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EXTERNAL TRANSMITTAL AUTHORIZED

OAK RIDGE NATIONAL LABORATORY

Operated By

UNION CARBIDE NUCLEAR COMPANY

UCCPOST OFFICE BOX P
OAK RIDGE, TENNESSEE**ORNL**
CENTRAL FILES NUMBERCF-56-8-199

DATE: August 15, 1956

SUBJECT: ORR Project Progress Report, #19

FROM: J. P. Gill and T. E. Cole

Previous Progress Reports:

ORNL-CF-54-6-55	ORNL-CF-54-10-164	ORNL-CF-55-2-187	ORNL-CF-55-8-155
ORNL-CF-54-7-138	ORNL-CF-54-11-110	ORNL-CF-55-3-224	ORNL-CF-55-10-137
ORNL-CF-54-8-163	ORNL-CF-54-12-213	ORNL-CF-55-4-185	ORNL-CF-55-12-158
ORNL-CF-54-9-234	ORNL-CF-55-1-186	ORNL-CF-55-5-192	ORNL-CF-56-2-158
		ORNL-CF-55-7-100	ORNL-CF-56-5-190

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GENERAL

Construction of the reactor building, reactor structure and process water system is approximately 70% complete, and is scheduled to be finished by December 15, 1956.

Purchase and fabrication of equipment by ORNL, necessary to complete the installation, is 60% complete. Present schedules show that the reactor should be operating at full power, ready for experiments by June 15, 1957.

The request for additional project funds amounting to \$515,000, explained in the previous progress report as relating to an extension of building and facilities construction, has been reviewed by the AEC and although it is not official, some indication has been given that approval can be expected shortly.

A new Job Planning Schedule for the ORR Project is now in effect showing a breakdown of each phase of the work.

CONSTRUCTION

Lack of advance planning on the part of the construction contractor with regard to the training and qualification of aluminum welders is continuing to delay the construction. Since a majority of the pipes and sleeves within the reactor shield and pool walls are aluminum, this has presented a serious bottleneck to continuing the construction within the building. A major part of the first floor cannot be poured until the reactor pool floor is completed, which is dependent on the welding of the main reactor cooling lines to the bottom plug liner. For this reason work within the building, with the exception of the piping of equipment in the basement area, has practically come to a halt.

It has only been within the past few weeks that progress has been made with the butt welding of the large diameter aluminum pipe which will pass our radiograph and dye-check standards and a major part of the solution here has been in the ability of the welders to work both inside and outside of the pipe. Fabrication of the large diameter pipe and the repair of some 400 feet of pipe originally seam welded by the Wolferz Company is now being satisfactorily completed by the O'Neil Company in New Orleans. Again their success has been due to their ability to weld inside and outside the pipe.

In the field installation there will be a number of joints that will not be available from the inside for back-welding. Consideration is now being given at these points to the use of integral or removable backing rings as the best means of insuring complete penetration without objectionable over-penetration.

The building crane has now been installed but the power supply cannot be connected until after the pool floor and first floor have been poured.

Erection of the air cooler units is nearing completion. Redesign of the piping in this region was required by the substitution of the Trane unit for the Fluor unit originally specified.

The two twenty-thousand-gallon storage tanks have been delivered and installed. Fabrication of the decay tank and heat exchanger has been completed and should be delivered next week.

All other materials and equipment, with the exception of the Dall Flow Tube are at the site so that rapid progress can be expected after the next few weeks with the placing of the concrete for the reactor pool floor and first floor.

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REACTOR COMPONENT PURCHASE

Fabrication of the reactor mechanical control unit has been completed by the ORNL Shops, and it is now assembled and undergoing tests in Building 2018.

The reactor tank being fabricated by the O. G. Kelley Company is approximately 35% complete, with delivery expected by the first of the year. The side plates forming the lattice housing have been successfully rifle-drilled, machined and are ready to be welded into the box unit. All of the plates forming the upper tank section including the ribs, flange, nozzle, etc., have been tack welded into an assembly ready for final welding. The lower tank section is now being fitted with the lattice support ribs. A major part of the other plates and shapes forming the center section has been completed and will be available for assembly after the welding of the lattice housing. Delivery of the vessel to ORNL is now scheduled for the end of December. In an effort to speed up the work a welding machine from K-25 was loaned to the O. G. Kelley Company.

The finished machined beryllium reflector pieces have been delivered and are now being fitted with aluminum end adapters in the ORNL Shops.

The grid plate, lower shim rod bearings and support, upper grid mechanism assembly, thermal and ion chamber shields, dummy fuel elements and aluminum lattice pieces are all from 50% to 75% complete.

The inlet water line expansion joints have been delivered.

With the recent completion of the shim rod design all of the fabrication drawings for the ORR Reactor have been completed. Some installation drawings are still in process.

EXPERIMENTAL FACILITIES

Preliminary drawings have been completed on the design of the north and south experimental facilities and have been distributed for comment. All of the material is now on hand for their fabrication, and present thoughts are that the combined ORNL and Paducah Shop facilities will be used.

The Engineering Department has made considerable progress in the design of the four experiments proposed for the north facility and should be in a position to install the equipment as soon as the reactor becomes available.

Detail design for the beam hole facilities is expected to begin within the next few weeks. After a series of investigations and discussions with the experimental group using these facilities, a single plug design has been agreed upon. Fabrication drawings should be completed by October 15th.

INSTRUMENTATION AND CONTROL

The relay, amplifier and power cabinets along with seven sections of the vertical board, arrived here approximately six weeks ago from the Taylor Instrument Company, Rochester, New York. (The remaining five vertical board sections are expected within the week.) The console arrived last week and is being stored with the above listed equipment in Building 3551.

The engineering group under A. M. Tripp is now detailing the servo limit switches and associated drives; the basic design having been completed but not yet approved by the project staff.

Checking is proceeding on the control system interconnection drawings, and a proposed layout is under consideration for the sub-pile room.

The hardware for the pool level alarms and building evacuation alarms has been received, and the installation is being mocked-up in the Laboratory.

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A system of modular hardware is being designed to accommodate a simple approach to the air-monitors and monitron system.

The purchase order for 36,000 feet of five conductor cable has been sent to the low bidder; viz., U. S. Rubber Company.

The Modern Sound Company of Pittsburgh, Pennsylvania has agreed to send us their auxiliary intercom components (paging speakers, handsets and jacks, amplifier, and cables) to evaluate these devices for the ORR intercom. The basic system is composed of the Webster Electric Company Teletalk units -- the same units used in the Graphite and LITR Buildings.

E. S. Bettis is working with this group in organizing a central block diagram and writing an operations memorandum for the ORR. Work is still continuing along this line.

The thermocouple installation around the reactor bottom plug liner has progressed to the point where all the support frames and polystyrene wiring devices have been fabricated, the thermocouples assembled and check calibrations run. This work is now awaiting completion of the installation of the bottom plug liner and outlet water lines.

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ORR Project
ORNL Accounts & Expenditures
August 1, 1956

Account No.	Description	Cost or Estimated Cost	April	May	June	July	Total to Date
x3900-15	Preliminary Design	99,657					99,657
x3900-1900-2	A-E Services - Part I	71,736					71,736
*3900-1900-3	Inst. and Controls Design	60,000	1,641	829	1,092	1,208	43,375
x3900-1900-4	A-E Design Criteria	23,709					23,709
x3900-1900-5	5 MW Cooling System Design	15,536					15,536
x3900-1900-6	Utilities & Site Design	14,319					14,319
*3900-1900-7	Reactor Design	92,000	551	1,881	1,711	1,401	90,453
x3900-1900-8	Controls Development	27,686	1,723	181	793		27,686
*3900-1900-9	Controls Purchases	108,900	1,236	2,423	883	34,001	44,801
*3900-1900-10	Instrumentation Purchase	23,500	169	444	1,921	85	10,533
x3900-1900-12	20 MW Cooling System	33,080					33,080
x3900-1900-13	A-E Services - Part II	24,362					24,362
x3900-1900-14	Reproduction for Contract Dwgs. & Specs	5,270					5,269
*3900-1900-15	Site and Utilities Preparation	6,425	106	148			6,230
*3900-1900-17	Inspection of Construction	50,000	2,084	1,067	1,550	3,520	42,933
*3900-1900-18	Utilities and Site Construction	42,125	1,817	637	178	1,296	20,752
*3900-1900-19	Beryllium Reflector Purchase	100,000		9	23	1,301	89,532
*3900-1900-20	Reactor Unit Purchases	150,000	7,905	7,400	10,962	35,064	68,181
*3900-1900-21	A-E Service - Part III	23,903	2,514	1,730	113**	1,390	23,012
*3900-1900-22	Reactor Controls Installation	41,000					
*3900-1900-23	Cooling System Inst. Installation	15,500					
*3900-1900-24	Lead Shields - Fabrication	10,129	614	938	1,903	2,511	6,946
*3900-1900-25	Lower Bearings and Support Plate	7,000	892	1,083	975	892	6,455
x3900-1900-26	Lead Brick	1,739					1,739
*3900-1900-27	Mechanical Controls Fabrication	75,000	20,563	12,114	9,078		69,336
*3900-1900-28	Upper Grid Mechanism Fabrication	20,000	137	2,446	6,309	5,477	14,370
*3900-1900-29	Large Facilities Purchase	42,000	30		1,034	799	1,864
*3900-1900-30	Fuel Element (Dummy)	10,000		1,546	1,077	1,043	3,666
*3900-1900-31	Design of Bldg. Decontam. System	5,000				414	414
*3900-1900-32	Material to Contractor	5,000			1,044	1,149	2,193
3900-1900	Reactor Assembly & Installation	50,000					
3900-1900	Beam Hole Components	20,000					
3900-1900	Rabbit Tube Installation	10,000					
3900-1900	Installation of Bldg. Decontam. System	35,000					
		1,319,076	41,982	34,876	40,420	87,683	862,139
x Work Completed - Account Closed	Contingency	14,924					
* Work in Progress - Account Open	Total	1,334,000					

** Credit to Account

CC: F. A. Kocur, C. A. Beatty, T. E. Cole, J. P. Gill, W. R. Gall, G. Morris, D. W. Cardwell, F. W. Wuest

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