

EXPORT LICENSE

NRC FORM 250

NRC LICENSE NO.: PXB6.28

Page 1 of 9

NRC DOCKET NO.: 11006027**LICENSE EXPIRES:** January 31, 2028

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

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 of 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

Alpha-Omega Services, Inc.
9156 Rose Street
Bellflower, CA 90706

Attn: Carl Tunnell

ULTIMATE CONSIGNEE(S) IN FOREIGN COUNTRY(IES)

See following page(s)

INTERMEDIATE CONSIGNEE(S) IN FOREIGN COUNTRY(IES)
None

OTHER U.S. PARTY(IES) TO EXPORT
See following page(s)

APPLICANT'S REFERENCE: AMD 28

ULTIMATE DESTINATIONS: Canada and Japan

**DESCRIPTION OF 10 CFR PART 110, APPENDIX P, BYPRODUCT
MATERIALS TO BE EXPORTED, INCLUDING CONDITIONS AND NOTES**
(NOTE: SEE PAGE 9 FOR DEFINITIONS OF CATEGORY 1 AND CATEGORY 2)

Export to Canada, of Category 1 quantities of Co-60 (not to exceed 244.2 TBq per shipment), contained in sealed sources for use in medical teletherapy devices, is authorized. For Category 1 exports, see conditions on page 2.

Export to Japan, of Category 2 quantities of Ir-192, contained in sealed sources for use in medical brachytherapy devices, is authorized.

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 pertinent documentation required by 10 CFR § 110.32(g) at least 24 hours prior to shipment. See page 9 for Mandatory Advanced Notifications.

This license replaces PXB6.27-R amending its authority by adding three additional parties to the list of "Other U.S. Part(ies) to Export."

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 the other provisions of said Acts, now or hereafter in effect and to all valid rules and regulations of the Nuclear Regulatory Commission.

**THIS LICENSE IS INVALID UNLESS SIGNED BELOW
BY AUTHORIZED NRC REPRESENTATIVE**

NAME AND TITLE:

**Mohamed K. Shams, Acting Deputy Director
Office of International Programs**

DATE OF ISSUANCE:

August 28, 2019

EXPORT LICENSE

CONDITIONS FOR CATEGORY 1 EXPORTS

Licensee is prohibited from shipping 10 CFR Part 110 Appendix P Category 1 quantities of Co-60 to Canada, for which government-to-government consent has not yet been requested, received and processed until the following actions are taken:

1. The licensee submits a consent request to the NRC with pertinent details for a specific shipment or series of shipments on the NRC Form 7, which notifies the NRC to request and obtain consent for the specified transaction(s) from the importing country's regulatory authority;
2. The NRC receives and considers the consent from the importing country's regulatory authority pursuant to 10 CFR §110.42(e)(3); and
3. The NRC has informed the licensee in writing, that the consent request has been granted and it is authorized to ship the materials to the ultimate consignee(s) specified on the NRC Form 7 consent request.

ULTIMATE CONSIGNEE(S) IN FOREIGN COUNTRY(IES):

- | | |
|--|---|
| 1. For export of 10 CFR Part 110 Appendix P, Category 1 quantities of Co-60 Nordion (Canada) Inc. 447 March Road Ottawa, Ontario K2K 1X8 Canada | 2. For export of 10 CFR Part 110 Appendix P, Category 2 quantities of Ir-192 Japan Radioisotope Association (JRIA) 28-45 Honkomagome 2-Chome Bunkyo-Ku, Tokyo 113-8941 Japan |
|--|---|

OTHER U.S.PARTY(IES) TO EXPORT:

- | | |
|---|---|
| 1. Adventist Health Systems/Sunbelt Inc. Florida Hospital Plaza 2501 N. Orange Avenue Orlando, FL 32803 | 2. Akron General Medical Center 762 South Cleveland Massillon Road Montrose, OH 44333 |
| 3. Alexian Brothers Medical Center 800 West Biesterfield Road Elk Grove Village, IL 60007 | 4. Alpha-Omega Services, Inc. 1282 Big Woods-Starks Road Vinton, LA 70668 |
| 5. Anchorage Radiation Oncology Management, Inc. d/b/a Anchorage Radiation Therapy Center 2841 Debarr Road, Suite 100 Anchorage, AK 99508 | 6. Augusta University Medical Center 1120 15th Street Augusta, GA 30912 |
| 7. Aurora Health Care Metro, Inc. d/b/a Aurora St. Luke's Medical Center Room 115, Gamma Knife Department 2900 West Oklahoma Avenue Milwaukee, WI 53215 | 8. Baptist Hospital of Miami, Inc. Department of Radiation Oncology 8900 North Kendall Drive Miami, FL 33176 |
| 9. Baylor All Saints Medical Center Fort Worth 1400 Eighth Avenue Fort Worth, TX 76104 | 10. Billings Clinic 2800 Tenth Avenue North Billings, MT 59101 |

OTHER U.S.PARTY(IES) TO EXPORT Continued:

11. BRFHH Shreveport, LLC
DBA University Health Shreveport
1541 Kings Highway
Shreveport, LA 71130
12. Bryan Medical Center
2300 South 16th Street
Lincoln, NE 68502
13. Center for Advanced Medicine
Long Island Jewish Medical Center
450 Lakeville Road
Lake Success, NY 11042
14. Central DuPage Hospital Association
Northwestern Medicine Cancer Center
Central DuPage Hospital
4405 Weaver Parkway
Warrenville, IL 60555
15. Central Mississippi Medical Center
Radiation Oncology Department
1850 Chadwick Drive
Jackson, MS 39204
16. Chippenham and Johnston-Willis Hospitals,
Inc.
d/b/a CJW Medical Center, Johnston-Willis
Campus
1401 Johnston-Willis Drive
Richmond, VA 23235
17. Chippenham and Johnston-Willis Hospitals,
Inc., d/b/a CJW Medical Center
Johnston-Willis Campus, Chippenham
Campus
7101 Jahnke Road
Richmond, VA 23235
18. Columbia-Presbyterian Medical Center
Gamma Knife Suite Basement Level Room
GK2, Children's Hospital of New York
Presbyterian Hospital
630 West 168th Street
New York, NY 10032
19. Cooper Health System
Robert Wood Johnson Medical School at
Camden
3 Cooper Plaza
Camden, NJ 08103
20. Covenant Health System
Covenant Gamma Southwest
3603 21st Street
Lubbock, TX 79410
21. Covenant Health System
DBA Joe Arrington Cancer Research &
Treatment Center
4101 22nd Place
Lubbock, TX 79410
22. Deaconess Medical Center Gamma Knife
Gamma Knife Suite, Basement Floor
Room 117
910 West Fifth Avenue
Spokane, WA 99204
23. Doctors Hospital, Inc.
d/b/a Doctors Hospital
5000 University Drive
Coral Gables, FL 33146
24. Fort Sanders Regional Gamma Knife
Center 1915 White Avenue
Knoxville, TN 37916
25. Gamma Knife Center of the Pacific
2226 Liliha Street, Level B2
Honolulu, HI 96817
26. GE-Hitachi Nuclear Energy Americas, LLC
Vallecitos Nuclear Center
6705 Vallecitos Road
Pleasanton, CA 94586
27. Good Samaritan Hospital
1225 Wilshire Boulevard
Los Angeles, CA 90017
28. Hackensack University Medical Center John
Theurer Cancer Center
92 2nd St.
Hackensack, NJ 07601
29. Harborview Medical Center
325 9th Avenue
Gamma Knife Suite
Seattle, WA 98133

OTHER U.S.PARTY(IES) TO EXPORT Continued:

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| 30. HCA Health Services of Oklahoma, Inc. d/b/a OU Medical Center Presbyterian Hospital 700 N.E. 13th Street Oklahoma City, OK 73104 | 31. Hoag Memorial Hospital Presbyterian One Hoag Drive Newport Beach, CA 92658 |
| 32. Holy Spirit Cancer Center Gamma Knife Center 880 Century Drive Mechanicsburg, PA 17055 | 33. Indiana University Health Methodist Hospital 1701 N. Senate Blvd Indianapolis, IN 46202 |
| 34. Intermountain Medical Center Jon and Karen Huntsman Cancer Center Gamma Knife Room, 5121 South Cottonwood Street Murray, UT 84157 | 35. Jewish Hospital, LLC. 4777 East Galbraith Road Cincinnati, OH 45236 |
| 36. John F. Kennedy Medical Center 65 James Street Edison, NJ 08818 | 37. Karmanos Cancer Center Gershenson Radiation Oncology Center Room 379 4100 John R. Street Detroit, MI 48201 |
| 38. Kettering Medical Center 3535 Southern Boulevard Kettering, OH 45429 | 39. Larkin Community Hospital, Inc. 6129 Southwest 70th Street South Miami, FL 33143 |
| 40. Legacy Health System 1130 North West 22nd Avenue, Suite LL50 Portland, OR 97210 | 41. Lehigh Valley Health Network 1240 South Cedar Crest Boulevard Allentown, PA 18103 |
| 42. Lewis Hall Singletary Oncology Center at John D. Archbold Memorial Center 919 S. Broad Street Thomasville, GA 31792 | 43. Los Robles Regional Medical Center 2200 Lynn Road Thousand Oaks, CA 91360 |
| 44. Lovelace Medical Center 601 Dr. Martin Luther King, Jr. NE Albuquerque, NM 87102 | 45. Marshall Clinic St. Joseph's Hospital 611 St. Joseph Avenue Marshfield, WI 54449 |
| 46. Mayo Clinic Hospital-Rochester St. Mary's Campus 1216 2nd St. NW Rochester, MN 55905 | 47. Mayo Clinic Jacksonville 4500 San Pablo Road Jacksonville, FL 32224 |
| 48. Medical College of Wisconsin Froedtert Memorial Lutheran Hospital 9200 West Wisconsin Avenue Milwaukee, WI 53226 | 49. Medical University of South Carolina 171 Ashley Avenue Charleston, SC 29425 |
| 50. Memorial Hermann Healthcare System d/b/a Hermann Hospital 6411 Fannin Avenue Houston, TX 77030 | 51. Mercy Health Center 4300 West Memorial Road Oklahoma City, OK 73120 |

OTHER U.S.PARTY(IES) TO EXPORT Continued:

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|---|---|
| 52. Methodist Healthcare System of San Antonio LTD Methodist Hospital 7700 Floyd Curl Drive San Antonio, TX 78229 | 53. Mid-Michigan Gamma Knife Facility 4000 Wellness Drive Room 160 Midland, MI 48670 |
| 54. Nebraska Methodist Hospital 8303 Dodge Street Omaha, NE 68114 | 55. Neurologic & Orthopedic Institute of Chicago 4501 N. Winchester Chicago, IL 60640 |
| 56. New York University Hospitals Center Arnold and Marie Schwartz Health Care Center Gamma Knife Suite, 550 First Avenue New York, NY 10016 | 57. Northern Westchester Hospital Center 400 East Main Street Mount Kisco, NY 10549 |
| 58. Northwest Hospital Gamma Knife Center Building 310, Ground Floor, Suite G-5 1560 North 115th Street Seattle, WA 98133 | 59. Northwestern Memorial Hospital Galter Pavilion 201 E. Huron Street Chicago, IL 60611 |
| 60. Palmetto Health Richland 7 Medical Park Columbia, SC 29203 | 61. Penn State Milton S. Hershey Medical Center 500 University Drive Hershey, PA 17033 |
| 62. Piedmont Hospital Radiation Oncology Services 1968 Peachtree Road N.W. Atlanta, GA 30309 | 63. Pitt County Memorial Hospital d/b/a Vidant Medical Center 2100 Stantonsburg Road Greenville, NC 27835 |
| 64. Providence Portland Medical Center North Pavilion 4805 NE Glisan Street Portland, OR 97213 | 65. Puerto Rico Medical Services Administration Puerto Rico Medical Center, Centro Medico de Rio Piedras First Floor, Central Building, Carr 22 Barrio Monacillos San Juan, PR 00935 |
| 66. Puget Sound Radiosurgery Gamma Knife Suite, Room 103, St. Joseph's Medical Center 1802 South Yakima Tacoma, WA 98405 | 67. Research Medical Center Midwest Gamma Knife Center 2316 E. Meyer Blvd. Kansas City, MO 64132 |
| 68. Rhode Island Hospital 593 Eddy Street Providence, RI 02903 | 69. Robert Wood Johnson University Center Gamma Knife Suite 10 Plum Street New Brunswick City, NJ 08901 |
| 70. Rocky Mountain Gamma Knife Center, LLC 1635 Aurora Court Aurora, CO 80045 | 71. Roswell Park Cancer Institute Elm & Carlton Street Buffalo, NY 14263 |
| 72. Sacred Heart Health System, Inc. d/b/a Sacred Heart Hospital of Pensacola 5151 North 9th Avenue Pensacola, FL 32504 | 73. Sacred Heart Medical Center 1255 Hilyard Street Eugene, OR 97401 |

OTHER U.S.PARTY(IES) TO EXPORT Continued:

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| 74. Saint Francis Medical Center 530 NE Glen Oak Avenue Peoria, IL 61637 | 75. San Antonio Community Hospital 999 San Bernardino Road Upland, CA 91786 |
| 76. San Diego Gamma Knife Center 9834 Genesee Avenue, Suite 110 La Jolla, CA 92037 | 77. South Nassau Communities Hospital One Healthy Way Oceanside, NY 11572 |
| 78. St. Joseph's Hospital 5665 Peachtree Dunwoody Road Atlanta, GA 30342 | 79. St. Joseph's Hospital and Medical Center 350 West Thomas Road Phoenix, AZ 85013 |
| 80. St. Lukes The Woodlands Hospital 17200 St. Luke's Way The Woodlands, TX 77384 | 81. St. Vincent Medical Center 2 Shircliff Way Jacksonville, FL 32204 |
| 82. Sunrise Diagnostic Center 3006 South Maryland Parkway Las Vegas, NV 89109 | 83. SUNY Upstate Medical University 750 East Adams Street Syracuse, NY 13210 |
| 84. Sutter Gamma Knife Center 2801 K St., Suite 110 Sacramento, CA 95816 | 85. Sutter Medical Center Sacramento Sutter Gamma Knife Center 2801 K Street, Suite 110 Sacramento, CA 95816 |
| 86. Swedish Medical Center 799 East Hampden Ave. Suite 100 Englewood, CO 80113 | 87. Temple University Hospital 3401 N. Broad Street Philadelphia, PA 19140 |
| 88. Tenet Good Samaritan, Inc. 1309 North Flagler Drive West Palm Beach, FL 33401 | 89. Texas Health Presbyterian Hospital Dallas 8200 Walnut Hill Lane Dallas, TX 75231 |
| 90. The Cleveland Clinic Foundation 9500 Euclid Avenue Cleveland, OH 44195 | 91. The Methodist Hospital DBA Houston Methodist 6551 Bertner Avenue Houston, TX 77030 |
| 92. The Ohio State University Radiation Medicine Department, Arthur G. James Cancer Hospital and Richard J. Solove Research Institute, 300 West 10th Avenue. Columbus, OH 43210 | 93. The Regents of the University of California San Francisco Medical Center 505 Parnassus Ave, Room L56 San Francisco, CA 94143 |
| 94. The Regents of the University of California U.C. Davis Medical Center 2315 Stockton Blvd. Sacramento, CA 95817 | 95. The Swedish Radiosurgery Center Suite A10 James Tower 550 17th Avenue Seattle, WA 98122 |
| 96. The University of Texas MD Anderson Cancer Center 1515 Holcombe Boulevard Houston, TX 77030 | 97. The Valley Hospital Luckow Pavilion 1 Valley Health Plaza Paramus, NJ 07652 |

OTHER U.S.PARTY(IES) TO EXPORT Continued:

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|---|--|
| 98. Thomas Jefferson University and Hospitals 900 Walnut Street Philadelphia, PA 19107 | 99. Tufts – New England Medical Center 800 Washington Street Boston, MA 02111 |
| 100. UAB Highlands Hospital 1201 11th Avenue South Birmingham, AL 35205 | 101. University Hospitals of Cleveland 11100 Euclid Avenue Cleveland, OH 44106 |
| 102. University of Arkansas for Medical Science 4301 West Markham Street Little Rock, AR 72205 | 103. University of Iowa Medical Center 200 Hawkins Drive Iowa City, IA 52242 |
| 104. University of Kentucky Markey Cancer Center, Roach Bldg., Room CC049 800 Rose Street Lexington, KY 40536 | 105. University of Maryland Medical System Gamma Knife Suite, South Hospital B Wing 22 South Greene Street Baltimore, MD 21201 |
| 106. University of Minnesota Medical Center Room 1-285 500 SE Harvard Street Minneapolis, MN 55455 | 107. University of Mississippi Medical Center 350 West Woodrow Wilson Avenue Jackson, MS 39216 |
| 108. University of Pennsylvania Pennsylvania Hospital Campus 800 Spruce Street Philadelphia, PA 19107 | 109. University of Pittsburgh Presbyterian University Hospital 230 Lothrop Street, Room G-102 Pittsburgh, PA 15213 |
| 110. University of Pittsburgh Presbyterian University Hospital 230 Lothrop Street, Room F-185 Pittsburgh, PA 15213 | 111. University of Pittsburgh Presbyterian University Hospital 230 Lothrop Street, Room F-179 Pittsburgh, PA 15213 |
| 112. University of Texas Southwestern Medical Center at Dallas 5151 Harry Hines Blvd. Suite G49 Dallas, TX 75390 | 113. University of Virginia Health Services Foundation Lars Leksell Center for Gamma Surgery Building 1143; Room G411 1215 Lee Street Charlottesville, VA 22908 |
| 114. USC University Hospital 1540 Alcazar Street Los Angeles, CA 90033 | 115. Wake Forest Baptist Health Radiation Oncology Department, Comprehensive Cancer Center Medical Center Boulevard Winston-Salem, NC 27157 |
| 116. Washington Hospital Center 110 Irving Street, NW Washington, DC 20010 | 117. Washington Hospital Healthcare System 2500 Mowry Ave. Fremont, CA 94538 |
| 118. Washington University in St. Louis 4921 Parkview Place St. Louis, MO 63108 | 119. West Virginia University Hospital, Inc., Ruby Memorial Hospital, Mary Babb, Randolph Cancer Center, and Health Sciences Center South Building, Medical Center Drive Morgantown, WV 26506 |

OTHER U.S.PARTY(IES) TO EXPORT Continued:

120. William Beaumont Hospital
Department of Radiation Oncology
3601 W. Thirteen Mile Road
Royal Oak, MI 48073

121. Yale-New Haven Hospital
20 York Street
New Haven, CT 06519

MANDATORY ADVANCED NOTIFICATIONS PER 10 CFR PART 110.50(c)

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

Mandatory Advanced 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 301-287-9056.

Mandatory Advanced 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 Advanced 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 301-287-9056.

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 radionuclide 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 AR1 = activity limit for radionuclides or source number 1
R2 = activity for radionuclides or source number 2 AR2 = activity limit for radionuclides or source number 2
RN = activity for radionuclides or source number n 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.