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DATE: January 15, 1958

SUBJECT: PAR Loop Schedule Review

TO: W. F. Schaffer, Jr.

FROM: B. B. Klima

COPY NO. 50

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To: W. F. Schaffer, Jr.
From: B. B. Klima
Date: January 15, 1958
Subject: PAR Loop Schedule Review

The status of the overall design, fabrication, and installation of the component items of the PAR loop experiment in the ORR has been reviewed.

Summary

The schedule previously published* has been completely revised to take into account changed delivery dates of equipment and testing schedules of the ORR. There is a distinct probability that the schedule will have to be completely revised again in the near future as a result of failure of the Autoclave valves to pass inspection.

The Autoclave valves for the equipment chambers were prepared by Westinghouse by welding tubing stubs on both the inlet and outlet. After welding they were inspected at ORNL and the root welds were found to be defective. The disposition of these valves and an adequate valve design will be mutually decided in the near future.

The ORR was originally scheduled to start critical tests early in December. These tests are now scheduled to start early in February.

Scope

The following schedule is broken down into such individual design or constructional units as seems logical so that the progress of these units can be followed. A description of each of the individual items was given in the previous schedules.* Only sufficient details have been included in this review as will describe current progress or changes.

A description of the experiment together with the basis for the schedule are given in the original issue of the schedule* and are not repeated.

The overall plan for arrangement of the equipment for the PAR loop installation at the ORR is shown in Figures 1 through 4. Notations of code numbers have been put on these drawings where possible to further identify the equipment.

The brackets on the schedule indicate the calendar period at which a phase is to be completed. An asterisk by a phase designation indicates that that phase is completed. An asterisk in front of the item number indicates that the schedule for that item has been changed.

*B. B. Klima, PAR Loop Schedule, ORNL-CF-57-11-145, dated November 15, 1957
B. B. Klima, PAR Loop Schedule, ORNL-CF-57-11-145, Supplement No. 1, dated December 16, 1957.

1. South Facility Plug

The manufacture of the south facility plug at Paducah was completed, and it was shipped to ORNL. It has been tried in the south facility hole and was found to fit. The distances found from the flange faces for the two holes to the face of the reactor lattice along the centerline of the sleeves was found to be 9 ft - 2-13/16 in. for the HS-1 hole and 9 ft - 5-5/16 in. for the HS-2 hole. Currently the plug is being filled with aluminum pellets. Filling with pellets was only possible after cutting a four-inch-diameter fill hole since the two one-inch holes provided were inadequate. After filling with aluminum pellets the rear of the plug will be filled with barytes concrete before insertion of the plug into the reactor.

Drawings: D-29865 through D-29875, D-29877 through D-29879, D-29904 and D-29905, D-29908.

2. Liner HS-1

A longitudinal weld in the liner being made at Y-12 was found to leak. This weld was removed and replaced and again leaked. After failure of that weld together with other potential weldment difficulties, it was decided to remake the liner and use the existing liner (if it can be repaired) only during the critical experiments in the reactor and to replace it prior to insertion of the first PAR loop. The existing loop was finally repaired and was found to be water-tight January 14. Construction of the second liner has been started at Y-12.

Drawings: D-29885, D-29908.

3. Dummy Plug HS-1

The inner dummy plug was completed and delivered to ORNL and is ready for insertion in the reactor. Construction of the donut or outer dummy plug was completed at Y-12, but it must still be filled with barytes concrete.

Drawings: D-29886 through D-29888.

4. HS-2 Extension

Manufacture of the extension of the HS-2 beam hole was completed at Y-12, and it has been delivered to ORNL.

Drawing: D-29902.

5. HS-2 Plug

Manufacture of this plug was completed at Y-12, and it has been filled with barytes concrete.

Drawings: D-29903, 30206 through 30209.

6. Temporary Shielding

During the test period of the ORR, temporary shielding consisting of standard barytes block must be installed. This will surround the south facility plug and its appurtenances. The design of this shield is completed, and the block will be stacked after connection of the temporary water and drain lines to the facility plug and the dummy plugs.

Drawing: D-30177.

7. Process Piping Preliminary

Piping must be installed prior to initial startup of the reactor, in the basement and to the south facility plug. This includes cooling water to the dummy plugs, which are installed in the facility plug. Installation in the basement includes drilling two holes in the concrete walls, installation of a pump and tank in addition to piping and drilling two holes in the floor slab of the south hole.

Drawings: D-30026, D-31102, D-31104, D-31105 and D-31107.

8. Rear Shielding

No change except schedule.

Drawings: D-30014, 30015, 30017, and 30018.

9. Sleeves

Drawings of the sleeve installation have been completed.

Drawing: D-20026.

10. Equipment Chamber B

Equipment Chamber B is being manufactured by Cincinnati Ventilating Company, Cincinnati, Ohio. Delivery is expected approximately the 8th of February.

Drawings: E-29920, 29921, D-29922, 29923 and D-29939.

11. Shielding Top and Side of Equipment Chamber B

No change except schedule.

Drawings: D-30014, D-30015, 30017, 30018, 30020.

12. Equipment Chamber C

Equipment Chamber C is being manufactured by Young and Bertke, Cincinnati, Ohio. Delivery is expected at the end of January.

Drawings: E-29924, 29925, D-29926, 29927.

13. Shielding Top-Sides Equipment Chamber C

No change except schedule.

Drawings: D-30014, 30015, 30017, 30018, 30020.

14. Equipment Chamber D

Equipment Chamber D is being manufactured by Cincinnati Ventilating Company, Cincinnati, Ohio. Delivery is expected approximately the 22nd of February.

Drawings D-29928, 29929, D-29930 and D-29931.

15. Shielding Top and Sides Equipment Chamber D

No change except schedule.

16. Equipment Chamber E

Design is now being completed.

17. Shielding Top and Side of Chamber E

No change except schedule.

18. Equipment Chamber A

Equipment Chamber A is being manufactured at the Paducah machine shops. Delivery is expected approximately the 1st of March. Design of the sampler "capper" and sampler "opening sealer" is being completed. The piping will be added to the chamber at ORNL.

Drawings: E-29913, 29914, D-29915 through D-29918, D-29940, D-29941, and D-29948.

19. Floor in Pit

The floor in front of the south facility plug will be brought up to the surrounding floor level using three prefabricated plugs. Design is complete.

Drawing: D-30026.

20. Shield Front of Chamber B

No change except schedule.

Drawings: D-30014, D-30015, 30016, 30018, 30020 and 30022.

21. Shield Front of Chamber C

No change except schedule.

Drawings: D-30014, 30015, 30016, 30018, 30020, and 30021.

22. Shield Front of Chamber D
No change except schedule.
23. Shield Front of Chamber E
No change except schedule.
24. Shield Around Slurry Lines
No change except schedule.
25. Concrete Shield East Chamber B
No change except schedule. Drawings: D-30015
26. Concrete Frame Shield
No change. Drawings: D-30015.
27. Concrete Door
No change. Drawings: D-30015.
28. Lead Shutter
No change. Drawings: D-30015.
29. Concrete Block East of Chamber A
No change except schedule. Drawings: D-30015.
30. Shield above Chamber A
No change.
31. Lead Donut Shield Chamber A
No change except schedule.
32. Booster Pumps
No change.
33. Caustic System
No change.
34. Slurry Charging System
No change.

35. Slurry Sampling System

No change.

36. Gas Sampling System

No change.

37. Slurry Removal Carrier

No change.

38. Loop Carrier

It is presently contemplated that two loop carriers will be made.

39. Storage Igloo

No change.

40. Utility Instrument Panel

No change.

41. Utilities Instruments

No change.

42. Process Instrument Panel

No change.

43. Process Instruments

No change.

44. Basement Process Instrument Panel

No change.

45. Basement Process Instruments

No change.

46. Radiation Instrument Panel

No change.

47. Radiation Instruments

No change.

48. Electrical Panel

No change.

50. Metering Pump and Auxiliaries

No change except schedule.

51. Low Boy Trailer

Use of two loop carriers will probably necessitate two low boy trailers.

52. Slurry Removal - Unit Shielding

No change except schedule.

53. Lead Back Shielding

No change except schedule.

54. Concrete Block West of Chamber D

No change except schedule.

55. Trailer Ramp

A removable ramp for use when backing the low boy trailer into the ORR Building.

60. In-Pile Loops and Vapor Containers

No change.

68. Loop End Jigs and Fixtures

No change. Drawings: D-29977 through D-29979.

69. Loop Handling Tool

No change.

70. Disconnect Handling Tool

Test of the tool indicated that it should be two feet longer and that the end needed to be made heavier. These changes were made, and it worked satisfactorily. A second handling tool of the old light design is needed for the slurry drain disconnects.

Drawing: D-26417 - D-26423

72. Disconnect Wrench

No change

73. Loop Wheel Gauge

No change.

Drawing - Field sketch only.

74. 27-inch Trough

No change except schedule. Drawing: E-26421.

75. 10-inch Trough

No change except schedule. Drawing: D-26422.

76. Disconnect Wrench

Special disconnect wrenches were needed for installing and removing the slurry drain disconnects. These were made and found to be unsatisfactory; they are being redesigned and will be again tried.

Drawing: D-26424.

93. Mockup Loop HS-1

The weight of the mockup was reduced to 4200 pounds with the center of gravity located 0.50 inches off center to the left looking forward from the back plate and 20.8 inches forward of the outside rear surface of the back plate.

Drawings: E-27075 through 27077.

94. Mockup Disconnects

The mockup must be modified to try out the one-inch disconnects which are to be used on the high pressure cooling water lines.

95. Slurry Valve No. 3

No change.

96. Ultrasonic Slurry Sampler

No change.

97. Gold Seal Disconnect

No change. Drawing: C-26418.

98. Sample Sealer Mockup

A mockup of the sealer and capper for the sampler is necessary to prove the operability of this design.

118 through 124

The Westinghouse schedule has not been revised; therefore, it has not been included in this review.

B. B. Klima
Process Design Section
Chemical Technology Division

FIGURE 1

FIGURE 2

ELEVATION OF EQUIPMENT
OPERATING FLOOR-ORR

ORNL-LR-DWG.-2411-R1
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PLAN OF EQUIPMENT - BASEMENT FLOOR ORR

FIGURE 3

ELEVATION OF EQUIPMENT
BASEMENT FLOOR - ORR

FIGURE 4

PROCUREMENT SUMMARY

PAR GROUP

ITEM No.	ITEM	PURCHASE REQUEST	PURCHASE REQUISITION	PURCHASE ORDER	PROMISED DELIVERY	COST	RECEIVED	REMARKS
1	PAR Loop Mockup	8/21/57	D-131642 8/21/57	96X-79975 9/3/57	9/16/57	\$3,231.95	10/2/57	Process Equipment Co., Tipp City, Ohio
2	Bearings for Mockup	8/21/57	D-131643 8/21/57	L.R. X-34 8/21/57	8/30/57	\$17.40	9/11/57	Dixie Bearings, Inc., Knoxville, Tenn.
3	Bearings for Dummy Plugs	9/5/57	D-131646 9/5/57	L.R. X-43 9/10/57	10/4/57	\$34.80	9/12/57	Dixie Bearings, Inc., Knoxville, Tenn.
4	Ratchet Wrenches for use with Disconnects	9/13/57	D-131652 9/19/57	S-72757 10/9/57	10/21/57	\$25.67	10/23/57	R. T. Clapp. Co., Knoxville, Tenn.
5	5 ft Handle for Ratchet Wrenches for use with Disconnects	9/13/57	D-131653 9/19/57	22X86802 9/26/57	10/4/57	\$6.70	10/4/57	Dempster Machine Shop, Knoxville, Tenn.
6	Torque Wrench for use with Disconnects	9/16/57	---	---	10/25/57	---	9/20/57	From Stores
7	Republic Valves for Disconnect Mockup	9/17/57	D-131654 9/20/57	S-81501-22 9/26/57	9/25/57	\$131.64	10/1/57	Leinart Engr. Co., Knoxville, Tenn.
8	Ermeto Fittings for Disconnect Mockup	9/16/57	D-131655 9/23/57	44X86257 10/1/57	11/18/57	\$415.35	11/8/57	Abernathy - Thomas Co., Kingsport, Tenn.
9	Tubing for Disconnects for Disconnect Mockup	9/16/57	D-131657 9/23/57	44X-86247 9/26/57	10/10/57	\$178.19	11/7/57	Ray Miller Co., S. Charleston, W. Va.
10	Autoclave Valves and Fittings for Disconnect Mockup	9/16/57	D-131660 9/23/57	41X-86429 9/27/57	10/3/57	\$577.42	11/1/57	Autoclave Engr. Sales, Erie, Pennsylvania
11	Bar 1-1/2" x 5 for Equipment Chambers B, C, and D	9/24/57	D-131661 9/26/57	44X-87669 10/10/57	10/15/57	\$1,946.60	10/16/57	Knoxville Steel Prod. Co., Knoxville, Tenn.
12	Desilverized lead for shielding, 320,000 lbs	10/17/57	10/17/57	42X91346 11/21/57	12/1/57	\$43,200.00		National Lead Co., Cincinnati, Ohio Partial Shipment 12/12/57
13	Aluminum Valve Couplers for Dummy Plug HS-1	10/31/57	D-160211 10/31/57	41X-89417 11/4/57	11/11/57	\$101.46	11/14/57	Snap-Tite, Inc., Union City, Tenn.
14	Circuit Breaker	11/1/57	D-174844	53X-89869 11/8/57	11/18/57	\$46.50	11/18/57	Stokes Elec. Co., Knoxville, Tenn.
15	Transformer	11/1/57	D-17844A	53X-90729 11/11/57	11/28/57	\$190.47	12/1/57	Westinghouse Elec. Corp., Knoxville Tenn.
16	Stainless steel for Equipment Chamber A 1-1/2", 3/4" Plate & 1" Rod	11/4/57	D-131665 11/5/57	42X91364 11/25/57	12/9/57	\$4,206.50	1/2/58	Price Change 1/3/58 Vance Iron & Steel Co., Chattanooga, Tenn.
17	Stainless steel for Equipment Chamber A 5/8" and 1/4" Plate	11/4/57	D-131665A 11/5/57	42X91365 11/25/57	12/2/57	\$531.75	1/2/58	Sandmeyer Steel Co., Philadelphia, Pa.

PROCUREMENT SUMMARY

PAR GROUP

ITEM No.	ITEM	PURCHASE REQUEST	PURCHASE REQUISITION	PURCHASE ORDER	PROMISED DELIVERY	COST	RECEIVED	REMARKS
18	Structural Steel for Shielding	11/6/57	D-131637 11/11/57	42X-90095 11/14/57	12/6/57	\$310.38	12/2/57	Steel Supply, Inc., Knoxville, Tenn.
19	Steel for Equipment Chambers B, C, and D	11/6/57	D-131639 11/11/57	73X87967 11/27/57	12/2/57	\$1,091.36	12/10/57	Steel Supply, Knoxville, Tenn.
20	Equipment Chamber C	11/12/57	D-131671 11/15/57	96X90521 11/27/57	1/31/58	\$1,368.00		Young and Bertke Co., Cincinnati, Ohio
21	Preliminary Piping - Stainless Steel Pipe	11/18/57	D-131674 11/20/57	70X-84396 12/2/57	12/12/57	\$1,115.75	1/3/58	Stainless Piping & Supply, Charleston W. Va.
22	Preliminary Piping - Steel Pipe 660 ft 1/2" Sch. 80	11/18/57	D-131675 11/20/57	70X84388 11/25/57	11/29/57	\$98.93	12/2/57	Industrial Piping & Supply, Knoxville, Tenn.
23	Preliminary Piping - Stainless Steel Tubing	11/18/57	D-131679 11/21/57	70X92554 12/4/57	12/15/57	\$245.00	K.2.58	Ray Miller, Inc., S. Charleston, W. Va.
24	Preliminary Piping - Stainless Steel Tubing 20 ft - 9/16" o.d.	11/18/57	D-131674A 12/3/57	70X84395 12/3/57	12/10/57	\$102.80	12/12/57	Ray Miller, Inc., S. Charleston, W. Va.
25	Equipment Chamber B	11/21/57	D-131680 11/21/57	96X-93951 12/24/57	1/22/58	\$2,995.00		Cincinnati Ventilating Co., Cincinnati, Ohio
26	Equipment Chamber D	11/25/57	D-131683 11/27/57	96X-93951 12/24/57	2/7/58	\$3,342.00		Cincinnati Ventilating Co., Cincinnati, Ohio
27	Equipment Chamber Powell Angle Valves	11/26/57	D-131682 11/26/57	35X-93525 12/18/57	1/18/58	\$ 240.00		Industrial Piping Supply, Knoxville, Tenn.
28	Globe Panel Mounted/Valves - Equipment Chamber E Hoke Type	11/26/57	D-131684 11/27/57	59X93460 12/18/57	1/15/58	\$ 138.40		James C. White Co., Greer, S. Carolina
29	Autoclave Elbow Fittings - Equipment Chamber A	12/6/57	D-131686 12/6/57	77X-93071 12/30/57	2/15/58	\$ 177.00		Autoclave Engineers, Erie, Pennsylvania
30	Neoprene "O" Rings - Hole Liner HS-1	12/12/57	D-131687 12/12/57	96X93937 12/18/57	12/30/57	\$ 72.00	1/2/58	Minnesota Rubber & Gasket Co., Minneapolis
31	Switch for Drain Sump	1/3/58	D-131691 1/6/58		1/17/58			
32	Pump for Drain Sump	1/3/58	D-131692 1/6/58	45X95482 1/9/58	1/17/58	\$ 160.00		Aurora Pump Co., Knoxville, Tennessee
33	Three floor filler slabs	1/14/58			2/1/58			
34	Pipe and Fittings	1/14/58			2/1/58			

PAD 12004

LOOP AUXILIARIES

1/15/58

16

*Asterisk indicates completion of phase.

ITEM NO.	ITEM	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	REMARKS
* 1.	South Facility Plug	*Des.		* Fab		Inst.					Fabricated at Paducah
* 2.	Liner HS-1	*Des.	Temp. Fab.		Temp. Inst	Final Fab	Final Inst				First Plug (temporary, made at Y-12. 2nd Plug being made at Y-12.
* 3.	Dummy Plug HS-1	*Des	*Fab			Inst					Fabricated at Y-12.
* 4.	HS-2 Extension	*Des	*Fab			Inst					Fabricated at Y-12
* 5.	HS-2 Plug	*Des	*Fab			Inst					Fabricated at Y-12
* 6.	Temporary Shielding		*Des			Inst	Removal				
* 7.	Process Piping Preliminary			*Des		Inst					
* 8.	Rear Shielding			*Des		Inst					
* 9.	Sleeves				*Des	Inst					
* 10A.	Equipment Chamber B				*Des	Fab	Inst				Being constructed at Cincinnati Ventilating Co.
* 10B.	Packaged Unit B						Rec	Inst			Westinghouse to furnish
* 10C.	Cover Plate B			*Des		Fab			Inst		Being constructed at Cincinnati Ventilating Co.
* 11.	Shielding Top & Side of Equip. Cha. B			* Des				Inst			
* 12A.	Equipment Chamber C			* Des		Fab		Inst			Being constructed at Young and Bertke
* 12B.	Packaged Unit C							Rec	Inst		Westinghouse to furnish
* 12C.	Cover Plate C			* Des		Fab			Inst		Being constructed at Young & Bertke
* 13.	Shielding Top-Sides of Ch C			*Des					Inst		
* 14A.	Equipment Chamber D			*Des		Fab	Inst				Being constructed at Cincinnati Ventilating Co.
* 14B.	Packaged Unit D						Rec	Inst			Westinghouse to furnish
* 14C.	Cover Plate D			*Des		Fab			Inst		Being constructed at Cincinnati Ventilating Co.
* 15.	Shielding Top Sides of Ch. D				Des			Inst			
* 16A.	Equipment Chamber E				Des	Fab		Inst			
* 16B.	Packaged Unit E				Des		Fab	Inst			Westinghouse furnishing components
* 16C.	Cover Plate E				Des	Fab			Inst		
* 17.	Shielding Top-Sides of Ch. E				Des				Inst		

PAR

GROUP

LOOP AUXILIARIES

-17-

*Asterisk indicates completion of phase

Jan 15, 1957

ITEM NO.	ITEM	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	REMARKS
* 18	Equipment Chamber A		Des.			]	Fab.	]	Inst.		Being constructed at Paducah
* 19	Floor in Pit			Des.	]	]					Construction bids requested
* 20	Shield Front Chamber B			* Des.		Fab.		Inst.		]	Being Constructed at ORNL
* 21	Shield Front Chamber C			* Des.]		Fab.			Inst.	]	Being Constructed at ORNL
* 22	Shield Front Chamber D			Des.	]	Fab.		Inst.		]	
* 23	Shield Front Chamber E			Des.		Fab.		Inst.	]		
* 24	Around Shield/Slurry Lines				Des.	]	Fab.	]	Inst.		
* 25	Concrete Shield East Ch. B					Des.		Inst.			
26	Concrete Frame Shield					Des.		Fab.	Inst.		
27	Concrete Door					Des.		Fab.	Inst.	]	
28	Lead Shutter					Des.		Fab.	Inst.	]	
* 29	Concrete Shield E. Ch. A					Des.			Inst.		
30	Shield above Ch. A					Des.		Fab.	Inst.		
* 31	Shield Lead Donut Chamber A					Des.]		Fab]	Inst.		
32	Booster Pumps					Des	Inst.				Westinghouse to furnish pump.
33	Caustic System				Des.		Fab.		Inst.		
34	Slurry Charging System				Des.	Rec.		Fab]	Inst.		Westinghouse to furnish components
35	Slurry Sampling System				Des.		Fab.				
36	Gas Sampling System				Des.		Fab.				
37	Slurry Removal Carrier					Des.	Rec.		Fab.		Westinghouse to furnish components
* 38	Loop Carrier			Des.		]	Fab.				
39	Storage Igloo				Des]				Fab.	Inst.]	
40	Utilities Instrument Panel			Des.		]	Fab.		Inst.		
41	Utilities Instrument				Rec]		Inst.				Westinghouse to furnish components
42	Process Instrument Panel						Rec.	]	Inst.		

PAR GROUP Loop Auxiliaries and Loop

*Asterisk indicated completion of phase

4/15/57

[illegible]

PAR

GROUP

Tools, Jigs, and Fixtures

*Asterisk indicates completion of phase

L/15/57

[illegible]