

INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

-4 E (11) - 4-6
-5 E III
-04

1. LICENSEE Atomic Energy of Canada 720 ... (11/27/70) ...	2. REGIONAL OFFICE REGION 3 DIV. OF COMPLIANCE 1100 ROAD ... ILL. 61337
3. LICENSE NUMBER(S) 12-33147-1 ... -05	4. DATE OF INSPECTION -9-9-70

5. INSPECTION FINDINGS

- A. No item of noncompliance was found.
- B. Rooms or areas were not properly posted to indicate the presence of a RADIATION AREA. 10 CFR 20.203(b) or 34.42
- C. Rooms or areas were not properly posted to indicate the presence of a HIGH RADIATION AREA. 10 CFR 20.203(c) (1) or 34.42
- D. Rooms or areas were not properly posted to indicate the presence of an AIRBORNE RADIOACTIVITY AREA. 10 CFR 20.203(d)
- E. Rooms or areas were not properly posted to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(e)
- F. Containers were not properly labeled to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(f) (1) or (f) (2)
- G. A current copy of 10 CFR 20, a copy of the license, or a copy of the operating procedures was not properly posted or made available. 10 CFR 20.206(b)
- H. Form AEC-3 was not properly posted. 10 CFR 20.206(c)
- I. Records of the radiation exposure of individuals were not properly maintained. 10 CFR 20.401(a) or 34.33(b)
- J. Records of surveys or disposals were not properly maintained. 10 CFR 20.401(b) or 34.43(d)
- K. Records of receipt, transfer, disposal, export or inventory of licensed material were not properly maintained. 10 CFR 30.51, 40.61 or 70.51
- L. Records of leak tests were not maintained as prescribed in your license, or 10 CFR 34.25(c)
- M. Records of inventories were not maintained. 10 CFR 34.26
- N. Utilization logs were not maintained. 10 CFR 34.27

William H. ...
 (AEC Compliance Inspector)

6. LICENSEE'S ACKNOWLEDGMENT

The AEC Compliance Inspector has explained and I understand the items of noncompliance listed above. The items of noncompliance will be corrected within the next 30 days.

_____ (Date) _____ (Licensee Representative — Title or Position)

Atlantic Richfield Company
License Nos. 12-140-4 & -5
July 7, 1970

HEALTH PHYSICS EVALUATION

The licensee conducts a very limited byproduct material program under the provisions of a broad research and development license. The scope of the program at the present time is limited to various tracer studies, principally at various field locations of the licensee. The licensee personnel who were interviewed during this inspection demonstrated by discussion a good knowledge of radiological safety procedures. In addition, the licensee has facilities and equipment which are more than adequate for a program of this scope. The cobalt 60 radiation facility is available for use but at the present time, due to the limited need, the program is at a standstill. The licensee personnel interviewed during this inspection had a good knowledge of applicable AEC regulations as well as the license conditions, and it is the opinion of the AEC representative that these licensed programs are conducted with adequate regard for radiation safety.

REPORT COMPILED SHEET

Identifying Information

Type Report (circle) 591 592

- 1. Licensee Atlantic Richfield Company
- 2. Address 400 East Sibley Boulevard
Harvey, Illinois 60426
- 3. License No(s) 12-140-4 and -5
- 4. Date of Inspection July 7, 1970
- 5. Inspector W. H. Schultz
- 6. Status of Compliance Clear

Items of Noncompliance

7. Section of Regulation or License Condition	Details Paragraph
A. _____	A. _____
B. _____	B. _____
C. _____	C. _____
D. _____	D. _____
E. _____	E. _____
F. _____	F. _____
G. _____	G. _____

Classified Information

- 8. This report contains classified or business confidential information.
Yes No

W. H. Schultz 7-14-70
Inspector Date

Jm Allan 7-14-70
Reviewer Date

D E T A I L S

GENERAL INFORMATION

9. This was an announced reinspection which was conducted on July 7, 1970. The AEC representative contacted Dr. Adolph I. Snow, RSO, by telephone and made arrangements to conduct this inspection.
10. Due to last minute scheduling of this inspection, the Illinois State Health Department was not notified of this inspection, and the AEC representative was not accompanied.
11. All information in this report was furnished by the following licensee personnel:
 - Dr. A. I. Snow - Chairman of the Isotope Committee and RSO
 - Mr. L. A. Baillie - Senior Research Chemist
 - Mr. G. A. Uhl - Research Chemical Engineer

INSPECTION HISTORY

12. The last previous reinspection (Reinspection No. 7) of License No. 12-140-4 was conducted on June 27, 1969. During that inspection, no items of noncompliance and a Form AEC-591 was issued.
13. The last previous reinspection (Reinspection No. 4) of License No. 12-140-5 was conducted on April 8, 1968. During that inspection, two items of noncompliance were noted. These included the licensee's failure to post the entrance door to the cobalt 60 irradiation facility with the conventional radiation caution symbol and the words "High Radiation Area," contrary to 10 CFR 20.203(c)(1). In addition, the licensee did not in all cases maintain a record of the results of leak tests which were made on the cobalt 60 sealed source in the irradiation facility. Corrective action: During the July 7, 1970 reinspection, the AEC representative observed that the entrance door to the irradiation facility is now posted with the required "High Radiation Area" sign and is maintaining records of the results of all leak tests which are made on the cobalt 60 sealed source.

PROGRAM

14. License No. 12-140-4

This license authorizes the use of any byproduct material with Atomic Nos. between 3 and 83, inclusive. However, the scope of this byproduct material program is very limited at the present time. The principal use of radioisotopes at the Harvey, Illinois research facility is for the preparation of various tagged compounds which are then transported by licensee personnel to various facilities of Atlantic Richfield Company throughout the United States. These tagged compounds are used for process evaluation and for various types of tests for leaks in systems. The last time the licensee used any significant quantities of radioisotopes for preparation of tagged compounds was on July 1, 1968. At this time, the licensee prepared various kinds tritium compounds for future use at their facilities throughout the United States. A complete inventory of all isotopes on hand in June 1970 is attached to this report as Exhibit A. Although this inventory shows numerous small quantities of carbon 14 compounds, licensee personnel stated the C-14 research program is essentially inactive at the present time.

15. License No. 12-140-5

This license authorizes the possession of up to 15,000 curies of cobalt 60 as sealed sources in a gamma radiation facility. At the time of this inspection, the licensee had on hand 4,000 curies of cobalt 60 in their gamma radiation facility. However, Dr. Snow^{stated} the use of the cobalt 60 sealed source has been negligible since the last reinspection. He stated the licensee plans to keep the facility available for research programs, however, there are no immediate plans to use the irradiation facility.

16. A review of the licensee's inventory records showed the licensee is complying with possession limits, forms, and specific radioisotopes.

ORGANIZATION AND ADMINISTRATIVE CONTROL

17. Since the last reinspection, the licensee has revised the membership of the Isotope Committee. This revision was made because of the limited scope of the two licensed programs. At the present time, the Radioisotope Committee consists of Dr. Snow and Messrs. Baillie and Uhl. Dr. Snow said this change was made because the three named committee members are the only persons who are currently involved in any way in the preparation and use of radioactive materials. Dr. Snow stated the only other person who is administratively responsible for the radioisotope programs is his immediate supervisor, George Masologites, Manager of Process Research.

FACILITIES AND EQUIPMENT

18. There has been no change in the facilities or equipment since the last reinspection.

PERSONNEL MONITORING

19. Film badge service is provided by R. S. Landauer on a bi-weekly and quarterly basis (twin-films). The licensee currently receives 30 film badges each period, however, only a small number of these badges are currently assigned to licensee personnel. In addition to the film badge processor's report, the licensee also maintains Form AEC-5. During this inspection, the AEC representative reviewed the film badge records for the year 1969 and for the year 1970 through March 31, 1970. During this period, the maximum quarterly exposure was 100 millirem.

RADIATION SURVEYS

20. The licensee makes smear type surveys of the Radioisotope Laboratory area three times each year (in conjunction with leak tests of sealed sources). During the inspection, the AEC representative viewed the smear surveys which were made since the last reinspection and noted all smears showed the presence of less than 5×10^{-5} uc of activity. In addition, at the same time the licensee also makes direct reading radiation surveys throughout the Isotope Laboratory area. The AEC representative observed that the licensee is keeping a written record of all survey results. This includes both the direct reading and the smear type radiation surveys.

POSTING AND LABELING

21. During this inspection, the AEC representative observed that all posting and labeling was in accordance with the applicable sections of 10 CFR 20.203. Also, the licensee had posted a copy of Form AEC-3, "Notice to Employees."

LEAK TESTS

22. All sealed sources are leak tested by the licensee three times each year. At the time of this inspection, the inventory included three cesium 137 sealed sources which were procured under the -4 license and 4,000 curies of cobalt 60 which was procured under the -5 license. The cesium 137

22. Continued

sealed sources are leak tested with the conventional smear technique, and the cobalt 60 sealed source is checked for leakage by analysing a sample of the water in the storage pool in the irradiation facility. The most recent leak test was made on June 24, 1970, and all sealed sources showed less than 2×10^{-5} uc of removable contamination.

TRANSPORTATION

23. Dr. Snow stated the licensee prepares the various tagged compounds in their research facility and transports them to nearby locations in a company vehicle. However, in those instances where the various tests are made at out-of-state locations, the tagged compounds are prepared at the work site and are not prepared in the research laboratory. He stated the necessary materials are shipped directly from a supplier to the work site, and he or Messrs. Baillie or Uhl then travel to the work site and conduct the various tests.

WASTE DISPOSAL

24. Since the last reinspection, the licensee has made one shipment of radioactive waste material to Atomic Disposal Company. This shipment consisted of three strontium 90 sealed sources with a total strength of 30 millicuries. The shipment was made on September 23, 1969. No other radioactive waste material has been disposed of since the last reinspection.

RECORDS

25. The licensee maintains records showing the receipt and use of radioactive material, transfer of byproduct material, results of direct reading and smear type radiation surveys, personnel exposure information, leak test results, and waste disposal records. During this inspection, the AEC representative reviewed the various records which are maintained by the licensee and observed that these records are maintained in adequate detail and on an up-to-date basis by licensee personnel.

LICENSE CONDITIONS

26. During this inspection, the AEC representative discussed the conditions of License Nos. 12-140-4 and -5 with licensee personnel. Based on statements made by the three licensee personnel who were interviewed during this inspection, a review of the licensee's records, and an inspection of the licensee's facilities, the licensee is complying with all conditions of these licenses.

MANAGEMENT DISCUSSION

27. At the conclusion of this inspection, Dr. Snow was informed by the AEC representative that no items of noncompliance or other deficiencies were noted, and a Form AEC-591 was issued.

ISOTOPE INVENTORY
June, 1970

C^{14}

BaCO ₃	20 mc
n-octane	4.5 mc
dotriacontane	4.0 mc
Na-acetate	0.5 mc
Ethylene	0.5 mc
Isopropanol	0.2 mc
Isobutane	0.1 mc
propylene	0.05 mc
propane	0.05 mc
naphthalene	0.05 mc
cetane	0.09 mc
heneicesane	0.05 mc
ethyl iodide	0.1 mc
t-butyl alcohol	0.05 mc
benzoic acid	0.0025 mc
indole	0.0025 mc
butene-1	0.1 mc
toluene	0.35 mc
Methylcyclopentane	0.5 mc
n-heptane	0.9 mc

H^3

H ₂ O	8.3 curies
Ethylcyclohexane	6.2 curies
Ethylbenzene	6.25 curies
H ₂	1.78 curies
Anisole	3505 mc
n-butane	390 mc
butene	89 mc
propane	89 mc
propylene	89 mc
benzene	45 mc
p-xylene	1 mc
pentamethyl benzene	3 mc
durene	8.5 mc
n-hexane	8.5 mc
lube stocks	202 mc

Other Sources

Kr ⁸⁵	19 curies
Ni ⁶³	10 mc
Cl ³⁶	0.9 mc
Cs ¹³⁷	423 mc (3 sealed sources)
Cs ¹³⁷	294 mc (solution)
Co ⁶⁰	4000 curies (sealed source)
Co ⁶⁰	4.3 mc (solution)
Zn ⁶⁵	16.4 mc
Fe ⁵⁹ (Shale)	0.5 mc
Sc ⁴⁶ (Ceramic Balls)	3.6 mc

EXHIBIT A