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June 29, 1956 NLO

**TRIP REPORT TO GENERAL ELECTRIC PLANT AT  
SHELBYVILLE, INDIANA ON JUNE 25 AND 26, 1956  
J. A. Quigley, M.D.**

E. M. Chenault

OBJECTIVE OF TRIP:

This trip was made to observe the operation and to make recommendations from a health and safety standpoint during the process of compacting small pieces of thorium metal into an electrode; to conduct a health and safety survey, and to advise on the proper decontamination methods after the compacting operation was completed.

CONCLUSIONS AND RECOMMENDATIONS:

During the compacting operation full protective clothing; Dust-foe respirators, gloves, and safety goggles, all supplied by NLO, were worn by the two men engaged in handling the thorium metal. At the completion of the test the compactor, along with the area surrounding the machine, was completely decontaminated and monitored with a 2610-A Geiger counter. It was recommended that the thorium metal be kept centralized in order to prevent the spreading of contamination. Adjacent areas to the compactor were kept clean and the dust exposure was held down to a minimum by the use of a portable vacuum cleaner held as close to the work as possible. The equipment and area showed no measurable amount of radioactive contamination after decontamination.

Although air dust samples taken during the dumping operation were slightly above MAC, the exposure to the operators was very low as the time involved was only a total of eight minutes and respirator were worn all the time. General Air samples taken during the compacting operation were very low.

BACKGROUND FOR TRIP:

As a result of a series of tests conducted by the Technical Division they have accumulated 500 pounds of thorium metal, which has been broken up into small pieces. The purpose of the test was to attempt to compact this material into electrodes, which it is hoped can be used directly in an arc melting furnace. This would save a number of time-consuming operations, which have proven, in the past, to be quite serious health problems.

PERSONS VISITED:

Dr. Ward, Head of Advance Planning; R. Wright, Industrial Heating Specialist; L. Johnson, Head of Marketing; and A. Kirscht, Engineer in Charge of Compacting.

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J. A. ~~Quigley~~, M.D.  
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DESCRIPTION OF TRIP:

Five hundred (500) pounds of thorium metal, in small pieces no larger than 3/4", was divided into five groups. These were fed by hand into the General Electric Compactor, where they were compressed to form five-inch diameter electrodes. The largest electrode made was 13-3/4" long and weighed 150 pounds. The other electrodes were broken into pieces 5" to 6" long in removing them from the machine. The time required to hand feed the thorium into the compactor totaled only eight minutes.

At the conclusion of the operation, all of the thorium metal was placed back into the original containers and returned to FMPC. The Compactor and the surrounding area were vacuumed with a portable vacuum cleaner. The paper which had been placed on the floor surrounding the compactor was placed in containers and returned to FMPC. The dies used to form the electrodes were turned down on a lathe to remove the surface contamination, and these turnings were shipped back to NLO along with the other metal. The portable vacuum cleaner was held close to the dies while they were being turned down and paper was used to catch the turnings.

MISCELLANEOUS COMMENTS:

Everyone concerned with the Compactor operation at General Electric was very cooperative and congenial. General Electric personnel were very helpful and welcomed all health and safety recommendations. They did a good job in handling the material to prevent the spreading of contamination, and also decontaminated the equipment and area very well.

(Attached is a sketch of the General Electric Compactor used in the test).

COMMITMENTS:

None.

ORIGINAL SIGNED BY

E. M. Chenault

EMC:ljm

Attach.

cc: R. C. Heatherton  
R. H. Starkey  
G. W. Wunder (2X)

Central File

# ANALYTICAL DATA SHEET

ANALYTICAL DEPT. - HEALTH AND SAFETY DIVISION

NLO

1956	Industrial Hygiene or Medical Dept.						A			
I. H.#	962	Sample Nos.	1	Date Collected	6-25	by	EC	Route to	EC	Date Receiv
Location	GENERAL ELECTRIC		Type of Sample	Air dust	Analyzed for	F	Alpha X	Date Report		
Remarks	Shelbyville, Indiana			U	Beta	Method of				
	Operation of GE vacuum arc furnace with Compactor		No <sub>3</sub>	Ra						
	for continously forming thorium ingots.		Oil	pH	Counting Da					
			Be	Th	BKGD	.16				

Sample No.	Hour	Sample Description	R	T	Q	Count	T
219	1500	BZ - 2 men observing into compacting area from the platform. Dust-foe respirator worn.	.02	2	.04	20	6

**DISTRIBUTION:**  
 1-ANALYTICAL LABORATORY DEPARTMENT (RECORD COPY)      3-MEDICAL DEPARTMENT  
 2-INDUSTRIAL HYGIENE DEPARTMENT                              4-DIRECTOR OF HEALTH & SAFETY DIVISION  
 NLO - H&S - 736 (2-2-56)

**ANALYTICAL DATA SHEET**

ANALYTICAL DEPT. - HEALTH AND SAFETY DIVISION

1956	Industrial Hygiene or Medical Dept.					A				
I. H. #	963	Sample Nos.	2	Date Collected	6-25-	by	EC	Route to	EC	Date Receiv
Location	GENERAL ELECTRIC		Type of Sample	Air dust Analyzed for		F	Alpha x	Beta	Counting D	Date Repor
Remarks	Shelbyville, Indiana					U	Beta	No <sub>3</sub>	Ra	Method of
	Disassembling compactor. Dust-foe respirators worn and area is roped off.					Oil	pH	Be	Th	Counting D
						BKGD				

Sample No.	Hour	Sample Description	R	T	Q	Count
7597	2200	GA - While disassembling compactor. Pump is set up approx. 2' from the dis-assembling area.	.02	15	.30	20
221	2300	GA - Same as 7597.	.02	15	.30	20

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# ANALYTICAL DATA SHEET

ANALYTICAL DEPT. - HEALTH AND SAFETY DIVISION

1956	<b>Industrial Hygiene or Medical Dept.</b>	Air
I. H. # 959	Sample Nos. 3	Date Collected 6-25
	by EC	Route to EC
Location GENERAL ELECTRIC,	Type of Sample Air dust	Analyzed for F Alpha x
Remarks Shelbyville, Indiana		U Beta
		No <sub>3</sub> Ra
Compacting thorium metal into a 5" ingot in a General	Oil	pH
Electric Compactor.	Be	Th
		Counting Da
		BKGD

Sample No.	Hour	Sample Description	R	T	Q	Count	T
212	1530	GA - At the base of the Compactor while compacting thorium metal. A vacuum hose is held at the source of the dust, but a considerable amount becomes air-borne.	.02	20	.40	20	1
213	1550	GA - Same as 212, except for a larger vacuum system replacing NLO portable Electrolux.	.02	20	.40	12	2
215	1610	GA - Same as 213.	.02	20	.40	3	1

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# ANALYTICAL DATA SHEET

ANALYTICAL DEPT. - HEALTH AND SAFETY DIVISION

1956	Industrial Hygiene or Medical Dept.					A
I. H.#	960	Sample Nos.	2	Date Collected	6-25 by EC	Route to EC
Location	GENERAL ELECTRIC		Type of Sample	Air dust	Analyzed for	F Alpha <sup>X</sup>
Remarks	Shelbyville, Indiana					U Beta
	Operating GE Compactor. Some dust and smoke emanates					No <sub>3</sub> Ra
	from the Compactor during the Compacting process.					Oil pH
	Vacuum hose was held at the source.					Be Th
						Counting D
						BKGD .1

Sample No.	Hour	Sample Description	R	T	Q	Count	T
214	1545	GA - On the platform approx. 1' beside the Compactor while compacting thorium metal. A larger vacuum system has replaced the small type Electrolux. There are 2 men on the platform wearing dust-foe respirators.	.02	20	.40	10	1
218	1420	GA - Same as 214.	.02	20	.40	20	4

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# ANALYTICAL DATA SHEET

ANALYTICAL DEPT. - HEALTH AND SAFETY DIVISION

1956	Industrial Hygiene or Medical Dept.						A
I. H. # 964	Sample Nos. 3	Date Collected 6-25	by EC	Route to EC		Date Receiv	
Location GENERAL ELECTRIC	Type of Sample Air dust	Analyzed for F	Alpha X			Date Report	
Remarks Shelbyville, Indiana		U	Beta			Method of	
		No <sub>3</sub>	Ra				
Compacting thorium metal into a 5" ingot in a GE compactor.		Oil	pH			Counting D	
		Be	Th			BKGD .16	

Sample No.	Hour	Sample Description	R	T	Q	Count	T
209	1500	BZ - Two men standing on platform while compactor is in operation. Some smoke and dust is emanating from the compactor during the compacting process. Dust-foe respirators worn.	.02	3	.06	20	8.
210	1510	BZ - Same as 209, except time.	.02	3.5	.070	20	2.
211	1515	BZ - Same as 209.	.02	3	.06	20	0.

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# ANALYTICAL DATA SHEET

ANALYTICAL DEPT. - HEALTH AND SAFETY DIVISION

1956	Industrial Hygiene or Medical Dept.					A
I. H.# 961	Sample Nos. 4	Date Collected 6-25	by EC	Route to RUS	Date Receiv	
Location GENERAL ELECTRIC	Type of Sample Air dust	Analyzed for F	Alpha x		Date Report	
Remarks Shelbyville, Indiana		U	Beta		Method of	
	Compacting pieces of thorium metal into a 5" ingot in a GE compactor.	No <sub>3</sub>	Ra		Counting De	
		Oil	pH		BKGD .1	
		Be	Th			

Sample No.	Hour	Sample Description	R	T	Q	Count	T
208	1430	BZ - 1 man emptying drum of thorium pieces into feed hopper. Dust-foe respirators worn and vacuum hose is held at the source of the dust.	.02	1.5	.030	20	9
216	1500	GA - Approx. 3' from compactor at the base while running pieces of thorium metal through.	.02	20	.40	9	1
217	1600	BZ - Same as 208, except a larger vacuum system has replaced NLO Electrolux	.02	1.5	.030	20	3
220	1700	BZ - Same as 208.	.02	1.5	.030	20	1

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