

1. Department of the Air Force
USAF Special Weapons Center
Kirtland Air Force Base
Albuquerque, New Mexico 87117
2. License No. 30-03110-02, Category E(1) Priority II
3. March 11 and 12, 1968, Announced reinspection
4. Persons accompanying inspector: None
5. Persons contacted:

Capt. B. H. Sheets, Base Health Physicist and Chairman of Radioisotope Committee
Lt. Col. Wolff, Director, Base Medical Services
Col. W. R. Morton, Vice Commander, Air Force Special Weapons Center
Capt. William Walker, Health Physicist, Radiobiology Lab., Air Force Weapons
laboratory
Maj. V. T. Penikas, Member, Radioisotope Committee, AFWL
Mr. Harry M. Murphy, Member, Radioisotope Committee.
Master Sgt. Ralph D. Robinson, Nuclear Electronics Specialist and Member,
Radioisotope Committee
Tech. Sgt. Wood, Nuclear Electronics Specialist

6. The only items of noncompliance noted during the inspection conducted on March 11 and 12, 1968, of the activities authorized by Byproduct Material License No. 30-03110-02 were:

All sealed sources have not been leak tested at intervals of six months or less, as required by License Condition 18.C. (Para 22)

Records of leak tests that have been performed have not been maintained in units of microcuries, as required by License Condition 18.D. (Para 22)

7. March 7 and 8, 1966
8. No

<u>254</u> Initials	James E. Hyder Inspector	<u>3/26/68</u> Date
<u>257</u> Initials	Glen D. Brown Reviewer	<u>3/26/68</u> Date

Inspection History

9. The activities authorized by License No. 30-03110-02 were last inspected on March 7 and 8, 1966. As a result of that inspection, Form AEC-592 was issued, listing two items of apparent noncompliance. These were (a) during the period March 15, 1965 to March 7, 1966, sealed sources were not tested for leakage and/or contamination at intervals not to exceed six months, and (b) on March 7, 1966, the container in which 20 mc of Ce-144 were stored was not labeled in the manner prescribed by 10 CFR 20.203(f)(1).
10. During the inspection conducted on March 11 and 12, 1968, spot checks for labeling of storage containers were made. During this inspection, no improperly or unlabeled containers were located. In regard to leak testing of sealed sources at six months intervals a review of the records indicated that this item had been corrected; however, it was also noted that for many of the sealed sources it had recurred. (See par. 22 of this report)

Organization and Administration

11. Capt. Sheets explained that in addition to his duties as Radiation Protection Officer as Base Health Physicist, he is also in charge of the ~~Military~~ Public Health and the ~~Occupational Medical Programs~~ for Kirtland AFB. Sheets stated that for activities relating to the ~~Military~~ Public Health and ~~Occupational Medicine~~ he reports to the Flight Surgeon who normally reports to the Director of Aerospace Medicine. Sheets stated that both of these positions are currently filled by Capt. Currey, M. D. Sheets stated that for his responsibilities as Radiation Protection Officer, he reports directly to Lt. Col. Wolff, Director of Base Medical Services. Capt. Sheets stated that the Commander of AFSWC, Kirtland AFB, was Brigadier General David B. Miller, and the Vice Commander is Col. William R. Morton.
12. Capt. Sheets explained that in addition to being Radiation Safety Officer, he was also Chairman of the Isotope Committee. The current membership of the AFSWC Radioisotope Committee is set forth by special order, A-698, issued on 10 August 1967. The membership of this committee is as follows:

Capt. B. H. Sheets, Chairman
Capt. W. J. Walker, Alternate Chairman
Mr. Charles A. Abaeby, ~~Member~~
Master Sgt. H. D. Robinson
Maj. V. T. Penikas
Mr. Harry M. Murphy
Mr. John F. Ridosko
1st Lt. B. C. Straw

In addition, alternate members have been specified for the majority of those listed above. Capt. Sheets stated that the isotope committee meets monthly and provides ~~copies~~ ^{for review} of detailed minutes of these meetings. It was noted that all new proposed uses of radioactive materials are reviewed in detail by this committee as well as the qualifications and training of each isotope user. An outline of the proposed use of licensed materials, as well as a summary

of the individual's experience and training are made a part of these committee meeting notes. It should be noted that in actuality, this committee is also responsible for radiation safety for all equipment, such as x-ray machines, which may produce ionizing radiation.

13. Capt. Sheets explained that he was retiring from the Air Force on April 30, 1968, at which time Lt. Col. R. C. Wolff, Director of Base Medical Services, is assuming the chairmanship of the committee and it is anticipated that Maj. Fenikas will be designated, at least temporarily, as Radiation Protection Officer.
14. Capt. Sheets explained that Kirtland AFB is designed as the Air Force Special Weapons Center and that most of the byproduct material utilized at the AFSWC is actually utilized by the Air Force Weapons Laboratory, a tenant organization. Capt. Sheets stated that he is assisted in his duties as Health Physicist by personnel such as Capt. Walker and Master Sgt. Robinson, both individuals who are assigned to the AFWL.

Scope and Conditions of License

15. Byproduct Material License No. 30-03110-02 was amended in its entirety on January 13, 1966. This license authorize the possession and use of any byproduct material with Atomic Nos. 3-84, inclusive, in amounts up to 300 mc each, for a total not to exceed 5 curies, plus selected sealed sources of specified manufacture and maximum size, plus millicurie amounts of Np-237, Ac-227, Am-241, ~~and~~^{and} microgram amounts of Th-228 and -230. These materials are to be used for research and development as defined in 10 CFR 30.4(q). License Condition 17 specifies the material may be used by or under the supervision of individuals designated by the Air Force Special Weapons Laboratory Radioisotope Committee. License Condition 18 imposes standard leak test conditions. License Condition 19 specifies the material may not be used in or on human beings or in products distributed to the public, and License Condition 20 specifies the material is to be used in accordance with statements, representations, and procedures contained in the application dated February 15, 1965 and amendments thereto dated July 15, 1965 and January 11, 1966.
16. The licensee maintains a running inventory of all byproduct material located at the AFSWC in a ~~card~~^{serial} card file. Each source or vial of material is listed on ~~a~~ separate cards, two cards being prepared. One card is filed by isotope and the other card is filed by location of use, or storage. For sealed sources, leak test records are kept in the back of the inventory card. Procurements of byproduct material, since the last inspection, have been very few, primarily in the millicurie range for the preparation of counting standards. A review of the card file maintained by isotopes, indicates the licensee possesses no material in excess of that authorized by the license.

Facilities and Uses

17. The licensee's facilities have remained essentially unchanged from those described in previous inspection reports. The bulk of the byproduct material located at the AFSWC is in the physical custody of Capt. Sheets and is located in a locked storage vault with the bulk of the material stored in shielded pits in the floor of this vault. Sgt. Wood provided a notebook which indicated the materials and the amounts stored in each pit. A spot-check of these indicated that this notebook was up to date and did, in fact, provide information for locating any material stored in the vault. Two large sealed sources are located in the instrument calibration range rooms immediately adjacent to the vault storage area. It was noted that both rooms are equipped with C(2) devices as described in the application dated February 15, 1965.
18. Most other isotopes are located at the Radiobiology Center, operated by the Weapons Laboratory. A review of this inventory indicates the maximum amount of any single isotope is less than 10 mc with the most less than 500 uc. Approximately one-half of these materials are for standards which are used for calibrating the whole body counter. Capt. Walker explained that previously some byproduct materials had been utilized by this group for injection into sheep. However, no injections into animals have been made within the past four years. It was noted that the radiobiology isotope lab contained a stainless steel hood which had been lined with plastic, stainless steel work bench and a tile floor. It was noted that this laboratory had a supply of lead brick and bags of lead shot for preparing shielding. Capt. Walker explained that the hood vent system had just been overhauled to improve its efficiency and that new filtering system had been installed. In addition, a few selected small sealed sources are located in several instrument repair facilities throughout the base.

Instrumentation and Calibration

19. A list of the health physics instrumentation is available and is a part of the licensee's application and a new application dated December 27, 1967 which provides an up-to-date listing of instrumentation has been submitted in request for license renewal. Capt. Sheets and Sgt. Robinson stated that survey instruments are calibrated at six month intervals and laboratory instruments are calibrated as used.

Radiological Safety Precautions and Procedures

20. A booklet entitled "Health Physics Program For The Safe Use of Radioisotopes on Kirtland Air Force Base, Albuquerque, New Mexico" has been prepared and distributed to all users of byproduct material on this base. In addition, each new proposed use of byproduct material is reviewed in detail by the radioisotopes committee who frequently provide additional directions and instruments to the individual users. Forms AEC3 were noted to be conspicuously posted at various locations throughout this post.

Radiation and Contamination Surveys

21. Radiation and contamination surveys are provided for the various laboratories in which materials are utilized. In addition, this licensee has submitted copies of radiation surveys for several of their fixed radiation facilities such as the calibration range rooms. As no changes have been made in these facilities, additional surveys are not required.
22. A review of the leak test records revealed that many of the larger sealed sources have not been leak tested at intervals of six months or less. As examples, item b., the 125-curie Cs-137 sealed source was not leak tested between February 6, 1967 and October, 1967; item c., 5-curie Cs-137 sealed source was not leak tested between July 15, 1966 and April 1967; and item d., 103-mc Cs-137 sealed source was not leak tested between February 3, 1966, and November, 1966; items e., and f., two Cs-137 sealed sources of approximately 3 mc each were leak tested January 4, 1966, February 9, 1967, and January 1968; item g., a 10-curie Co-60 sealed source was not leak tested between July 15, 1966 and February 6, 1967, nor was it leak tested between February 6, 1967 and October, 1967; item h., a 39-mc Co-60 sealed source not leak tested between July 15, 1966 and February 6, 1967; nor was it leak tested between February 6, 1967 and October 1967; item i., a 400-curie Co-60 source was not leak tested between July 15, 1966 and February 6, 1967 nor was it leak tested between February 6, 1967 and October 1967. Capt. Sheets explained that originally the leak test due dates for all sealed sources fell at the same time; however, to even out the work load, the leak test due dates for the many sealed sources have been staggered with all sources at a particular location being assigned the same leak test schedule. Capt. Sheets explained in the early fall of 1967 several of the sealed sources could not be leak tested at the prescribed time as the instrumentation utilized for counting a leak test sample was being moved from one building to another. It should be noted, however, that the time of this inspection, all sealed sources had been leak tested during the preceding six months. It was also noted that this licensee's records indicate the date as to month and year, and on a few occasions, the day, and the initials of the person performed the leak test but do not contain any indication as to the results other than, on a few occasions, a statement "within limits".
23. Capt. Sheets explained that the leak tests of the sealed sources are performed by either wiping the source or the container with a moist wipe and counting to determine the activity removed using a gas-flow proportional counter. Capt. Sheets stated that the leak tests for the larger sources are performed by Sgts. Robinson and Wood and him self, while leak tests of a number of smaller sources possessed by the Center that fell in the A-84 category are usually wiped by the individual users and the activity removed assayed by Sgts. Robinson and Wood. It was noted that the Np-237 foils had been leak tested in May and September, 1966; March and September, 1967; and were in the process of being leak tested at the time of this inspection. The Pu-239 and U-238 foils were leak tested at the same times.

Procurement Procedures and Controls

24. Capt. Sheets explained that procurement of radioactive materials is made by placing an order through the base procurement office and that prior to placing the order the health physics office was contacted for their approval. Delivery is made to the individual users with notification to Capt. Sheets. Capt. Sheets stated that all materials received on the base are checked by Sgts. Robinson or Wood for radiation levels at contact and possible contamination.
25. Capt. Sheets stated that in the event the material is found in one of the laboratories that has not been procured through proper channels, including the approval of the health physics office, the material is confiscated and removed from the user's laboratory.

Storage and Security of Material

26. The bulk of the radioactive materials possessed at the AFSWC is located in the storage vault which under control of the health physics office. This vault, which was described earlier, is kept locked, with a combination lock at all times when Capt. Sheets, Sgt. Robinson, or Sgt. Wood is not present. As described earlier, a number of storage pits are located in the floor; these storage pits are covered with a 6-inch thick, high density concrete plug to provide shielding the materials stored therein.

Waste Disposal

27. Capt. Sheets explained that solid radioactive waste is disposed of through Air Force channels as prescribed by Air Force Tech Orders. This involves contact the Air Force transportation officer, advise him of the materials, etc. The material is packaged by Kirtland personnel and packages are to identify the kinds and quantities of radioactive material, as well as radiation levels at contact and at one meter from the package. Shipment is made per the instructions of the Air Force transportation office. Records of such disposals are maintained on the inventory cards.
28. Capt. Sheets explained that low levels of liquid waste would be disposed of to the sanitary sewer. Capt. Sheets stated that the sewer flow is over one million gallons per day. Capt. Sheets stated that he expected to discard approximately 75 uc of liquid waste in the near future and that this would be the first such liquid disposal in the two years that he has been assigned to the Special Weapons Center. Capt. Sheets emphasized at this point that very little radiochemistry work was performed at Kirtland Air Force Base.

Posting and Labeling

29. During the inspection, spot-checks were made as to labeling of storage containers. It was noted that on all items checked, the labels indicated "Caution - Radioactive Material" in the prescribed colors and bearing the radiation emblem which had been affixed to all such containers. In addition, information as to kind and quantity and date of assay was available on the labeling of each such container inspected. All areas were conspicuously posted

as required by 10 CFR20.203 . The two range rooms in which large sealed sources of gamma emitters are exposed for instrument calibration were noted to be equipped with the required C(2) devices. It was also demonstrated at this time that these sources could not be exposed unless the C(2) device was operating.

Personnel Monitoring

30. Capt. Sheets explained that approximately 180 persons at the AFSWC are potentially exposed to radiation. Of these, approximately 30 work with x-ray units only, approximately 30 work with both radioactive materials and x-ray, and approximately 120 persons work with licensed material only. Capt. Sheets explained that all new individuals associated with the radiation program receive a baseline physical which includes a 24-hour urine sample which is assayed for gross beta and gross alpha. This letter test is performed by the Wright Patterson radiochemical laboratory. Capt. Sheets explained that film badges were obtained on a monthly frequency from the USAF Laboratory at Wright Patterson field in Ohio and that reports are received at the Special Weapons Center quarterly. Capt. Sheets explained that the film is delivered to the health physics office and that he is responsible for exchanging the film in each badge. A review of records indicate that the maximum exposure recorded during the fourth quarter of 1967 was 80 millirem. It was also noted that in the event that the film is damaged, or in ~~other cases~~ in a condition which cannot be evaluated, a potential exposure of 1.25 rem is assigned for that quarter for that individual. It was noted that this information is maintained on the Form AEC-5 equivalent which is Form DD-1141. This form also contains bioassay information. A review of these forms indicate that in most instances, the maximum quarterly exposure is less than 100 millirem. The only exception to the above is in the event of damaged or unreadable film when a 1.25 rem exposure is recorded for an individual.

Records

The licensee maintains records of purchases, receipts, and transfers as well as disposals of radioactive materials. The licensee maintains by a ~~list~~^{book} and file a running inventory of all by-product material on the base, as well as an inventory of material in any particular location on the base. Personnel monitoring records in the forms of the reports from the laboratory at Wright Patterson and Forms DD-1141 are maintained. Radiation and contamination surveys have been made and results recorded. Leak test results, however, have not been recorded in units of microcuries as required by the license.

Review with Management

42. At the conclusion of the inspection the results were reviewed with Col. William R. Morton, Vice Commander of the Air Force Special Weapons Center. Other individuals attending this meeting were Lt. Col. R. C. Wolf, Director of Base Medical Services; Capt. V. H. Sheets, Base Health Physicist; and Master Sgt. R. D. Robinson.

33. During the discussion it was pointed out that the only items of noncompliance noted involved the failure to leak test the sealed sources at six month intervals or less as required by the license and the failure to maintain records of the results of leak tests in units of microcuries, as a requirement of the license. Capt. Sheets explained that the delay in performing the leak tests in the fall of 1967 as a result of a move from one building to another such that equipment for assaying the activity of the wipes was not possible and stated that the requirement that the results of these leak tests be recorded in microcuries had escaped him. Col. Morton asked if, at the time of the inspection, any leak tests of sealed sources were overdue and the inspector pointed out that at this time all sealed sources had been leak tested at some time during the preceding six month period. Capt. Sheets pointed out that previously, all sealed sources were to have been leak tested at approximately the same time period, however, the proposed leak test dates have now been staggered to prevent overloading the counting equipment at any particular interval of time. Capt. Sheets informed Col. Morton that he felt that in the future leak tests could be performed with undue difficulty as prescribed periods of six months or less and that it would create no problem to record results in units of microcuries.

34. Col. Morton stated that he could see no reason why they could not comply with this license condition and instructed Lt. Col. Wolff, who is to be the incoming chairman of the radioisotope committee, to take whatever action is necessary to insure that these leak tests are performed at the prescribed interval and that the results be recorded as required by the license.

35. Following this meeting, a very short discussion was held with Lt. Col. Wolff who explained to the inspector that he had no previous experience with radioisotope committee, etc., and at this time the inspector explained briefly the Commission's regulatory program as to the various areas to division responsibilities and outlined to Lt. Col. Wolff the areas the Commission expected the radioisotope committee to supervise.

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