

EXPORT LICENSE

NRC FORM 250P
(12/10)

United States of America
Nuclear Regulatory Commission
Washington, D.C. 20555

NRC LICENSE NO.: **PXB114.02**

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NRC DOCKET NO.: **11006026**LICENSE EXPIRES: **July 31, 2014**

Pursuant to the Atomic Energy Act of 1954, as amended, and the regulations issued by the Nuclear Regulatory Commission (NRC) pursuant thereto, and in reliance on statements and representations heretofore made by the applicant/licensee, this license is hereby issued authorizing the licensee to export the byproduct materials listed below, subject to the terms and conditions herein. This license is only valid if the licensee or 'Other Party(ies) to Export' maintain the requisite NRC or Agreement State domestic license(s).

LICENSEE

Baker Hughes Oilfield Operations, Inc.
Attn: James Elrod
2001 Rankin Road
Houston, Texas 77073

APPLICANT'S REFERENCE: BHI-05-21-12

ULTIMATE FOREIGN CONSIGNEE(S)

Baker Hughes Asia Pacific Ltd. (BHAPL)
North Rumaila Field, Aratawi
North Rumaila Highway
Baker Hughes Operating Base
Basra
Iraq

INTERMEDIATE CONSIGNEE(S) IN FOREIGN COUNTRY(IES)

South Oil Company
Fields Commission
Burjesseya
Zubait Field
Basra, Iraq

OTHER PARTY(IES) TO EXPORT

NONE

COUNTRY(IES) OF ULTIMATE DESTINATION: Iraq

**CONDITIONS, NOTES, AND DESCRIPTIONS OF 10 CFR PART 110, APPENDIX P,
BYPRODUCT AND SOURCE MATERIALS TO BE EXPORTED**
(NOTE: SEE PAGE 2 FOR DEFINITIONS OF CATEGORY 1 AND CATEGORY 2)

Exports to Iraq of specified quantities of Am-241/Be, Am-241, Cs-137, Ra-226, and Co-60 for use in wire line operations, and specified quantities of Am-241/Be, Am-241 and Cs-137 for use in well logging operations and surface monitoring are authorized. When combined for shipping, these sources may aggregate to a Category 2 quantity. **See Page 3 for total number of sources and maximum activity levels for each source.**

Licensee is responsible for compliance with all applicable export, and other domestic regulatory requirements, including all terms and conditions of domestic material possession licenses. Licensee, if not already submitted with your application, must submit information required by 10 CFR §110.32(d) and pertinent documentation required by 10 CFR §110.32(g) at least **24 hours prior to shipment**. See Page 2 for Mandatory Pre-shipment Notifications.

Licensee shall submit by February 1 of each year one copy of a report of all americium shipments during the previous calendar year as required by 10 CFR §110.54(b). The report must include: (1) a description of the material, including quantity; (2) approximate shipment dates; and (3) a list of recipient countries, end users, and intended use keyed to the items shipped.

This license replaces PCB114.01 and amends its authority for the balance by: 1) extending the expiration date from September 30, 2012 to July 31, 2014; 2) revising an entry on the wireline operations 'Table of Sources' and 4) reissuing as an export only license.

Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954, as amended.

This license is subject to the right of recapture or control by Section 108 of the Atomic Energy Act of 1954, as amended, and to all of the other provisions of said Acts, now or hereafter in effect and to all valid rules and regulations of the NRC.

THIS LICENSE IS INVALID UNLESS SIGNED BELOW
BY AUTHORIZED NRC REPRESENTATIVE

NAME AND TITLE:

Mark R. Shaffer
Mark R. Shaffer, Deputy Director
Office of International Programs

DATE OF ISSUANCE:

July 13, 2012

EXPORT LICENSE

MANDATORY PRE-SHIPMENT NOTIFICATIONS PER 10 CFR PART 110.50(c)

The following Prior Shipment Notifications must be made to both the NRC and, in case of exports, the government of the importing country in advance of each shipment:

Prior Shipment Notifications to the NRC are to be emailed to hoo.hoc@nrc.gov (preferred method) or faxed to the NRC at 301-816-5151. In the subject line of the email or on the fax cover page include: "10 CFR 110.50(c) Notification." For technical assistance, use the same e-mail address or call 301-816-5100.

Prior Shipment Notifications to the government of the importing country must be emailed or faxed to the appropriate foreign government authorities. To locate the point-of-contact for international Prior Shipment Notifications see: <http://www-ns.iaea.org/downloads/rw/imp-export/import-export-contact-points.pdf>. In the subject line of the email or on the fax cover page include: "NOTIFICATION TO THE IMPORTING STATE PRIOR TO SHIPMENT OF CATEGORY 1 OR 2 RADIOACTIVE SOURCES." For technical assistance or for countries not listed, contact the Office of International Programs' export/import staff at 301-415-2344.

Table 1: Appendix P to Part 110—Category 1 and Category 2 Radioactive Material Threshold Limits

Radioactive Material	Category 1		Category 2	
	Terabequerels (TBq)	Curies (Ci) ¹	Terabequerels (TBq)	Curies(Ci) ¹
Americium-241 (Am-241)	60	1,600	0.6	16
Americium-241/Beryllium (Am-241/Be)	60	1,600	0.6	16
Californium-252 (Cf-252)	20	540	0.2	5.4
Curium-244 (Cm-244)	50	1,400	0.5	14
Cobalt-60 (Co-60)	30	810	0.3	8.1
Cesium-137 (Cs-137)	100	2,700	1.0	27
Gadolinium-153 (Gd-153)	1,000	27,000	10.0	270
Iridium-192 (Ir-192)	80	2,200	0.8	22
Plutonium-238 ² (Pu-238)	60	1,600	0.6	16
Plutonium-239/Beryllium ² (Pu-239/Be)	60	1,600	0.6	16
Promethium-147 (Pm-147)	40,000	1,100,000	400	11,000
Radium-226 ³ (Ra-226)	40	1,100	0.4	11
Selenium-75 (Se-75)	200	5,400	2.0	54
Strontium-90 (Y-90)	1,000	27,000	10.0	270
Thulium-170 (Tm-170)	20,000	540,000	200	5,400
Ytterbium-169 (Yb-169)	300	8,100	3.0	81

Calculation of Shipments Containing Multiple Sources or Radionuclides:

The "sum of fractions" methodology for evaluating combinations of radionuclides being transported is to be used when import or export shipments contain multiple sources or multiple radionuclides. The threshold limit values used in a sum of the fractions calculation must be the metric values (i.e., TBq).

I. If multiple sources and/or multiple radionuclides are present in an import or export shipment, the sum of the fractions of the activity of each radionuclides must be determined to verify the shipment is less than the Category 1 or 2 limits of Table 1, as appropriate. If the calculated sum of the fractions ratio, using the following equation, is greater than or equal to 1.0, then the import or export shipment exceeds the threshold limits of Table 1 and the applicable security provisions of this part apply.

II. Use the equation below to calculate the sum of the fractions ratio by inserting the actual activity of the applicable radionuclides or of the individual sources (of the same radionuclides) in the numerator of the equation and the corresponding threshold activity limit from the Table 1 in the denominator of the equation. Ensure the numerator and denominator values are in the same units and all calculations must be performed using the TBq (i.e., metric) values of Table 1.

R1 = activity for radionuclides or source number 1
R2 = activity for radionuclides or source number 2
RN = activity for radionuclides or source number n

AR1 = activity limit for radionuclides or source number 1
AR2 = activity limit for radionuclides or source number 2
ARN = activity limit for radionuclides or source number n

$$\sum_{i=1}^n \left[\frac{R_1}{AR_1} + \frac{R_2}{AR_2} + \frac{R_n}{AR_n} \right] \geq 1$$

¹ The values to be used to determine whether a license is required are given in TBq. Curie (Ci) values are provided for practical usefulness only and are rounded after conversion.

² The limits for exports of Pu-238 and Pu-239/Be can be found in § 110.21.

³ Discrete sources of Radium-226.

LICENSE CONDITIONS (CONT'D)

SOURCES AUTHORIZED FOR WIRELINE OPERATIONS

TOTAL NUMBER OF SOURCES	SEALED SOURCE OR DEVICE TYPE	ISOTOPE	END USE	TOTAL MAXIMUM ACTIVITY OF ALL SOURCES FOR EACH ISOTOPE
	Density Logging	Cs-137	Wireline Density Logging	
	Neutron Logging	Am-241/Be	Wireline Density Logging	
	Well-site Verifier	Cs-137	Wireline Density verifier	
	Well-site Verifier	Am-241/Be	Wireline Density verifier	
	Lab source	Am-241/Be	Wireline Density Lab Calibration	
	Well-site Verifier	Ra-226	Wireline Gamma Ray Calibration	
	Lab source	Am-241/Be	Wireline Density Lab Calibration	
	Lab source	Cs-137	Wireline Density Lab Calibration	
	Lab source	Cs-137	Wireline Density Lab Calibration	
	Production Logging	Am-241	Production Logging	
	Production Logging	Cs-137	Production Logging	
	Crystal Detectors	Cs-137	Density tool verification	
	Crystal Detectors	Cs-137	Density tool verification	
	Crystal Detectors	Cs-137	Density tool verification	
	Collar Markers	Co-60	Marking Drill Collar Location	

SOURCES AUTHORIZED FOR LOGGING WELL DRILLING OPERATIONS AND SURFACE MONITORING:

TOTAL NUMBER OF SOURCES	SEALED SOURCE OR DEVICE TYPE	ISOTOPE	END USE	TOTAL MAXIMUM ACTIVITY OF ALL SOURCES FOR EACH ISOTOPE
	Density Logging	Cs-137	LWD Density Logging	
	Neutron Logging	Am-241/Be	LWD Density Logging	
	Neutron Verifier	Am-241/Be	Jobsite Verification	
	Neutron Lab Test	Am-241/Be	Lab Tests	
	Density Lab Test	Am-241	Lab Tests	
	Gamma Calibration	Cs-137	Lab Tests	
	Alpha Calibration	Am-241/Be	Lab Tests	
	Gamma Detectors	Cs-137	Density Tool Verification	
	Gamma Detectors	Cs-137	Density Tool Verification	
	Gamma Detectors	Cs-137	Density Tool Verification	
	Gamma Detectors	Cs-137	Density Tool Verification	
	Gamma Detectors	Cs-137	Density Tool Verification	
	Densitometers	Cs-137	Surface monitor	
	Densitometers	Cs-137	Surface monitor	

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