

MA.0-03-1

~~MA 6~~

B2809

NOV 5 1980

EV-141

Englehard Industries, Makepeace Division

E. Jacewsky, CORO

This office is conducting an investigation into the operation of the Makepeace Division of Englehard Industries to determine the type and extent of activities conducted for the Westinghouse, Bettis Field Operations around July 1956. The Makepeace Division was designated an accountability station by the former Atomic Energy Commission's Chicago Operations Office under the Pittsburgh Area Office.

Please provide any records that can be obtained in regard to the activities of the Makepeace Division, especially during the 1956 time frame. I am enclosing a summary of the information we have been able to accumulate so far.

Original signed by:

William E. Mott, Director
Environmental and Safety
Engineering Division
Office of Environment (EV-14)

Enclosure

bcc: Aerospace
A. Whitman, EV-141

EV-141:AWhitman:dr:353-5439:11/3/80:DF-38

CONCURRENCES	
RTG. SYMBOL	EV-141
INITIALS/SIG.	<i>[Signature]</i>
DATE	11/4/80
RTG. SYMBOL	EV-14
INITIALS/SIG.	Mott
DATE	11/4/80
RTG. SYMBOL	
INITIALS/SIG.	
DATE	
RTG. SYMBOL	
INITIALS/SIG.	
DATE	
RTG. SYMBOL	
INITIALS/SIG.	
DATE	
RTG. SYMBOL	
INITIALS/SIG.	
DATE	
RTG. SYMBOL	
INITIALS/SIG.	
DATE	
RTG. SYMBOL	
INITIALS/SIG.	
DATE	

ENGELHARD INDUSTRIES, INC.
(D.E. Makepeace Co.)
Plainville, Massachusetts

SITE FUNCTION:

D.E. Makepeace Co. was initially involved in the refining of precious metals and in July 1956 began work with uranium metal under a contract with Westinghouse, Bettis Field Operation. The site was designated an accountability station by the Atomic Energy Commission, Chicago Operations Office under the Pittsburgh Area Office.

In July 1957 D.E. Makepeace applied for and was granted a license under 10 CFR part 70 in order to expand its operation to the commercial sector. Under the licenses (SNML-185 and SUB-172) the facility conducted operations with natural, depleted and enriched and alloyed uranium and associated metals that involved:

- Vacuum induction and Arc melting
 - Hot and cold rolling
 - Hot bonding by rolling
 - Forging
 - Vacuum Annealing
 - Machining
 - High pressure corrosion testing
 - Vacuum and atmospheric welding
 - X-raying
- and
- Special inspections

These activities were limited to the Plainville facility. In July 1959 an application was made to the AEC to increase the Companies allowed storage capacity by allowing them to use their Attleboro metal fabricating facility. The application was withdrawn and based on available information the Attleboro facility did not process nuclear material.

From 1957 to termination of nuclear activities in 1963 the Plainville facility produced numerous fuel element assemblies for various clients. Table 1 lists some of the contracts and gives the available data on the material. The Engelhard Industries licenses were terminated in September 1963.

SITE DESCRIPTION:

The facility was located in Plainville. The facility contains one building for processing uranium and associated waste handling areas including an incinerator and a leaching field.

OWNER HISTORY:

The site was owned by D.E. Makepeace Co., whose parent company was Baker & Co., Inc. The facility became D.E. Makepeace Division of Engelhard Industries, Inc., in early 1958. The company ceased uranium operations in 1962. Current activities and owners are unknown.

RADIOLOGICAL HISTORY:

During the operation of the facility standard NRC inspections and medical exams for employees were conducted. Film badges were worn by employees and only one incident is known to have occurred where the film badges showed above acceptable exposure. The NRC investigation indicated the incident was probably due to poor badge handling technique. All working areas were monitored and decontaminated as needed.

Waste disposal was handled as shown on Figure 1. Liquid waste was handled in a number of separate systems. All areas except the laundry, showers and laboratory, were connected to one of 2 main drain systems, one for natural uranium and one for enriched. The laundry, shower and laboratory went to a separate system. Each of the drains had separate pumps and were channeled through separate filter systems made up of 50 micron and 5 micron filters. After filtration the water was placed in a common 2500 gallon tank. When the tank was filled the water was transferred to a second tank, homogenized and checked for activity. If the water met 10 CFR 20 requirements it was pumped to the leaching field. If not it was processed through an ion exchange column and rechecked before transfer to the leaching field. Filter and filtering media were combusted to reduce volume, sampled for accountability and handled with the solid waste.

All dust generating areas were hooded. The air was filtered prior to venting. The filters were assumed contaminated and handled in the same manner as the liquid waste filters.

All combustible waste was burned in the incinerator in the boiler room. The exhaust was vented through the boiler stack. It was filtered prior to discharge. Contaminated ash was placed in 30 gallon drums and disposed of at sea (generally by Crossroads Marine Disposal). Reclaimable uranium was drummed and covered with oil and shipped to National Lead Company of Ohio by a company hired truck. Enriched waste material was shipped to Oak Ridge, also by a company hired truck.

The company requested that their license be cancelled in June of 1963. The AEC concluded that due to the insignificance of contamination on equipment there was no hazard and the license was terminated in September 1963. It appears the majority of the equipment was sold to a company in Italy. There is no record of the decontamination or where the wastes were disposed of, but it is assumed that the same disposal procedures discussed above were used.

TABLE 1

FUEL ELEMENT FABRICATION AND URANIUM WORK
PERFORMED BY MAKEPEACH (ENGLEHARD)

<u>CONTRACT</u>	<u>TASK</u>	<u>DATE</u>
S-33 AVI-NMINK, AT(30-1) 1-1565 Nuclear Metal, Inc.	Rolling Uranium - Aluminum elements (14%U , 93.15% enriched); Total \approx 21.8 kg of U235	License Request Feb. 1958
#31-109-38-978 Sub #1 CP-5 Reactor Argonne National Lab.	Fabrication of tubular fuel elements; Uranium Aluminum elements, 26% uranium at 93% enrichment;	
PRDC, Detroit, Mich. EnricoFermi Fast Breeder Reactor	Fabricate Fuel elements; 90% Uranium (25.6% enriched Uranium) 10% Molybdenum and Clad with Zirconium; subassemblies made with 2.75% Mo and 97.25% depleted uranium	Request June 1959
Atomics Int., Inc. Sodium Reactor Exp.	Fabricate Prototype Fuel Pins; 90% Uranium (10% enriched) and 10% Molybdenum; Uranium from Mallinckrodt	Feasibility Report March 1959
Watertown Arsenal OMRR	Fabricated 4 types of experimental plates; 14.3% Uranium (93% enriched) and 85.7% Aluminum	Feasibility October 1959
Wright Field AFNETF Contract AF 33(616)-6059 Air Force Nuclear Eng. Test Facility	Fabricated Uranium Aluminum Plate elements; 12-15% Uranium (93% enriched) balance Aluminum	Feasibility November 1959
Westinghouse Test Reactor, Order # 54-W2-84482	Fabricated Fuel elements; 13% Uranium (93% enriched) 87% aluminum	Feasibility February 1960
Japan Atomic Energy Research Inst. Fast Breeder Exponential Experimental Facility, Okura and Co.	Fabricate Fast Neutron Converter Elements; elements 19 to 20% Uranium - 235 (produced by mixing 25.6% enriched with 0.36% depleted uranium)	

TABLE 1

FUEL ELEMENT FABRICATION AND URANIUM WORK
PERFORMED BY MAKEPEACH (ENGLEHARD) (Cont'd)CONTRACTTASKDATE

Davison Chemical Co.

Converted Scrap to UO_2 ;
Uranium Scrap was converted to
 UO_2 and shipped to Davison for
recovery

February 1962

FIGURE 1. WASTE DISPOSAL SYSTEM

