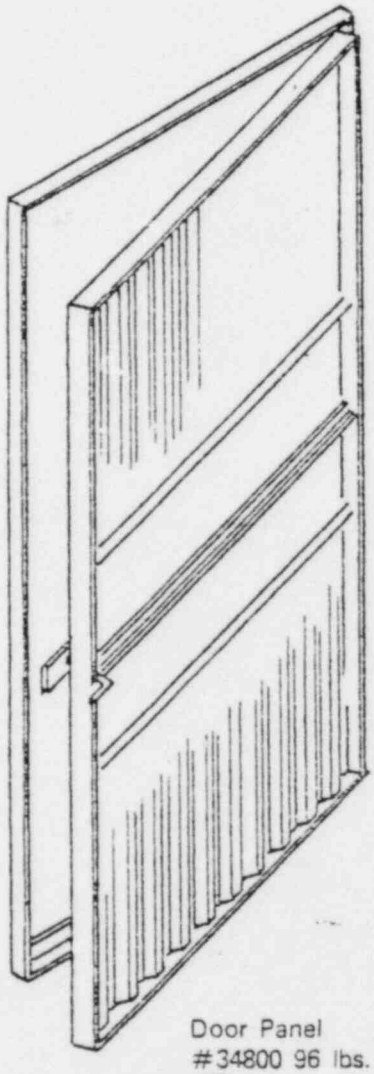
Constructed of 7/8" x 3/16" hot roll strip. It is heat treated and zinc plated for long life and protection from rust and corrosion. Keys lock side-wall, roof panels, and erection angles together.



Shipping Storage Frames
#41010 73 lbs.

Angle iron frame work designed specifically to encompass up to 30 panels. Panels in frames can easily be moved by crane or forklift for convenient, economical handling and storage.

Same steel frame and fiberglass we offer you on the other standard panels is also seen in the Kelly door panel. It is designed to fit in where you need it. With the addition of a 4'x4' panel the door will easily replace any 4'x12' panel.



Door Panel
#34800 96 lbs.

KELLY CLOSURE SYSTEMS

Box 443
Fremont, Nebr. 68025

DISTRIBUTED BY

KELLY KLOSURE SYSTEMS

LET US CHALLENGE YOUR WEATHER

402-727-1344
P.O. BOX 443
FREMONT, NEBRASKA 68025

August 13, 1973

Attn: Mr. E. D. Baldi
Suntac Nuclear Corp.
1528 Walnut Street
Philadelphia, Pa. 19102

Re. Suntac P.O. 34491-2020-3

Subject: Confirmation of conformance with the above P.O.

Dear Sir:

Kelly Klosure hereby acknowledges full conformance with Suntac P.O. 34491-2020-3. Kelly Klosure will provide Class I noncombustible, heavy duty corrugated, translucent fiberglass reinforced panels. All panels shall be complete with steel angle frames and necessary hardware. All materials to be properly packaged and shipped on August 14, 1973.

Respectfully yours,

Robert L. Voss
V.P. of Marketing

ek

075899

3488/-2020-3-3.2

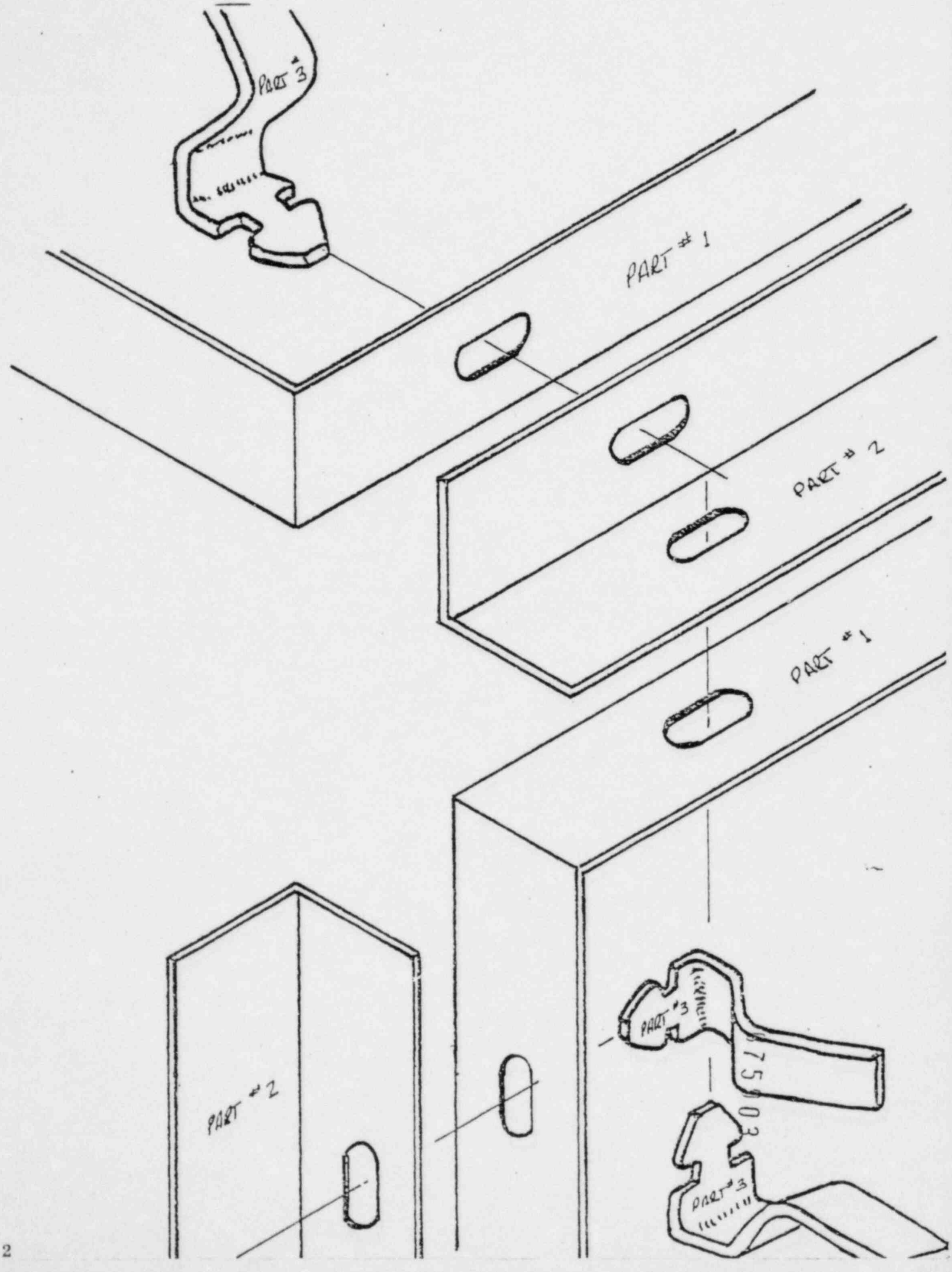
KELLY KLOSURE

SET-UP MANUAL

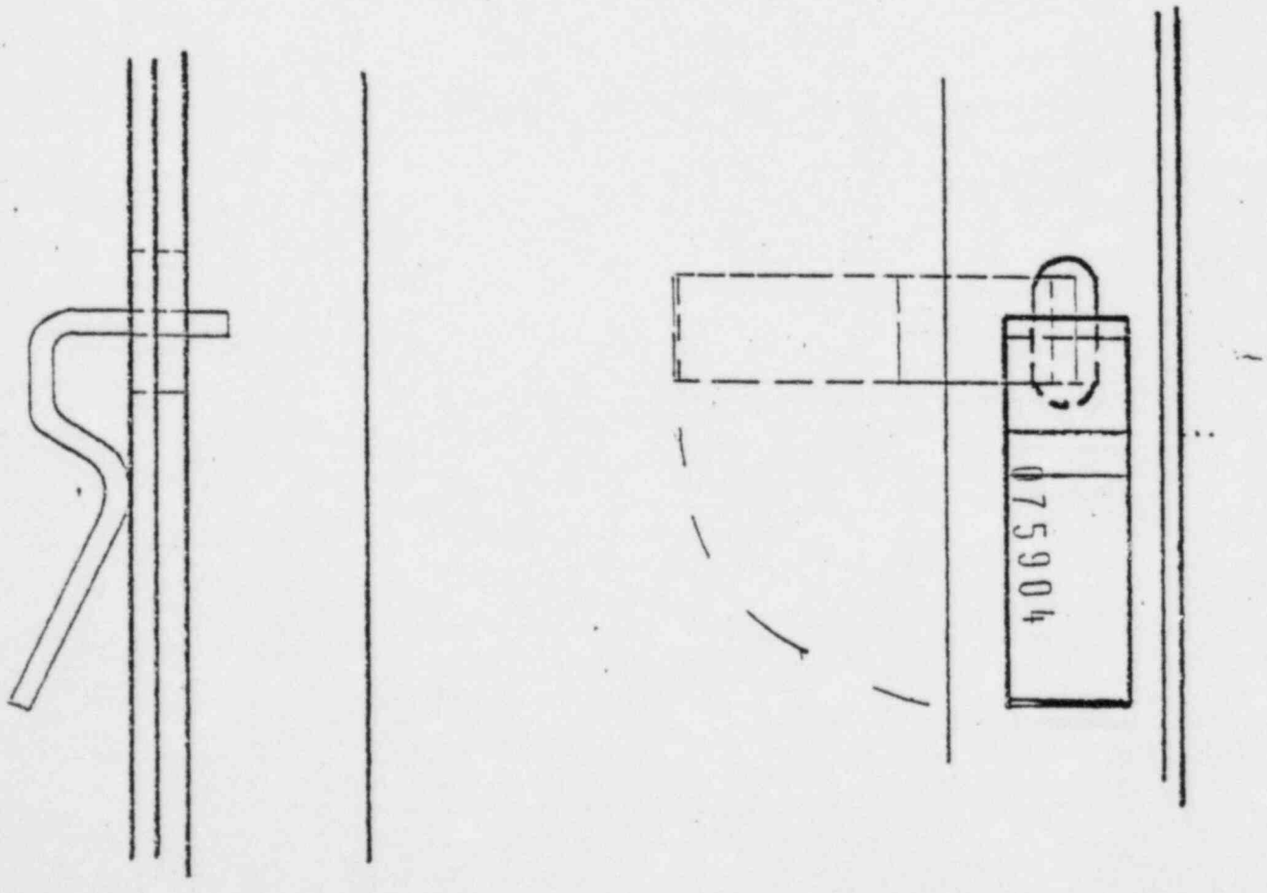
075900

KELLY KLOSURE SYSTEMS
P.O. BOX 443 (402) 727-1344
FREMONT, NEBRASKA 68025

INDEX

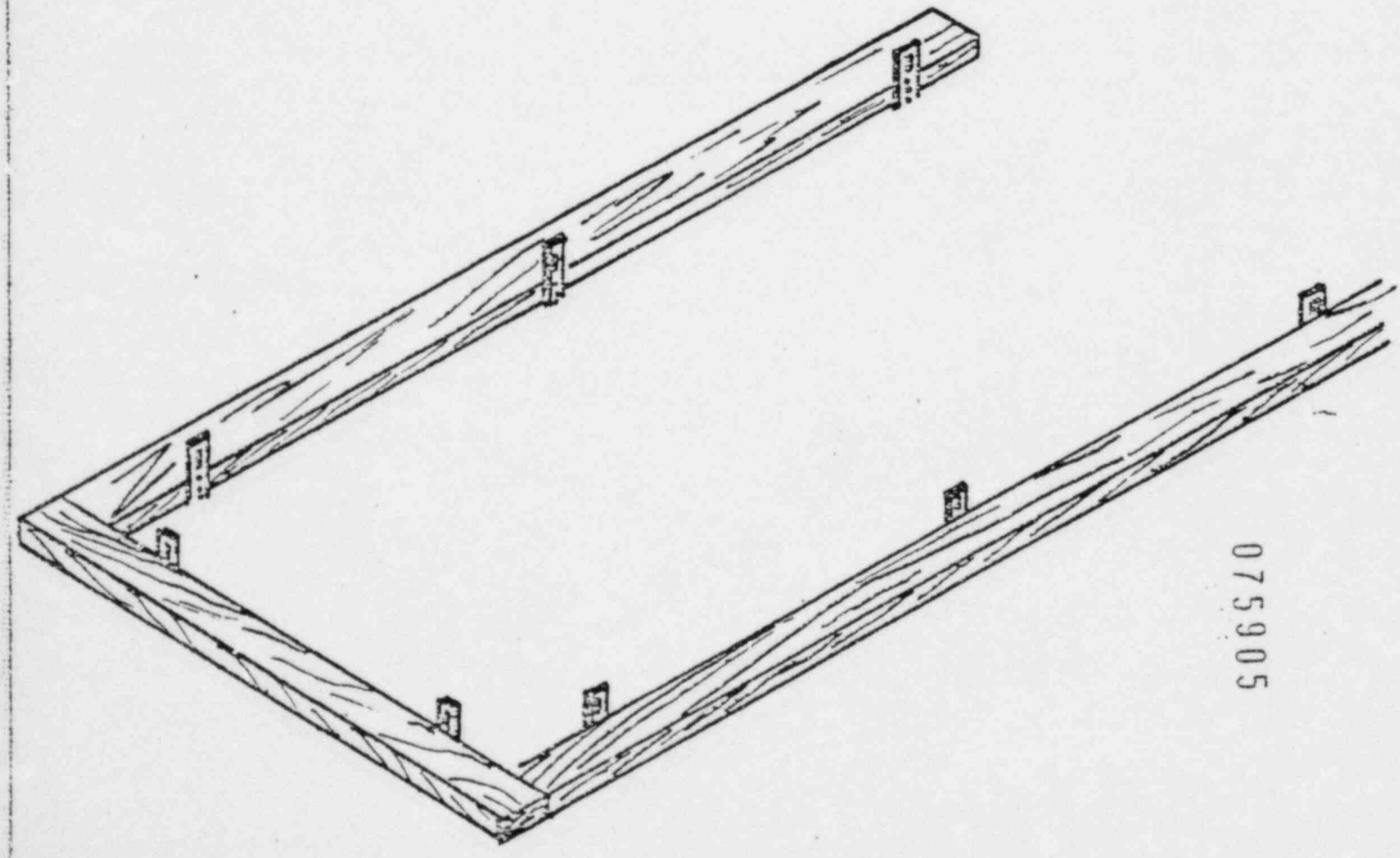

PART # 3
PART # 1
PART # 2
PART # 1
PART # 2
PART #3
PART #3

or exterior of the shelter. The circumstances under which the enclosure is erected will determine which is the most practical. Kelly panels are completely interchangeable and require no sorting during erection. Parts #2 (Page 2) are 90° erection angles and are attached to parts #1 via Kelly Keys Parts #3. Each panel requires 8 Keys for maximum strength. THE USE OF A STANDARD DRIFT PIN IN ASSEMBLY PERFECTLY ALIGNES ALL KEY HOLES AND NOT ONLY SAVES TIME BUT HOLDS THE PANEL SECURE UNTIL THE KEYS ARE LOCKED. The drift pin and a common claw hammer are the only tools necessary to erect the Kelly Klosure System.



Step #2

The drawing below shows a 2x4 base plate (not furnished) on which to erect the shelter. The base plate should be placed far enough either side of the working wall that scaffold and materials can be used on one side of the shelter and yet leave ample room for access through the other side for striking masonry. It is possible to set the enclosure up on frozen ground for thawing so that excavation can be done within the shelter without moving the setup. The 2x4 base plate should be staked on one side only, preferably inside. It must be as straight as possible both horizontally and vertically. Voids in terrain can be over come by blocking up under the base plate. The base plate should be staked at 8' intervals and stakes should be nailed to plates using 16d scaffold nails. Terrain and soil conditions should determine stake length needed and also the need to stake at closer intervals as the case may be.



075905

Step #3

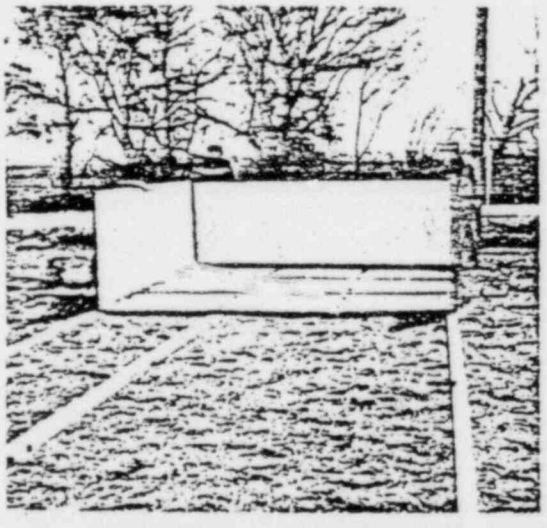
After 2x4 plates have been secured, enclosure erection may begin. In most enclosure erection, panels must be nailed to the base plate. 16d scaffold nails work well for this purpose and snugly secure panels when clinched over in the holes provided. (Exceptions—The Kelly Klosure "A" frame and lean-to shelters require no base plates.)

KELLY KLOSURE ERECTION

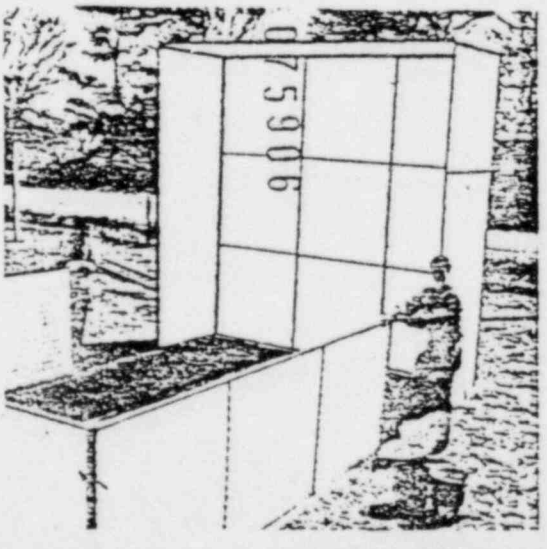
It would be impossible to cover each and every type of shelter which can be erected from K K panels, however we will cover the most commonly used. Keep in mind that all contractors and construction jobs differ. A method of erection may work fine in one case and not so well in another. (Greatly depending on equipment available, terrain, and prevailing wind conditions.)

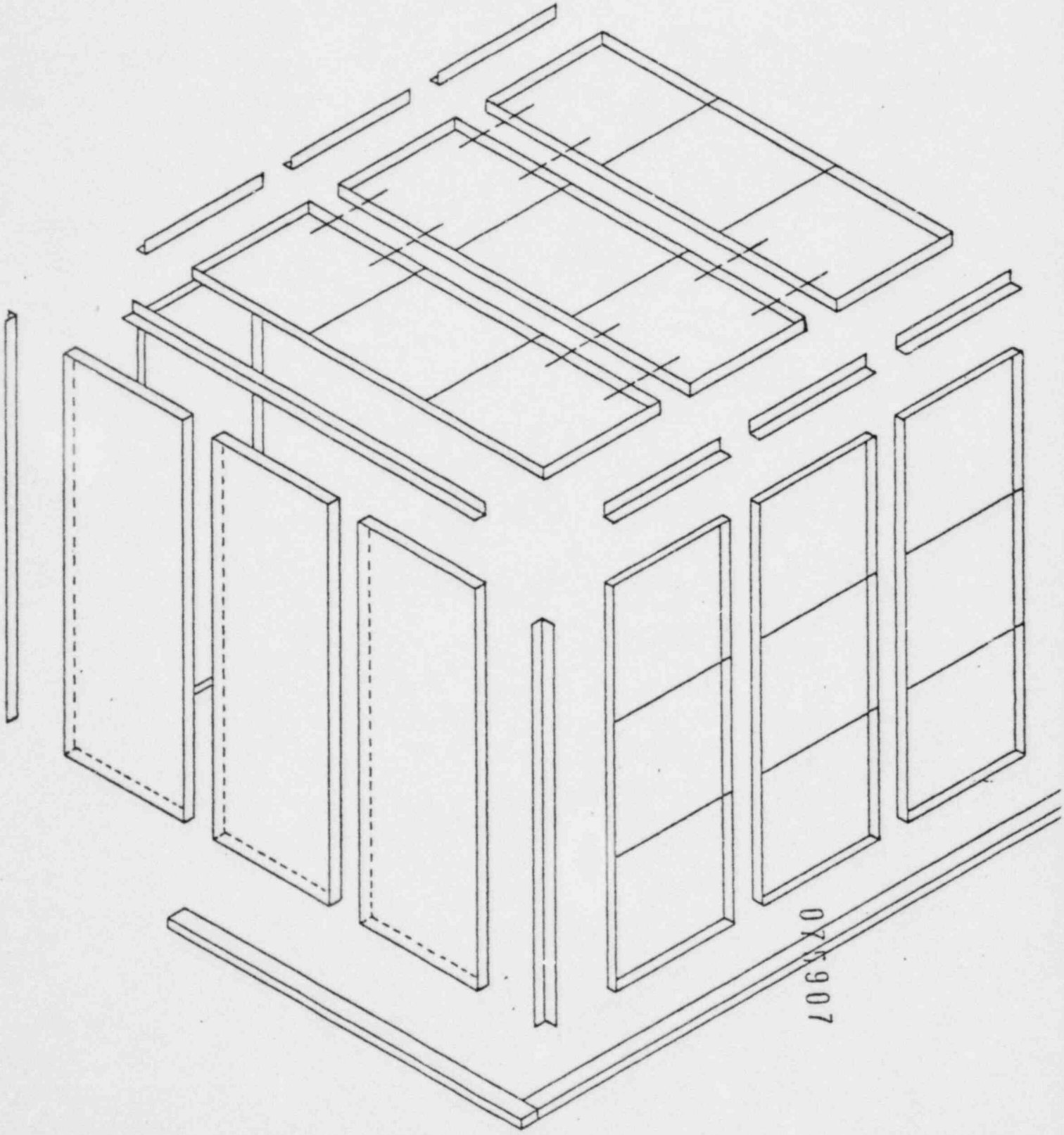
1. 12'x12'x12' Structure

Using 4 men, we recommend assembly of the entire end on the ground then simply tilting it up and fastening it to the base plate. Note the 3 panels laying down are keyed on the inside while side wall and roof panels are keyed from the exterior.



End section is in place and men are ready to stand up the next three panels. It is not necessary to climb out on the roof if only the roof panel keys shown in drawing page 6 are used.




07-907

2. 8'x12'x8' Structure

Ideal for job site shack, equipment and material storage and numerous other uses. 8' side walls are created by simply stacking two panels horizontally and attaching roof sections as previously instructed.

3. Attaching to Steel Scaffold

Panels may be adapted to scaffold by attaching a 2x4 plate at any desired height and nailing panels to the plate. Placing the panels with the locking side inward permits all keying to be done from the scaffold. Occasionally panels should be wired to the scaffold to aid in their support. Panels may be arranged standing upright, laying down, or a combination of the two.

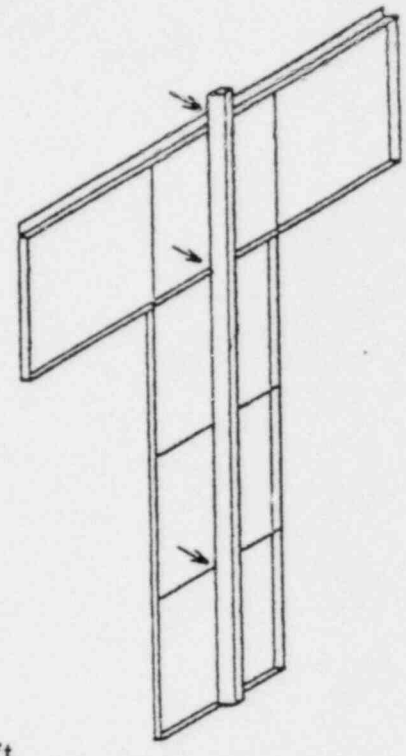
4. Heights 16' and Greater

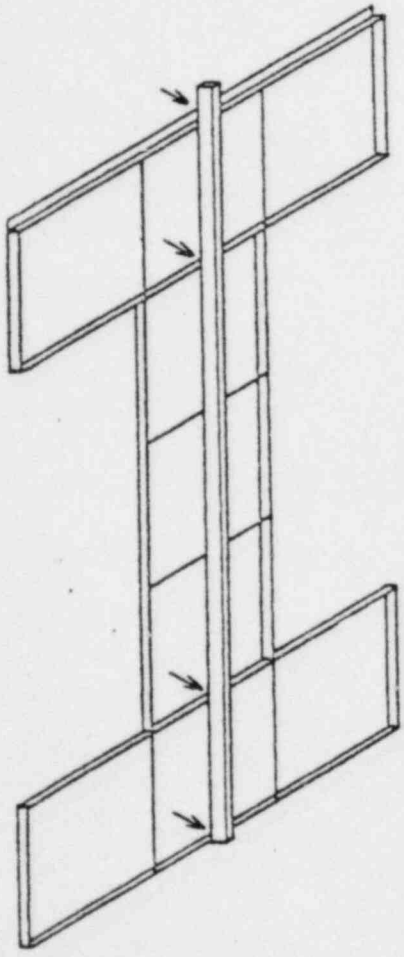
In cases where a 16', 20', or 24' high enclosure is desired, it is best to set up the scaffold and stock it with needed masonry materials before erecting the enclosure. Once this has been done attach the panels directly to the one side of the scaffold as in the previous instructions. After all panels are attached up to the desired height, the roof and opposite or free standing wall may be erected.

Drawings page 8 show the best methods of arranging the panels for the free standing wall in a 16', 20' and 24' enclosure. In each case the panels are assembled on the ground as pictured and a 2x6 or 2x8 stiffback is locked into place with Kelly stiffback clamps. The sections are then raised into place. Roof sections should be assembled with the key holes to the interior of the enclosure to permit keying from the scaffold itself. Each section of the free standing wall should be leaned against the scaffold to permit attaching the roof sections directly from the scaffold. After the roof panels are attached to the free standing wall the entire assembly is simply slid into place and the roof panels attached to the opposite Kelly wall.

16' Panel Arrangement Right

Wall section should be erected as shown and roof sections fastened into place before inserting the two missing panels. Note: 12' Junction Angle is attached prior to standing in place.

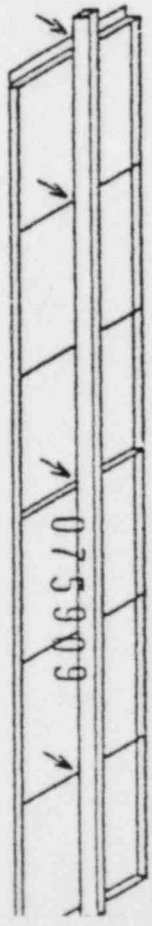




20' Panel Arrangement Left

Wall section should be erected as shown and roof sections fastened into place before inserting the two missing panels.

Note: 12' Junction Angle is attached prior to standing in place.



24' Panel Arrangement Right

Wall section should be erected as shown and the roof section fastened into place.

Note: 4' Junction Angle is attached prior to standing in place.

Note: ⟶ Indicates placement of stiffback clamp.

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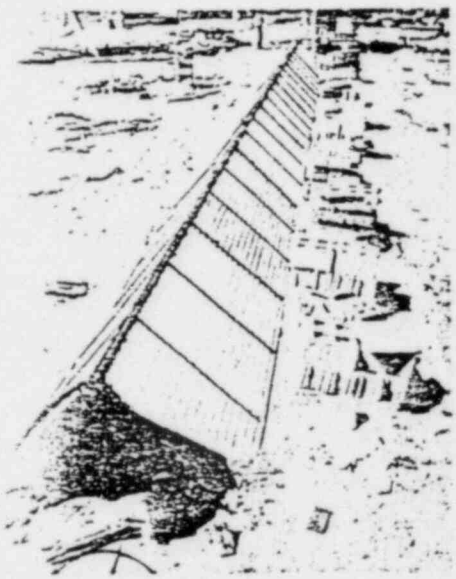
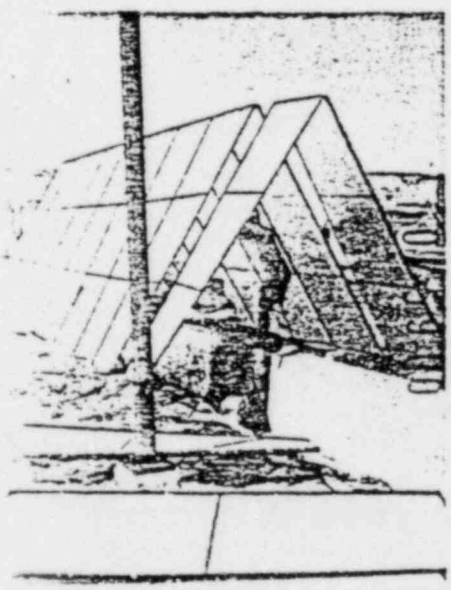
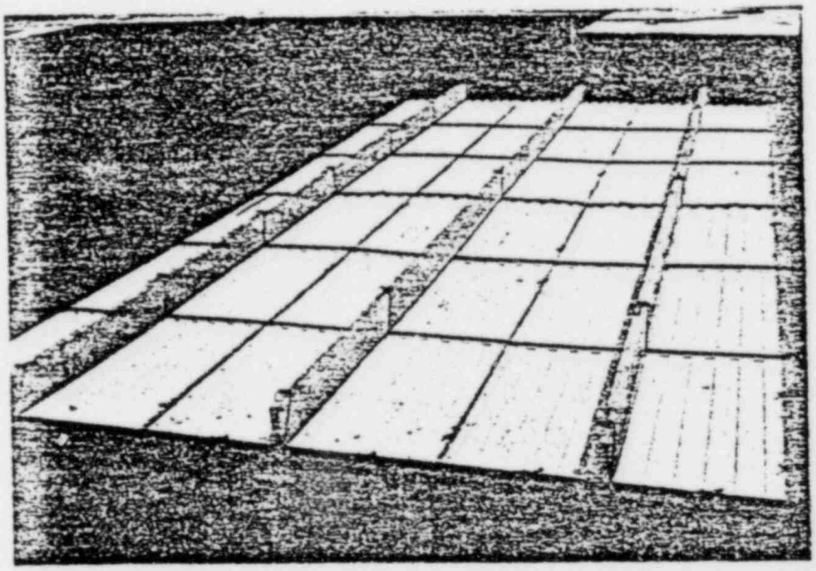


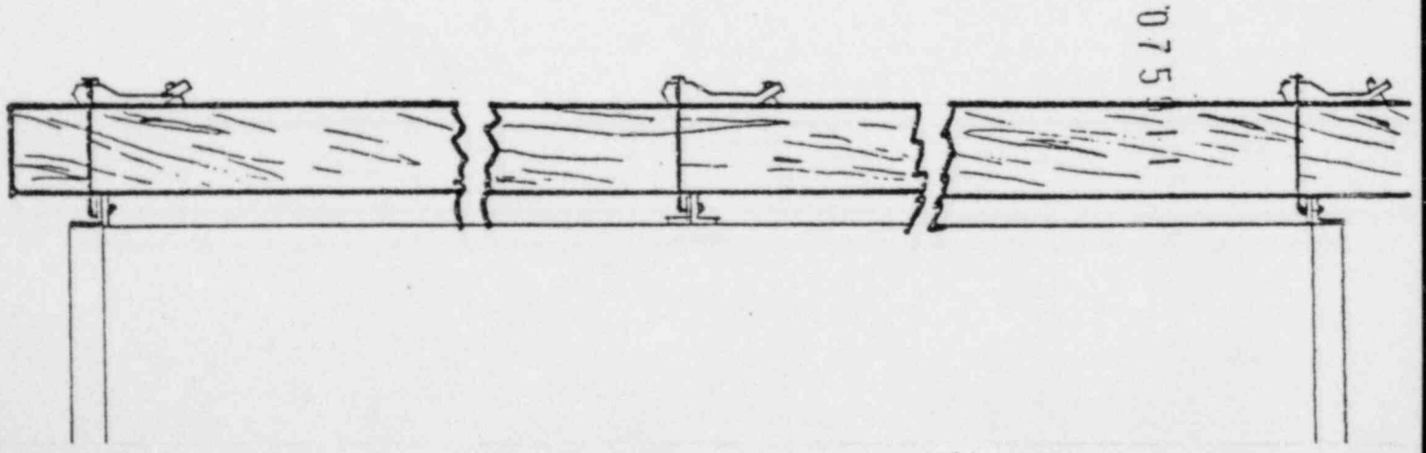


"A" frame erection may begin immediately because no base plate is needed. Simply join two panels on the ground with the 120° angle and lift into place. Panels may be set up with the erection holes to the interior or exterior of the shelter, however we prefer the latter which simplifies the anchoring of the enclosure. Kelly Stakes driven at the exterior base of the "A" frame and wired to the bottom erection holes of the panels serve as an adequate anchor. End of "A" frame shelters can be closed in with Kelly panels, tarpaulins, or visqueen.

Use of Stiffbacks

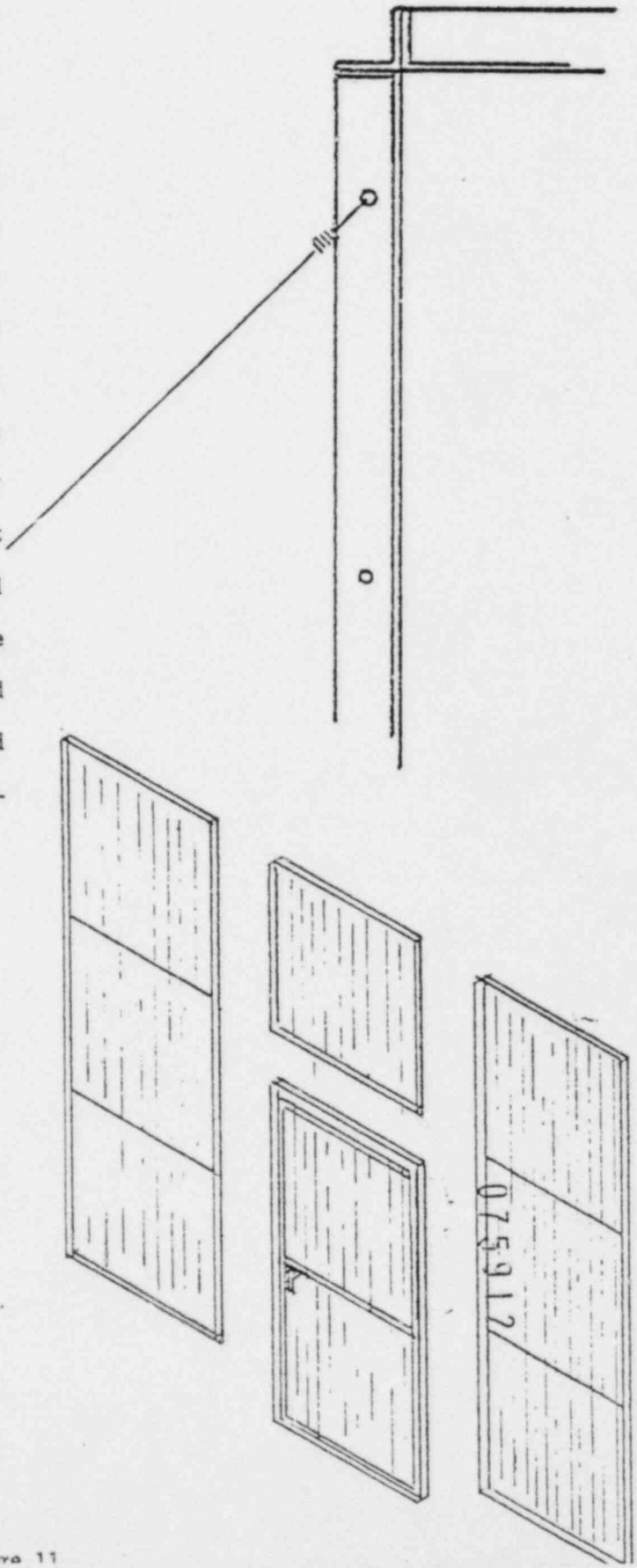
Picture and drawing this page show the Kelly stiffback clamp assembly used on a 2x6 framing member. This is required when heights and widths exceeding 12' are desired and to counteract extremely heavy wind and snow loads. This particular component of the system is available for use on 2x6 or 2x8 lumber depending on the span desired.





Guy and Bracing Instructions (Note Drawing)

The life expectancy of a Kelly Klosure System is highly dependent on how well it is anchored down after each erection. We recommend guying every third panel with #9 wire at a 45° angle to a 20" Kelly stake which is provided. Under certain ground and soil conditions (such as on frozen ground) the 20" stake may not be adequate to properly anchor your System. If this is the case, improvise with something that is adequate such as a steel fence post. The same applies to how often a System is guyed. If the enclosure height is 16' or greater, don't hesitate to add additional guy wires. Since sudden winds are unpredictable we recommend this practice at all times. 2x4 and 2x6 braces can also be used in lieu of this method by simply nailing the member to a vertical stiff-back and staking it to the ground.



Kelly Access Door

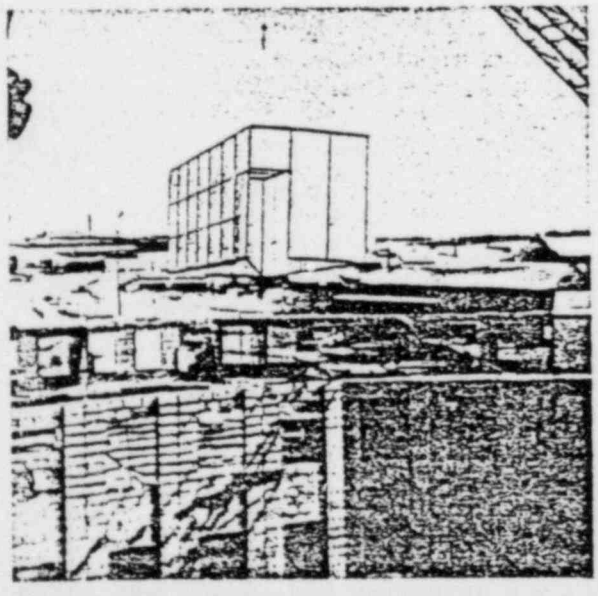
The Kelly Klosure walk-in door shown to the right is designed so that it may be installed at any opportune place in lieu of any 4'x12' standard panel. The 4'x4' panel is used above the door and at each bottom right hand corner of this panel is a pivot hole into which the top pivot pin on the door section is to be inserted.

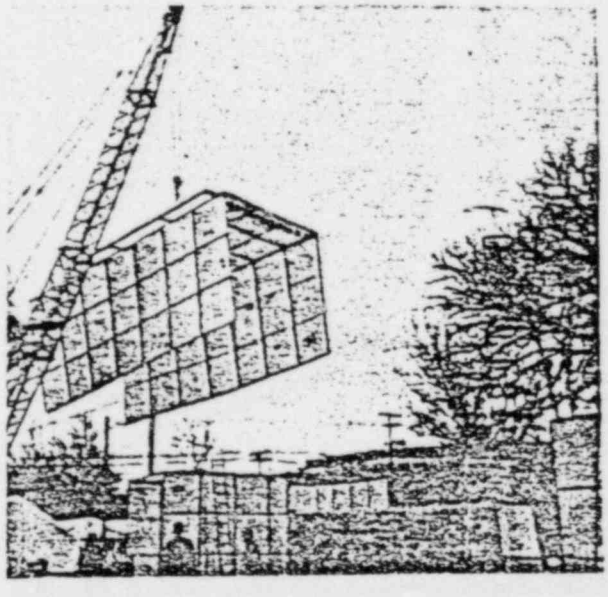
The bottom hinge section (2) is a separate part and must be bolted to the adjacent sidewall panel.

Note—The 4'x4' panel need not be used exclusively with the door section. It serves well as an access for feeding materials and is useful in numerous other applications.

Gang Moves

Whenever possible Kelly panels should be moved in mass section by an overhead crane. By incorporating this method Kelly panels need never be disassembled until the job is completed. Shown below are two methods of flying your enclosure. At the left the enclosure has been stiffened up with 2x4s and simply cabled off at the four corners. The method shown on the right incorporates the Kelly Gang spreader, available through Kelly Klosure or easily fabricated by the contractor on the job. Quick hookups permit the gang spreader to be attached and disconnected to an enclosure setup through holes provided in the panels. The gang spreader also permits larger sections to be moved and eliminates stress on the panels.





DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

Big Rock Point Plant
FMMacri, P-14-230, Last

GWO: 5909

Plant: Big Rock Point
Fuel Pool Liner Installation

File

Date: 7/24/73

Description: Procedure & Spec. Index

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	REDeWitt/JSRang			X	MCPatel	
	X	GSKeeley			X	RLWilson	
	X	JNWalstrum			X	WPCooke	
	X	CJHartman/CRAbel					
	X	CQHills					
	X	WClark					

From: FMMacri

Comments Requested by: 7/31/73

Documents:	Previous Review Rev	Previous Review Date
Suntac Procedures & Specifications Index		

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to FMMacri.

0761 69

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: 7/20/73

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

SUNTAC NUCLEAR CORPORATION

PHILADELPHIA, PENNSYLVANIA 19102

SPECIFICATIONS & PROCEDURES
CONTRACT NO. 34491

SERIES	ISSUE DATE	REVISION NUMBER
100		
200		
300		
400		
500		
600		
700		
800		

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

CONTRACT SPECIFICATION SCHEDULE

SPEC. NO.	DESCRIPTION	PREP. BY.	DATE SCH.	DATE ACT.	C.C.Co. APPR. F/A	CLIENT APPR.	ISSUE DATE AFC	REV.
	S-100							
34491-2400-102	Q. A. Program Requirements non Nuclear Matl. - Parts - Components and Services	WLP	7/3	7/3	7/16			
34491-2400-109	Vacuum Box Leak Testing	WLP	7/3	7/5	7/15			
34491-2400-110	Dye Penetrant Testing	WLP	7/3	7/17	7/17			
34491-2400-111	Radiation Protection Control - Spent Fuel Pool Decontamination & Liner Installation	JTE	7/3	6/23	7/16			
	S-300							
34491-4200-301	Welding Stainless Steel	RTG	7/3	7/2	7/16			
34491-4200-302	Welding Stainless Steel to Carbon Steel	RTG	7/3	7/2	7/16			
34491-4200-303	Repair Welding Stainless Steel	RTG	7/3	7/2	7/16			
34491-4200-304	Metal Arc Welding - Stainless Steel	RTG	7/3	7/3	7/16			
34491-4200-305	Metal Arc Welding - Stainless Steel to Carbon Steel	RTG	7/3	7/3	7/16			
34491-4200-306	Welding Carbon Steel to Carbon Steel	RTG	7/20					

14970

SUNTAC NUCLEAR CORPORATION
PHILADELPHIA, PENNSYLVANIA 19102

CONTRACT PROCEDURES SCHEDULE Page 2

PROC. NO.	DESCRIPTION	PREP. BY.	DATE SCH.	DATE ACT.	C.C.Co. APPR.	CLIENT APPR.	ISSUE DATE	REV.
	P-100 (Work Packages)							
34491-CWP-151	Install Enclosure	WLP	7/20					
34491-CWP-152	Decontaminate Spent Fuel Pool	WLP	8/3					
34491-CWP-153	Installation of Lead & Monitor System	WLP	7/20					
34491-CWP-154	Concrete Pour in Spent Fuel Pool	WLP	7/20					
34491-155	Prefabricate & Install in Spent Fuel Pool	WLP	7/20					
34491-156	Fabricate & Install Support Platform for Ventilation System	WLD	7/20					
34491-157	Remove Enclosure	WLP	9/14					
	P-400							
34491-RCP-401	Radiation Protection Control (NUS)	VOID						
34491-RCP-402	Decontamination Procedure (NUS)		7/20					
							07/6172	

CONTRACT PROCEDURES SCHEDULE

PROC. NO.	DESCRIPTION	PREP. BY.	DATE SCH.	DATE ACT.	C.C.Co. APPR.	CLIENT APPR.	ISSUE DATE	REV.
	P-500							
34491-QAP-501	General Job Q. A. Procedure							
	.A - Design Control							
	B - Receiving Handling Control							
	C - Material Certification and Identification							
	D - Documentation Control							
	E - Non Conforming Material							
	F - Cleanliness and Cleaning							
	P-600							
34491-QAP-601.A	Welding Procedure and Welding Qualification Procedure							

0701 13

CONTRACT PROCEDURES SCHEDULE

PROC. NO.	DESCRIPTION	PREP. BY.	DATE SCH.	DATE ACT.	C.C.Co. APPR. F/A	CLIENT APPR.	ISSUE DATE A/C.	REV.
	P-700							
34491-QAP-701.A	NDE Personnel Qualification	WLP	7/13	7/3	7/14			
	P-1000							
34491-QAP-1001.A	Hydro Test Procedure	WLP	7/3					

0761174

Consumers Power Company

R. W. Nacri

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

CWO: 7209

Plant: Big Rock Point Plant

Date: 4/18/73

Description: Fuel Pool Liner Installation

File: Review Records

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
*		R. B. DeWitt	JR 5/2/73	*		C. A. Hunt	
	*	D. A. Bixel		*		J. W. Walstrum	
					*	W. P. Cooke	
				*		R. L. Wilson	
				*		V. M. Battles	

From: F. M. Nacri

Comments Requested by: May 2, 1973

Documents:	Previous Review Rev	Date
Specification 10, 211-C-1 Rev A		
* C132 Rev A		
* C172 Rev A ✓		
* C171 Rev 2	Rev 1	3/30/73
Drawings 10, 211-C-1 Thru C-3		
* 10211-SK-C-1 Thru C-3		

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to M. C. Patel.

INFORMATION COPY
676831

To Be Filled in by Originator:

Date Document Received From Originator: _____

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

[redacted]Eberi, P-14-226

[redacted]Ebney, P-21-313

May 2, 1973

Big Rock Point Spent Fuel
Pool Liner Installation

Emag 80-73

[redacted]DeWitt, P-21-307
[redacted]Hobbie, P-21-121
[redacted]Vetal, P-14-299

File 30168 - [redacted]

The following comments are offered on Specification 10, Z11-C-1, Rev A, C-132, Rev A, C-172, Rev A, C-171, Rev 2, Drawings 10, Z11-C-1 through C-3 and SK-C-1 through C-3.

Specification C-172, Revision A

Item 6.0 - This specification still refers to a nuclear finish which should be clarified. Also, the ASTM designations of A167 or A240 in 6.1a and A276 or A479 in 6.1b should be selected to avoid the confusion as to which one will be followed in practice.

Item 8.7 - A specification is needed on the care of welding electrodes, ie, baking, etc, if Process (b) in Item 8.7 is used.

Item 9.0 - Since large plates are going to be installed that have been shop welded, a provision should be added to Section 9.0 that will require an additional 100% dye-penetrant inspection of these welds after plate erection. This will [redacted] any possible damage that could occur to the weld material during shipping and handling of the large cumbersome plates.

It should also be a requirement that all test reports be signed by the examiner indicating legibly the examiner and his work affiliation.

An ASTM designation should be specified. The same holds true in Item 5.0 of C-171 as specified above in Item 6.0 of C-172.

Item 9.2 - Should not 9.2 read "At the completion of erection and liquid penetrant testing..." rather than "...halim testing...?"

Specification No 10, Z11-C-171

Item 5.1 - Its a poor way to specify the nuclear finish "and given a nuclear finish as produced by the Allaghany Ludlum Steel Corporation or equal." An ASTM designation should be specified. The same holds true in Item 5.0 of C-171 as specified in Item 6.0 of C-172 above.

Item 8.7 - As indicated above in Item 8.7 of Specification C-172, a specification is needed on the care of electrodes, ie, baking, etc, if Process (b) in Item 8.7 is used.

Missouri, P-1-[illegible]
Big Rock Point Spent Fuel
Pool Liner Installation
May 2, 1973

Drawing C-2, Revision 2

Detail 3, C-2 - Indicates there may be a weld along the west wall of of the skimmer trough but its not apparent on Drawing C-2.

Drawing C-1, Revision 2

What is the basis for establishing the maximum gap between liner plate and the existing wall of 1/2"? If a 1/2" gap is existant around the entire periphery, will the welds and wall withstand the bowing effect exerted by the water pressure?

Drawing C-2, Revision 2

Detail 12, C-2 - (1) What is the interface between the concrete slab and the existing 4" drain line?

(2) Where the tubes exit, the 4" drain pipe they should be welded to the cover plate so that the water tight integrity of the drain line is maintained. Any accumulation of water in the drain pipe can then be drained off to a convenient location which should be provided

Detail 15, C-2 - Its not evident how the leak tight seal is formed between the SS lined trough and the trash screen and skimmer duct.

Drawing C-3, Revision A

1. Please show a detail illustrating how the stiffback clamps are fastened to the L's.

2. Illustrate also what is required to remove the roof panels once they have been fastened to the side panels.

3. Illustrate also how the L's are attached to the roof and wall panels.

4. Please indicate how the base plate is attached to existing floor.

[illegible], P-19-225

[illegible], P-71-313

May 21, 1973

NDE Liquid Penetrant Examination
Procedure C171-5-1

Engg 20-73

[illegible]witt, P-21-307

File X0160 E29

The following recommendations are made in review of Rhoter Corporation Liquid Penetrant Examination Procedure C171-5-1:

Item I

It is recommended that the standards stated in Section 7.1.2 specifying material acceptance criteria also be utilized as the weld acceptance standards replacing those stated in Section 7.2. These standards are slightly tighter for rounded indications which can cause leaks during the hydrotest and operation of the pool system in the absence of the helium leak check.

Additional Recommendation

It is also recommended that a section be added on cleaning to insure all foreign dye-penetrant materials are properly removed.

Consumers Power Company

DOCUMENT TRANSMITTAL
Generating Plant Modifications Department

GWO: 5909

Date: 5/14/73

Plant: Big Rock Point
Spent Fuel Pool Liner

File: Review Records

Description: Vendor Weld Exam Procedure

Review	Information	Separate Copy to:	Initial & Date	Review	Information	Routing Copy to:	Initial & Date
	X	R. B. DeWitt	JSE 5/18/73		X	W. P. Cooke	
	X	D. A. Bixel			X	R. L. Wilson	
	X	A. J. Birkle			X	M. C. Patel	

From: F. M. Macri

Comments Requested by: 5/18/73

Documents:	Previous Review Rev	Previous Review Date
Liq Penetrant Exam Procedure - C171-5-1		

Please review the above document(s) and initial this form to indicate completion of review. Return this form and transmit comments to F. M. Macri.

INFORMATION COPY 676809

To Be Filled in by Engineering Coordinator

Date Document Received From Originator: _____

Date Comments Transmitted to Originator: _____

Review Complete: _____

Date: _____

FCD-30165

COMMENTS ON HOOVER CORPORATION LIQUID PENETRANT EXAMINATION

1. I recommend using the material acceptance standards in 7.1.2 for the weld acceptance standards in 7.2. These standards are slightly tighter for rounded indications. These rounded indications can cause leaks and difficulty during hydrotest and operation in the absence of the leak check.

2. I recommend adding a section on cleaning at the end of this procedure to insure all foreign dye-penetrant materials are properly removed.

D. M. Noble

5/18/73

I sent in Memo stating same to M C Patel on 5/1.73

INFORMATION COPY

676810

10211-000-C171-S-1

INFORMATION COPY

APR 20 1973

DISTRIBUTION

	2
	E
	J
	1
	3
	R+1

5+ 3-73

VENDOR'S DRAWING REVIEW

1 X

5-3-73

CS

RRP

676811

ROUTER CORPORATION
ST. LOUIS, MISSOURI

QUALITY ASSURANCE PROGRAM

LIQUID PENETRANT EXAMINATION

DOCUMENT NO. QAP-10.2
DATE March 1, 1973
REVISION
DATE
PAGE 1 OF 3
PREPARED BY
APPROVED BY

INFORMATION COPY

1. SCOPE

This document describes the procedure and acceptance standards for performing liquid penetrant examination in accordance with Section III, Paragraph IX-3600, of the ASME Boiler and Pressure Vessel Code.

2. DESCRIPTION

2.1 Color contrast dye penetrants will be used with the solvent removable or post emulsification methods. Unless otherwise specified, either method may be used.

2.2 Liquid penetrant examination is a method of nondestructive examination which provides for the detection of discontinuities open to the surface in ferrous and nonferrous materials which are non-porous. Typical discontinuities detectable by this method are porosity, slag, cracks, seams, cold shuts, and laminations.

2.3 A liquid dye penetrant is applied to the surface to be examined and allowed to enter openings. After the excess penetrant is removed, the developer is applied and is wetted or otherwise affected by the penetrant entrapped in the discontinuities. This increases the evidence of the discontinuities so that they may be seen.

3. PENETRANT MATERIALS

Color contrast dye penetrants contain a dye which is readily detectable to the unaided eye in artificial or natural light. Dye penetrant examination materials used on nickel based alloys or austenitic stainless steels are analyzed for sulphur content and total halogens in accordance with ASTM Standards D-129-64 and D-808-63. The residual amounts of total sulphur or halogens may not exceed 1% by weight. A certification of these tests for each penetrant material used, giving the batch numbers and test results, is maintained on file.

3.1 Type of Penetrant: Turco Products Dy-Chek Penetrant, Magnaflux Corp., "Spotcheck," Penetrant, Sherwin Inc. DUBL-Chek, DP-40, or a commercial equivalent.

3.2 Type of Penetrant Remover: Turco Products Dy-Chek Remover #3, and Magnaflux Corp., "Spotcheck," SKC-S Clearr, Sherwin Inc. DUBL-Chek DR-60 Remover, or a commercial equivalent.

676812

3.3 Type of Emulsifier: Turco Products Dy-Chek or Fluro-Chek Emulsifier; Magnaflux Corp., "Spotcheck." Sherwin Inc. DUBL-Chek, or a commercial equivalent.

3.4 Type of Developer: Turco Products Dy-Chek Developer, non-aqueous; Magnaflux Corp., "Spotcheck," SKD-S, Sherwin Inc., DUBL-Chek D-100, or a commerical equivalent.

4. SURFACE PREPARATION

4.1 General: Prior to liquid penetrant examination the surfaces to be examined and any adjacent areas within one inch of the test surface will be dry and free of any dirt, grease, lint, scale, welding flux, spatter, oil, or any extraneous matter that would obscure surface openings or otherwise interfere with the examination.

Before examination, the materials or parts may be cleaned by detergent cleaning, vapor degreasing, abrasive blasting, descaling solutions or solvents, such as those listed in 3.2.

4.2 Welds: As-welded surfaces, following the removal of slag, are considered suitable for liquid penetrant examination without grinding, provided the weld contour blends into the base metal without undercutting, and the contour and the surface finish of the weld cannot mask or be confused with any unacceptable discontinuities.

5. TEST PROCEDURE

5.1 Penetrant Application: The penetrant will be applied by dipping, brushing, or spraying. If the penetrant is applied by spraying with compressed air type apparatus, a filter will be placed at the air inlet to preclude contamination of the penetrant from oil, water, and dirt sediment that may have collected in lines. Penetration time is critical. When the temperature is between 60 to 125 degrees F., the penetration time will be a minimum of 10 minutes. The penetration time for temperature below 60 degrees or about 125 degrees F. will be determined in accordance with IX-3660 of Section III of the ASME Boiler and Presssure Vessel Code.

As a standard technique, the temperature of the surface or part to be examined, the liquid penetrant, the rinse, when used, and the developer will not be below 40 degrees F. nor above 125 degrees F. throughout the examination period. Local heating and cooling is permitted provided temperatures remain in the range of 40 degrees to 125 degrees F.

5.2 Removal of Excess Penetrant: Care will be exercised to limit the removal of penetrant from any defect to as little as possible. After allowing the penetrant to remain on the surface being tested for the length of time prescribed, the excess penetrant will be removed as follows:

5.2.1 Solvent Removable Method: As much excess penetrant as possible will be removed by wiping the surface thoroughly with a clean, dry cloth or absorbent paper when using solvent removable penetrants. On smooth surfaces, it is sometimes possible to wipe the surface sufficiently clean without the use of solvent. If any excess penetrant remains, it will be removed by wiping the surface with a clean cloth dampened with penetrant remover. Care will be exercised to limit the removal of penetrant from any discontinuities to as little as possible. Flushing the surface with any liquid following the application of the penetrant and prior to developing is prohibited.

5.2.2 Post Emulsification Method: The emulsifier will be applied to the area covered by the penetrant by spraying or dipping. This operation will be followed by the removal of the mixture of penetrant and emulsifier by swabbing with a clean cloth saturated with water or by spraying with water at a pressure less than 50 psi and a temperature less than 110 degrees F.

Emulsification time depends on surface roughness and the type of defects sought. It is the time necessary to remove all excess penetrant and will not exceed 5 minutes unless the procedure is qualified in accordance with IX-3660 of Section III of the ASME Boiler and Pressure Vessel Code.

5.3 Drying: The drying of test surfaces after the removal of excess penetrant will be accomplished by normal evaporation, by blotting with absorbent paper or clean lint-free cloths, or by forced warm air circulating in excess of normal ventilation in the examination area provided that the temperature of the surface being examined is not higher than 125 degrees F. and the air flow at the test surface is low enough to insure that no penetrant is removed from any discontinuity. A minimum period of 5 minutes will be allowed in order to insure that the cleaning solvents have evaporated prior to the application of the developer.

5.4 Developing: Liquid developer is a suspension of powder in a volatile solvent and will be applied by dipping or spraying. Care will be exercised in applying the non-aqueous wet developers. Insufficient coatings may not be adequate to draw the dye out of discontinuities. Conversely, excessive coatings of developer result in pooling and may mask discontinuities. Prior to applying the liquid developer to the test surface, the developer will be thoroughly agitated to insure that the particles in the suspension are dispersed.

5.5 Examination

5.5.1 General: The true size and type of discontinuities are difficult to appraise if the dye diffuses excessively in the developer. For this reason the surface will be observed during the application of the developer in order to detect the nature of certain indications which might tend to bleed out profusely. Final interpretation, however, will be made after allowing the penetrant to bleed out for a minimum of seven (7) minutes to a maximum of thirty (30) minutes. If the test surface is sufficiently large to preclude complete testing and examination within the prescribed time, the surface will be tested and examined in suitable increments.

The developer forms a uniform white coating and the surface defects are indicated by the bleeding out of the penetrant which is a deep red color. Indications which exhibit a light pink color may indicate excessive or inadequate cleaning. Areas exhibiting indications of this nature shall be cleaned and retested to insure that the proper level of sensitivity has been achieved.

Illumination will be provided which is adequate to insure that there is no loss of sensitivity to the test.

6. EVALUATION OF INDICATIONS

All evaluations will be made by personnel certified Level II or Level III in accordance with the requirements of Procedure MDE-10. Mechanical discontinuities at the surface are indicated by bleeding out of the penetrant; however, localized surface imperfections such as machining marks may produce similar indications which are relevant to the detection of unacceptable discontinuities. Any indication in excess of the acceptance standards which is believed to be non-relevant will be regarded as a defect and will be re-examined to verify whether or not actual defects are present. Surface condi-

tioning will preceed the re-examination. Non-relevant indications and broad areas of pigmentation which could mask indications of discontinuities are unacceptable.

Relevant indications are those which result from mechanical discontinuities. Linear indications are those indications in which the length is more than three times the width. Rounded indications are indications which are circular or elliptical with the length less than three times the width.

7. ACCEPTANCE STANDARDS

7.1 Materials:

7.1.1 Only indications with major dimenions greater than 1/16 inch shall be considered relevant.

7.1.2 The following relevant indications are unacceptable:

A. Any linear indications greater than 1/16 inch long for materials less than 5/8 inch thick, greater than 1/8 inch long for materials 2 inches thick and greater;

B. Rounded indications with dimensions greater than 1/8 inch for thicknesses less than 5/8 inch and greater than 3/16 inch for thicknesses 5/8 inch and greater;

C. Four or more indications in a line separated by 1/16 inch or less edge to edge.

D. Ten or more indications in any 6 square inches of area whose major dimensions is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

7.2 Welds

The following relevant indications are unacceptable:

A. Any cracks and linear indications.

B. Rounded indications with dimensions greater than 3/16 inch.

C. Four or more rounded indications in a line separated 1/16 inch or less edge to edge.

D. Ten or more rounded indications in any six square inches of surface with the major dimension of this area not to exceed six inches with the area taken in the most unfavorable location relative to the indications being evaluated.

8. REPAIRS

Repairs will be examined by the same procedure used for the detection of the defects. Acceptability of repairs will be as specified in paragraph 7.

9. REPORT OF EXAMINATION

A report of the penetrant examination will be prepared in accordance with IX-3690. Form NDE-302 will be used.

10. RECORDS

Certifications of materials and examination reports are retained in accordance with the applicable quality assurance program requirements.

Nooter Corporation
St. Louis Missouri

Job Number _____
Item Number _____

LIQUID PENETRANT EXAMINATION PROCEDURE & CERTIFICATION

1. Test Material: Type _____ Stage of Fab. _____
   Surface Preparation and/or Condition _____

2.

MATERIALS	MFG. AND TYPE	METHOD OF APPLICATION	DRYING OR PENETRATION TIME
Penetrant			
Cleaner: Pre-exam			
Pen. Removal			
Post Exam.			
Emulsifier			
Developer			

3. If times, temperatures, etc., were other than those specified in 5.1, 5.2, and 5.3, indicate the time(s), temperature(s), test comparator, etc. used for qualification in accordance with IX-3660.

4. Results: _____

5. Examiner(s) _____ Date _____

6. Certification:
   We certify that Item Number _____ of Nooter Job Number _____ was liquid penetrant examined in accordance with Procedure NDE-302.

NOOTER CORPORATION

BY _____

DATE _____

Form NDE-302 3/1/73

CHECK LIST FOR HYDROSTATIC TESTING

Sheet 1 of 1 | Q.A.-41A
Rev. | Date
Ref. No.

Check List No. _____

Job No. _____

Project _____

System _____

Pool Level	Start	Stop	Hold Time	Test Results	Signature
10,000 Gallon					
20,000 Gallon					
30,000 Gallon					
40,000 Gallon					
50,000 Gallon					
60,000 Gallon					
70,000 Gallon					
80,000 Gallon					
90,000 Gallon					
100,000 Gallon					
Operating Level					

REMARKS: _____

FINAL TEST ACCEPTANCE
Performed by _____
Witnessed by _____

(1). S-Satisfactory U-Unsatisfactory NR-Not Required

1009 1M 4-73

CONSUMERS POWER COMPANY
FACILITY CHANGE OR MAINTENANCE ORDER

ORDER NO. OR CHANGE NO. | COPY
SYSTEM YR | C NO
SFP | 74 | 244 | 1

EQUIP NO.	DWG REF	P-ID	SCHEME	INIT SUPVR

SAFETY ANALYSIS REQD ☒ YES ☐ NO FACILITY CHANGE ONLY
QA REQD ☒ NO
COORD

CONDITION DESCRIPTION — INITIATING SUPERVISOR

Install assistant fuel pool liner plate and leak chase system per General Work order No 6248

Work performed by Suntan Corporation under the direction of C.P.Co. General Construction Dept

Safety analysis attached

REPAIRS MADE

MAN-HOURS
MAN-REMS
OUTAGE HOURS

PRINTS 11-25-74
0740 G 20132 REV. B NOTED CF LINER ADD.
& REF. TO GWO NO. 6248 & JCB NO. 10211
PRINTS M-100, C-1, C-2, C-3, ON FILE

DISTRIBUTION

AREA OR NO	FUNCTION OR ACCOUNT	P	PRIORITY
R520	GWO 6248		

REQUESTED BY — DATE
C2 J.C. Tyson — INITIATING SUPERVISOR — 3/19/74

APPROVED BY
C3 C J H — COORDINATOR / PLANT SUPT — 3/19/74

ENGINEERING

PROJECT ENGINEER

PROCUREMENT STATUS

1 ORDERED	2 EXPECTED	3 ON SITE

ENGINEERING COMPLETED

COORDINATOR

Suntan Corporation
C.P.Co. Construction Dept — 3/19/74
SUPERVISOR ASSIGNED WORK

RELEASED FOR REPAIR BY
SHIFT SUPERVISOR

COMPLETED AND INSPECTED
Inspected by CO. Coordinator
Dept & Plant Section Engineer — 3/19/74
SUPERVISOR IN CHARGE OF WORK

C1 WHEN ORDER IS COMPLETED ROUTE IN ORDER LISTED

COORDINATOR

ACCEPTED FOR SERVICE BY
J.C. Tyson — 4/2/74
INITIATING SHIFT SUPERVISOR

ASSISTANT PLANT SUPERINTENDENT

C4 J.C. Tyson & C J H — PLANT SUPERINTENDENT — ~~4/1/74~~ 4/2/74

COORDINATOR — 10/3/74

PRINTS UPDATED — 11-25-74

0740-G

ENTERED ON HISTORY CARD — Init. Date

REPAIRMAN OR TECHNICIAN

SURVEILLABLE INSPECTION REPORT

BPI-221

INSPECTION ASSIGNMENT NO 10211-C-171-AC
P.O. NO 10211-C-171-AC REV 1
SHIP TO ORDER S. S. SPENT FUEL BOL LINER
PRIME SUPPLIER NOOTER CORP.
SUPPLIER NOOTER CORP.
LOCATION ST LOUIS, MO.

REPORT NO 9 (FINAL)
DATES INSPECTION PERFORMED JAN. 2 & 9, 1979
PAGE 1 OF 1
REV NO
S.O. NO L-3992

1. SUPPLIER CONTACTS AND SUPPLIER'S ESTIMATES FOR SCHEDULE CONTROL.

NAME	TITLE	FABRICATION TO BEGIN	ORDER TO BE COMPLETED
MR. R. SIECKHAUSE	SALES ENGR.	COMPLETE	COMPLETE
MR. R. RODES	SHOP INSPECTOR.		
MR. R. JOHNSTON	CHIEF INSP.		

2. STATUS OF SUPPLIER DRAWINGS, PROCEDURES, AND DATA SHEETS THAT REQUIRE BECHTEL ENGINEERING APPROVAL
ALL APPROVALS OBTAINED.

3. MATERIAL RELEASED FOR SHIPMENT DURING THIS REPORT PERIOD
FINAL (2) ASSEMBLEYS ON ORDER.

4. STATUS OF PREVIOUSLY REPORTED UNCORRECTED NONCONFORMANCES
CORRECTED

5. DESCRIPTION OF UNCORRECTED NONCONFORMANCES DISCOVERED DURING THIS REPORT PERIOD
NONE.

J.O. 10277

6. DRAWINGS AND SPECIFICATIONS USED FOR INSPECTION PURPOSES

DRAWING NO	REV	SPECIFICATION NO	REV
SUPPLIERS DRAWINGS L-3992		10211-C-171	1

7. SUMMARY OF WITNESS POINTS, HOLD POINTS AND OTHER INSPECTIONS PERFORMED DURING THIS REPORT PERIOD

VISITS MADE FOR FINAL INSPECTION OF LAST TWO ASSEMBLYS ON THIS ORDER, OVER FLOW TROUGH. SUPPLIER MARK NO'S 4 & 14 N. WELDING, WORKMANSHIP & DIMENSIONS FOUND SATISFACTORY. LIQUID PENETRANT EXAM. WAS PERFORMED BY MR R RODES, A.S.N.T. LEVEL II. MINOR UNDER CUT & POROSITY DETECTED WAS REPAIRED AND RECORDED ON REQUIRED WELD MAP. THE WELDS REQUIRED TO BE GROUND FLUSH, HAD NOT BEEN POLISHED TO OBTAIN THE NUCLEAR FINISH. THIS WAS BROUGHT TO SUPPLIERS ATTENTION AND WAS DONE SATISFACTORY. TEMPERA PEELABLE PAPER WAS THEN APPLIED. ATTACHED IS TELECON RELEASE RECORD AND A-7 CHECK SHEET.

ALL INSPECTION ON THIS ASSIGNMENT COMPLETE.

DISTRIBUTION
Inspection Manager
Project Engineer (1)
Expediter
Construction Manager
Secretary (2)

PREPARED BY Frank J. Fry
REVIEWED BY
PROJECT INSPECTION SUPERVISOR DATE

INFORMATION COPY

INSPECTION CHECK SHEET
A-3 CONTAINMENT LINER PLATES

I. GENERAL DATA

P.O. NUMBER 10211-E-171-AC REV 3 SUPPLIER NOATER CORP.

P.O. ITEM NO. F ITEM 6 TAG NO L-3992 QUANTITY LOT DATE RELEASED JAN. 9, 1973

DESCRIPTION STAINLESS STEEL SPENT FUEL FREE LINER PLATES

II. PROGRESSIVE INSPECTION

A. WITNESS POINTS

	CHECKED
1 RADIOGRAPHIC FILE EXAMINATIONS	S
2 FIT AND WELDING	S
3 REINFORCING PAD PRESSURE TESTS	NR
4 HEAT TREATING	NA
5 WELDING REPAIRS	NC
6 SURFACE PREPARATION COATING	S

B. HOLD POINTS

	CHECKED
1 RADIOGRAPHS	NR
2 HYDROSTATIC LEAK TEST	NR
3 FINAL INSPECTION	S
4 DOCUMENTATION	S

C. IN-PROCESS QUALITY VERIFICATION

	CHECKED
1 VISUAL INSPECTION OF MATERIAL	S
2 WELDER QUALIFICATIONS	S
3 APPROVED WELDING PROCEDURES	S
4 VISUAL INSPECTION OF WELDS	S
5 WELDER SYMBOLS	S
6 NDE PERSONNEL QUALIFICATIONS	S
7 APPROVED NDE PROCEDURES	S
8 UT TECHNIQUE	NA
9 MT RESULTS	NA
10 PT TECHNIQUE	S
11 PT RESULTS	S
12 MT TECHNIQUE	NA
13 MT RESULTS	NA
14 UT TECHNIQUE	NA
15 UT RESULTS	S
16 MINIMUM WALL THICKNESS	S
17 HEAT TREATMENT PROCEDURES & PRACTICES	NA
18 INTERNALS MATERIALS & WORKMANSHIP	NA
19 EXTERNALS MATERIALS & WORKMANSHIP	S
20 PREPARATION FOR SHIPMENT	S

III. FINAL INSPECTION

A. CONSTRUCTION AND DIMENSION

	CHECKED
1 SHELLS HEADS INSERTS	NA
2 NOZZLES MANWAYS	NA
3 SUPPORT LEGS SKIRT	NA
4 INTERNALS PIPING SUPPORTS	NA
5 EXTERNAL ATTACHMENTS	S
6 PROTECTIVE COATING & LINING	S
7 FIELD WELDING BEVELS	NA
8 FLANGE FACES & BOLT HOLES	NA
9 END TO END & OUTLINE DIMENSIONS	S
10 NOZZLE ORIENTATION & DIMENSIONS	NA

B. DOCUMENTATION

	CHECKED
1 COMPLETENESS PER SPECIFICATION	S
2 ACCURACY PER ASME AND CODE	S
3 MTRS AS TO DESIGNATION HEATING	S
4 MTRS CHEMISTRY MECH PROPERTIES	S
5 NDE REPORTS ITEMIZED PROCEDURE	S
6 NDE REPORTS RESULTS SATISFACTORY	S

C. MARKING, TAGGING, AND TRACEABILITY

	CHECKED
1 NAMEPLATE DATA CODE SYMBOL	NA
2 TAGGING	S

REMARKS

ALL SHOP FABRICATION HAS BEEN FOUND SATISFACTORY

[signature]

LEGEND: S - SATISFACTORY
U - UNSATISFACTORY
NR - NOT REQUIRED BY APPLICABLE DOCUMENT
NA - NOT APPLICABLE TO THIS ITEM