UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PA 19406-2713

December 22, 2014

Docket No. 040-00791 License No. SMB-151

L. Renee Welsh
Director, EH&S and Facilities-MCO
United Technologies Corporation
Pratt & Whitney
400 Main Street
MS 124-26
East Hartford, CT 06108

SUBJECT: NRC INSPECTION REPORT NO. 040-00791/2014-002, UNITED TECHNOLOGIES CORPORATION, PRATT & WHITNEY, EAST HARTFORD, CONNECTICUT AND THE MIDDLETOWN, CONNECTICUT SITE

Dear Ms. Welsh:

On November 5 and 6, and December 8, 2014, Betsy Ullrich of this office conducted a safety inspection at the above address and at Aircraft Road, Middletown, Connecticut of activities authorized by your NRC license. The inspection was limited to a review of the implementation of the Final Status Survey Plans for the facilities in East Hartford and Middletown, in preparation for termination of the license. The findings of the inspection were discussed by telephone on December 16, 2014, with David Alberghini and Matthew Gustafson of your organization, and Peter Hollenbeck of Radiation Safety Control Services, Inc. Inspection Report 040-00791/2014-002 is enclosed for your review.

Within the scope of this inspection, no violations were identified.

Current NRC regulations and guidance are included on the NRC's website at www.nrc.gov; select **Nuclear Materials; Med, Ind, & Academic Uses;** then **Regulations, Guidance and Communications.** The current Enforcement Policy is included on the NRC's website at www.nrc.gov; select **About NRC, Organizations & Functions; Office of Enforcement; Enforcement documents;** then **Enforcement Policy (Under 'Related Information').** You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 8:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays).

No reply to this letter is required. Please contact Betsy Ullrich at (610) 337-5040 if you have any questions regarding this matter.

Sincerely,

/RA C. Z. Gordon for/

Blake Welling, Chief
Commercial, Industrial, R&D
and Academic Branch
Division of Nuclear Materials Safety

Enclosure:
Inspection Report 040-00791/2014-002

cc w/Enclosure:
David Alberghini
State of Connecticut

No reply to this letter is required. Please contact Betsy Ullrich at (610) 337-5040 if you have any questions regarding this matter.

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State of Connecticut

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SUNSI Review Complete: EUllrich

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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No.	040-00791/2014-002
Docket No.	040-00791
License No.	SMB-151
Licensee:	United Technologies Corporation, Pratt & Whitney
Address:	400 Main Street East Hartford, Connecticut
Locations Inspected:	400 Main Street East Hartford, Connecticut Aircraft Road Middletown, Connecticut
Inspection Dates:	November 5-6, 2014 and December 8, 2014
Exit Meeting:	December 16, 2014

Inspector: ***/RA C. Z. Gordon for/*** _____ ***12/22/14*** _____

Betsy Ullrich — date
Senior Health Physicist
Commercial, Industrial, R&D and
Academic Branch
Division of Nuclear Materials Safety

Approved By: ***/RA C. Z. Gordon for/*** _____ ***12/22/14*** _____

Blake D. Welling, Chief — date
Commercial, Industrial, R&D and
Academic Branch
Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

United Technologies Corporation, Pratt and Whitney
NRC Inspection Report No. 040-00791/2014-002

United Technologies Corporation, Pratt & Whitney (UT/P&W) is decommissioning its facilities in preparation for termination of License No. SMB-151. A Region I inspector observed the final status surveys performed to demonstrate that the facilities meet the NRC criteria for release for unrestricted use.

License No. SMB-151 (Docket No. 040-00791) was first issued on March 31, 1961, by the Atomic Energy Commission (AEC). The license authorized possession and use of thorium. Prior to that, activities with source material were authorized by the AEC under Docket No. 40-791 with License Nos. C-3724 and C-4559 as early as April 17, 1957. Since 1961, the license was amended 23 times. Early use focused on a thorium-magnesium alloy, but since 1978, most of the actual use of thorium was in the form of a thorium-nickel alloy known as TD-Ni, containing not more than 4% thorium oxide in the alloy. The TD-Ni alloy was used in aircraft engine parts.

The licensee's original location of use in 1957 was East Hartford, Connecticut. Since then, licensed activities were performed at eight other locations. The Middletown location was added in 1966. Prior to 2002, all locations were released from the license except East Hartford and Middletown. In a letter dated February 18, 2013, UT/P&W notified the NRC that they decided to permanently cease activities and would decommission the facilities in East Hartford and Middletown, and request termination of License No. SMB-151 when decommissioning was completed.

The licensee determined that scoping surveys and remediation of the facilities were not required. The licensee requested and obtained approval of a site-specific Derived Concentration Guideline Level (DCGL) for residual thorium of 354 disintegrations per minute (dpm) per 100 square-centimeters (cm^2) area for both the Middletown and East Hartford facilities, and submitted the Final Status Survey Plans (FSSP) for approval prior to implementation.

The inspector performed site inspections on November 5 and November 6 in Middletown, and December 8 in East Hartford to observe the implementation of the FSSP at each location. The FSSP for each location was implemented as required. No violations or safety concerns were identified.

REPORT DETAILS

1. Scope of the Inspection and Historical Review

a. Inspection Scope

The inspector observed the implementation of the Final Status Survey Plan (FSSP) for the United Technologies Corporation, Pratt & Whitney (UT/P&W) facilities in East Hartford and Middletown, Connecticut. Because the licensee intends to terminate the license when decommissioning is completed, the inspector also reviewed the history of the use of source material under License No. SMB-151.

b. Observations and Findings

United Technologies Corporation, Pratt & Whitney (UT/P&W) was issued License No. SMB-151 (Docket No. 040-00791) on March 31, 1961, by the Atomic Energy Commission (AEC) for possession and use of thorium. Prior to that, activities with source material were authorized by the AEC under Docket No. 40-791 with License Nos. C-3724 and C-4559 as early as April 17, 1957. Since 1961, License No. SMB-151 was amended 23 times. Early use was limited to a thorium-magnesium alloy, but since 1978, most of the actual use of thorium was in the form of a thorium-nickel alloy known as TD-Ni, containing not more than 4% thorium oxide in the nickel alloy. The TD-Ni alloy was used in aircraft engine parts.

The licensee's original location of use in 1957 was at the UT/P&W facilities in East Hartford, Connecticut. Since then, eight other locations of use were added to and seven locations removed from, the license at various times. The facilities in Middletown, Connecticut were added to the license in 1966. As of 2002, only the East Hartford and Middletown locations remained listed on the license. In a letter dated February 18, 2013, UT/P&W notified the NRC of the decision to permanently cease activities and begin decommissioning the East Hartford and Middletown facilities, with the intention to terminate the license.

Based on results of surveys performed during active operations with thorium, the licensee determined that additional scoping surveys were not required, and remediation activities were not required. The licensee requested and obtained approval of a site-specific Derived Concentration Guideline Level (DCGL) for residual thorium of 354 disintegrations per minute (dpm) per 100 square-centimeters (cm^2) area for both the Middletown and East Hartford facilities (Amendment No. 22). The licensee submitted the FSSP for approval. The FSSP for Middletown was approved in Amendment 22 and the FSSP for East Hartford was approved in Amendment No. 23.

The licensee's contractor, Radiation Safety and Control Services, Inc. (RSCS), performed surveys during the periods of November 3-7, 2014, in Middletown, and December 8-11, 2014, in East Hartford. The inspector performed site inspections on November 5 and November 6 in Middletown, and December 8 in East Hartford, to observe the implementation of the FSSP at each location.

c. Conclusions

The inspector observed decommissioning activities performed in accordance with the FSSPs for Middletown and East Hartford. No violations or safety concerns were identified

2. Surveys

a. Inspection Scope

The inspector observed surveys performed by RSCS staff of the UT/P&W facilities formerly authorized for use of thorium under License No. SMB-151. The inspector also interviewed workers about the surveys, and reviewed records of surveys.

b. Observations and Findings

The inspector observed the RSCS health physics (HP) technicians perform static surveys, scan surveys, and collect wipes for removable contamination. HP technicians performed static surveys and collected wipes at the required number of locations in each survey unit. The survey units and measurement locations were designated as described in the FSSP. Because most areas of the facilities are in current use for non-licensed activities, the HP technicians performed those surveys as close to the designated measurement locations as possible, as described in the FSSP. In a few cases, when the original designated location was inaccessible, a Team Lead changed a measurement location in accordance with the FSSP.

The HP technicians performed static surveys for the length of time determined by the Team Lead and Project Manager, and recorded data accurately. The HP technicians collected wipe samples using materials as described in the FSSP. The HP technicians documented collection of the wipe samples, labeled them as required, and provided them to the Team Lead for transfer for analysis.

The HP technicians performed scan surveys of an area approximately equal to a circle with a radius of 1 meter, near the static survey locations. The FSSP for the Middletown facilities originally stated that scan surveys would be performed over 10% of the area of each survey unit. However, because of non-licensed activities in the facilities, surveys of 10% of the area could not be performed. All survey units in Middletown were Class 3 survey units, which require only judgmental scanning in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) guidance, therefore the change to the area of the scan surveys was acceptable. The FSSP for the East Hartford location incorporated the same change prior to its approval by the NRC. The HP technicians stated that they reported the typical or ‘average’ survey reading during scan surveys at each measurement location. They further stated that any area which exceeded a reading over an investigational level was reported and follow-up actions taken as needed. The inspector reviewed survey records, which indicated that very few areas exceeded an investigational level. When investigational levels were exceeded, additional surveys were performed, and RSCS staff determined that any residual contamination did not exceed the site-specific DCGL. They also determined that the areas did not require re-classification or further remediation.

c. Conclusions

The inspector observed HP technicians perform and document surveys in accordance with the requirements of the FSSP. No violations or safety concerns were identified.

3. Instrumentation

a. Inspection Scope

The inspector reviewed the instruments used for surveys during implementation of the FSSPs by RSCS staff. The inspector interviewed RSCS staff about the selection and operation of the instruments.

b. Observations and Findings

Static and scan surveys were performed using the same type of instrumentation: an Eberline Model E-600 survey meter with a Ludlum Model 43-89 alpha/beta probe. This model survey meter was operated in scaler and ratemeter modes for the static and scan surveys, respectively. All instruments used during implementation of the FSSPs were calibrated as required prior to field use. During the FSSP implementation, instruments were checked daily to determine operability and background. Based on the daily checks, the Project Manager or Team Lead calculated the length of time necessary for a given instrument to obtain sufficient data during a static survey to meet the required sensitivity. The required static count time was provided to each HP technician for the instrument the technician would use that day.

The inspector observed the HP technicians perform daily instrument operation and background checks prior to performing surveys, and instrument operation and background checks after surveys were completed for the day. HP technicians described to the inspector the correct operation of the instruments and described issues that would cause them to question if the instruments were operating properly. The inspector observed that the HP technicians performed static surveys for the length of time determined by the Team Lead and Project Manager, and recorded data appropriately. HP technicians used a jig to ensure a constant and appropriate height of the detector above the surface during both static and scan surveys. The inspector observed scan surveys performed over appropriate areas and at appropriate speed. During the inspection, an HP technician identified a problem with a survey meter and brought it to the attention of the Team Lead. Because the instrument was not functioning properly, RSCS staff decided to re-survey those locations in which the damaged instrument was used that day.

c. Conclusions

The instruments used during implementation of the FSSP were appropriate for the surveys performed. Instruments were used correctly during the surveys observed. No violations or safety concerns were identified.

4. Records and Documentation

a. Inspection Scope

The inspector reviewed documentation and records generated during the implementation of the FSSPs for the facilities in Middletown and East Hartford. The inspector also reviewed documentation of surveys performed in East Hartford during licensed operations that were not submitted with the FSSP. These surveys were used to determine that scoping surveys and remediation were not required prior to performing the final status surveys.

b. Observations and Findings

The inspector reviewed records of daily checks and the calculations performed by the Project Manager and/or Team Leads to calculate the average background, and the static survey time, for each instrument used in order to meet the required minimum detectable activity for the surveys. The inspector performed confirmatory calculations and determined that the instruments used, and the surveys performed, were adequate to meet the decommissioning requirements. The inspector reviewed records of instrument calibrations and determined that the instruments observed during the inspection were in calibration.

The inspector reviewed results of the final status surveys of the UT/P&W facilities performed by RSCS staff early in the week prior to the Middletown site inspection. Most results were less than the minimum detectable activities. There were no survey results that exceeded the site-specific DCGL at the time of the inspection. The inspector also reviewed the surveys planned to be performed, and determined that all the areas required to be surveyed in accordance with the FSSPs for East Hartford and Middleton were included in the surveys completed or planned.

The inspector reviewed the East Hartford facility survey reports that were performed while licensed activities were in progress, prior to the decision to cease activities. Annual survey reports from 2001 through 2010 indicated that residual contamination levels usually were less than the lower limit of detection, reported in the range of 12-15 dpm/100cm^2 for alpha and 11-15 dpm/100 cm^2 for beta. Several decommissioning surveys for specific areas of the East Hartford facilities did not find residual contamination exceeding the NRC screening value for thorium of 6 dpm/100 cm^2. Based on these survey results, the licensee decided that additional scoping surveys were not necessary, given the site-specific DCGL of 354 dpm/100 cm^2. The inspector determined that the reports of those surveys support the conclusion that additional scoping surveys were unnecessary.

The inspector reviewed chain-of-custody documentation for wipe samples collected for analysis and determined that they included appropriate information. The inspector interviewed RSCS staff members and reviewed training records to determine that the RSCS staff implementing the FSSPs was knowledgeable and adequately trained.

c. Conclusions

Records and documentation related to implementation of the FSSPs for the East Hartford and Middletown facilities were adequate. No violations or safety concerns were identified.

5. Exit Meeting

The exit meeting occurred on December 16, 2014, by telephone. The inspector discussed the observations and areas reviewed. The RSCS representative stated that they expect to provide the final status survey reports for both locations to the licensee early in January 2015. The licensee stated that they would request termination of the license when they submit the final status survey report to the NRC for review. The inspector stated that a letter with a short report of the inspection would be issued.

ATTACHMENT: SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee
*David Alberghini, EHS Manager, Connecticut Operations
#Tanja Ashlin, Middletown EHS Site Manager
*Matt Gustafson, Site Environmental Health and Safety
Sandy Soucy, former Radiation Safety Officer (retired)

Radiation Safety & Control Services, Inc.
Bruce Chatterton, HP Technician
Ron Como, HP Technician
Pete DiChiara, Team Lead
*Pete Hollenbeck, CHP, Project Manager
Frank Matovic, HP Technician
#Joe Medellin, Team Lead
Gary Walker, HP Technician

#Present at entrance meeting
*present at exit meeting

INSPECTION PROCEDURES USED

Manual Chapter 2800, "Materials Inspection Program"

Inspection Procedure 87104, "Decommissioning Inspection Procedure for Materials Licensees"

LIST OF DOCUMENTS REVIEWED

License Commitment documents
- Letter dated August 11, 2014 (ML14231A078)
- Site-Specific Pratt & Whitney Building Surface DCGL Using RESRAD-BUILD (ML14134A096)
- Final Status Survey Plan, Termination of License SMB-151 at the Middletown, CT Facility, Revision 0 (ML14164A554), Revision 1 (ML14231A078) and Revision 2 (ML14338A535)
- Letter dated October 24, 2014 (ML14309A493)
- Final Status Survey Plan, Termination of License SMB-151 at the East Hartford, CT Facility, Revision 0 (ML14309A493) and Revision 1 (ML14338A535)

Licensee Records
- RSA Final Radiological Status Report, Pratt & Whitney, East Hartford Facility (Portions) North Production Test, dated July 16, 2007
- RSA Decommissioning Pratt & Whitney North Experimental Test Building, dated November 1, 2010
- RSA Final Radiological Status Report, Pratt & Whitney, East Hartford Facility (Portions), dated January 8, 2004

- RSO Final Radiological Status Report, Welding/Blending Area, L-Building, Pratt & Whitney, East Hartford, Connecticut, dated September 17, 2008
- Annual Radiological Survey results for: July 18, 2001; July 18, 2002; July 18, 2003; August 3, 2004; June 2005; July 13, 2006; August 29, 2007; August 25, 2008; August 5, 2009; and September 9, 2010.

LIST OF ACRONYMS USED

AEC	Atomic Energy Commission
DCGL	Derived Concentration Guideline Level
dpm	disintegrations per minute
cm^2	centimeters squared
FSSP	Final Status Survey Plan
HP	health physics
MARSSIM	the Multi-Agency Radiation Survey and Site Investigation Manual
RSCS	Radiation Safety and Control Services, Inc.
RSO	Radiation Safety Officer
UT/P&W	United Technologies Corporation, Pratt & Whitney

Attachment