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Explosives Department
Wilmington 98, Delaware

DPW-55-15-2

SR/H--936

February 10, 1955

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MINUTES OF TECHNICAL DIVISION STEERING COMMITTEE MEETING
FEBRUARY 8, 1955, SAVANNAH RIVER LABORATORY

Committee Members Present

D. F. Babcock	V. R. Thayer
J. W. Croach	M. H. Wahl
L. C. Evans	C. W. J. Wende
W. C. Kay	J. C. Woodhouse
J. W. Morris	H. Worthington

Others Present During
Parts of the Meeting

H. W. Bellas	R. T. Huntoon
J. T. Carleton	S. M. Katz
J. L. Crandall	H. M. Kelley
B. W. Dunnington	W. E. Llewellyn
R. R. Haefner	S. A. McNeight
E. E. Hayes	W. P. Overbeck
E. J. Hennelly	P. H. Permar
R. R. Hood	D. S. St. John

APPROVALS

The following Studies were approved for the programs outlined in the appendixes:

Study No.	Title	Man Months	From	To
8506	100 Area Process Development - General	19.5	2/1/55	4/30/55
8509	Design and Evaluation of Fuel Elements	41.5	2/1/55	4/30/55
8518	Theoretical Physics	40	2/1/55	4/30/55
8519	Experimental Pile Physics	70	2/1/55	4/30/55
8520	100 Area Mechanical Development	38	2/1/55	4/30/55

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MASTER

Reviewing

Official

J. Banick
J. Banick, AED Class Officer

Date

2/4/89

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INFORMATION AND AGREEMENTS REACHED1. Safety.

The Laboratory's minor injury frequency for January was 0.28, the same as for December. Most of the injuries were to hands and fingers. Accordingly, stress will be placed on wearing gloves while performing tasks that can lead to such injuries.

Laboratory incidents involving activity indicate the need for following established procedures. This point is being emphasized.

Faulty, and rather inaccessibly located, screens in laboratory sinks have resulted in plugged jets at the waste tanks as well as other difficulties. Improved sink strainers are being obtained.

2. The Laboratory had three security violations in January, a decrease from nine in December.

3. Arrangements have been made for interviewees with physics training to visit Building 777 when this seems desirable.

4. Procedures have been written for handling various fissionable materials on a large scale in the fabrication laboratory. These procedures cover radiation control, security, criticality, and accountability, and are now being reviewed for approval by interested persons.

5. The Laboratory shop again has a substantial backlog of orders and is working six days a week. The force will be increased and the Laboratory will see if more work can be sent to outside shops.

6. The limited number of applications do not justify the use of depleted uranium in the Laboratory in view of the difficulty of maintaining segregation and accountability of the many required materials.

7. While operating with slug elements, the Savannah Plant can follow Hanford requirements as to the average and variation of U-235 content in sidestream material.

8. The Laboratory will supply the various dimensions and tolerances that probably will be required for tubes with spiral ribs. This will permit aluminum fabricators to develop the necessary techniques and tools for producing these tubes.

9. The various dies and aluminum shapes now being held by aluminum fabricators will be shipped to the Laboratory for use, if suitable, or disposal, if outdated.

10. Obtaining proper hydraulic performance, particularly the elimination of vibration, is the most serious need prior to test irradiations of plate fuel assemblies in a production reactor. Any successful design must first pass a hydraulic test for about two months at CMX.

11. The Laboratory will prepare preliminary scopes of work covering the process requirements for producing natural uranium elements in plate form and in tubular form. Although the processes for producing these elements are not fully established, these scopes will permit the Process Section to make preliminary studies to see how much equipment can be used in common for producing both types of elements.

12. The Laboratory also is preparing a scope of work covering the production of tubular enriched elements.

13. Arrangements will be made in the near future for a review of the Nuclear Metals program.

14. Tentatively, the next Steering Committee meeting will be held at the Laboratory on March 8, and the following meeting will be on April 5. This latter date is a departure from the usual schedule.

15. Attached for information are:

Appendix A - Financial Status

Appendix B - Reactor Engineering Program

Appendix C - Physics Program

Appendix D - Technical Division Study Status

TECHNICAL DIVISION

L. C. Evans
L. C. Evans

LCE:hw
Attachs.

APPENDIX AFINANCIAL STATUS

Technical Division expenditures for December totalled \$726,000, overrunning the Financial Plan by \$62,000. This overrun resulted principally from Engineering Department charges that were about \$20,000 higher than normal and from a general increase in charges for supplies and maintenance labor and materials. Expenditures for FY-1955 through December totalled \$3,849,000, or 1.6% over the Financial Plan.

Because of the nature of the Laboratory program for the next few months, expenditures for supplies and for maintenance labor and materials are expected to continue to increase gradually. In addition, Engineering Department expenditures will also increase as work progresses on the Fluid Pressure Bonding facility and on the 88 Recycle facility. The current Financial Plan takes these increases into consideration and is believed to be adequate except for work on the 88 Recycle facility. As soon as the requirements for this facility become more firm, the Financial Plan will be increased by the amount necessary to cover this work.

A review of expenditures over the past year shows that the increased pace of work in the Laboratory has caused expenditures under the Laboratory overhead accounts to increase by approximately \$40,000 per month. During the same period, Plant Overhead allocations to the Laboratory have increased approximately \$35,000 per month. These increases total about \$900,000 per year and account for the increase of about \$4,000 per budgeted man year noted in recent months. The budget for FYs 1956 and 1957 takes these increases into account.

APPENDIX B

REACTOR ENGINEERING PROGRAM
February 1, 1955 - April 30, 1955

MANPOWER FORECAST

Estimated
Man Months

Study 8506 - 100 Area Process Development - General	19.5
Study 8509 - Design and Evaluation of Fuel Elements	41.5
Study 8520 - 100 Area Mechanical Development	<u>38</u>
Total	99

PROGRAM

Estimated
Man Months

NEW FUEL ELEMENTS

75.5

Fuel Element Design

Target and Fuel
End Fittings

Monitoring

Requirements
Hydraulic Testing
Mechanical Design

Fuel Element Hydraulics

Fuel Element Handling

Assembly and Disassembly
Contamination Confinement
Inspection Devices

Special Irradiations

Special Problems

APPENDIX B (Cont.)

Estimated
Man Months

PRESENT FUEL ELEMENTS

4.5

Hydraulics
Monitoring
Special Problems

HIGHER POWER OPERATION

8.5

Thermal Shield
Secondary Components
Fuel Failures

IMPROVEMENTS TO PRESENT OPERATION

10.5

Decontamination
Purification Area Studies
General Chemical Problems
Special Mechanical Devices

APPENDIX C

PHYSICS PROGRAM
February 1, 1955 - April 30, 1955

MANPOWER

Estimated
Man Months

Study 8518 - Theoretical Physics	40
Study 8519 - Experimental Pile Physics	70

PROGRAM

THEORETICAL PHYSICS

- I. Natural Uranium Slug Loading
 - (a) Half-rod curves - to contend with xenon in startup after shutdown at higher power operation.
- II. Natural Uranium Plate Loading
 - (a) Spiking (a study of using some enriched elements to increase the number of effective tubes)
 - (b) Control rod analysis (to see if other configurations or strengths would lead to better control).
- III. Thorium and Enriched Slug Loading
 - (a) Half-rod positioning
 - (b) Study of expected sheath temperatures versus power levels.
- IV. Thorium and Enriched Tube Loading
 - (a) Reactivity and production studies
- V. Special Studies
 - (a) Contamination build-up in U-233 and recycled thorium
 - (b) Fuel variability (side stream material)

APPENDIX C (Cont.)EXPERIMENTAL PHYSICSI. Standard Pile

- (a) Nuclear Test Gauge (February 7 to March 15)
 - 1. Startup
 - 2. Test of procedures for checking LM slugs
 - 3. Determine fuel arrangements for testing the various fuel, control rod, and target elements.
- (b) Quatrefoils (February 1 to February 15)
 - 1. Extension of empty and full coolant channel tests
 - 2. Remeasure radial buckling with natural U slug loading
- (c) Boron Addition for τ Measurement (February 15 to April 1)
- (d) Light Water Addition (April 1 to May 16)
 - 1. Measure changes in B^2 , L^2 , and τ
- (e) Items (b), (c), and (d) will be postponed in favor of a full SE loading of plates and of enriched tubes with thorium targets - as soon as these elements are available.

II. Process Development Pile

- (a) Enriched Tubes with Thorium Targets - Single Hex (February 1 to March 25)
 - 1. Calibration of central hex
Buckling vs. D_2O height
 - 2. Find bucklings of 13%, 14% and 15% tubes with both slug and tubular targets
 - 3. Detailed flux traverse to measure L^2 and f in most promising combinations
- (b) Rod Oscillation (March 28 to March 31)
- (c) Wet and Dry Quatrefoil Coolant Channels (April 1 to April 8)
- (d) Shield and Reflector (April 11 to May 6)
 - 1. Measure fast neutrons, slow neutrons, and gamma rays in the shield
 - 2. Remove outer quatrefoils and remeasure in shield

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APPENDIX D

TECHNICAL DIVISION STUDY STATUS

DPW-55-15-2

Study No.	Title	Man Mo.	From	To	Man Mo. used to 1/31	Total Man Mo. used FY-1955	Program	Budget
8501	Non-destructive Testing	12	1/1/55	3/31/55	3.40	57.95	40% MD 30% MD 30% MD	2802 2961 2922
8502	300 Area Process Development - Present Components	3	1/1/55	3/31/55	.50	7.75	MD	2802
8503	New Fuel Element Fabrication	7	1/1/55	3/31/55	3.20	22.15	MD	2802
8504	Protective Coatings for New Fuel Elements	25	1/1/55	3/31/55	7.30	47.05	MD	2802
8505	Corrosion	12	1/1/55	3/31/55	3.30	27.10	30% MD 50% MD 20% MD	2802 2922 2961
8506	100 Area Process Development - General	19.5	2/1/55	4/30/55	0	35.35	60% RPD 40% RPD	2803 2923
8507	Heat Transfer and Water Quality					0	RPD	2803
8508	Instrument Development - 300 Area	25	1/1/55	3/31/55	6.55	6.55	40% MD 30% MD 30% MD	2802 2922 2961
8509	Design and Evaluation of Fuel Elements	41.5	2/1/55	4/30/55	0	97.25	50% RPD 50% RPD	2803 2923
8510	Purex Design Testing			Inactive			CPD	2804
8511	Separations Process and Equipment Demonstration	35	12/1/54	2/28/55	20.35	72.55	80% CPD 10% CPD 10% CPD	2804 2910 2924
8512	Separations Process Chemistry	50	12/1/54	2/28/55	31.45	109.15	40% CPD 5% CPD 50% CPD 5% CPD	2804 2910 2924 2962

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APPENDIX D

TECHNICAL DIVISION STUDY STATUS (Cont.)DPW-55-15-2

Study No.	Title	Man Mo.	From	To	Man Mo. used to 1/31	Total Man Mo. used FY-1955	Program	Budget
8513	Separations Engineering Development	40	12/1/54	2/28/55	23.35	75.35	75% CPD 25% CPD	2804 2924
8514	Instrument Development - 200 Area	23	1/1/55	3/31/55	7.50	7.50	50% RPD 50% RPD	2803 2923
8515	Instrument Development - 100 Area	19	1/1/55	3/31/55	6.95	6.95	70% CPD 10% CPD 20% CPD	2804 2910 2924
8517	Separations Process Hazards	3	12/1/54	2/28/55	2.40	8.00	CPD	2924
8518	Theoretical Physics	40	2/1/55	4/30/55	0	71.20	55% RPD 45% RPD	2803 2804
8519	Experimental Pile Physics	70	2/1/55	4/30/55	0	148.25	60% RPD 40% RPD	2803 2804
8520	100 Area Mechanical Development	38	2/1/55	4/30/55	0	79.45	60% RPD 40% RPD	2803 2923
8521	Hydriside Development	6	12/1/54	2/28/55	5.00	17.90	CPD	2910
8522	Analytical Chemistry Development	20	12/1/54	2/28/55	21.15	64.45	45% CPD 20% CPD 10% RPD 25% MD	2804 2924 2803 2922
8523	Waste Handling	3	12/1/54	2/28/55	1.40	1.40	CPD	2804
8524	New LM Elements	40	1/1/55	3/31/55	12.65	92.85	35% MD 65% MD	2922 2961
8525	Fluid Pressure Facility			(For construction cost only)			MD	2802
8526	Recycle Facility			(For construction cost only)			CPD	2604

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