

Donald E. Warner, Act. Asst. Dir. for
Materials, Division of Compliance, HQ.

MAY 4 1961

Robert W. Kirkman, Director
Compliance Division, NYOO

ENGELHARD INDUSTRIES, D. E. MAKEPEACE DIVISION,
ATTLEBORO, MASSACHUSETTS - LICENSE NO. C-5161 -
REPORT OF OVEREXPOSURES

CMP:PBK

EX 6

Transmitted herewith is (1) a letter dated 4/18/61 from Controls for Radiation to the subject licensee concerning excessive quarterly doses for two employees as evidenced by their film badge exposures for the first quarter ending 3/5/61, and (2) a letter dated 4/24/61 from the licensee to DL&R, together with two forms AEC-5. The forms AEC-5 for the two Engelhard employees show cumulative radiation exposures for the first quarter to be 3540 mr for (b)(6) and 3020 mr for

(b)(6)

A study of the film badges by ConRad, as revealed in their letter, indicates that high film badge readings found for both men, who were engaged in melting of depleted uranium ingots, were due to film badge contamination.

Norton M. Weiss, Health and Safety Manager, D. E. Makepeace, reported in his letter to DL&R that to prevent a recurrence of film badge contamination, he has issued protective coverings and new badge holders to all personnel.

No further action is contemplated by this office with regard to the incident at this time. However, we intend to investigate this film badge contamination incident during the next-scheduled inspection of this licensee.

Enclosures:

1. ltr dtd 4/18/61
2. ltr dtd 4/24/61 w/2 forms AEC-5

Information in this record was deleted
in accordance with the Freedom of Information
Act, exemptions 6
FOIA- 2008-0314

H/35

CMP/BK

39
68

MAY 10 1961

Engelhard Industries, Inc.
D. E. Makepeace Division
Pine and Dunham Streets
Attleboro, Massachusetts

Attention: Mr. Norton M. Weiss
Health and Safety Manager

Gentlemen:

Thank you for your letter of April 24, 1961, reporting film badge overexposures for two employees. We will advise you if further information is required.

Sincerely yours,

Eber R. Price
Assistant Director
Division of Licensing
and Regulation

bcc: Compliance Division, HQ - w/cpy ltr 4-24-61
Compliance Division, NYOO
~~EMPLOYEE~~ USAEC - Chicago, Illinois - Mr. D. M. Gardiner

Signed concurrence copy in Docket No. 40-768

OFFICE ▶	DLR:EB RE Cunningham:hgs	DLR E R Price 5/10				
SURNAME ▶						
DATE ▶	5-3-61					

DOCKET NO. 40-768

File Copy
Copy in 70-139
info

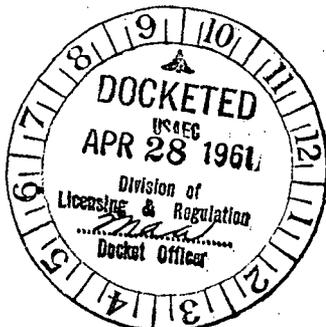
ENGELHARD INDUSTRIES, INC.

D. E. MAKEPEACE DIVISION

PINE & DUNHAM STREETS
ATTLEBORO, MASS.
ATTLEBORO 1-0090

Myrtle-5-9358

April 24, 1961



Director, Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington 25, D. C.

Subject: Report of Radiation Overexposure in Accordance with
Standards for Protection Against Radiation, Part 20,
Par. 20.405.

Gentlemen:

On March 27, 1961, a film badge exposure report was received from Controls for Radiation, Inc. listing radiation exposures for the period 2-6-61 - 3-5-61. Using the data from this report, it was determined that two (2) of our personnel had exceeded allowable quarterly doses as specified in Title 10-Part 20-Par. 20.101. A copy of form AEC-5 for each man is enclosed showing his cumulative radiation exposure for 1961. The two (2) men, each of whom is a (b)(6) were transferred to other jobs involving little or no radiation exposure on March 28, 1961. EX 6

An investigation was immediately started in an effort to determine the cause of exposure. As shown on form AEC-5, film badge reports indicated that films were contaminated, which prevented an accurate evaluation of exposure. This fact was confirmed through a visit to Controls for Radiation where the films involved and numerous others showed large amounts of contamination. Upon request, Controls for Radiation made a re-evaluation of the films, and submitted their report, a copy of which is attached.

The main source of exposure to the two (2) men in the course of their normal work is beta radiation which would be received from the radioactive decay of U-238 while melting depleted uranium ingots. Surveys of the melting

no copy made for file. P. on 70-139
4-28-61

(70)

April 24, 1961

area are taken quite frequently and beta levels as high as 5,000 mr/hr. have been noted on crucibles used in melting 350 pound depleted uranium ingots. Exposure to personnel is effected by the handling of crucibles and molds, and also by entrance into the furnace chamber for short periods of time. It is evident that film badges become highly contaminated during the performance of normal melting operations, and therefore, the values which are reported are not true indications of actual exposure.

In an effort to eliminate the contamination problem, we have covered all of our film badges with polyethylene, which is changed bi-weekly along with the film. Also, as of April 17, new badge holders have been put into use by all personnel. We feel that these measures will insure that any future film badge report will be indicative of a true exposure and not contamination.

Summary:

It is our opinion that the high readings reported on the films of the two (2) men were mainly due to contamination rather than a true exposure. To prevent a reoccurrence, we have issued protective coverings and new badge holders to all personnel. The two (2) men have been transferred from the melting furnace to other jobs which will allow them to receive little or no radiation exposure for a period of three (3) months, at which time their cumulative exposures will be within allowable limits.

In addition, new handling procedures are being instituted which will minimize the handling time in crucible cleaning and other furnace maintenance operations, in an effort to reduce direct exposure of personnel. The two (2) men have been notified in accordance with 20.405(b.) of 10 CFR 20.

We trust that the information as stated is sufficient in nature and scope to conform with requirements. Should further data be required, it will be transmitted upon request.

Very truly yours,



Norton M. Weiss
Health & Safety Manager

Copy to: (1) Manager, N.Y. Operations Office, N.Y.C.
(1) USAEC - Chicago, Ill., Mr. D. M. Gardiner
(1) Commonwealth of Mass., Dept of Labor & Industries
Mr. T. F. Kelly

NMW/sal



controls for radiation

INC.

130 ALEWIFE BROOK PARKWAY, CAMBRIDGE 40, MASSACHUSETTS

April 18, 1961

UNIVERSITY 4-8220

Mr. Norton Weiss
Engelhard Industries, Inc.
D. E. Makepeace Division
Route 152
Plainville, Massachusetts

Dear Mr. Weiss:

As you requested during your recent visit, we have examined in detail films which lead to the reporting of high doses for certain exposure periods covered by your film badge service.

The study of these films indicates that all of the films were grossly contaminated with what appears to be a beta emitter. The amounts of contamination noted on the film would cause localized high densities so that the density measured utilizing routine densitometer techniques would probably not be representative of the overall dose received by the film. We therefore attempted to measure the minimum density present on each film, and, assuming this represents that density reflecting the least effects calculated a maximum gamma dose based on these densities. The results of this approach are presented below.

<u>Wear Period</u>	<u>Badge Number</u>	<u>Maximum Possible Gamma Dose (mrem)</u>
1/23/61	(b)(6)	330
		320
		140
2/6/61		700
		1000
		350
		310
2/20/61		800
		800
		140

EX 6

Mr. Norton Weiss

-2-

April 18, 1961

In evaluating the validity of this method of determining maximum doses it should be noted that for many of the above films it was not possible to locate a film area larger than that seen by the densitometer which was uncontaminated. This would cause a bias in the direction of high doses.

It is our opinion, based on the density patterns clearly seen on the films in question, that these densities were caused by beta contamination present on the covering of the film pellicle. Therefore, neither the doses calculated above nor those previously reported to you are necessarily indicative of the dose received by the film from a source other than the material contaminating the film packet. Any such other dose would in all cases be substantially lower than the reported dose.

Very truly yours,


Richard G. Fix
Assistant Technical Director

RGF:gr

DOCKET NO. 40-768

70-139
File Copy

ENGELHARD INDUSTRIES, INC.

D. E. MAKEPEACE DIVISION
PINE & DUNHAM STREETS
ATTLEBORO, MASS.
ATTLEBORO 1-0090

February 21, 1961



Mr. J. C. Delaney, Chief
Nuclear Materials Branch
Division of Licensing and Regulation
U.S. Atomic Energy Commission
Washington 25, D.C.

Dear Mr. Delaney:

We would like to take this opportunity of commenting on your letter of February 10th addressed to Mr. Canham.

He has obtained a memorandum from Norton Weiss, our Health and Safety Officer, copy of which I am enclosing, herewith. We feel this covers the situation and trust you agree.

Thanking you for bringing these matters to our attention, we are

Very truly yours,

D. E. MAKEPEACE DIVISION

W. F. Mittendorf
W. F. Mittendorf
Senior Vice-President

WFM/ms
Enclosure

ENGELHARD INDUSTRIES, INC.

D. E. MAKEPEACE DIVISION
ATTLEBORO, MASS.

DATE February 17, 1961

MR. C. A. Canham

SUBJECT AEC Letter of 2-10-61

PIES TO

Mr. W. F. Mittendorf

With reference to the above letter from the AEC mentioning two (2) instances of non-compliance with our license, the following comments are in order:

EX 6
At the time of the alleged overexposure to (b)(6) July 1960, radiation surveys were made with G-M survey meters which were the only instruments available to us. It was felt that, in view of the high levels of radiation which were being encountered, instrumentation of a higher capability and wider range should be obtained. Additional instruments were procured and also additional personnel to utilize them properly.

We have been in compliance with sections 20.201, and 20.401 since September 1960 and this fact was confirmed by Mr. Klevin in his inspection made in December 1960.

Sincerely,



Morton M. Weiss

NMW/sl

RADIATION SAFETY CHECK

Company Engelhard Industries, Inc. Docket No. 40-768

References 70-139 Docket + 40 docket

Material Requested 5 ounces Quantity 60,000 lbs

Weight % any Form any Quantity on hand at any one time: _____

Intended Use Research & development of fused salt into fuel element

FACILITIES Not Required _____ See Comments _____ Adequate ✓

In Application: Not Required: _____
Hot Cell _____
✓ Vented Area _____
✓ Storage _____

EQUIPMENT Not Required _____ See Comments _____ Adequate ✓

In Application: Not Required: _____
✓ Processing _____
✓ Hood _____
Dry box _____
✓ Filter _____
✓ Resp. Prot. _____
✓ Strge. Cont. _____
✓ Handling _____

all equipment that will produce dust or gas will be hooded. If air samplers, etc. are needed, additional protection is installed.

INSTRUMENTS Not Required _____ See Comments ✓ Adequate ✓

In Application: Not Required: _____
✓ Beta gamma _____
✓ Alpha _____
Neutron _____
✓ Air samplers _____
Countg. (Scalers) _____
Fluorimeter _____

criticality alarm also present

ADMINISTRATIVE PROCEDURES Not Required _____ See Comments _____ Adequate ✓

RADIATION PROTECTION PROCEDURES Not Required _____ See Comments _____ Adequate ✓

In Application: Not Required: _____
✓ Shipping _____
✓ Handling _____
✓ Processing _____

RADIATION SAFETY CHECK

(Page 2)

RADIATION SURVEY PROCEDURES Not Required _____ See Comments _____ Adequate

In Appli- Not
cation: Required:
_____ Rad. levels _____
_____ Contamination _____
 Air Sampling _____
 Effluents _____
_____ Leak testing _____

PERSONNEL MONITORING Not Required _____ See Comments _____ Adequate

In Appli- Not
cation: Required:
 Film badges _____
_____ Dosimeters _____
_____ Calculations _____
 Urinalysis _____
blood test

*Work clothing, also hair, must be kept separate
(T-shirts, shorts, coveralls + surgical cap)*

WASTE DISPOSAL No Waste _____ See Comments _____ Adequate

Estimated Quantity _____ Method: O.K. with Part 20 _____
_____ Burial _____
_____ Sewer _____ Requires approval _____
_____ Transfer _____
_____ Incineration _____

TRAINING & EXPERIENCE AVAILABLE
In Appli- Not Not Required _____ See Comments _____ Adequate
cation: Required
 Rad. safety officer _____
 Supervision _____
 Instruc. of Personnel _____

ADDITIONAL INFORMATION REQUESTED none (date)
Reviewed by Hanson Date approved 26 April, 61

~~WITHHOLD ALL~~ EX. 6

U.S. ATOMIC ENERGY COMMISSION
CURRENT OCCUPATIONAL EXTERNAL RADIATION EXPOSURE

See Instructions on the Back

IDENTIFICATION

(b)(6) 12 SOCIAL SECURITY NO.

OCCUPATIONAL EXPOSURE

<p>5. DOSE RECORDED FOR (Specify: Whole body, skin of whole body; or hands and forearms, feet and ankles.)</p> <p>Skin of whole body</p>	<p>6. PERMISSIBLE DOSE AT BEGINNING OF PERIOD COVERED BY THIS SHEET</p> <p>137.3</p>	<p>7. METHOD OF MONITORING (e.g., Film Badge—FB; Pocket Chamber—PC; Calculations—Calc.)</p> <p>GAMMA <u>FB</u> BETA <u>FB</u></p> <p>NEUTRONS _____</p>
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8. PERIOD OF EXPOSURE (From—to)	DOSE FOR THE PERIOD (rem)				13. RUNNING TOTAL FOR CALENDAR QUARTER (rem)
	9. GAMMA	10. BETA	11. NEUTRON	12. TOTAL	
12/26/60-1/8/61	10-	10		20	20
1/9/61-1/22/61	190	640		830	850
1/23/61-2/5/61	* No evaluation given				
2/6/61-2/19/61	*1100	0		1100	1950
2/20/61-3/5/61	*1300	290		1590	3540

EMPLOYEE'S ACCUMULATED DOSE

14. PREVIOUS TOTAL DOSE (rem)	15. TOTAL DOSE RECORDED ON THIS SHEET (rem)	16. TOTAL ACCUMULATED DOSE (rem)	17. PERM. ACC. DOSE (rem) $5(N-18)=$	18. PERMISSIBLE DOSE (rem)
12.7				

19. NAME OF LICENSEE: **Transferred from furnace 3-28-61
ENGELHARD INDUSTRIES, INC.
D. E. MAKEPEACE DIVISION**

~~WITHHOLD ALL - Ex. 6~~

Form approved
Bureau of Radiat. (No. 48-5120)
Expiration date: June 15, 1957

U.S. ATOMIC ENERGY COMMISSION

CURRENT OCCUPATIONAL EXTERNAL RADIATION EXPOSURE

See Instructions on the Back

IDENTIFICATION

1. NAME (Last, first, and middle)	2. SOCIAL SECURITY NO.
(b)(6)	

OCCUPATIONAL EXPOSURE

3. BODY PARTS EXPOSED (Skin of whole body, or hands and forearms, feet and ankles)	4. PERMISSIBLE DOSE AT BEGINNING OF PERIOD COVERED BY THIS SHEET	5. METHOD OF MONITORING (e.g., film badge, TLD, pocket chamber, etc.)
Skin of whole body	150 R	CR
		DATE: 11/15/51

6. PERIOD OF RECORD (From - to)	7. DOSE FOR THE PERIOD (rem)				8. EXPOSURE TOTAL FOR CALENDAR QUARTER (rem)
	9. GAMMA	10. X-RAY	11. NEUTRON	12. TOTAL	
12/28/50-1/3/51	* No emulsions given				
1/9/51-1/26/51	210	130		340	340
1/28/51-2/7/51	580	400		980	1120
2/8/51-3/19/51	* 900	0		900	2020
3/20/51-3/31/51	* 1000	0		1000	3020

LIFETIME ACCUMULATED DOSE

13. TOTAL DOSE RECORDED ON THIS SHEET	14. TOTAL ACCUMULATED DOSE	15. PERMISSIBLE DOSE
20,490	20,490	15 R

Transferred from Form 8-20-51
ENGELHARD INDUSTRIES, INC.
D. I. MARKETPLACE DIVISION