

COMPLIANCE INSPECTION REPORT

I - C

Name and address of licensee Harshaw Chemical Company 1945 East 97th Street Cleveland, Ohio	2. Date of inspection April 25, 1962
	3. Type of inspection Initial
	4. 10 CFR Part(s) applicable 20 and 30

License number(s), issue and expiration dates, scope and conditions (including amendments)

<u>34-6558-1</u>	6-29-60	6-30-62	Initial	(Copies attached)
Amendment #2 (amended in entirety)	10-13-61	6-30-62		
Amendment #3	11-15-61	6-30-62		
Amendment #4	2-12-62	6-30-62		

Inspection findings (and items of noncompliance)

This unannounced scheduled inspection was conducted on April 25, 1962. The only items of noncompliance observed or otherwise noted are as follows:

License No. 34-6558-1 (Note - A copy of this license appears as Exhibit A to this report)
10 CFR 20.207 - in that licensed byproduct materials were not secured against unauthorized removal while stored in an unrestricted area. See paragraph 20 of report details. *8 MP's not stored in restricted area. 4 Security violations.*

10 CFR 20.206(c) - in that a form AEC-3 was not posted at the licensee facility. See section 25 of report details. *10 CFR 20.206(c) not found.*

License Condition 16 - in that the leak tests were not performed on a 6-month basis. See section 27 of report details.

on 10 LEAK tests for

2 10 MC 0-137 2.2
1 5 MC 0-60 2.2
1 20 MC 0-55 2.2

1 10 MC plotted for 210 source
1 2 MC " " 241 source

*by plot of source to
not require LT.*

Date of last previous inspection None	8. Is "Company Confidential" information contained in this report? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Specify page(s) and paragraph(s))
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TRIBUTION:

Division of Compliance
Headquarters (orig.)

Division of Licensing and Regulation
Headquarters (1 cy)

Approved by:

James M. Allen
James M. Allen
(Inspector)

Roy C. Hageman, Director
Region III
(Operations office)

May 14, 1962
(Date report prepared)

additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to head mat, 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

Harshaw Chemical Company
Cleveland, Ohio

April 25, 1962

DETAILS

9. Type of Inspection

Unannounced.

10. Notification

The Ohio Department of Health as well as the Atomic Energy Coordinator for the State of Ohio were notified by advance letter of the plans for this visit. The inspector was unaccompanied during the course of the inspection.

11. Persons Interviewed

Messrs. William Managan, Manager Crystal Division and C. T. Schmidt, Research Physicist, Crystal Division and Radiological Safety Officer, and Andrew Ayllies, Manager of Research, were interviewed during the course of this inspection. All information contained within this report is reported in substance unless otherwise indicated.

Inspection History

12. This report covers the initial inspection of this license.

Program

13. The Crystal Division of the licensee organization is engaged in the manufacture of scintillation type radiation detection and counting equipment crystals. The licensee utilizes byproduct material as sealed sources during research and development work on new materials and improved methods and techniques for the growing of scintillation crystals. Some material as sealed sources is used in the calibration of instruments, all of which is authorized by this license.

14. The following materials were on hand at the time of this inspection:

<u>Authorized</u>	<u>Form</u>	<u>On Hand</u>
? Cobalt 60	20 uc Tracerlab sealed sources	1 sealed source-5 uc
Cesium 137	20 uc " " "	2 " " -10 uc each
Tin 113	30 uc " " "	None have been obtained
Cerium 144	30 uc " " "	" " " "
Mercury 203	50 uc " " "	" " " "
Selenium 75	20 uc " " "	" " " "
? Iron 55	20 uc " " "	1 source of 20 uc
Americium 241	24 uc ORNL plated sources	1 source of 2 uc
Curium 244	20 uc " " "	None have been obtained
Californium 252	10 uc " " "	" " " "
Polonium 210	1 mc Monsanto Research Corp. Plated source	1 plated source of 10 uc
Cesium 137	5 mc Tracerlab sealed source	1 sealed source-4.5 mc

15. The licensee procures the authorized byproduct material as the need arises. There is no steady standing order for isotopes. The isotopes on hand at the time of the inspection were in quantities and forms and amounts as authorized by the licensee. The licensee maintains his procurement and inventory control by a logbook which is maintained by Mr. Schmidt. The logbook shows how much material is authorized, how much material is on hand and in what form, the rate of procurement and supplier. Byproduct material possessed and used under this license is used by the Crystal Division of the licensee's organization.

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Program, Cont'd.

16. The Crystal Division is primarily a research and development section and is under the direction of Mr. W. W. Managan, Manager of the Commercial Development portion of the program. Mr. Andrew Aylies is Director of Research for the licensee organization. Mr. Managan is a research physicist. Mr. C. T. Schmidt, also a research physicist, works directly under Mr. Managan in the conduct of research and also serves as the radiological safety officer on a part time basis for this program. Mr. Managan and Mr. Schmidt are the only people in the department who utilize the byproduct material in this program. All work is performed by these individuals. There is no isotope committee established by the licensee. All work to be performed is discussed and decided by Messrs. Managan and Schmidt, in coordination with Mr. Aylies.

Mr. C. T. Schmidt, the Radiological Safety Officer, as previously stated functions in a part time capacity in conjunction with research which he is performing under the license. He is responsible for the radiological safety program involving surveys, leak testing, inventory control, use of material, storage facilities, posting, labeling and personnel monitoring. Mr. Schmidt is directly responsible to Mr. Managan for these responsibilities.

Administrative Control

18. Since Mr. Managan is manager of the section in which this byproduct material is used, he is part of licensee management and has direct participation in the control of the licensee material program, and is one of the two individuals who use the byproduct material in the program.

Radiological Safety Procedures

19. No formal written administrative instructions have been prepared by the licensee. However, since only Messrs. Managan and Schmidt are involved in the use of this byproduct material, both of whom have a broad background in the use of isotopes, formal instructions and training programs are not deemed necessary for using licensed material under this program according to Mr. Managan.

Facilities

20. The licensee's research facilities for the Crystal Division are located on the third floor of the 97th St. facility. The room in which the crystals are grown contains a number of furnaces and associated crystal growing devices. The byproduct material authorized under the license is stored in an area approximately 200 feet distant from the research section facilities, although located on the same floor. The storage area is located in one corner of an instrument and counting room. The byproduct materials themselves are stored in a lead cave which has 4" of lead shielding on the bottom and sides. However there was no top on the storage cave. The physical size of the lead cave is approximately 2' x 2' x 2'. The inspector questioned Mr. Managan as to the physical security this type of storage locker would offer. Mr. Managan stated that it would offer none in that the cave could not be locked as presently designed since there was no top to the cave and that the storage area itself was considered by Mr. Managan to be an unrestricted area and that no control over individuals entering the area has been exercised. The inspector informed Mr. Managan that since this licensed material was being stored in an unrestricted area and was not secured against unauthorized removal from the place of storage a violation of 10 CFR 20.207 existed. Mr. Managan stated that he would have a wooden top placed on the storage cave and have it equipped with a key-type lock, to which he and Mr. Schmidt would retain the keys.

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Facilities, Cont'd.

Mr. Managan stated that the door to the room in which the material is stored is not locked at any time. A sign bearing the conventional radiation caution symbol and colors and the wording CAUTION RADIOACTIVE MATERIAL is posted on the exterior of the storage cave. Mr. Managan stated that the majority of materials are used in the same room in which the materials are stored as previously described.

Equipment

21. The licensee possesses long handled tongs, long tweezers, lead shielding and special equipment which is used in conjunction with the sealed sources in testing and calibrating the scintillation crystals, which are manufactured. The sealed sources are stored in individual storage containers which are not equipped with any type of locking devices, these in turn are stored in the lead storage cave previously described. Each individual storage container was posted and labeled in accordance with 10 CFR 20.203 (f)(1) and (f)(4) requirements. The licensee possessed a Victoreen Model 740B Cutie Pie 0 - 2500 milliroentgens per hour range, a Beckman Model MX 5 Beta Gamma Survey Meter from 0 - 20 milliroentgens per hour range, and a Pulse-Height Analyzer used in conjunction with Sodium Iodide crystals manufactured by the Harshaw Company. The instrumentation possessed by the licensee is comparable to that which he submitted on his license application.

Personnel Monitoring and Exposure Determination

22. The licensee subscribes to the Nuclear-Chicago film badge service on a bi-weekly basis. Five badges are obtained, two of which are assigned; those being to Mr. Managan and to Mr. Schmidt. One badge is used as a control badge and the other two are used as spares or as Mr. Managan stated would be used by other individuals in the department if they were assigned to work with him on any of the projects. Film badge records are maintained by Doris Smith, Secretary to the Laboratory Director, Andrew Aylies. The records are maintained on the forms supplied by Nuclear-Chicago Corporation. A review of these records for the period January 1, 1961 through the period of inspection revealed that no exposures in excess of the minimal reporting of 50 millirem per two week period or more than 150 millirem for any calendar quarter had been recorded for any individual under film badge service. Mr. Managan stated that Doris Smith reviews the film exposure records as they come in from Nuclear-Chicago and copies are sent to Mr. Schmidt, the Radiological Safety Officer, who also performs a review. The licensee does not maintain exposures on forms AEC-4 or 5. The licensee does not possess or use pocket dosimeters or pocket chambers.

Radiation Surveys and/or Evaluation

23. The licensee survey program consists of direct reading surveys using a portable survey instrument on devices or counters in which the sealed sources are placed when testing or evaluating Sodium Iodine crystals, and in the areas in which the byproduct materials are stored. The surveys are recorded in a logbook maintained by Mr. Schmidt. The surveys showed that no radiation levels in excess of 2 milliroentgens per hour have been found to exist in any unrestricted areas in which the byproduct materials are used or stored.

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Posting and Labeling

24. With the small quantities of byproduct material on hand and authorized by the license, the largest source being 4.5 millicuries of Cesium-137, no High Radiation Areas are generated during the use of this material. The storage areas and storage containers were posted in conformance with 10 CFR 20.203(f)(1) and (f)(4) requirements. The storage area was posted with a sign bearing the conventional radiation caution symbol and colors of magenta on a yellow background and wording CAUTION - RADIOACTIVE MATERIAL. The individual storage containers were labeled with stickers having the conventional radiation caution and symbol in colors of magenta on yellow background and the wording CAUTION RADIOACTIVE and further furnished the kind, quantity and date of material contained in each container.
25. A copy of the byproduct material license is made available by Mr. Managan to any interested individuals. The license is stored in his desk along with other pertinent regulations and directives. A form AEC-3 was not posted at any location in the licensee facility. The inspector questioned Mr. Managan regarding this requirement and he stated that he did have a copy of Form AEC-3 but "had not posted it since things like this tended to get covered up on the Bulletin Board by other pieces of paper and that it had slipped his mind to post it in any other location." He did state that he would post a Form AEC-3 in the research laboratory and storage areas. Mr. Managan was informed by the inspector that by not having a Form AEC-3 posted, a violation of 10 CFR 20.206(c) "Instruction to Personnel - Posting of Notices to Employees" existed.

Transportation

26. Mr. Managan stated that all byproduct materials are carried from their place of storage to their place of use in the research department in their storage containers and are kept there until used and replaced when finished.

Leak Tests

27. License Condition 16-A requires that each sealed source containing Cobalt 60, Cesium 137, Tin 113, Cerium 144, Mercury 203, Selenium 75 or Iron 55 shall be tested for leakage and or contamination at intervals not to exceed 6 months. In the absence of a certificate from a transferor indicating that this has been made within 6 months prior to the transfer, the sealed source shall not be put into use until tested. The license condition further requires that the leak test be capable of detecting the presence of 0.005 of a microcurie of contamination of the test sample. Mr. C. T. Schmidt is the individual who performs all leak tests on the sealed sources possessed under this license. Mr. Schmidt stated that he performs a wipe test by using an 11 centimeter diameter piece of filter paper saturated with acetone and wipes the outside of each capsule. The filter paper is then placed under a 2" x 2" sodium iodide crystal surrounded by 2" of lead shielding and tested in conjunction with a multichannel pulse height analyzer. According to leak test records maintained by Mr. Schmidt no leakers have been found. However as indicated by the leak test records an interval of more than 6 months between leak tests has been allowed to elapse. The leak test records indicated tests have been performed on the following dates: 11/18/60 leak tests were performed on the 10 microcurie Cesium 137 source, the Cobalt 60 sealed source of 5 microcuries, the Iron 55 sealed source of 20 microcuries. These were the only materials on hand at that time. The next subsequent leak test was performed on 7/13/61, at which time an additional 10-microcurie Cesium 137 source had been procured making 2 sources; therefore, the two 10-microcurie Cesium 137 sources, the 5-microcurie Cobalt 60 source, the 20-microcurie Iron 55 source were tested

Continuation Sheet #5

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Leak Tests, Cont'd.

on that date. No subsequent leak tests have been performed on any of the sealed sources since July 13, 1961. The ~~Polonium-210~~ source, the ~~Americium-241~~ source and 4.5-millicuries Cesium-137 source have been received since the July 13, 1961 leak test date. These sources were certified by the suppliers as having been leak tested within 6 months prior to the transfer. By allowing the leak test dates to be more than a six-month time interval, the licensee is in violation of license Condition 16-A.

Waste Disposal

28. The licensee has not encountered any waste disposal problems since all material possessed is in the form of sealed sources. Mr. Managan stated that should such an occasion arise here a source would have to be disposed, it would be returned to the supplier.

Reports of Theft and Loss

29. No material has been lost or stolen according to Messrs. Managan and Schmidt. All material carried on the licensee inventory was noted to be on hand at the time of the inspection.

Enclosure:
Exhibit A

MAY 1 1962