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October 10, 1961

NLO

REPORT: TRIP REPORT TO AX-MAGNETHERMIC UNIT, OHIO  
OCTOBER 31, 1961  
TO: J. A. Quigley, I.D.  
FROM: D. L. Flowers

*jeep*

CENTRAL FILES

OBJECTIVE OF TRIP

With the timely use of industrial hygiene measures at the subject company, no lead also previously agreed to NLO personnel were sent to check for radioactive contamination and to supervise the packaging and labeling of materials to be returned to NLO.

CONCLUSIONS AND RECOMMENDATIONS

No significant radioactively contaminated areas or equipment above contamination limits were found. AX-Magnetometric personnel had performed a very thorough clean-up of the process area, prior to our arrival.

The SS materials and other radioactive residues were properly packaged and labeled according to NLO and IEC procedures and regulations for return to NLO.

The analysis of urine samples, collected from each of the AX-Magnetometric employees engaged in the work with uranium, revealed insignificant levels of uranium.

BACKGROUND HISTORY

The subject company fabricated an industrial heating unit, for heat treatment of uranium slugs. For this the heating unit required additional development to obtain the desired efficiency. It was thought by both NLO Technical Division and AX-Magnetometric personnel advisable to send a limited quantity of uranium to Washington for them to use in their development work. Uranium slugs were heat treated only intermittently, to evaluate the efficiency of the unit and to attempt to obtain the uranium requirements for the heat treatment of uranium slugs.

PERSONS VISITED

- Owen Hull - Project Sales Engineer
- Paul Lavins - Project Engineer

DESCRIPTION OF TRIP

Three operations were performed in the overall project. They were the drilling of thermo-couples holes, application of heat, and the quenching of uranium slugs. The operations were conducted in an area measuring approximately 600 square feet, with no physical barriers separating it from the remaining portion of the plant.

ON OCTOBER 31, 1961

J. A. Quigley, M.D.

November 10, 1961

The areas and the equipment used for each of the above-mentioned operations were thoroughly monitored. No significant levels of contamination were found. ( $<500$  d/m/100 cm<sup>2</sup>)

SS material was accounted for, packaged, labeled, and returned to NLO. The quench water was placed in a 30 gallon container, surrounded with an absorbent, in a larger container. The turnings, generated from the drilling operations, were placed in the quench water. The vacuum cleaner bags, containing uranium oxide, were placed on top of the 30 gallon container and the absorbent within the 55 gallon container.

Urine samples were obtained without any apprehension, from five of the AJAX-Magnetthermic employees. The following uranium concentrations were obtained from the urine samples:

<u>Name</u>	<u>U-235/1</u>
Fred Rechlies	.009
George Santullo	.005
John Niles	.009
Paul Lavins	.009
Wilbur Grouley	.012

These results when compared with NLO data, indicates a very low order of exposure, well below the maximum permissible concentration for a 40-hour work week.

#### COMMENTS

X It was agreed, that with the approval of NLO Management, a brief report of the urinalysis results would be forwarded to AJAX-Magnetthermic supervision. This will be forwarded to Mr. Hull by Mr. Heatherston, if NLO Management has no objections.

#### MISCELLANEOUS COMMENTS

The subject company has in its possession a slab of uranium measuring approximately 48" x 2 1/8" x 2/16". The piece of metal has been there for seven years. It came from Chalk River, Canada. No one seemed to know the complete details concerning the metal. The metal is contained in a plastic bag. Presently it is being stored in the office area. The metal was recently moved to its present location after it was almost mistakenly discarded from a warehouse as "scrap". The metal is slightly oxidized and gives radiation levels of  $>20.0$  mrad/hr - at contact and 5.0 mrad/hr at a meter's distance. AJAX-Magnetthermic supervision was informed that the disposition of the metal would be referred to the local AEC.

*D. L. Flowers*  
D. L. Flowers

DLP/ep

cc: J. H. Noyes (2x)  
J. A. Quigley, M.D. (1x)  
R. H. Starker

NATIONAL LEAD COMPANY  
OF OHIO  
Cincinnati 39, Ohio

August 18, 1961

CF  
B4-1-300  
72  
CENTRAL FILES

**SUBJECT:** TRIP REPORT TO AJAX-MAGNETHERMIC CORPORATION, YOUNGSTOWN, OHIO  
ON AUGUST 3-4, 1961  
**TO:** J. A. Quigley, M.D. and P. L. Cuthbert  
**FROM:** D. L. Bowers and R. F. Bauer

OBJECTIVE OF TRIP

On 8/1/61 a call was received from the subject company relating that a vacuum cleaner bag containing black oxide had burst. The objectives of the trip were to determine the extent of radioactive contamination, obtain urine samples, and to secure other pertinent information regarding the incident and the status of the induction-heat contract operations.

CONCLUSIONS AND RECOMMENDATIONS

No publicity of the incident was released by the local Civil Defense Agency or the subject company.

Alpha monitoring of the work area and of the employee's clothing revealed insignificant levels of contamination.

Air samples collected the day after the incident indicated no significant residual air contamination in the work area. No air dust levels exceeded normal background. The urine samples, collected one each on three consecutive days, from each of the four employees involved in the incident contained such a relatively low concentration of uranium so as to confirm the opinion that any release of radioactive material that may have occurred was indeed insignificant with respect both to quantity and personnel exposure. This opinion is substantiated by the extremely low levels of activity detected on the employees' work clothing, on surfaces in the work area, and in the air in the immediate working environment.

The above favorable conditions found probably resulted from the alertness of one employee's action of immediately switching on the roof fan located above the site of the bag eruption, and the cessation of vacuuming operations.

Ajax-Magnethermic supervision were advised to inspect the dust bag of the vacuum unit more frequently and to make the bag changes with the NLO-provided supply of dust bags. All bags and other contaminated items are to be retained for return to NLO upon completion of the project.

BACKGROUND FOR TRIP

On 8/3/61 Elmer Bowers, Assistant Purchasing Agent for Ajax-Magnethermic called to inform us of the incident. Mr. Bowers also stated

TRIP REPORT TO AJAX-MAGNETHERMIC CORPORATION, YOUNGSTOWN, OHIO  
ON AUGUST 3-4, 1961  
J. A. Quigley, M.D. and F. L. Cuthbert  
August 18, 1961

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that a radiation survey meter had been obtained from the local Civil Defense Agency, and a layman's evaluation of the incident had been made. NLO management felt that the incident warranted a thorough investigation.

#### PERSONS VISITED

Gene Keller - Salesman  
Paul Lavins - Project Engineer  
Elmer Bowers - Assistant Purchasing Agent  
John Wrasman - Project Engineer

#### DESCRIPTION OF TRIP

We arrived at the subject company on 8/4/61. A thorough explanation of the incident was given to us by Ajax-Magnethermic supervisory personnel. It was explained that a low range ( $\beta/\gamma$ ) survey meter was obtained from the local Civil Defense Agency by Mr. Elmer Bowers immediately after the incident. The only interest expressed by Civil Defense personnel was relative to the knowledge of operation of the instrument.

The four employees in the incident were interviewed and assured that there was no reason for alarm in view of the nature of the incident. No apprehension was in evidence of the individuals involved and they were very cooperative in submitting urine specimens and receptive to the brief health and safety discussion. Urine specimens were also requested from the four individuals involved in the incident for the following two days to be forwarded to NLO. This also was readily agreed upon.

The area being utilized for the fabrication of the induction coil and intermittent induction heat applications to uranium slugs, measures approximately 800 square feet with no physical barriers separating it from the remaining portion of production area (15,000 sq.ft.). The incident area was then thoroughly monitored with an alpha proportional counter (PAC-3G). A small floor area (2-3 sq.ft.) around the site of the vacuum cleaner produced alpha levels of 4000-4500 d/m/100cm<sup>2</sup>. The area was vacuumed more thoroughly and reduced to essentially background level. The other floor areas and the top of various pieces of apparatus had been thoroughly decontaminated immediately after the incident by Ajax-Magnethermic personnel. As stated in the conclusion, the switching on of the roof fan aided greatly in the prevention of gross contamination inside the plant and of excessive inhalation of the radioactive dust by the workers. Four general air samples of 15 minutes duration were taken in the incident area. The analysis of each of the four air samples produced alpha levels of  $< 1$  d/m/m<sup>3</sup> or normal background levels. Each of the four employees changed their clothing and showered after the incident. The clothing was left at the plant. The shirts and trousers were monitored for alpha contamination. The highest alpha level obtained was slightly above the background of the instrument. Since there was no loose or visible radioactive material on their clothing, they were informed that home laundering would be harmless and permissible.

TRIP REPORT TO AJAX-MAGNETHERMIC CORPORATION, YOUNGSTOWN, OHIO  
ON AUGUST 3-4, 1961  
J. A. Quigley, M.D. and P. L. Cuthbert  
August 18, 1961

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The following uranium concentrations were obtained from the urine samples:

<u>Name</u>	<u>Fri. 8/4/61</u>	<u>Sat. 8/5/61</u>	<u>Sun. 8/6/61</u>
Fred Rechlies	.027 mg/l	.008 mg/l	.018 mg/l
*George Santalio	.006	.027	.016
John Niles	.021	.011	.013
*John Lish	.029	.019	.026

\*denotes those employees closest to the plume of black oxide.

#### COMMENTS

It was agreed that with the approval of NLO management that a brief report of the urinalysis results would be forwarded to Ajax-Magnethermic supervision.

#### MISCELLANEOUS COMMENTS

After the decontamination problem was solved, the status of the NLO induction coil was discussed.

For the past two months Ajax-Magnethermic has been developing an induction coil to beta heat treat uranium cores on a more uniform and repeatable basis than the original NLO coil design. Mr. John Wrasman, Project Engineer who designed the new coil and directs the test procedures, stated that a 50°F temperature difference is noticed around the core periphery and a 100°F difference from the center to the end. These results indicate that more work and testing are required before the new coil can be accepted. Mr. Wrasman feels he can give a more definite answer on a solution to the temperature difference problem in about two weeks. Since the results, at this time, are not as good as anticipated, the Ajax people were asked to keep the old NLO coil in its original configuration, providing an improvement cannot be realized on the new one.

All Ajax-Magnethermic personnel were very amicable and cooperative during the entire investigation of the incident.

  
D. L. Flowers

  
R. F. Bauer

DLF/RFR/bw

cc: J. H. Noyes-2x  
C. R. Polson

R. H. Starkey  
Central File

# OFFICIAL USE ONLY

B4-1-300 CR  
72  
NLO

NATIONAL LEAD DEPARTMENT  
OF NLO  
Cincinnati 39, Ohio  
June 7, 1962

SUBJECT: SUMMARY OF TRIP TO THE AJAX-MAGNETHERMIC CORP., TOWNSTOWN, OHIO  
5/23/62 - 5/24/62  
TO: J. A. Quigley, M.D.  
FROM: E. L. Stevens

CENTRAL FILES

## PURPOSE OF TRIP

The purpose of this trip was to advise proper Health and Safety practices during the induction-heat treating of uranium metal. Part of the test was to evaluate the two copper heating coils which were utilized for induction-heat. One of the coils, belonging to NLO, had been returned to the Ajax-Magnetometric Corp. for precision improvements. The other heating coil was especially fabricated for another off-site test (Project M-10-5-7- GFM) to be performed at the Ethaca Gun Company, Ethaca, New York.

## RESULTS OF THE TRIP

Prior to any tests, the Ajax-Magnetometric and NLO Technical personnel were given recommended Health and Safety guides for each phase of the operation. These guides were derived from analytical data obtained from previous induction-heat treating tests (1958) performed at the subject company. They were as follows:

1. Respiratory protection should be worn in the immediate vicinity of the heating operation.
2. Respiratory protection should be worn during the quenching of uranium metal.
3. The quench water used in the above should be retained for return to NLO for disposal.
4. Respiratory and eye protection should be worn during the drilling of thermocouple holes in the uranium metal.
5. The uranium chips which are generated during the above operation should be retained for return to NLO.
6. Vacuuming of the process area and equipment at the end of each shift, to remove uranium contamination.
7. Vacuuming of the heating coil after several heat applications to remove uranium contaminant.

Air sampling was performed during the evaluation of both heating coils. The quenching of the uranium metal, by immersion in water, produced the highest air concentration of alpha activity. Of the three samples taken of the quenching operation, an average alpha activity concentration of 40 MAC was obtained. The MAC specified for insoluble natural uranium in air - appendix B, Table I of 10 CFR - Part 20 - is  $6 \times 10^{-11}$   $\mu\text{C}/\text{ml}$  or approximately

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SUMMARY OF TRIP TO THE AJAX-BAGWETHERMATIC CORP., YOUNGSTOWN, OHIO

Page 2

5/23/61 - 5/24/61

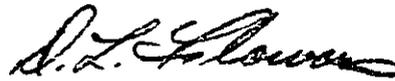
J. A. Quigley, M.C.

June 7, 1961

133  $\mu\text{d}/\text{m}^3$ . Other process, breathing zone, and general area type samples were within this MAC. Dust-type respiratory protection was worn by all personnel during the test.

## COMMITMENTS

Health and Safety coverage will be extended for the decontamination of the process areas and for the packaging of residues for return to NLO upon completion of the test.



D. L. Flowers

ELP/bw

cc: R. Baxer  
R. J. Jensen  
J. H. Noyes-2x  
R. H. Starkey

Central File

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NATIONAL LEAD COMPANY  
OF OHIO

December 23, 1959

NLO  
F2  
WB4-1-3

SUBJECT TRIP REPORT TO AJAX-MAGNETHERMIC CORPORATION, YOUNGSTOWN, OHIO ON 12/21/59  
TO J. A. Quigley, M.D.  
FROM D. L. Flowers

CENTRAL FILES

OBJECTIVE OF TRIP

The company visited specializes in the application of induction heat. The purpose of this trip was to advise on health and safety measures for the preacceptance testing of induction heat treating equipment procured by NLO.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions drawn pertaining to the health and safety hazards involved in the induction heat treating of uranium metal are stated in another trip report (D. L. Flowers to J. A. Quigley, M.D., 12/18/58). Based on those conclusions, the following recommendations were given to Ajax-Magnethermic personnel to be used for the preacceptance testing of the NLO procured equipment.

1. That one of the two vacuum units supplied be placed at each end of the heating coil with Type S pleated filters attached to the exhaust end of each vacuum unit.
2. That these vacuum units be utilized as a means of ventilation for radioactive fumes generated from the heating of uranium slugs.
3. That dust-type respirators be worn by all personnel within the testing area during the heating and quenching of the metal.
4. That smocks be worn by all personnel involved in the test, and gloves be used in the handling of the metal.
5. That the water used for quenching of the metal be saved for return to NLO.

BACKGROUND FOR TRIP

Feasibility tests on induction heat treatment of various forms of uranium metal were conducted by the above-mentioned company in 1958. Results of the desired beta phase within the metal were attained by the application of induced heat. A pilot scale piece of equipment has been procured. Health and safety coverage was provided both as a service and to obtain additional data on the unit prior to installation at NLO.

PERSONS VISITED

E. Keller, Sales Engineer, Ajax-Magnethermic Corporation  
D. Zarlenga, Mechanical Engineer, Ajax-Magnethermic Corporation

J. A. Quigley, M.D.  
December 23, 1959

O. Hull, Project Engineer, Ajax-Magnethermic Corporation  
N. Ross, Technical Director, Ajax-Magnethermic Corporation

DESCRIPTION OF TRIP

This trip was of an advisory nature with R. Bauer of the Technical Division and myself of the Industrial Hygiene & Radiation Department representing NLO. The above-mentioned recommendations were given to Mr. Eugene Keller, Sales Engineer, to serve as a guide during the preacceptance testing of the heating coil.

An area measuring approximately 200 square feet had been enclosed with wooden panels for the test area. This was not present during the feasibility tests conducted last year. This area was supplied with fire extinguishers and a box of sand, which were advised by the local fire authorities.

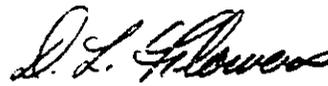
Further health and safety coverage and additional sample data will be obtained during the final acceptance test some time in January, 1960.

MISCELLANEOUS COMMENTS

The Ajax-Magnethermic Corporation is performing similar tests for the General Electric Company, Hanford Works, Richland, Washington. The material being tested is of normal hollow zirconium clad uranium. No similar health and safety measures were given to them by the Hanford representative, who happened to be Mr. A. Guay, a former NLO employee.

COMMITMENTS

Technical and Industrial Hygiene & Radiation representatives will be present for the final acceptance test of the equipment prior to shipment to NLO. Decontamination coverage and proper packaging instructions of the materials to be returned to NLO will also be provided at the culmination of the test.

  
D. L. Flowers

DLF:bg

cc: J. H. Noyes (2x)  
J. A. Quigley, M.D.  
R. H. Starkey  
R. F. Bauer  
C. E. Polson

Central File ✓

NATIONAL LEAD COMPANY  
OF OHIO

December 12, 1958

FR  
en 34-1-3

NLO

**SUBJECT** ERIP REPORT TO MAGNETHERMIC CORPORATION, YOUNGSTOWN, OHIO, ON 9/29-9/30;  
11/17-11/20; & 12/2-12/3/58

**TO** J. A. Quigley, M.D.

**FROM** D. L. Rogers

CENTRAL FILES

OBJECTIVE OF ERIP

The company visited specializes in the application of induction heat. The general purpose of the entire project was to conduct feasibility tests on various sizes and shapes of uranium rods and tubes with induction heat treatments of the metal. The industrial hygiene and radiation purpose was a threefold one: first, to advise or recommend proper health and safety coverage during the actual tests; secondly, to survey the operations by taking air samples to determine to what extent, if any, ventilation will be required if such facilities are acquired here; and thirdly, to survey for contamination and advise the most practical ways and means of decontamination.

CONCLUSIONS AND RECOMMENDATIONS

Since the tests were not conducted within an enclosed or secluded area and the equipment used was of simple laboratory type, some means of ventilating the radioactive fumes had to be devised. Consequently, a portable vacuum cleaner was employed to serve this purpose.

It was noted that the larger and the more highly oxidized samples of uranium treated by induction heat produced more radioactive fumes. Air samples were taken from six inches to three feet above the induction coil. The air concentration during the five-inch slug testing produced .9 X MAC alpha and 2.9 X MAC beta without the use of the portable vacuum unit, and .03 X MAC alpha and 1.4 X MAC beta with the use of the portable vacuum unit. The air concentration during the eight-inch slug testing produced .95 X MAC alpha and 4.2 X MAC beta without the use of the vacuum unit, and .9 X MAC alpha and 1.9 X MAC beta with the use of the vacuum unit. The four-foot rods produced contamination levels of 61.9 X MAC alpha and 37.2 X MAC beta without the use of the vacuum unit, and 1.5 X MAC alpha and 1.9 X MAC beta with the use of the vacuum unit. Similar results could not be obtained with the tubular material because the vacuum unit could not exhaust the fumes generated from the inner portion of the tube. The vacuum unit was used constantly throughout the project with the exception for purposes of taking air samples. Although the above air concentrations reflect intermittent testing, ventilation will definitely be needed if such an application is placed into production.

It was also noted that the quenching of the metal generated contaminated steam and subsequent contaminated water. The uranium concentration of the quench water will justify a recovery process from both an accountability and a health standpoint.

ON 9/28-9/30; 11/17-11/20; &amp; 12/2-12/5/58

J. A. Quigley, M.D.

December 18, 1958

Contamination of the laboratory area and the equipment used was very slight. With the exception of exhaustion of fumes during heating of the metal, the process is a relatively clean one. However, monitoring and subsequent decontamination was performed after each trip and upon completion of the project to background instrument radiation readings.

#### BACKGROUND FOR TRIP

At the present, salt bath facilities are used to heat treat uranium to obtain the desired physical structures. It was felt that these same characteristics could be duplicated with the application of induction heating. If so, a great improvement in our process could be realized. Therefore, feasibility tests were conducted by the above mentioned corporation.

Magnethermic Corporation obtained a source material license C-4275 from the AEC. The provisions of this type license are stated in Part 20 of the Federal Register, which in essence delegated responsibility to them for adequate radiological health and safety coverage during the feasibility tests of uranium. However, it was felt that NLO would profit from providing such coverage to obtain information on possible health and safety hazards associated with the induction heat application to uranium. Also, this service was extended to this corporation as a courtesy since they were not familiar with the health and safety problems.

#### PERSONS VISITED

Peter Hassell, Development Engineer  
Nicholas Ross, Technical Director  
Gene Keller, Sales Department  
Paul Levins, Project Engineer

#### DESCRIPTION OF TRIP

Three trips were made to Magnethermic Corporation to provide health and safety coverage during the performance of feasibility tests of induction heat treatment of uranium. At the conclusion of each trip, decontamination was performed and all uranium and other materials used were secured in an isolated portion of the plant.

The feasibility tests for the induction heat application of uranium were conducted in the laboratory portion of the plant. The entire production area of the plant measures approximately 16,000 square feet, of which an area of 800 square feet was designated as the laboratory portion with no physical separations. The height of the ceiling throughout the plant measures approximately 30 feet. There were only two windows in the immediate laboratory area.

ON 9/29-9/30; 11/17-11/20; &amp; 12/2-12/5/58

J. A. Quigley, M.D.

December 18, 1958

The equipment used during the tests consisted of a heat station with an attached water-cooled copper coil, a starter, a 10,000-cycle motor generator, thermocouples, and a recorder. A drill machine was also used for drilling thermocouple holes in each sample piece of metal.

As stated in the contract, all health and safety equipment was furnished by NLO. This included respirators, goggles, gloves, protective clothing, rubbers, rags, and safety solvent.

During the first trip (9/29-9/30) only five-inch slugs of 1-1/2" and 1-1/4" diameter were treated by the induction heat process. These slugs were statically treated. That is, they were positioned within a copper coil which inductively conducted heat to the metal. Air samples were taken at various heights above the coil where visible fumes could be seen evolving. After heat application, the slugs were removed with tongs and quenched in a ten-gallon drum of water. Samples were taken of the quenching process and of the contaminated water. These slugs were heated to a temperature range of 1320° to 1360° F in an approximate total time of 45 seconds. The samples were returned to NLO for further preferred orientation and metallographic studies. The results were favorable, and on the second trip (11/17-11/20) ten eight-inch slugs were treated by the same application. Additional health and safety coverage was provided and more air sampling was performed.

Upon completion of the test runs for the eight-inch slugs, a vertical scanner was prepared for tests (12/2-12/5) on four-foot rods of 1-1/2" and 1-1/4" diameter and four-foot tubes of 3" OD with approximately 1/4" wall thickness. In this particular operation, manual quenching of the metal was not practical. Instead, the heat treated metal portion was quenched immediately after passing vertically through a stationary induction coil. Approximately 30 to 40 gallons of water were required to quench each metal sample. The quench water was contained momentarily in a tank and a hose conducted it into the floor drainage system. Since recycling of the quench water would have required installing a pumping system and the increased temperature of the water may have influenced the quality of the sample, an alternative had to be advised. A strainer coupling was advised to be inserted in the hose with gauze wrapped around the contained strainer. A piece of cloth was also wrapped around the end of the hose as a further filtering means.

Thermocouple holes were drilled into each sample piece of metal at varying depths and positions to record the temperatures induced into the metal. Air samples were also taken of this operation and health and safety coverage was provided. The uranium filings were gathered up and placed in a container.

Upon completion of the entire project, a thorough decontamination of the area and equipment was performed. All monitoring was performed

J. A. Quigley, M.D.  
December 18, 1958

with an Eberline E-200A Beta-Gamma Survey Meter and an Eberline Alpha Proportional Counter. Monitoring of the floor area produced contamination levels of 0.5 to 1.0 mreps/hr and 200 to 300 c/min. The floor was vacuumed and background instrument readings were obtained. The equipment used during the operation was also slightly contaminated with low and high readings of 3.0 to 5.0 mreps/hr respectively obtained from the heating coils, tables, and the vertical scanner tank. The heating coils were cleaned with trichloroethylene and the tables vacuumed to safe limits. The scanner quench tank was allowed to dry with the aid of Merco-Dry and thoroughly vacuumed until only background instrument readings were indicated.

All uranium sample pieces were packaged and returned to NLO. The contaminated clothing, rags, gloves, and quench water from the five and eight-inch feasibility tests were also packaged according to the procedure "Handling of Residue at Off-Site Facilities", from J. A. Quigley to F. L. Cuthbert, dated 9/10/58. These contaminated items were not shipped back to NLO because of the pending of the contract for the fabrication of induction heat equipment. It was decided by NLO representatives that if the contract was awarded to this corporation further tests will have to be performed to meet design specifications and consequently more contaminated items would be generated.

#### MISCELLANEOUS COMMENTS

The Magnethermic Corporation and NLO Technical Division personnel were very amicable and cooperative during the entire project.

#### COMMITMENTS

An NLO representative will have to complete the packaging of the contaminated residues for return shipment in the event Magnethermic Corporation is not awarded the contract for the fabrication of the induction heating equipment.

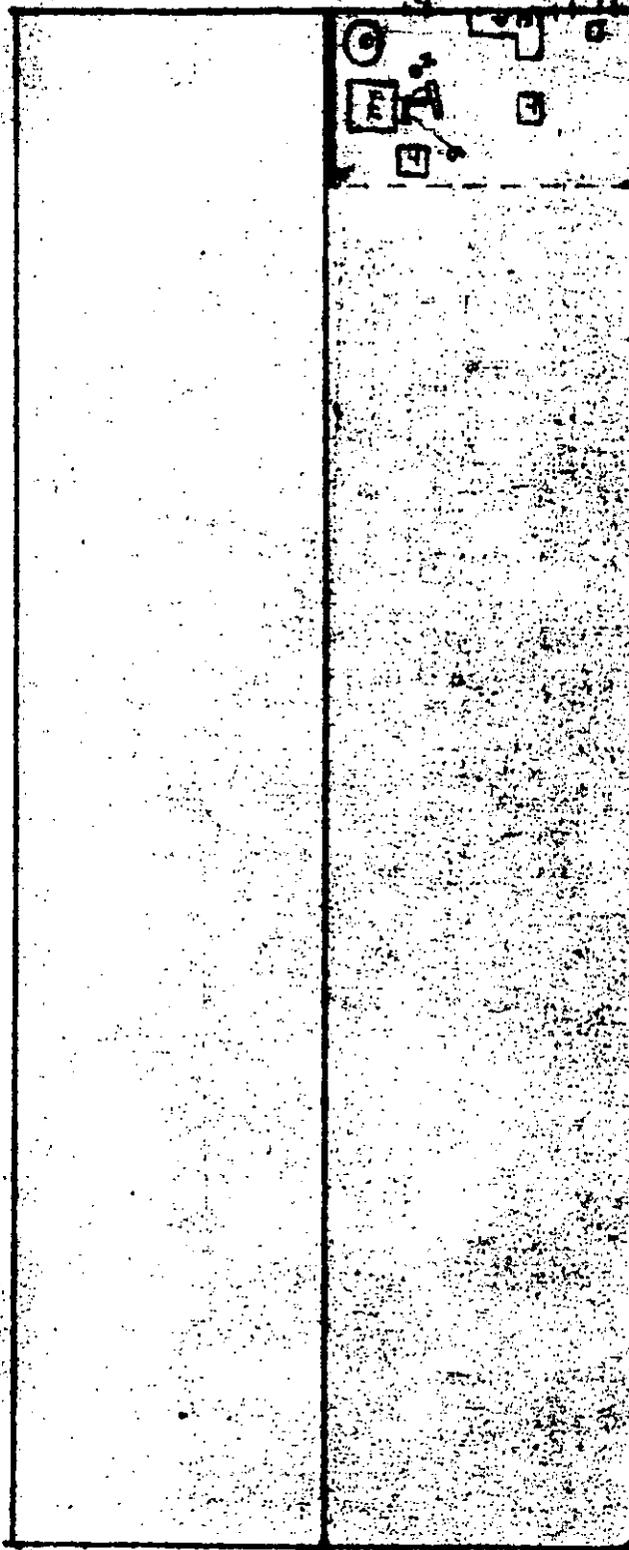


D. L. Flowers

DLF:bg

cc: J. H. Noyes (3)  
R. H. Starkey  
N. P. Hehner  
J. F. Schiltz

Central File ✓



- W - Window
- D - Door (or #)
- T - Table
- CP - Control Panel
- H - Quartz Unit
- H.U. - Heating Unit
- C - Copper Coil

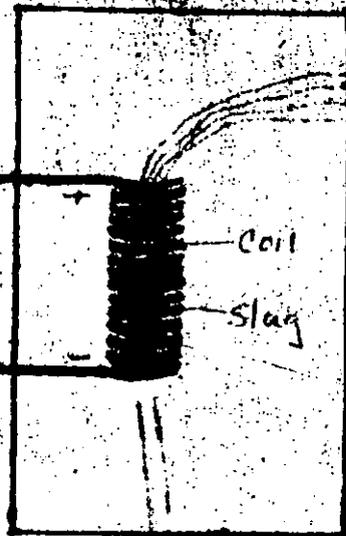
**NATIONAL LEAD COMPANY OF OHIO**  
**FERNALD, OHIO**

**DEPARTMENT:**

DATE	12/2/54
CHARGE	
DESIGNED BY	
APPROVED	

Motor  
Generator

Starter



Armature Wires  
Panel Board

Table

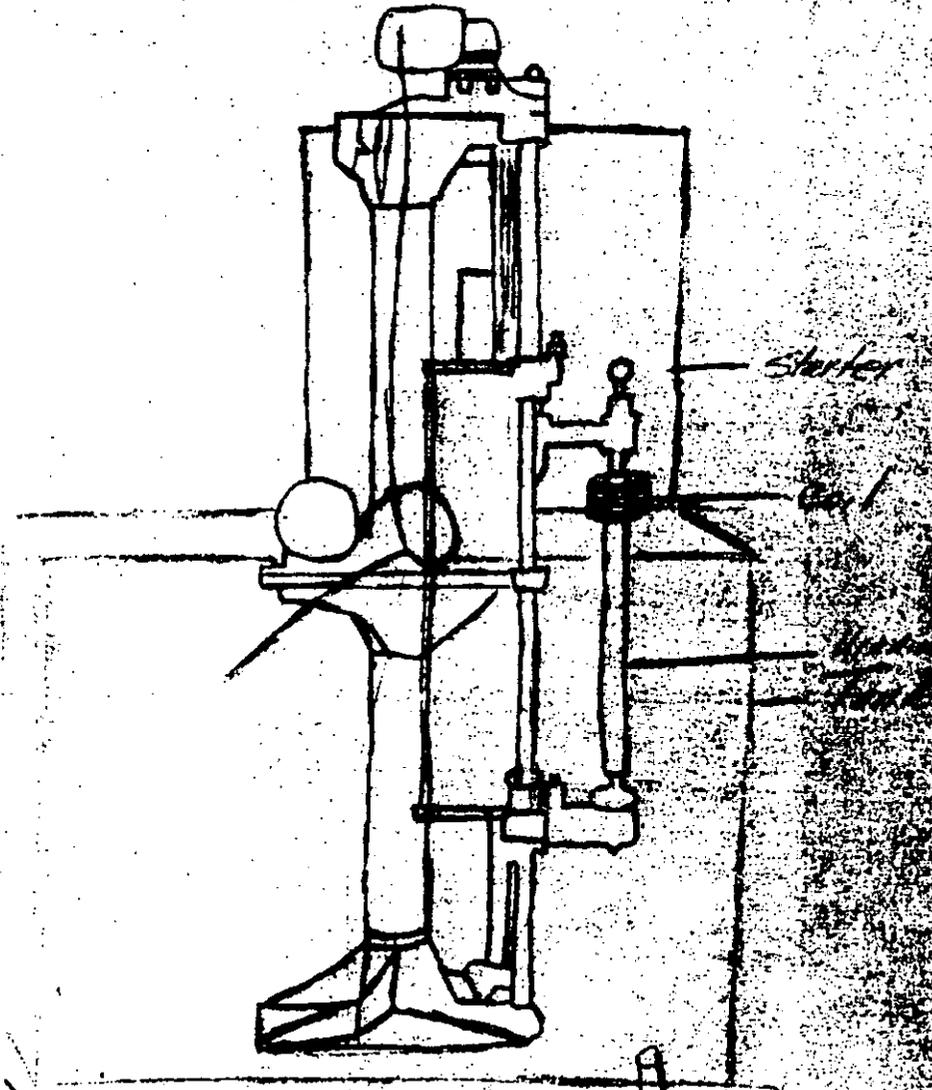
Vacuum  
Cleaner

{ 150# for 5 and }  
{ 8 inch slugs }

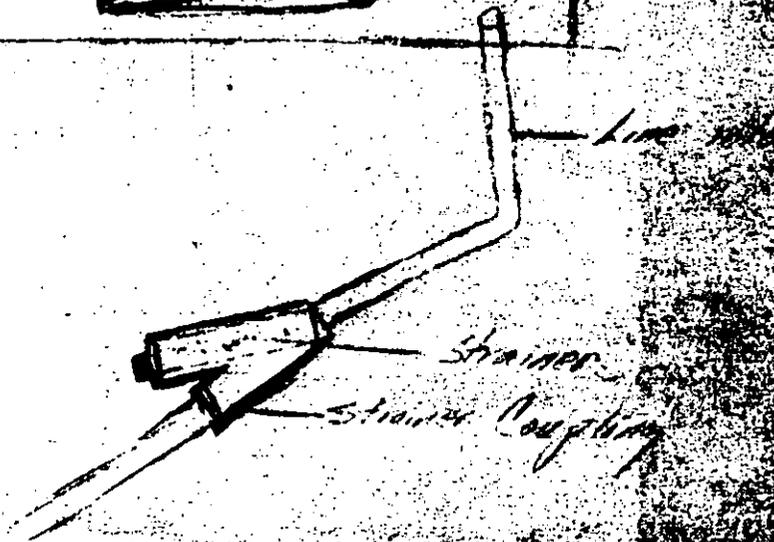
NATIONAL LEAD COMPANY OF OHIO  
FERNALD, OHIO  
DEPARTMENT

FORM NO. 10  
DATE 1/1/35

# Vertical Scanner



Used for 4th  
10's and tubes



**NATIONAL LEAD COMPANY OF OHIO**  
**FERNALD, OHIO**  
**DEPARTMENT:**

DATE: *11/1/34*  
DRAWN BY: *[Signature]*  
CHECKED BY: *[Signature]*  
APPROVED BY: *[Signature]*

NLO

October 6, 1958

SUMMARY OF TRIP TO MAGNETHERMIC CORP., YOUNGSTOWN, OHIO, ON 9/29/58 - 9/30/58

J. A. Quigley, M.D.

D. L. Flowers

PURPOSE OF TRIP

The purpose of this trip was a threefold one. First, to advise or recommend proper health and safety practices during the induction heat testing of various sizes of uranium; secondly, to survey the testing operation by taking air samples to determine to what extent, if any, ventilation will be required if we decide to utilize the induction heating facilities in our plant; and thirdly, to survey for contamination and advise the most practical ways and means of decontamination.

RESULTS OF TRIP

The purpose of this trip has not been completely fulfilled as of this date because further metallographic studies will have to be performed here of several induction-heat treated samples to determine the actual success of the operation before more samples are treated at the suspected adequate temperature range. Further testing of induction-heat effect on uranium will probably resume within two or three weeks.

It was recommended that: (1) the portable vacuum cleaner be utilized as an exhaust system for the fumes generated from the induction-heat treatment of uranium samples, (2) quench water and all other waste be contained for shipment back to NLO, and (3) proper protection was advised and demonstrated.

Although samples have not been analyzed or evaluated, it was generally agreed upon by NLO Technical personnel and Magnethermic personnel that health and safety coverage will be needed for further air studies and subsequent decontamination of all pieces of equipment and areas utilized for the operation.

ORIGINAL SIGNED BY

D. L. Flowers

DLF:bg

cc: J. H. Noyes (2)      N. Hehner  
     R. H. Starkey        J. Schiltz

Central File