

JUL 17 1970

Pratt and Whitney Aircraft Division
United Aircraft Corporation
400 Main Street
East Hartford, Connecticut 06108

Attention: Mr. J. Martin, Manager Health and Safety

Gentlemen:

This letter relates to the discussion Mr. Eugene Epstein of this office held with Mr. J. Martin and W. Patton following the inspection conducted on July 7, 1970 of the activities authorized under AEC Byproduct Material License No. 06-0550-03.

As noted during the discussion, it appears that certain of your activities were not conducted in full compliance with AEC requirements. The items and references to the pertinent requirements are listed in Item 8 of the enclosed Form AEC-592.

The purpose of this letter is to give you an opportunity to advise us in writing of your position concerning these items and of any corrective steps you have taken or plan to take with respect to the listed items and the date all corrective action was or will be completed. Your reply should be sent to us within 20 days of the date of this letter to ensure that it will receive proper attention in our further evaluation of this matter.

Should you have any question concerning this matter, you may communicate directly with this office.

Very truly yours,

Robert W. Kirkman
Director

CO:I:KE

Enclosure:
Form AEC-592

I-3

OFFICE ▶	COMPLIANCE				
SURNAME ▶	Epstein/cáz	Nelson	Kirkman		
DATE ▶	7/17/70		7-17-70		

**UNITED STATES ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE**

<p>1. LICENSEE</p> <p>Pratt and Whitney Aircraft Division United Aircraft Corporation 600 Main Street East Hartford, Connecticut 06108</p>	<p>2. REGIONAL OFFICE</p> <p>U. S. Atomic Energy Commission Region I, Division of Compliance 970 Broad Street Newark, New Jersey 07102</p>
<p>3. LICENSE NUMBER</p> <p align="center">06-0550-03</p>	<p>4. DATE(S) OF INSPECTION</p> <p align="right">July 7, 1970</p>

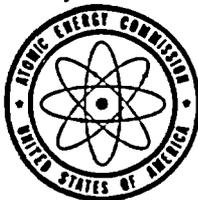
5. The following activities under your license (identified in Item No. 3 above) appear to be in noncompliance with AEC regula or license requirements, as indicated.

- a. Contrary to the provisions of 10 CFR 20.201(b), "Surveys", evaluations and surveys made to determine concentrations of nuclides in air for those persons making entries into restricted hot cells were inadequate to determine compliance with 10 CFR 20.103(a), "Exposure of individuals to concentrations of radioactive materials in restricted areas".
- b. Contrary to the provisions of 10 CFR 20.207(b)(2), "Personnel exposure and monitoring reports", reports were not sent to the Director of Regulations within the first calendar quarter year of 1970 of those individuals who during the year 1969 exceeded the radiation dose specified in 10 CFR 20.101(a) for an applicable calendar quarter year.

Supplementary page NONE attached. Eugene Epstein, Radiation Spec. 7/17/70
AEC Compliance Inspector Date

ORIGINAL: LICENSEE.

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UNITED STATES
ATOMIC ENERGY COMMISSION

DIVISION OF COMPLIANCE
REGION I

970 BROAD STREET
NEWARK, NEW JERSEY 07102

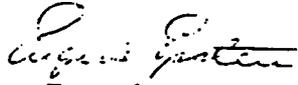
201 645-

July 17, 1970

INSPECTOR'S EVALUATION OF
PRATT AND WHITNEY AIRCRAFT DIVISION
UNITED AIRCRAFT, CANEL FACILITY
LICENSE NO. 06-0550-03

Licensee has transferred almost all material and is in process of remote decontamination of his hot cell facility. A weakness appears in Management followup. It appears they rely on general statements from the site RSO and leave matters to him rather than a followup to determine whether previous noted items of noncompliance were corrected. Facilities are adequate and removal of material has materially decreased any hazard to employees. Personnel appear to be aware of exposure limits and take care not to exceed these.

The license is properly categorized as E(1) with priority II. No extension of inspection frequency is recommended and the license will next be scheduled for reinspection during July, 1971.


Eugene Epstein
Radiation Specialist

REGION I, DIVISION OF COMPLIANCE
NEWARK, NEW JERSEY

AEC-592 Backup Notes

1. Name and address of licensee: Pratt and Whitney Aircraft
Division of United Aircraft Corporation
400 Main Street
East Hartford, Connecticut 06108
2. Date of Inspection: 7/7/70
3. Type of Inspection: Announced
Reinspectic
4. License Number(s), docket number(s), number and date of last amendment for each license. Category and Priority of each license:

License No. 06-0550-03
Category E(1), Priority II
Parts 20 - 30, Amendment No. 11 dated June 9, 1970

Location Inspected: CANEL FACILITY
Middletown, Connecticut
5. Date of previous inspection: 10/15/69 ~~None~~
6. Is "Company Confidential", or proprietary, or classified information contained in report?
Yes _____ No X
(Specify paragraphs)

Eugene Epstein
Eugene Epstein, Radiation Specialist

Inspector

July 16, 1970

Date

Paul R. Nelson, Sr.
Paul R. Nelson, Sr. Radiation Specialist

Reviewer

July 16, 1970

Date

Persons Accompanying

Mr. Arthur Huebner, State of Connecticut Health Department

Persons Contacted

Mr. J. A. Martin, Manager of Health and Safety, United Aircraft Corporation
Mr. Floyd Parsons, Sr. Industrial Hygienist of Middletown
Mr. W. Patton, Head of Health and Safety, Pratt and Whitney Division
Mr. D. MacFarlane, Radiation Protection Officer at Canel
Mr. F. Felber, Supervisor, Hot Lab Operations

Background Information

1. The last prior inspection was conducted October 15, 1969 and the results reported using form AEC-592 with one item of noncompliance as follows:
20.201(b), ^{NC} ~~The~~ surveys were performed to determine concentrations of airborne radioactivity existing in hot cells while personnel were therein to determine compliance with 10 CFR 20.103(b).
2. This inspection revealed that while some surveys were made they were inadequate and this item of noncompliance is recurrent. The details will be discussed in this report under "Surveys".

Organization and Management

3. There has been no change since the last previous inspection.

Facilities and Uses of Materials

4. There had been no change in facilities used since the last inspection. A complete description of the facilities comprising 7 hot cells and support activities, is contained in the licensee's "Application for License PWA-3255 - dated December 15, 1967 pages 56 - 63; included with the application of December 21, 1967.
5. Material on hand presently consists of the following:

a. Inside Cells

Cell No.4	20,000 Ci Co-60 as minipellets (sealed source)
Cell No.5	10 Ci Co-60 and Cs-137 waste (sealed source)
Cell No.3	20 Ci Co-60 and Cs-137 canned waste (sealed source)

b. In addition to the above -

- License Item A - any material as contaminated, equipment and waste, 50 Ci
- Item M - Residual contamination in cells, 5 Ci
- Item I - Cs-137 in an Ohmart soil density gage, 4 mCi
- Item D - Co-60 as calibration sources, 2 sources, 20 uCi each
- Co-57 accelerator produced, 10 mCi

6. Records indicate that 10,000 Ci of Co-60 was transferred to Atcor as waste on June 22, 1970 and 24,000 Ci Co-60 as sealed sources was transferred to hospitals as teletherapy sources during April, 1970.
7. Records of cell entries indicate that approximately 30 cell entries were made between that last inspection and July 1, 1970. During January and February, a six week period was devoted to removal of sources and packaging of waste items produced during the first calendar quarter year 1970, whole body exposures resulting from this work^{which} ranged from 500 mrem to 2140 mrem for 10 persons. This work, according to MacFarlane, involved placing of pellets and materials in small cans and in some instances placing the cans inside authorized shipping containers.
8. Present work consists of remote decontamination of hot cells using the slave units to swab walls and floors of hot cells. MacFarlane stated they would receive a low bid from an outside decontamination firm if contamination levels inside cells were below present levels. The swabs are placed in cans which are then removed remotely with handling tools and placed in concrete shielded 55 gallon drums for disposal.

Personnel Monitoring

9. Records of personnel monitoring were reviewed. The licensee uses monthly whole body film badges supplied by Landauer for 10 persons. The licensee maintains Forms AEC-4 and -5, with all entries completed for all these employees. Ex. 6
10. Records indicate that [] was the only person who exceeded 1.25 R annual whole body exposure for 1969. His annual whole body exposure was 1740 mrem ^{Ex. 6} and 1827 mrad B + γ . Both [] and Parsuns both stated no report was ever sent during 1970 to the Director of Regulation reporting this exposure in accordance with 10 CFR 20.207(b)(2).
11. From January 1, to February 13, 1970 weekly film badges were used as well as monthly badges. The total of the weekly badges through February 13, 1970 also are the quarterly exposures since no exposure was received after February 13, 1970.

The records show the following:

[1250 mr
	1470 mr
	2140 mr
	1560 mr
	810 mr
	1340 mr
	1410 mr
	1610 mr
	560 mr

Ex. 6

- 12. One evaluation of hand dose was made and it was noted that the ratio of gamma dose to the hand to that of the whole boey was 500 to 1.

1/4/70 []- 35 mr whole body
 1800 mr hands

Ex. 6

[]- 30 mr whole body
 1600 mr hands

- 13. The above evaluation was done by MacFarlane during the first removal of radio-nuclides from cells 4 and 5. A dosimeter pen was strapped to the back of the two persons hands and compared with a dosimeter worn on the breast. MacFarlane stated after this result, only remote handling tools were used to avoid hand exposures.

Surveys

Air Surveys

- 14. At a conference with management during the last inspection it was stated by J. Martin, Manager Health and Safety, United Aircraft and W. Patter, Manager Health and Safety, Pratt and Whitney Division, that lapel air samplers would be used in all cell entries. (See 592 Notes Pg. 30, dtd. 11/10/69.) In the licensee's letter of November 21, 1969 replying to CO:I citation for 10 CFR 20.201(b), failure to determine concentrations of radionuclides in air inside,hot cells during entry, signed by Martin, a statement was made that an air survey inside hot cells would be made during all cell entries.
- 15. MacFarlane stated that no surveys had been conducted or made inside hot cells during cell entries. He stated, however, that air surveys were conducted on November 11, 1969 and November 12, 1969 using a Gelman low volume air sampler drawing air from the hot cell through an inserted tube for 24 hours at the rate of 1 cfm. MacFarlane stated air in all No.4 was five times mpc for 40-hour ex-

15. Cont'd

posure to insoluble Co-60. Concentrations of 4.5×10^{-8} uCi/ml air were noted. The mpc for Co-60 insoluble Appendix B, Table I, is 9×10^{-9} uCi/ml air. Air in cell No.5 was taken in the same manner and was determined not to exceed 5×10^{-11} uCi/ml air Cs-137 and less for Co-60. Samples were counted on a pulse height analyzer. All samples were taken while no work or entry was in progress. No other samples were taken and air was not sampled in cells 1, 2, 3, 6 and 7.

16. These cells were heavily contaminated at the time of entry; up to 30×10^6 dpm/100 cm² of Co-60 and Cs-137 contamination (see paragraph 19). MacFarlane stated that it was possible that all ~~entries~~^{entries}, particularly those during January and February, 1970, could have stirred up this contamination. He stated no further cell air surveys were made. Records indicate 20 cell entries during January and February 1970, mainly in Cells No.4 and No.5.
17. MacFarlane stated the reason he did not use personnel air samplers was because he believed they did not give accurate results.

Stack Air

18. Air from the hot cells and service areas is exhausted via one exhaust stack with an air flow of 45000 cfm. Each hot cell has a prefilter and absolute filter in the exhaust lines and all cell exhaust is connected to one plenum equipped with three prefilters and one large absolute filter. Air is sampled daily for 24 hours and counted on a pulse height analyzer. No long-lived activity in excess of background was noted in the records maintained by the licensee.

Smear Surveys and Direct Radiation Surveys

19. Smear surveys and direct radiation surveys were made at each cell entry. Records are as follows:

4/70 Surveys

Cell No.1 30 mr/hr at 3' distance from floor.
Floor - 60000 dpm/100 cm²
Walls - 40000 dpm/100 cm²
Lazy Susan - 500,000 dpm/100 cm²

Cell No.2 40 mr/hr at 3' distance from floor.
Floor - 1×10^6 dpm/100 cm²
Walls - 1×10^6 dpm/100 cm²
Lazy Susan - 1.8×10^6 dpm/100 cm²

Cell No.3 150 mr/hr at 3 ft. from floor. On desk 700 - 900 mr/hr. 2 R/hr on Lazy Susan.
Floors - 1.9×10^6 dpm/100 cm²
Walls - 6.7×10^4 dpm/100 cm²
Lazy Susan - 1.3×10^6 dpm/100 cm²

Cell No.4 150 - 175 mr/hr at 3 feet from floor.
30 x 10⁶ dpm/100 cm² every where

Cell No.5 0.7 R/hr at 3 feet from floor.
Floor - 32 x 10⁶ dpm/100 cm²
Walls - 2 x 10⁶ dpm/100 cm²
Lazy Susan - 1 x 10⁶ dpm/100 cm²

Cell No.6 - 100 mr/hr at 3 feet from floor.
Floors- 6 x 10⁵ dpm/100 cm²
Walls - 3 x 10⁵ dpm/100 cm²
Lazy Susan - 5 x 10⁶ dpm/100 cm²

Cell No.7 - 2.5 mr/hr at 3 feet from floor.
Floors - 35 x 10³ dpm/100 cm²
Walls - 23 x 10³ dpm/100 cm²
Lazy Susan - 1 x 10⁶ dpm/100 cm²

Security

20. Cells have combination locks which only MacFarlane opens for cell entries as discribed in license backup. Certification to the effect that MacFarlane opens the cells personally is contained in a work log record.

Posting and Labeling

21. All hot cells were posted with signs reading, "Caution, High Radiation Area" and "Caution, Radioactive Materials", w/symbol. Adjacent areas had signs reading "Caution, Radiation Area", with symbol. Form AEC-3 was noted posted at sufficient areas to allow all persons to see the notice.

Waste Disposal

22. All waste has been disposed to Atcor in DOT approved containers. Appropriate surveys have been made to ensure compliance with DOT regulations. Records have been maintained showing kind, quantity and date of disposal.
23. Liquid waste consisting of wash water is drained to a hold up tank. Samples are taken prior to pumping tank contents to the sanitary sewer. Concentrations prior to d&lution did not exceed 1 x 10⁻⁷ uCi/ml Cs-137 or Co-60.

License Conditions

24. 10. Materials used only at the Canel Facility.
12. Materials noted used only under direct physical supervision of named individuals.
13. All sealed sources prior to shipment were tested for leakage and removable contamination and swabs counted in a pulse height analyzer. Sealed sources used for calibration were tested at intervals which did not exceed six months. Leakage in all cases did not exceed 0.001 uCi.
14. Use of materials was noted to be in accordance with listed documents. These documents do not contain any mention of air surveys upon cell entries.
15. Designated casks were used in packaging.
16. Copper tubes were used on April 28, 1970 for shipments. Verification of tests, dimensions and fit, were maintained on written certificates.
17. License Items 6K and 6L have been transferred to vendors. Item 6M is still in the licensee's possession.

Items of Noncompliance

25. a. Contrary to the provisions of 10 CFR 20.201(b), "Surveys", evaluations and surveys made of concentrations in air in hot cells were inadequate to determine compliance with 10 CFR 103(a). (See paragraph 14 through 17, report details.)
- b. No report in writing was sent to the Director of Regulations in 1970 of those persons whose annual dose in 1969 exceeded the applicable quarterly limit specified in 10 CFR 20.101(a). (See paragraph 10 report details.)

Management Review of Items of Noncompliance

26. A discussion was held immediately subsequent to the inspection at East Hartford. Attending the conference was Mr. J. Martin, Manager, Health and Safety, UAC, and W. Patton, Manager, Health and Safety, Pratt and Whitney Corporation. It was pointed out to Martin that the citation for 10 CFR 20.201(b) was recurrent.

Martin was surprised that his directive to use personnel lapel air samplers after the last inspection was not carried out. Patten explained that MacFarlane had submitted to him a written report stating that he had performed the required surveys and that these showed maximum permissible concentrations would not be exceeded. Patton stated he did not review in depth MacFarlane's method or data. Martin ordered Patton to see that a survey is made during each cell entry. Regarding the citation for 20.207 Patton stated they did not properly understand the regulation but that a proper report will be sent.