Completed figure

PROC

26,893 kg

5976 ✓ #

450 | 26,893,000

2250

4393

4050

3430

3150

2800

2700

1000

900

Cite overpassed

Contract Mat'l

Normal U	ANL	21 Kg
AI		151

Total 172 Kg

> 75% Enriched

ANL 25,486 gm 235

License Mat'l

PRDC		25.6%	421,139 gms 235
Uevite	(SNM 183)	93%	747
W-A		93%	5043
WADC		93%	6388
ORE		10%	5321
			438,578 gms 235

Portable

Barrel full of depleted Ring no
Acid solution - no tables 15-20 gms enriched U
Storage (25%) ests. no analytical remedies
Red Car 6.4 Kg enriched U 70
.25
Vault posted

Part 40 Export - import licenses
record of receipt & transfer - Photographs of display
no records of receipt & transfer
records cite

Part 30 OK

Criticality Control

Process sheets — made up by ~~Engineering~~ Mfg — formally checked by Weiss (Critical), Quality Control Acct, Engineering before material goes out to floor

Enriched Material (1) (Red Card) - route card travel with material to every operation.

(2) Before material can be moved - Criticality monitor must be notified. (Monitor notes time date, location) movement

No enriched material left on process floor over nite must be moved to Vault.

Fire Safe -

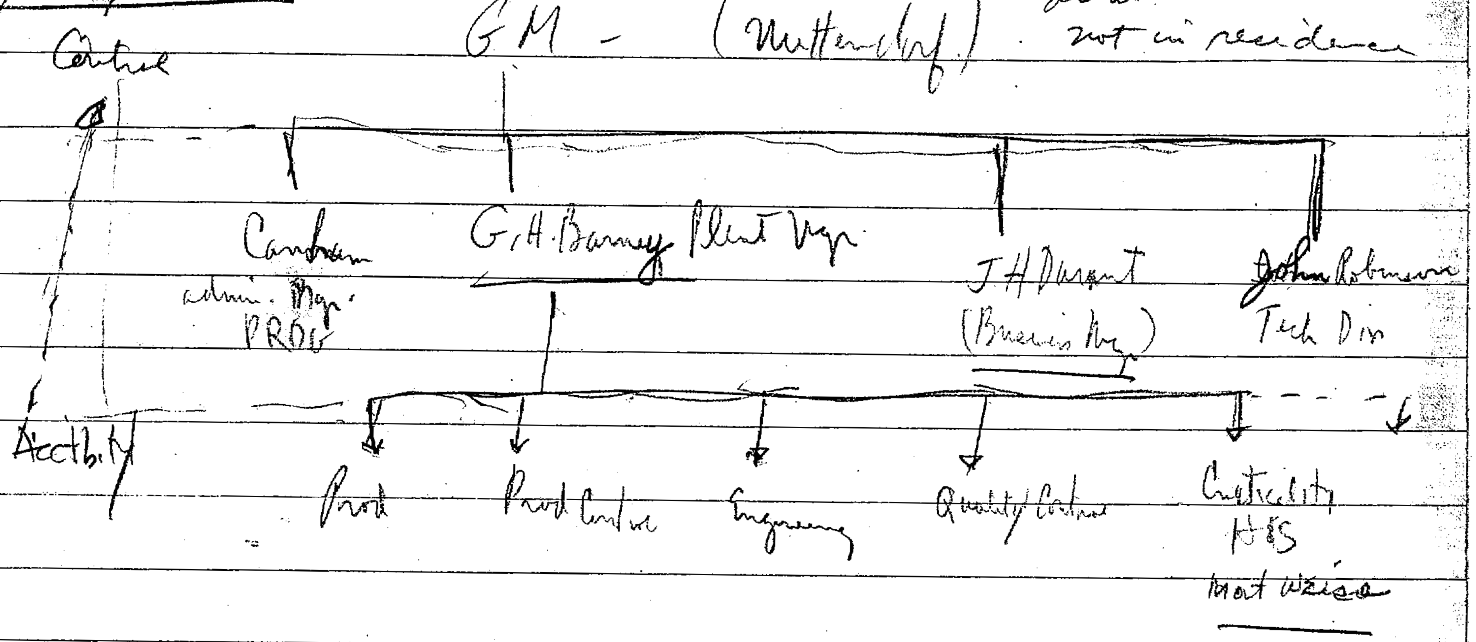
Chicago - instructor
NO. Attle & Attleboro — toured the plant
Plainville

total plant area
50,000'
25,000 mfg. area

D.E. Makepeace - Engelhard Industries

Contract - Enrico Fermi Reactor
Nuclear Equipment "
40 production people
20-25 - engineering admin

Organization



M. Weiss - Rad. Safety - Critical - has 2 people
~ Establishes

Degree in Chemistry Tulane
Dr. Friedland - U of Conn former consultant - trained Weiss in Criticality - 9 to 10 months
Dr. S. Malasker - Newark College of Engineering - Consultant

Plant in Operation since 1957 -

Conducted 4 - sessions on radiation control & radioactivity
all plant employees

Air Sampler
Incineration of wastes (cite) (305)
highest 236 d/m/M^3 2 1/4 x tol

Incineration on Aug 13, 19, 20, 26, 27, 31
Sept 2. 8, 9, 14, 23, 24, 25, 28 29. 30
citation Oct 14, 15 16 20 21 22, 26, 27 28, 29, 30
Nov 2 – 4, 6, 7, 9, 10 – 13, 16, 17

Physicals Annual Physical – urine, blood, general, Chest x-ray

Urinalysis – 6 month sampling of all personnel
1958 max urine 36 μg/l Av – .003
100 μg – recheck 9RE contaminant
Personnel Monit.
Bi. Weekly Nuclear Corp of America Bklyn NY
all ... 1958
308 — 930 Beta 1951
no minors max 2 week γ – 90 β 1958
γ – 950 β 390
Cumulative 13 week period
24
52
check
* R. Nadeau → melters helper – ~~contacted Weir~~ notified
melterers
10/30/59
investigated
400 β
2300 γ β
Called D. Smith Ch. O.O.
10/16/59 2400 β 360 γ
No Notification to NYOO

5

Smear 100 dpm/0'

			d/m/0'
Preoperational	Dec 23 1957	–	0-1
Operational	Jan 3 1958		
		Rolling Mill	3900
8 Samples		Forge press	3858
~~1 sample~~		Enriched Vault	1700
1 sample from 6		Hall	10
Feb.		Mat'l inspection Bench	1295
		Rolling Mill	11 492

Part 40 import

Records / cite

Export - import license

Torit NMI & Matheson

citation: no records of receipt & transfer records available

reduced levels after cleaning

average ranges 10 - 500 d/m/□'

1954 2000 → 20 after clean

power saw area
Nov. 1958 - range 8-150 d/m/□'

Water 7×10^{-6} unrestricted level

Septic Tank used instead of [illegible] sewer

Ave 2.7×10^{-6} μc/ml
7.0×10^{-6} μc/ml high

(1958)

22 (15570)

MEC water 4/28 before 42,280 after 14,848

1 on [illegible]

8/4 116,160 6,632

(1959)

range 0.2 to 6.0×10^{-6} μc/cc

Air D/M/M^3 instead of μc/ml

101c citation

cite 40.1c

(20X tolerance)

$1 - 112$ d/m/M^3 1959

Nuclear [illegible] **Film Badge**

		B	γ
10/2/59	-	0	0
10/16/	..	~~850~~	410 [illegible] (105)
10/23		1750	65
10/30		400	2300

2 wk film badge not returned to date 260

Will file report to Commission

Waste Disposal Info

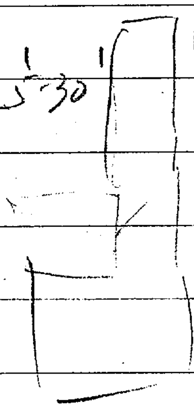
see (1) 11 liquid waste disposal

(2) no solids disposed to date
Intend to dispose at [illegible]
Stored within fenced area
on property

Cite 305 → (3) Incinerator
papers, wood boxes (debris) some
[illegible]
[illegible]

storage area

stack height 25'-30'



No air samples in unrestricted areas taken to date

Cite 201

incinerator
offices outside
etc

2/

LA 2063 TID 7016 } Criticality
K 1380
K 1019

No full time consultant on criticality

JOBS -

Atomics Internat. 40000 # 20% enriched
L.FRC - B&W - 20-25 Kg fully enriched 18% of 93% U in Al
Foils

B.Khaven 10 Kg U^{235} 2500 14% U.

CP-5 refueling original order 72 23 elements produced so far
30 Kg 93% enriched
7 Kg now on hand
23 Kg alloyed

Licensed Watertown Arsenal - 5 Kg

Wright Patterson - A 12 Kg - 4 Ks
2 shipment 2 Kg each

WTR Core 3 Welty Hill - 200 Elements
none on hand

Posting

203 e(1) source Entrance
e(2) [illegible]

area posted with inadequate [illegible] sign & symbol
Caution Radioactivity

Containers

203. #1 (#4) spec. [illegible]
for Cf Source

no sign
symbol
[illegible]
~~[illegible]~~
amount

#

Ventilation

Surveys
201 B

no sampling of stacks
several hoods - no air flow
(Jacket stripping Hood) filters noted to be clogg.
filters stored in steel drums - storage area another [illegible]

3

PRDC 8 shipment — 4888
25% Enriched Debris

Melted approx 400-500 # to date
Cold Extruded
ready for swaging — End capping
a problem holding up
operation

Marsh McLennan INSurance

PRDC

PIC Villiage [illegible]

3 rods — 10% moly
90% Uranium 15% Enriched

---

4 Eberline Monitors — in dw [illegible] units

1 Mfg. Area 130 x 100 center of area

1 Enrichment Vault — 2 Vaults

1 assembly area (Clad material)

100 x 100

require - constant Voltage supply

No Drills to Date on evacuation

ENGELHARD INDUSTRIES, INC.

D. E. MAKEPEACE DIV.
ATTLEBORO, MASS.

PROJECT NUMBER PRDC

DEMCO NUMBER 03349

UNITS ON ORDER

PCS. UNIT PCS. CARD

DUE DATE

START

PART NUMBER REV D CARD NUMBER 4 OF 4

PART NAME DEPLETED U-Mo Blanket Element

MATERIAL:

BY DATE

PROJ. NO.	SCHED. DATE	OPER. NO.	SEQ	CST. CTR.	OPERATION	TOOL NUMBER	OPER. NO.	STD. HRS.	ACT. HRS.
-3349		230		23	Clean and bag				
3349		240		40	Ship to Union Street				
3349		250		37	Sodium Bonding				
3349		260		40	Ship to Plainville Plant.				
3349		270		44	Leak test				
3349		280		--	In Process storage.				

REVISIONS

FORM NO. 1001.4

ENGELHARD INDUSTRIES, INC. D. E. MAKEPEACE DIV. ATTLEBORO, MASS.

PROJECT NUMBER: PRDC | PART NUMBER: | REV: D | CARD NUMBER 1 OF 4

DEMCO NUMBER: 03349 | PART NAME: DEPLETED U-Mo BLANKET ELEMENT

MATERIAL: DEPLETED URANIUM - 2-3/4% MOLYBDENUM.

UNITS: | ON ORDER:

PCS. UNIT: | PCS. CARD:

DUE DATE:

START:

Mr. Schulte | DATE 10/27/59

PROJ. NO.	SCHED. DATE	OPER. NO.	S E Q	CST. CTR.	OPERATION	TOOL NUMBER	OPER. NO.	STD. HRS.	ACT. HRS.
3349		01		36	Receive and sample U				
3349		05		36	Receive moly				
3349		10		1	Prepare Melt				
3349		20		2	Melt and stamp				
3349		30		41	Weigh				
3349	D	40		24	Sample (Saw tip)				
3349	D	50		23	Pickle billet				
3349		60		41	Weigh				
3349		70		24	Inspection				

REVISIONS: A-9/1/59 | B-9/25/59 | C-10/1/59 | D-10/6/59

ENGELHARD INDUSTRIES, INC.

D. E. MAKEPEACE DIV.
ATTLEBORO, MASS.

PROJECT NUMBER: PRDC

PART NUMBER: REV. D

CARD NUMBER 1 OF 4

DEMCO NUMBER: 03349

PART NAME: DEPLETED U-Mo BLANKET ELEMENT

UNITS: ON ORDER:

MATERIAL:

DEPLETED URANIUM - 2-3/4% MOLYBDENUM.

PCS. UNIT: PCS. CARD:

DUE DATE:

START:

BY Mr. Schulte DATE 10/27/59

PROJ. NO.	SCHED. DATE	OPER. NO.	SEQ	CST. CTR.	OPERATION	TOOL NUMBER	OPER. NO.	STD. HRS.	ACT. HRS.
3349		01		36	Receive and sample U				
3349		05		36	Receive moly				
3349		10		1	Prepare Melt				
3349		20		2	Melt and stamp				
3349		30		41	Weigh				
3349	D	40		24	Sample (Saw tip)				
3349	D	50		23	Pickle billet				
3349		60		41	Weigh				
3349		70		24	Inspection				

REVISIONS: A-9/1/59 | B-9/25/59 | C-10/1/59 | D-10/6/59

FORM NO. 1001-4

ENGELHARD INDUSTRIES, INC. D. E. MAKEPEACE DIV. ATTLEBORO, MASS.

PROJECT NUMBER PRDC

DEMCO NUMBER 03349

UNITS ON ORDER

PCS. UNIT PCS. CARD

DUE DATE

START

PART NUMBER REV D CARD NUMBER 2 OF 4

PART NAME DEPLETED U-Mo Blanket Element

MATERIAL:

BY DATE

PROJ. NO.	SCHED. DATE	OPER. NO.	SEQ	CST. CTR.	OPERATION	TOOL NUMBER	OPER. NO.	STD. HRS.	ACT. HRS.
3349		80		19 38	Can, weld and trim				
3349		90		44	Leak test, Evac. and seal.				
3349		100		40	Ship to NMI				
3349		110		36	Receive from NMI				
3349		120		24	Inspection				
3349		130		48	Finish cut and sample				
3349		135 140		21 23	Pickle scrap ends				
3349		155		23	Clean				
3349		160		9	Heat treat				

REVISIONS

FORM NO. 10014

ENGELHARD INDUSTRIES, INC.

D. E. MAKEPEACE DIV.
ATTLEBORO, MASS.

PROJECT NUMBER: PRDC

DEMCO NUMBER: 03-49

UNITS: ON ORDER:

PCS. UNIT: PCS. CARD:

DUE DATE:

START:

PART NUMBER: REV: D

CARD NUMBER: 3 OF 4

PART NAME: DEPLETED U-Mo Blanket Element

MATERIAL:

BY: DATE: 10/27/59

PROJ. NO.	SCHED. DATE	OPER. NO.	SEQ	CST. CTR.	OPERATION	TOOL NUMBER	OPER. NO.	STD. HRS.	ACT. HRS.
3349		170		43	Straighten				
3349		180		47	Finish C'Less grind				
3349		190		48	Finish cut samples				
3349		195 200		18	Chamfer and deburr				
3349		197		43	Straightness check				
3349		200		23	Clean				
3349		210		24	Inspection				
3349		220		41	Weigh				
3349		225		28	Ultrasonic test				

REVISIONS

FORM NO. 1001-A

N Y O O

COMPLIANCE INSPECTION REPORT

20-30, 40, 70

I GENERAL INFORMATION

License No's.:

Type Inspection:

Date:

Persons Accompanying Inspector:

[illegible]
[illegible]
[illegible]

A. Name of Licensee:

B. Persons Contacted	Title	Radiation Duties
C. A. Canham	Project Mgr	
J. R. Durant	Bus. Mgr	
Milton Weiss	Criticality	

Experience and Radiation Training of Above Individuals

C. Organization, Administration, Affiliations, Overall Program:

See Notes - attached

Radiation Safety Committee - Formal Meetings? Frequency: Minutes Kept?
Scope of Authority:

Name

Position

Radiation Safety Officer, Training and Qualifications

Scope of Authority:

Other People Using Isotopes

Name	Title	Radiation duties, training and experience

Procurement

Person responsible for ordering:

Person responsible for seeing limit is not exceeded:

Procurement procedure:

Supplier(s)

Is shipment opened before user receives it?

Preassayed? Sterilized?

D. Facilities

Item	Description (size, etc.)
Lab	
Counting Room	
Fume Hood	
Dry Box	
Tables, Benches	
Remote Handling Equipment	

E. Restricted Area Established? Description

F. Handling Procedures or Operation

G. Instrumentation — Calibration Procedures

H. Material Use

Isotope & Form	Use	Qty./Exp.	Rate of Use	Qty. on Hand: Max.	Usual	Current
1.						
2.						
3.						
4.						
5.						

I. General

II PERMISSIBLE DOSES, LEVELS, & CONCENTRATIONS	Sat	Unsat*	N. A.
A. Exposure of Individuals in Restricted Areas			
1. Exposure of adults to radiation (20.101a)	✓		
2. Exposure of adults to airborne radioactive material (20.101b)	✓		
3. Overexposure of adults (20.105)	✓		
4. Exposure of minors to radiation (20.101c)	✓		
5. Exposure of minors to radioactive material (20.101c)	✓		
6. Overexposure of minors (20.105)	✓		
B. Unrestricted Areas			
1. Exposure to radiation (20.102a)	✓		
2. Exposure in terms of area levels (20.102b)	✓		
3. Exposure to radioactive materials (effluents) (20.103)	✓	✓	
III PRECAUTIONARY PROCEDURES	None		
A. Personnel Monitoring (20.202a)			
1. Film badges: Supplier Landauer Freq. 2W			
2. Wrist badges: Supplier ____ Freq. ____			
3. Dosimeters: Type ____ Freq. ____	None		
B. Surveys (20.201)			
1. Restricted areas	401C - records of direct radiation surveys		
2. Unrestricted areas None	401C - air samples		dpm/M³
3. Airborne contamination surveys			
C. Caution Signs, Labels & Signals			
1. Posting radiation areas (20.203b)	✓		
2. Posting high radiation areas (20.203c)	✓		
3. Posting airborne radiation areas (20.203d)	✓		
4. Posting rooms or areas (20.203e)			
5. Labeling containers (20.203f)			
6. Alarm signals & interlocks in high radiation areas (20.203c)			

	Sat	Unsat*	N. A.
D. Instruction of Personnel (20.206)	w - o		
E. Storage in Unrestricted Areas (20.207)			
IV WASTE DISPOSAL			
A. Disposal by transfer (20.301 1) qty/time			
B. Disposal into sanitary sewer (20.303) qty/time			
C. Disposal by burial (20.304) qty/time			
D. Disposal as an effluent (20.301 3) qty/time			
E. Other			
V RECORDS, REPORTS, & NOTIFICATION			
A. Records			
1. Personnel monitoring (20.401)			
2. Surveys (20.401)			
3. Leak tests (Condition ___ of License #_____)			
4. Receipts (30.41, 70.51)			
5. Transfers (30.41, 70.51)			
6. Exports (30.41)			
7. Inventory (70.51)			
8. Waste disposal (20.401c)			
B. Reports of Loss or Theft (20.402)			
C. Notification of Incidents			
1. Class A (20.403a)			
2. Class B (20.403b)			
3. Class C (20.403c)			

	Sat	Unsat*	N. A.
V COMPLIANCE WITH SPECIAL PROVISIONS OF LICENSE (Conditions_____)	____	_____	_____

*VI DESCRIPTION OF ALL UNSATISFACTORY ITEMS:

VII SURVEY DATA & GENERAL COMMENTS