PA.24-1

PA.24

N

3736

MEMORANDUM

TO: FILE

DATE 11/3/87

FROM: Andrew Wallo III

SUBJECT: Elimination of Summerill Tubing Co.

SITE NAME: Summerill Tubing Company

ALTERNATE NAME: _____

CITY: Bridgeport STATE: PA

OWNER(S)
Past: Summerill Tubing Co. Current: _____
Owner contacted ☐ yes ☒ no; if yes, date contacted _____

TYPE OF OPERATION
☒ Research & Development
- ☐ Production scale testing
- ☐ Pilot Scale
- ☐ Bench Scale Process
- ☐ Theoretical Studies
- ☐ Sample & Analysis
- ☒ Experimental

☐ Production
☐ Disposal/Storage

☐ Facility Type
- ☒ Manufacturing
- ☐ University
- ☐ Research Organization
- ☐ Government Sponsored Facility
- ☐ Other _____

TYPE OF CONTRACT
- ☐ Prime
- ☐ Subcontractor
- ☐ Purchase Order
- ☐ Other information (i.e., cost + fixed fee, unit price, time & material, etc) _____

Contract/Purchase Order # _____

CONTRACTING PERIOD: Early 1940's (met Lab. personnel use equipment on site

OWNERSHIP:

	AEC/MED OWNED	AEC/MED LEASED	GOVT OWNED	GOVT LEASED	CONTRACTOR OWNED	CONTRACTOR LEASED
LANDS	☐	☐	☐	☐	☒	☐
BUILDINGS	☐	☐	☐	☐	☒	☐
EQUIPMENT	☐	☐	☐	☐	☒	☐
ORE OR RAW MATL	☐	☐	☐	☐	☐	☐
FINAL PRODUCT	☒	☐	☐	☐	☐	☐
WASTE & RESIDUE	☒	☐	☐	☐	☐	☐

MED Metallurgical Laboratory personnel used equipment at Summerill to do drawing of tuballoy aluminum sheathing and some centerless grinding of uranium rod.

AEC/MED INVOLVEMENT AT SITE

Control
- [x] AEC/MED managed operations Met Lab
- [x] AEC/MED responsible for accountability Met Lab
- [ ] AEC/MED overviewed operations
- [ ] Contractor had total control
- [ ] unknown

Health Physics Protection
- [ ] Little or None
- [x] AEC/MED responsibility (Met Lab)
- [ ] Contractor responsibility

MATERIALS HANDLED:

Type (on basis of records reviewed)

- [ ] No Radioactive
- [x] Natural Radioactive from Feed Materials Production
  - [ ] Ore
  - [ ] Refined Source Material
  - [ ] Residue
- [ ] Natural Radioactive Material from Non-Nuclear Activities
- [ ] Man-Made
- [x] Other Uranium

Comment Experimental work with uranium very small scale -- records also indicate some light walled stainless steel was made for the MED

Quantities (on the basis of records reviewed)

- [ ] None
- [ ] Production Quantities
- [x] Small Amounts

Comment Experiments were done on a few pieces of metal at a time and by Met. Lab. personnel

OTHER PERTINENT FACTS:

- [ ] Facility was Licensed
  - [ ] During AEC/MED-Related Operations
  - [ ] For Similar Activities
  - [ ] For Other Activities

  Comment _____
- [ ] Commercial Production Involving Radioactive Material during AEC/MED Operations
- [ ] Facility was Decontaminated and Released
  - [ ] Availability of Close Out Records
    - [x] None
    - [ ] Some
    - [ ] Sufficient
- [ ] Radioactive Status:

	YES	MAYBE	PROBABLY NOT	NOT
Contaminated	---	---	---	X
Potential for Exposure (accessible)	---	---	---	X

QUANTITY OF RECORDS AVAILABLE:

☒ Very Little ☐ Some ☐ Sufficient

PROBABILITY OF FINDING ADDITIONAL RECORDS:

☒ Low ☐ Possible ☐ High

RECOMMENDATIONS:

☒ Eliminate
☐ Consider for Remedial Action
☐ Collect More Data

Comment It is clear from the records that very little radioactive material was used and it was under Met. Lab. personnel's control. Only radioactivity was from Normal Uranium. Lack of additional records suggest no production quantities were handled

REFERENCES: Attached

SUMMARY Records indicate Summerhill was only used by the MED MET Lab in the early 1940's to conduct experiments related to the preparation of uranium metal and none radioactive metal for use in reactors. Only a few pieces of uranium were experimented with and in all cases Met Lab people were there. Based on this and the description of Met Lab operating practices in the MED History there is no potential for exposures above guidelines at this facility. Probable no work was done there after 1943.

SUMMERILL TUBING Bridgeport PA.

DATE	FILE#	FROM	TO	SUBJECT	SITES	BOX #	
07/28/43	3.1CHO	CREUTZ, E.	COOPER, C.	SUMMARY ON THE USE OF CENTERLESS GRINDING EQUIPMENT ON URANIUM	SUMMERILL TUBING CO., WYCOFF DRAWN STEEL CO., ZEPHYR LAUNDRY MACHINE CO., INTERNATIONAL REGISTER CO.	MLRF	1969
04/30/43	3.1CHO	HOME, J.	COOPER, C.	HISTORY OF THE COATING PROGRAM	MULTIPLE, SUMMERILL TUBING, WOLVERINE, UNIVERSITY OF WISCONSIN, BATTELLE, GE, duPONT, ALCOA, JOSLYN	MUC	2143
04/23/43	3.1CHO	CHIPMAN, J.	DOAN, R.	LIST OF COMMERCIAL FIRLS DEALING WITH MET LABS	WOLVERINE, W.R. PRATT,JOSLYN, MIDWEST MANU. CO., GLOBE STEEL,ALCOA,B&T METALS, SUMMERILL,INTERNATIONAL REGISTER,WYCOFF,DOW	7X	3763
07/28/43	3.1CHO	CREUTZ, E.	COOPER, C.	CENTERLESS GRINDING	SUMMERILL TUBING, WYCOFF DRAWN STEEL, ZEPHYR LAUNDRY MACHINE, INTERNATIONAL REGISTER, GLOBE STEEL TUBES	34X	3775

Summary of memo to J.C.Sterns from the Methods and Materials Section of the MET LAB, Dated November 7, 1944

This memo describes 5 areas of study defined by the Methods and Material section that are important to the development of nuclear power:

Phases of special materials and their alloys
Fabrication
Corrosion
Heat Transfer and Fluid Flow
Special Physical Tests

In the first area, several Federal agencies and laboratories plus Educational institutions are listed. All of these were addressed in other FUSRAP investigations.

Fabrication is the only area where names of contractors are listed that have experiance or equipment that could be used.

Extrusion work was done at Wolverine.
Extrusion presses used for tests were located at:
B and T Metals, Columbus,OH
Revere Brass and Copper, Detroit, MI
Aluminum Co. of America, New Kensington
Extruded Metals Company, Grand Rapids, MI

Hot Piercing equipment available to the MET LAB included:

Wolverine
Globe Steel Tubes, Milwaukee(probably)

Cold rolling facilities available included:

Westinghouse, Bloomfield, NJ
Callite Tungsten Co., Union City, NJ
National Bureau of Standards

Hot rolling was done at:

Josyln Manufacturing, Fort Wayne,IN
Copperweld, Glassport, PA (facility offered only not used)

Forging was done at:

DOW Chemical, Midland, MI
Westinghouse, Bloomfield

Drawbench equipment is available at:

Wolverine
Extruded Metals
Globe
ALCOA
Copperweld

Summeril Tube Company in Bridgeport, PA made some light walled stainless steel. Midwest Manufacturing Co., Galesburg, IL was reported to have done deep drawing of sheets. Equipment for similar operations were reported available at DOW, Westinghouse, and Site B (Chicago). Swagging equipment was available at the Bureau of Standards, Westinghouse, and the Chicago Armory. Tube reducing could be done at Tube Reducing Corp., Wallington, NJ.

It is noted that this memo does not specifically indicate any radioactive materials were processed only "materials of interest". The Memo also specifically indicates the capablility is "available" at some of these sites not that they were used.

No sites are mentioned in the other areas of this memo.

This material was Summarized from a memo contained in the Met Lab files at the Washington DC National archives by A. Wallo III

A. Wallo III

Metallurgical Laboratory

July 28, 1943

C. M. Cooper

E. Creutz

[redacted]

For your information, I am summarizing our experience in the use of centerless grinding equipment on uranium. I also recommend the purchase of a Cincinnati centerless grinder for the Site B shop.

Our first experience with centerless grinding was obtained at the Summerill Tubing Company on January 4, 1943 when an extruded tube 2½ feet long and 1 5/16" in diameter was ground with an accuracy of about .0005" over the entire surface. Although I did not see this actual operation, I understand that great pains were taken. I do not know how long the grinding took.

On January 25, two tubes and one rod, each about 4 feet long, were taken to the Wyckoff Drawn Steel Company where they were surfaced with an accuracy of about .001". About an hour was required to adjust the machine properly so that it would handle this material, and about an hour to clean up the surfaces. The wheel used was somewhat too soft and had to be dressed frequently. Our impression after this test was that this method was a satisfactory one for obtaining good accuracy on uranium but was rather slow and would be expensive because of wheel wear. Harder wheels tended to fill and for this reason did not seem to offer much advantage. It was realized that it would be very desirable to make tests with a number of different types of wheels to try to determine the most satisfactory. On February 26, a visit was made to the Zephyr Laundry Machine Company which had recently started manufacturing centerless grinders. The manager offered us the opportunity to make tests with different types of wheels at some time in the future.

On February 29, some 1" diameter pieces 6" long were ground at the International Register Company again with an accuracy of about .001". The same impression was gained here that time spent on determining the most suitable type of wheel would be well worthwhile. The machine design people suggested cylindrical grinding of these short pieces as a more practical method if they were out of round although a roughing cut in a turret lathe and finishing in a centerless grinder also seemed practical.

On March 3, a 6 foot rod was straightened on an Abramson straightener and ground over its entire length with an accuracy of about .002" at Globe Steel Tubes. The wheel used here did not require

[redacted]

frequent dressing nor did it fill up. Although it was somewhat coarse, it seemed to give the best results of any we had tried. It was a carborundum wheel number 36MB. On May 18, some short pieces of rod 2 cm in diameter were ground at Globe preliminary to cladding with steel. On May 25, some 3 foot tubes were accurately ground at Globe to be clad with aluminum. For successful cladding, experience has shown that the tube should not taper or be out of round more than about .002".

On June 22, a 6 foot tube was ground and this longer length, requiring great care in handling, was successfully clad with aluminum.

In general, we have learned that centerless grinding can be very effective in producing high accuracy on short or long pieces of uranium providing the stock is not too far out of round, does not have excessive taper from end to end, and a wheel of the right composition is used. Also some time must be taken to set the machine properly. In cases where bad results have been obtained, one of these factors has apparently been at fault.

When a large number of accurate pieces of the same size are required, a good method seems to be to take a rough cut, for instance, on a turret lathe, and then finish on a centerless grinder. For short experimental rods and tubes of the sort finished recently for Abbott's experiments, the centerless grinder has been very useful. For accurate production of tubes or rods of lengths longer than a few feet, such as will probably be used in P-9 exponential and later piles, there seems to be no other available method than centerless grinding since a cylindrical grinder is not well suited for such work on pieces longer than about 3 feet. Therefore, to make use of the equipment for regular experimental parts, as well as to investigate thoroughly its applicability to long pieces and to special items such as thin walled tubing, I believe we should purchase a grinder that could be installed in the Site B shop.

E. Creutz

EC/o

cc Chipman
Smyth
Reading File

[redacted]

MUC-JPH- 21
Consisting of 5 pages. 15521
containing 0 figures
Copy No. 1 of 3 copies, Series A

THE UNIVERSITY OF CHICAGO

DATE April 30, 1943

To C. M. Cooper DEPARTMENT

From John P. Howe DEPARTMENT

Date 5/1/43

IN RE: History of the Coating Program

In accordance with your request of last week, Saturday, I am submitting this write up of the background and some of the decisions in the development of the coating program.

Development and Present Status

The writer was made coordinator of the work in coatings on October 19, 1942. Up to this point all the work in coatings had been done in Mr. Creutz's group and the writer's work had been connected entirely with testing of them under radiation. Shortly after the 19th a list of the various methods of interest was drawn up and ways and means of exploring them looked into. The following three months was a period of exploration and expansion. Many methods were examined and thrown out. The following excerpt from a report to the Committee on Coatings shows the status of the work as of January 15, 1943, at which time the number of methods still under consideration was a maximum.

"I. Creutz

A. Chicago
1. Hot-dipping methods
2. Electroplating methods
a. Particular attention to plates over zinc
3. Cementation or diffusion methods
a. Solid phase
(1) Attention to Be, Si, Zi
b. Vapor phase
(1) Attention to Be, Zr
4. Mechanical methods
a. Drawing of composite tubes at the Summerill Tubing Co. and Wolverine Tube Co.

B. H. B. Wahlin, University of Wisconsin
1. Hot-dipping methods
a. Attention to liquid cooled systems
2. Exploratory electroplating methods
3. Casting methods

II. R. Hoxeng, Ames, Iowa

A. Chemical methods
1. Oxidized coats
a. Produced by high temperatures) Protection against Bi as
b. Electro deposition) well as against water and air important

2. Carburized coats
3. Sulfidized
4. Inhibitors
   a. Organic for water cooled pile
   b. Other inhibitors to render oxidized or sulfidized coats self-renewing for water cooled piles
5. Electrolytic inhibition

III. du Pont Co., Cleveland, Ohio

A. Electroplating methods
   1. Ni plate on which any other plate may be deposited
   2. Ni plate followed by heat treatment to produce an alloy coat on which other metals may be plated
   3. Pb and Pb-Sn plate inhibited with $SO_4^=$
B. Hot-dip methods
   1. Application of any metal or alloy of proposed melting point
   2. Cemented or galvanic coats from molten salt bath
      a. Possible metals - Ni - Cu- Ta - Mo and Pd

IV. Battelle, Columbus, Ohio

A. Electroplating
   1. Exploratory
B. Hot-dip methods
   1. Exploratory
C. Vapor-phase cementation
   1. Program under consideration

V. General Electric Co., Nela Park, Cleveland, Ohio

A. Evaporated coats of Al, Cu
B. Assistance in heat treating
   1. High frequency induction
   2. Argon atmosphere furnaces

VI. Testing of Coats

A. Preliminary in all groups mentioned above
B. Semi-final as to corrosion in Howe's group
C. Retention of radioactivity in Coryell's group

SECRET

Comments:

The work of Creutz and Wahlin can be considered as exploratory in nature. This is the investigation of systems which are little known as yet and attention is toward protective coats for liquid systems.

Hoxeng's work is also of an exploratory character, the idea being to find what chemical substances afford protective coats and what may be done in the way of inhibiting the corrosion of the metal, in ways analogous in intent to those used on iron-steel.

The work at du Pont is directed almost exclusively toward production of coats for the helium cooled pile and the work may be considered quite far along towards a solution in both the hot dip and the electroplating work. In view of the shapes which will have to be coated, it seems that only the hot dip work can contribute significantly.

The work at Battelle has scarcely started, but would be a duplication of effort if allowed to proceed in the fields of electroplating and hot dip. There background in vapor phase cementation, however, is unique.

The arrangements with the General Electric Co. at Nela Park, Cleveland, have been completely informal, and have merely provided some assistance on minor points. There is no need for extending this connection at the moment."

Since the above date the program has narrowed down to the following:

1. Hot dipping - Grasselli
2. Electroplating - du Pont Electrochemical
3. Mechanical - E. Creutz, Aluminum Co. of America, Battelle, Wolverine, Joslen

All during the period mentioned above, chief attention was devoted towards developing a suitable coat for the helium cooled pile. Some of the work had to do with water systems but these were not pushed nearly so hard. The most important developments up to February 1st towards a coat for the high temperatures existing in the helium cooled pile were:-

1. Electroplating - Ni-Cu composite coats, heat treated
2. Hot dip - Cu-Sn alloys
3. Mechanical - Al jackets

At that point the hot dipped coat looked rather good inasmuch as it had withstood short time tests at fairly high temperatures. The heat treated Ni-Cu composite coat also seemed quite durable but was difficult to apply. Creutz's work had shown that there was considerable danger of alloying if aluminum was applied to uranium in such a fashion so as to establish a good thermal contact.

SECRET

The writer first learned of the decision to coat metal for the pile at Site X shortly before February 1st. This, of course, presented a different set of conditions for the coats to withstand and at this point the Cu-Sn system applied by hot dipping looked rather good because it was anticipated that if it could stand a few hours at a high temperature, it surely could withstand a long time at lower temperatures. Greenewalt and Jones came to Chicago on February 2 and during their stay some time was devoted to discussing the coatings. Greenewalt was familiar with the work in the Grasselli Laboratory from reports which came to Wilmington and it was his opinion that the hot dipped coats were the best for the air case. At that time the Cu-Sn system was rated as number one, Zn dip was number two, and terne coat as number three. Jones and the writer were asked to go to Cleveland and line up a development program to bring the methods to a production point as soon as possible. Apparently, the Grasselli Chemicals Department of the du Pont Company had been given a verbal commitment for the job of coating 54,000 hot dogs by hot dipping methods. When Jones and the writer reached Cleveland on February 4, 1943, a tentative program had been drawn up by the hot dipping group for the aforementioned development. However, during a conference on the 4th, the problem of producing a coat to withstand air at 200°C was laid before the electroplating group located at the same laboratory. This was their first indication that such conditions were desirable inasmuch as it was the writer's first trip to Cleveland following the decision to coat the metal for X. It is well to point out that as of this date the next most probable pile was to be helium cooled. This fact influenced the choice of the coating considerably since it was desirable to get experience with that type of coat which would have some future application beyond X.

Following the conference on the 4th of February, the electroplating group set about developing a coating method which might be expected to withstand air at 200°C. Their two candidates were the heat treated Ni-Cu composite coat and a Ni-Cu-Pb-Cu-Ni composite plate.

During the next month, a large number of specimens were coated in Cleveland by both groups and subjected to tests in air at 200°C. Within two weeks it became apparent that the Cu-Sn coats were subject to severe pinhole failure. Thus the Zn system was resorted to. Several modifications of the Zn dipping procedure had previously been tried and the addition of aluminum to the melt found beneficial. Some small specimens coated by this method have continued to show no failures up to the present time. However, larger specimens behaved poorly. The electroplating methods showed up very well inasmuch as immediate success was had with composite coats having a minimum of 5 mils of lead. On the 8th of March 1943, Woodhouse stated in a conference that the electroplates showed up much better than the hot dip coats and consequently concentrated effort should be placed on the electroplating. It is unfortunate that heat treating the Ni-Cu composite coat proved to be tricky.

During this time some work had gone on under the supervision of Mr. Creutz in the production of a coat by jacketing methods. Drawing methods had been tried at Summerill Tubing Company and Wolverine Tube Company. No method of end closure had been developed, however. At the time Battelle began to do work

for the project, they were encouraged to try aluminum jacketing also. At a conference on February 11 in Chicago between Greenewalt, Doan, Chipman, Russell, Grenell and Howe, Grenell displayed some specimens which had been jacketed by drawing methods without satisfactory end closures. Because such a coating had no real bond between the coating material and the base metal, Greenewalt was rather against the method. In the period following perhaps insufficient work was done on this particular method of coating, not so much because of the objection raised by Greenewalt but because of the desire to push the hot dipping and electroplating as fast as possible. Nevertheless, as troubles began to show up in these two methods it became apparent that the jacketing method should be developed and apparently the decision to do so was reached in Chicago approximately the same time as was in Wilmington. The latter was because of the recommendations of Jones.

On the 18th of March, the writer was shown some pieces of metal which had been jacketed with aluminum by drawing methods followed by a flame weld for end closure. High temperature tests were urged and Battelle promptly jacketed a representative number of specimens and placed them on test at 200°C and at 550°. At the present time, some of these have shown over one month's service at 200° with no failures except in the case of leaks. Out of the tests at 550°C came the knowledge that the metal tended to give off hydrogen. This has been explored further at Battelle and we know just wherein this outgassing may be dangerous.

In summary, it may be pointed out that the problem has resisted being frozen at every point. It has been proven important to keep as many alternative methods in progress as possible. Admittedly, at some point in a program alternative methods should be frozen out and the most profitable line of attack chosen. However, in the problem with which we have to do, we are far from this state. While we may be able to freeze on methods which will carry us through the next two or three months, neglect of others is apt to find us lacking when the immediate problem is passed and another one presents itself. For these reaons the writer would like to see a fairly large number of coating methods studied for some little time.

John P. Howe

JPH/c

File copy (2)

[SECRET]

Heading K

Metallurgical Laboratory

April 28, 1943

TO: John Chipman

FROM: R. L. Doan

SUBJECT: Experimental Work at Outside Companies

This is with reference to your memorandum of April 23, 1943, giving a list of 11 companies at which various members of the Metallurgical group have been conducting experimental work from time to time involving tube alloy metal.

Major Peterson has outlined a definite procedure to be followed in all cases where it is desired to conduct experimental or other work at locations outside the confines of the Metallurgical Laboratory, in order that the security angle may be adequately taken care of, and has requested that the prior approval of his office be obtained before any work of this kind is actually undertaken. The necessary forms for transmitting requests for approval of work to be done in outside plants are now available, and I have discussed them with you.

It is, of course, too late to obtain prior approval on such work as has already been done at the companies indicated in your list. However, as regards future work, I would like to request that one of the two following alternative be adopted by your group:

1. Suspend all activities at the companies listed in your memorandum until you can prepare the forms requested by the Area Engineer and secure his approval on each company.

2. If the nature of the work in hand at any of the companies indicated is too urgent to be held up pending obtaining the approval of the Area Engineer in the manner indicated above, it would be desirable to write a memorandum for Mr. Compton's signature to Major Peterson stating the special circumstances and requesting interim approval while the necessary request forms are being prosecuted.

MUC # 12-17
This document consists of 1 pages and 2 figures.
No. 6 of 7 copies, Ser. A
April 23, 1943

R. L. Doan

John Chipman

The following is a list of commercial firms with whom Mr. Crotts and I have had dealings. Also I am listing the names of the personnel with whom we have had contacts and the type of work which has been done. The names of the personnel for whom clearance has been requested are marked with an asterisk. We would welcome further discussion as to the advisability of requesting clearance on the others.

Company	Personnel	Work being done
Wolverine Tube Co. Detroit, Michigan	Otto Klopsch, Gen. Manager J. Rodgers*, Chief Met. J. Schumar*, Asst. Met.	Cold drawing and extrusion of tuballoy and aluminum jacketing
Wm. E. Pratt Co. Joliet, Illinois	Frank E. Clark, Pres. A. J. Blaeser*, Vice Pres.	Machining metal slugs
Joslyn Mfg. Co. Chicago and Fort Wayne	A. J. Blaeser*, Vice Pres. E. T Conners*, Metallurgist L. Fry*, Gen. Mgr. Fort Wayne	Hot rolling and cold straightening of tuballoy
Midwest Mfg. Co. Galesburg, Illinois	S. S. Battles, Manager	Methods for Al jacketing
Globe Steel Tubes Milwaukee, Wisconsin	H. M. Ihrig, Dir. of Res. Hofman, Metallurgist	Cold drawing and cold straightening
Aluminum Co. of Amer. New Kensington, Pa.	F. C. Frary* E. J. Fletcher* John R. Willard*	Aluminum tubing, corrosion, and jacketing of tuballoy
B and T Metals Co. Columbus, Ohio	Mr. Bonnell* Marvin Smith*	Extrusion of tuballoy and of aluminum
Summerill Tubing Co. Bridgeport, Pa.	Jack Dods	Cold drawing of tuballoy Aluminum sheathing
International Register Chicago	Mr. Bauerline Mr. Gallagher	Centerless grinding of tuballoy
Wycoff Drawn Steel Co. Chicago	Mr. Johnson, Mgr. Pat Newburn, Shop Foreman	Centerless grinding
Dow Chemical Co. Midland, Michigan	Wm. Loose, Metallurgist	Welding tuballoy

John Chipman

JC/e
cc C. M. Cooper, Reading File