

This document consists of 7  
pages and 0 figures.  
No. 4 of 4 copies, Series a.

To: J.P. Sinclair  
R.C. Thumser  
J.R. Brand

From: L.B. Enlet

*Training Prog.*

NOTED

AUG - 8 1945

M. D. WHITAKER

*C-file*  
*To Be destroyed*  
**SEALABORATORIES**  
**CENTRAL FILES NUMBER**  
**45-8-109**

### Monsanto Training Program

The attached list of topics and outlines to be presented to the Monsanto Trainees are submitted for your comments and suggestions. The names of individuals listed with some of the topics are only tentative, since none of the men have been approached on the matter.

The first seven discussions are of a general nature and should be of benefit to persons other than the 100 Area trainees. The last sixteen topics contain material specifically for the 100 Area operation.

The lectures would be of greater permanent value, if the persons giving the talks could be persuaded to prepare and issue to the trainees complete notes on the subject covered.

No definite time for starting this program can be chosen until the remainder of the trainees are on the plant.

CLASSIFICATION CANCELLED

DATE *10/13/66*

For The Atomic Energy Commission

*H.F. Carroll*  
TC  
Chief, Declassification Branch



**SECRET**

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1. History of Project - M.D. Whitaker

- a) Mass and Energy
- b) Atomic Theory - 1932-1934
- c) Fermi - 1934 suspected Np and Pu
- d) Hahn - Strassman - 1939 - Fission
- e) Compton Investigation - 1941
- f) West Stand Pile - Dec. 2, 1942
- g) He and water cooled piles
- h) Separation of Pu

Friday - 8:30 AM  
8/3/45

2. Review of Fundamentals - E.O. Wollen

- a) Coulombs Law - Electric Field Strength of a Charged Particle.
- b) Atomic Structure - protons, neutrons and electrons, forces within the nucleus
- c) Particles - Gamma Beta, Alpha, Deutrons, Neutrons
- d) Particle detection - Electroscope, Chambers, G-M-tubes
- e) Relationship - Definitions - Conversions

9:30 AM  
Sat 8/4/45  
6/7

3. Nuclear Chemistry - C.D. Coryell

- a) Natural Radioactive Cps.
- b) Artificial Radioactive Cps.
- c) Isotopes
- d) Decay Chains - Mechanics of Decay
- e) Seaborg's tables

Monday - 8:30 AM  
8/6/45

4. Nuclear Physics - L.B. Borst

- a) Cross Section
- b) Resonance Levels
- c) Induced activities
- d) Piles - Sigma, Exponential and Chain Reacting
- e) Pile Theory

Tuesday  
8/7/45



5. Radiation Hazards - ~~W. H. Morgan~~ or E.Z. Morgan

- a) Biological effects
- b) Tolerance of various particles
- c) Shielding for various particles
- d) Energy of particles
- e) Health-Physics Group responsibilities
- f) Clean up of contamination

wed  
8/8/45

6. Pile Construction - J.P. Sinclair

- a) General Description
- b) Design Limitations
- c) Mattress plates
- d) Raw Materials - Graphite and Uranium Slugs - ( General)

Thursday  
8/9/45

7. Plant Organization - M.D. Whitaker

- a) Medical
- b) Research - Technical
- c) Operating - Service - Maintenance - Power, etc.
- d) Research Coordination - 100 Area
- e) Security

Combined  
with #1

7.8. Pile Operation (~~W. H. Morgan~~) - 100 Area Group

- a) Rod Movements - In Hours - Evaluation of Rods
- b) Control Points
- c) Variables - Air, Metal, Pressure, etc.
- d) Limits - Metal Temperature - Air Exit Temperature - Back Wall Pressure
- e) Procedure for start up - running - shutdown of operation
- f) Pile Loading - Charging and Discharging

Friday  
8/10

8. Cooling System

- a) Original Fans
- b) New Fans - Difficulties Experienced

Sat  
8/11

- c) Air Handled
- d) Air Flow and Power Relations

9 10: Pile Shielding

- a) Temperature Limitations
- b) Experimental Holes
- c) Charging Holes
- d) Rod Holes
- e) Scanning Holes

Monday  
8/13

10-11. Controls - Method of Operation - Construction - 100 Area Group

- a) Shim Rods
- b) Regulating Rods
- c) Safety Rods
- d) Safety Tubes

Tues  
8/14

11-12. Control Circuits - Wiring and Trip Circuit Mechanics - 100 Area Group and Instrument Group

- a) Hydraulic System
- b) #1 Safety Circuit
- c) #2 Safety Circuit

Wed  
8/15

12-13. Instrumentation - 100 Area Group Instrument Group

- a) Temperature Measurements
- b) Air Flow
- c) Pile Intensity
- d) Function and Location of Each Instrument
- e) Instrument Calibration

Thurs  
8/16

13-14. Determination of Power and Energy Output - 100 Area Group

- a) Chambers - #1 Calv
- b) Thermopiles - L and H Integrator
- c) Energy by Heat Output Calculations
- d) Energy by Foil Measurements

Friday  
8/17

14 15. Utilities and Services - 100 Area 100 Area Group

- a) Electric Power
- b) Steam
- c) Water
- d) Air
- e) Sewage Disposal

Sat 8/18

15 16. Pile Physics - L.B. Borst

- a) Experimental Program
- b) Neutron Distribution
- c) Rod Calibration
- d) Foil Measurements
- e) Neutron Flux
- f) Neutron Reactions

Monday  
8/20

16 17. Raw Materials - 100 Area Group

- a) Graphite Testing
- b) Uranium Testing
- c) Slugs Testing - (R and A welded)

Tues  
8/21

Hydrogen Tested

Deflection Tested

Borst Test

17 18. Metal Accounting - Methods 100 Area Group

- a) Vault
- b) Pile
- c) Canal
- d) Shipping
- e) Monthly Inventory

wed  
8/22



19. Product Accounting 100 Area Group

- a) Neutron Distribution
- b) Position Factor
- c) Pile Coordinateg
- d) IBM Machines

8/23 - AM  
Thurs

20. Broken Slugs

- a) Scanning
- b) Removal
- c) Contamination - Clean up Methods

Friday  
8/23  
Thursday - PM

21. Operating Problems

- a) Poison
- b) Ice in Pitot Section
- c) Water in Pile
- d) Plugged Discharge Chute
- e) Broken Stringers, etc.
- f) Postum Production
- g) Myrnelloy Cans
- h) Canal Contamination and Cleaning

Friday AM  
8/24

22. Shipping Methods - 100 Area Group

- a) Containers available
- b) Shielding Requirements
- c) Procedure - Paper Work

Friday  
8/24 PM

23. History of 100 Area Operation - 100 Area Group

- a) Start up
- b) Initial Loading
- c) Power Increases
- d) Metal Temperatures and Air Plugs
- e) New Slugs and Loading

8/25 AM  
Sat

23 - open discussion

- f) "H" Beam Installation
- g) New Fans
- h) Additional Metal Added
- i) Myrmalloy and Postum Production