

JUN 11 1971

To : File

From: H. H. Crocker, Senior Facility Facilities Inspector  
Region I, Division of Compliance

BACKUP NOTES TO FORM AEC-591 (REPORT NO. 71-1)

WHITTAKER CORPORATION

NUCLEAR METALS DIVISION

WEST CONCORD, MASSACHUSETTS

LICENSE NO'S. SNM-65 (DOCKET NO. 70-82) AND

SMB-179 (DOCKET NO. 40-672)

There were no items of noncompliance observed during the inspection of May 13 and 14, 1971 of the licensee's facilities located at West Concord, Massachusetts and an all clear AEC-591 form was issued in the field for licenses SNM-65 and SMB-179.

The licensee did not possess any material under license SNM-65 and there are no planned uses of SNM for the remainder of calendar year 1971.

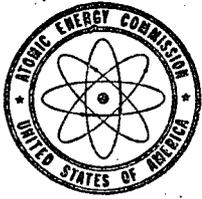
During the inspection fabrication work was in progress using depleted uranium to manufacture radiography shields, penetrators and counterweights. The licensee is hopeful of obtaining additional contract work in which depleted uranium will be used.

Some activities of laboratory work using radioactive material have been curtailed and the licensee has received authorization to cease effluent stack sampling in these locations.

There have been no significant changes in organization and the licensee plans to continue the practice of using consultants for the technical aspects of nuclear criticality and health physics.

The activities being performed during the inspection were in accordance with the requirements of licensee SNM-65 and SMB-179. The licensee does not plan to request a reduction in the requirements of license SNM-65 as a result of no material being possessed. The practices and procedures for health physics and criticality safety are satisfactory for the work in progress.

OFFICE ▶	COMPLIANCE	R. H. Smith Radiation Specialist		
SURNAMES	SMITH:caz H. Roy, CO	CROCKER <i>[Signature]</i>		
DATE ▶	6/7/71	<i>[Signature]</i>		



UNITED STATES  
ATOMIC ENERGY COMMISSION  
DIVISION OF COMPLIANCE  
REGION I  
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NEWARK, NEW JERSEY 07102

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Thru: H. W. Crocker, Senior Fuels Facilities Inspector  
Region I, Division of Compliance

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NUCLEAR METALS DIVISION  
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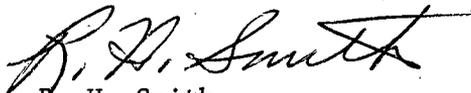
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R. H. Smith  
Radiation Specialist

cc: Gen W. Roy, CO

U. S. ATOMIC ENERGY COMMISSION  
Division of Compliance  
Region I

Title: Whittaker Corporation  
Nuclear Metals Division  
West Concord, Massachusetts  
License No's. SNM-65 and SMB-179  
Docket No's. 70-82 and 40-672  
Report No. 71-1

Period of Inspection: May 13 and 14, 1971

This report does not contain any company confidential information.

Inspector:

R. H. Smith  
R. H. Smith, Radiation Specialist,

June 11, 1971  
Date

Reviewer:

H. W. Crocker  
H. W. Crocker, Senior Fuel Facilities  
Inspector

June 11, 1971  
Date

BACKUP NOTES TO FORM AEC-591

By : R. H. Smith, Radiation Specialist, CO:I

Title: Whittaker Corporation  
Nuclear Metals Division  
West Concord, Massachusetts  
License No's. SNM-65 (Docket No. 70-82) and  
SMB-179 (Docket No. 40-672)  
Report No. 71-1

INTRODUCTION AND SUMMARY

1. An announced inspection was performed of the Whittaker Corporation facilities located at West Concord, Massachusetts, by R. H. Smith, Radiation Specialist, CO:I, on May 13 and 14, 1971. The purpose of the inspection was to review the criticality safety controls and health physics practices at the facilities. The last inspection of licenses SNM-65 and SMB-179 was conducted on July 15 and 16, 1970.
2. There were no items of noncompliance observed during the inspection and an all clear AEC-591 form was issued for licenses SNM-65 and SMB-179.
3. There was no SNM being possessed by the licensee at the time of the inspection and there is no work planned with SNM during the remainder of calendar year 1971.
4. Work was in progress during the inspection of fabricating radiography shielding devices, penetrators and counterweights from depleted uranium.
5. License amendment No. 2 of SNM-65 authorized the licensee to curtail exhaust effluent sampling of several stacks that are no longer used for exhausting radioactive effluents. At the present time the licensee does not plan to request authorization to reduce any safety program requirements as a result of indefinite processing of SNM in the future.

DETAILS

Scope

6. This inspection included a review of the health physics and nuclear safety records and practices, observations of depleted uranium work, criticality detection system, and a review of training programs.

Persons Contacted

7. M. A. Perella, Safety Director  
P. J. Zagarella, Nuclear Control Monitor  
J. C. Santangelo, Industrial Safety and Health Consultant

Organization

8. Mr. Perella stated that there were presently 80 plant employees and that it appeared the work force would remain constant. There have not been any organization or functional changes in responsibilities affecting the licenses.
9. In the event that SNM is received at the facility the duties of the criticality officer will be performed by Mr. L. Clark who is a consultant. Mr. Perella stated that other consultants and their fields that are presently being used were:

Dr. A. Seeler, Medical  
Dr. J. Japp, Medical  
S. Levin, Radiation and Health Physics  
J. Santangelo, Industrial Safety and Health  
F. Viles, Ventilation  
A. Boylyn, Environmental and Bioassay Programs  
E. Karaian, Instrumentation

Plant Inspection

10. The Butler building was inspected and it was observed that all containers for SNM were empty and that there was no SNM stored in the building. There was depleted uranium properly stored within the chain link fence surrounding the Butler building.
11. License amendment No. 2 of SNM-65 authorized the licensee to curtail exhaust effluent sampling on stacks E-1, E2, E3, E5, E9, E11, E12 and E13. An inspection of the areas exhausted via these stacks showed that no radioactive material was present in the areas. The affected areas were primarily laboratories located on the second floor of the building.
12. The fabrication of shielding devices for radiography sources using depleted uranium was observed and work was being performed in accordance with the conditions of license SMB-179. This work is intermittent and not of a production nature.
13. Work was in progress in the machine shop of machining some penetrators using depleted uranium with 2% molybdenum. Only a few of these are being made for a qualification contract. Mr. Perella stated that if this became a production contract that more definitive studies would be performed to determine personnel exposures. The machines were properly exhausted and there was no evidence of contamination spread.

14. A small order of counterweights were also being fabricated from depleted uranium and were to be cadmium plated. Mr. Perella was not sure of the point of distribution of the counterweights. The inspector informed Mr. Perella of the requirements of 10 CFR 40.13, "Unimportant quantities of source material", and discussed the requirements in detail. Mr. Perella stated that the requirements would be reviewed to assure compliance.
15. Mr. Perella stated that all employees working with depleted uranium wore plant clothing and showered before leaving the plant. There are also intermittent personal surveys made of employees leaving the plant. To assure contamination control Mr. Perella stated that he was requesting funds for a fixed survey instrument at the change room.
16. The ventilation hoods, storage areas and work areas in the plant were properly posted and labeled.

#### Criticality Monitors

17. All five detectors of the criticality monitoring system were observed to be properly functioning and the alarm settings were satisfactory. The alarms are functionally checked once each week and the instruments are calibrated each month by use of an internal source in each detector. Mr. Perella stated that he also planned to check the calibration by using an external source. The present plans are to maintain the system regardless of whether SNM is being possessed or not.

#### Emergency Evacuations

18. Emergency evacuation drills were conducted on August 5 and December 18, 1970 and also on May 12, 1971. The total time for evacuation ranged from one minute to one minute and 50 seconds. Mr. Perella stated that he observed the drills and that no deficiencies were observed.

#### Personnel Exposure

19. Film badge dosimeters are provided by Landauer and are exchanged monthly. The maximum exposure for calendar year 1971 through March 31 was 90 mrem, whole body and 1450 mrem, skin.
20. There are approximately 50 employees that routinely wear film badge dosimeters. Mr. Perella stated that the annual exposure report required by 10 CFR 20.407 had been forwarded to the AEC for calendar year 1970. All personnel exposures were observed to be properly recorded on AEC-5 forms.

Bioassay Program

21. A total of 12 personnel provided urine samples during the last six months of calendar year 1970. A review of the sample analyses records showed that all results were less than 15 dpm/l.

In-Plant Air Samples

22. A review of the records for fixed in-plant air samples during the period July through December, 1970 showed a maximum alpha activity of  $1.4 \times 10^{-12}$  uCi/ml and an average of  $5 \times 10^{-14}$  uCi/ml. For calendar year 1971 through April the maximum activity was  $7 \times 10^{-14}$  uCi/ml and an average of  $3 \times 10^{-14}$  uCi/ml.
23. During the extrusion of some depleted uranium with two percent molybdenum air samples were obtained of the heated effluent released from the press. The maximum alpha activity of the samples was  $2.1 \times 10^{-11}$  uCi/ml.

Exhaust Effluent Samples

24. The air sample records were reviewed for exhaust stacks for calendar year 1970 and the maximum alpha activity observed was  $9.75 \times 10^{-12}$  uCi/ml with an average of  $8.6 \times 10^{-13}$  uCi/ml. For calendar year 1971 through April the maximum alpha activity was  $8.2 \times 10^{-13}$  uCi/ml with an average of  $1.8 \times 10^{-13}$  uCi/ml.
25. The stack samples are exchanged and counted each month, weather permitting. Due to several locations on the second floor of the building where the use of radioactive materials has been discontinued the air sampling of the eight associated exhaust stacks has been discontinued.

Solid Waste

26. Mr. Perella stated that no shipments of radioactive solid waste had been made since the previous inspection of the plant.

Liquid Waste

27. There is no liquid waste generated from the processing of material possessed under License SNM-65 or License SMB-179.

Contamination Surveys

28. The plant is smeared at 22 locations on a monthly frequency and more often if deemed necessary due to work in progress. A review of survey records for calendar year 1970 showed a maximum smear result of 8 dpm/100 cm<sup>2</sup> with an average of less than 1 dpm/100 cm<sup>2</sup>. For the first quarter of calendar year 1971 the maximum contamination level was 4 dpm/100 cm<sup>2</sup> and an average of 1 dpm/100 cm<sup>2</sup>.

29. Direct surveys are also obtained at the 22 locations with a portable alpha survey instrument and the maximum reading from January 1970 through March, 1971 was 200 dpm/60 cm<sup>2</sup> with an average of less than 10 dpm/60 cm<sup>2</sup>.
30. Mr. Perella stated that they had not experienced any spreads of contamination from the plant work areas to the "clean" areas of the plant buildings.

#### Environmental Monitoring Program

31. There are water samples collected each year from eight on-site wells and from seven streams and ponds located off-site. The results of calendar year 1970 samples from on-site wells ranged from  $5.7 \times 10^{-10}$  uCi/ml to  $4.4 \times 10^{-9}$  uCi/ml of activity due to uranium. The off-site sample results that were analyzed for uranium content ranged from  $8.7 \times 10^{-10}$  uCi/ml to  $3.3 \times 10^{-9}$  uCi/ml.
32. Samples of soil are also obtained from the on-site and off-site water sampling locations and analyzed for uranium content. A review of the sample results for calendar year 1970 showed the on-site samples to range from  $1.5 \times 10^{-6}$  uCi/gram to  $2.3 \times 10^{-6}$  uCi/gram and the off-site samples were  $1.2 \times 10^{-6}$  to  $2.0 \times 10^{-6}$  uCi/gram.
33. Mr. Perella stated that the present plans were to continue the environmental sampling program and that samples would probably also be analyzed for selected chemical and metal contents.

#### Training Programs

34. During September, 1970 and April, 1971, Mr. S. Levin, Radiation Physics consultant conducted training sessions for plant employees regarding health physics aspects. Members of plant management also attended the class room sessions.
35. During December, 1970, Mr. E. Stone, Concord Fire Department conducted training sessions and demonstrations for the fire brigade team members. The training period consisted of one to three hours each day for ten days. The fire brigade team also has regular bi-monthly training meetings and drills at the plant.
36. Mr. Perella stated that during calendar year 1971 a training schedule was planned to qualify all fire brigade team members in first aid.

Materials Inventory

37. There was no SNM material in possession of the licensee at the time of the inspection. A review of records showed that on March 17, 1971 the SNM scrap was delivered to the United Nuclear Corporation, Wood River Junction, Rhode Island and consisted of 2.5 Kg of uranium enriched with U-235.
38. The total material being possessed under license SMB-179 was 22,602 pounds of depleted uranium.

Management Discussion

39. Those present at the management discussion meeting on May 14, 1971 were: Mr. P. Gummerson, Manager, Mr. M. Perella and Mr. J. Santangelo (consultant) of the Nuclear Metals Division and R. H. Smith, CO:I.
40. Mr. Gummerson, et al were informed that no items of noncompliance were observed during the inspection and an all clear AEC-591 form was issued for licenses SNM-65 and SMB-179.
41. Mr. Gummerson discussed the production schedule of planned work and stated that no work was planned with SNM for the remainder of calendar year 1971 and that any work in 1972 was doubtful. He also stated that contract negotiations were in progress for additional work with depleted uranium, however, there were no definite production plans.
42. The inspector discussed the significance of environmental monitoring and explained the licensee's obligations to reduce effluent releases and personnel exposure to levels, "as low as practicable". Mr. Gummerson stated that there were no plans to reduce their environmental monitoring program and that effluents and exposure would continue to be reviewed for methods or means of reducing them.
43. Mr. Perella discussed the plans for installing a personnel monitoring device in the plant change room and Mr. Gummerson instructed him to pursue the instrument purchase and installation.