

UNITED STATES ATOMIC ENERGY COMMISSION

Compliance Inspection Report

1. Name and address of licensee: Wah Chang Smelting & Refining Company, 233 Broadway, New York 7, New York
Date of inspection: May 22, 1957
Type of inspection: 10 CFR Part(s) Applicable: 20-20

5. License (or Permit) No(s) and Expiration date(s)
Number: R-130, Amend. 1; Exp. Date: December 1, 1957

6. Scope of License(s) and Permit:
Licensee authorized to receive possession and title to 10 lbs. of refined source material for use as an analytical reagent and in the manufacture of thoriated tungsten wire. License R-130 amended May 15, 1957, (Amend. 1) also authorizes possession and title to 1,100 lbs. of refined source material.

7. Special Conditions and Limitations of License(s) or Permit:
Licensee to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission within the limits of his license required to maintain records of his inventories of source material. Neither this license nor any right under it is to be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

8. Inspection Findings:
The Wah Chang Smelting & Refining Company uses thorium nitrate in the manufacture of thoriated tungsten wire. Storage and primary use of the licensed material is at the company's reduction and wire drawing plant in Glen Cove, New York. Although certain sintering and swaging operations involving the alloy also take place in their plant in Union City, New Jersey, the inspection was limited to the Glen Cove, N. Y. plant.
Thorium procurement is accomplished through Mr. Allen Lau, Assistant Treasurer, who maintains procurement records. No records of surveys, waste disposal or personnel monitoring are kept.

CONT'D.

9. Items of Non-compliance:
The licensee is in non-compliance with the following parts of 10 CFR 20:
20.201 (b) - "Surveys".
20.203 (f) (2) - "Labeling of containers".
20.206 - "Instruction of personnel".

10. Give date of last previous inspection: NONE
11. Is "Company Confidential" information contained in this report? YES
(Specify page(s) and paragraph(s)) Page 2, para. 3

Distribution:
4 cys. - Division of Inspection, Washington
2 cys. - Division of Inspection, New York Oper. Office
Approved by: Robert H. Engelman (Inspector), Robert W. Kirman (Operations Office)
Date report prepared: May 28, 1957

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If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using head to foot format, leaving sufficient margin at top for binding, identifying each item by number and noting "Continued" on the face of form under appropriate item.

RECOMMENDATIONS SHOULD BE SET FORTH IN A SEPARATE COVERING MEMORANDUM

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UNITED STATES ATOMIC ENERGY COMMISSION

Compliance Inspection Report

1. Name and address of licensee: Wah Chang Smelting & Refining Company, 233 Broadway, New York 7, New York
Date of inspection: May 22, 1957
Type of inspection: Initial
10 CFR Part(s) Applicable: 20.10

5. License (or Permit) No(s) and Expiration date(s):
Number: R-130, Amend. 1; Exp. Date: December 1, 1957

6. Scope of License(s) and Permit:
Licensee authorized to receive possession and title to 101 lbs. of refined source material for use as an analytical reagent and in the manufacture of thoriated tungsten wire. License R-130 amended May 15, 1957 (Amend. 1) to authorize possession and title to 1,100 lbs. of refined source material.

7. Special Conditions and Limitations of License(s) or Permit:
Licensee to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission within the limits of his license. Licensee to maintain records of the inventory of refined source material. Neither this license nor any right under it shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

8. Inspection Findings:
The Wah Chang Smelting & Refining Company uses thorium nitrate in the manufacture of thoriated tungsten wire. Storage and primary use of the licensed material is at the company's reduction and wire drawing plant in Glen Cove, New York. Although certain sintering and swaging operations involving the alloy also take place in their plant in Union City, New Jersey, the inspection was limited to the Glen Cove, N. Y. plant. Thorium procurement is accomplished through Mr. Allen Lau, Assistant Treasurer, who maintains procurement records. No records of surveys, waste disposal or personnel monitoring are kept.

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9. Items of Non-compliance:
The licensee is in non-compliance with the following parts of 10 CFR 20:
20.201 (b) - "Surveys".
20.203 (f) (2) - "Labeling of containers".
20.206 - "Instruction of personnel".

10. Give date of last previous inspection: NONE
11. Is "Company Confidential" information contained in this report? YES
(Specify page(s) and paragraph(s)): Page 2, Paragraph 15

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RECOMMENDATIONS SHOULD BE SET FORTH IN A SEPARATE COVERING MEMORANDUM

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PART 40 INSPECTION

Wah Chang Smelting & Refining Company
233 Broadway
New York 7, New York

Date of Inspection - May 22, 1957

Persons Contacted:

Mr. Allen Lau - Assistant Treasurer
Mr. Jack Arata - Assistant Foreman, Wire Department
Mr. R. V. Genscheimer - Supt., Drawing Department

12. Organization & Administration

The Wah Chang Smelting & Refining Company is a subsidiary of the Wah Chang Corporation. Mr. Allen Lau, Assistant Treasurer of the subsidiary company, is the person responsible for the procurement of refined source materials under License R-130.

Mr. Jack Arata, Assistant Foreman of the Wire Department, and Mr. R. V. Genscheimer, Supt. of the Wire Drawing Department, and Mr. Jim Lee, Production Supervisor of the Reduction Department, are the only persons primarily concerned with the handling and use of the licensed materials.

Executive offices for the firm are located at 233 Broadway, New York 7, New York. Storage and primary use of the licensed material is at the reduction and wire manufacturing plant at 63 Herhill Road, Glen Cove, New York. A smelting and refining plant is also located in Union City, New Jersey.

This inspection was limited to the reduction and wire manufacturing facilities at Glen Cove.

13. Procurement Procedures and Control

Thorium nitrate is requisitioned by the Wire Department through Mr. Allen Lau who maintains procurement records and determines whether the quantities requisitioned are within the scope of the license. Examination of procurement records revealed the following purchases:

<u>Material & Quantity</u>	<u>Supplier</u>	<u>Date Ordered</u>
100 lbs. Thorium Nitrate	General Chemical Div., Allied Chemical & Dye Corp.	6/20/55
30 lbs. " " "	" " "	October '56
750 lbs. Refractory Grade Thorium Oxide	Norton Behr Manning Overseas Worcester 6, Mass.	5/21/57

Shipments of this material are received unopened by Mr. Arata.

14. Facilities

Essentially two work areas are involved in thorium operations, the reduction building and the wire drawing building. Initial mixing of the licensed material is done in two large open kettles in an unventilated room in the reduction building. Smelting and fusing of the mixture is also done in this section of the plant. Final drawing of the alloyed wire is done in the wire drawing building.

ITEM #8 - CONT'D.

Licensed materials are stored under lock. Keys to the storage area are limited to two supervisory personnel. Independent measurements indicated that a radiation level of 4 mr/hr existed at the surface of the storage box. Neither the individual storage box nor the storage shed were posted with the prescribed radiation symbol.

The Wah Chang Company maintains no radiological health or safety program.

There have been no disposals of radioactive waste to date. All licensed material is utilized in the production process and scraps are re-smelted and used again.

No special facilities, such as fume hoods, protective clothing, dry boxes, etc., are available for handling the licensed material.

15. Description of the Manufacturing Process of Thoriated Tungsten Wire

In the past, the Wah Chang Company has produced batches of 500 lbs. of thoriated tungsten every six months. Mr. Lau anticipates increased activity in the production of thoriated wire in the future, however. Operations involving the use of licensed material were not in progress at the time of the inspection, but Mr. Genscheimer described them as follows:

1. Thorium nitrate is removed from the storage area and brought to the reduction building in the original containers.
2. Crystalline thorium nitrate in sufficient quantity to attain a 1 to 2% alloy with 220 kg. of WO_3 is placed into large mixing and drying kettles in an unventilated room.
3. Thorium nitrate is dissolved with water and mixed with tungsten oxide using large wooden stirring paddles.
4. This blend is then dried in the steam heated kettles in which the batch was mixed.
5. The blend is then sent through reduction furnaces in an H_2 atmosphere and emerges as thoriated tungsten metal (1-2% Th).
6. The metal is then shipped to the Union City, N. J., plant of Wah Chang, where it is smelted, pressed into ingot form, passed through sintering ovens, fused in an H_2 atmosphere and swaged into rods. The rods are then drawn to .015" wire and returned to Glen Cove for fine drawing.
7. Fine drawing consists of a multi-stage pass through progressively smaller dies. Each drawing stage involves an annealing operation consisting of passing the wire through a gas flame.

16. Instrumentation

No radiation detection or survey instrumentation was available at the reduction and wire drawing plant where the licensed material is stored and used.

17. Radiological Safety Precautions and Procedures

Wah Chang maintains no radiological health program nor are there any written instructions available to people who come in contact with the licensed material.

18. Records

Purchase and procurement records are maintained in the office of Mr. Allen Lau.

No records of surveys, personnel monitoring or waste disposal were available.

19. Storage

On the date of the inspection, 30 lbs. of thorium nitrate was stored in a locked wooden box which was lined on all sides with 1/8" lead. This box was kept in a locked transformer shed adjoining the wire production building. Independent measurements indicated a radiation level of 4 $\mu r/hr$ existed at the outer surface of the wooden box. Only Mr. Genscheimer and Mr. Arata have access to the transformer shed and the storage box keys.

20. Waste Disposal

There have been no disposals of waste material to date. All licensed material is utilized in alloying the thoriated tungsten. Scraps are re-smelted and used again.

21. Posting

Neither the storage shed nor the wooden storage bin were posted with the prescribed radiation symbol.

Items of non-compliance were called to the attention of Mr. Allen Lau, who agreed to comply with provisions of 10 CFR 20.