



U.S. Department  
of Transportation

Pipeline and  
Hazardous Materials  
Safety Administration

East Building, PHH-23  
1200 New Jersey Ave, SE  
Washington, D.C. 20590

**COMPETENT AUTHORITY CERTIFICATION FOR A  
TYPE B(U)  
RADIOACTIVE MATERIALS PACKAGE DESIGN  
CERTIFICATE USA/9360/B(U)-96, REVISION 0**

The Competent Authority of the United States certifies that the radioactive material package design described in this certificate satisfies the regulatory requirements for a Type B(U) package as prescribed in the regulations of the International Atomic Energy Agency<sup>1</sup> and the United States of America<sup>2</sup>.

1. Package Identification - Ten Hole Source Changer.
2. Package Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9360, Revision 0 (attached).
3. General Conditions -
  - a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.
  - b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Engineering and Research, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.
  - c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

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<sup>1</sup> "Regulations for the Safe Transport of Radioactive Material, 2012 Edition, No. SSR-6" published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

<sup>2</sup> Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

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- d. Records of Management System activities required by Paragraph 306 of the IAEA regulations<sup>1</sup> shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.
4. Marking and Labeling - The package shall bear the marking USA/9360/B(U)-96 in addition to other required markings and labeling.
5. Expiration Date - This certificate expires on August 31, 2024.

This certificate is issued in accordance with paragraph(s) 810 of the IAEA Regulations and Section 173.471 of Title 49 of the Code of Federal Regulations, in response to the August 28, 2019 petition by Industrial Nuclear Company, Inc., San Leandro, CA, and in consideration of other information on file in this Office.

Certified By:



September 12,  
2019

 William Schoonover  
Associate Administrator for Hazardous  
Materials Safety

(DATE)

Revision 0 - Issued to endorse U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9360, Revision 0.

**CERTIFICATE OF COMPLIANCE  
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
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2. PREAMBLE

- a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."
- b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

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| a. ISSUED TO ( <i>Name and Address</i> )<br>Industrial Nuclear Company, Inc.<br>14320 Wicks Blvd.<br>San Leandro, CA 94577 | b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION<br>Industrial Nuclear Company application<br>dated October 2, 2018, as supplemented. |
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4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5. (a) Packaging
- (1) Model No.: Ten Hole Source Changer
  - (2) Description

The Model No. Ten Hole Source Changer package consists of ten titanium source tubes welded to a titanium hub which is encased in an enamel-coated depleted uranium (DU) gamma shield assembly. The DU gamma shield assembly is enclosed within a welded, 12-inch Schedule 10S stainless steel pipe, with overall dimensions of 12.75-inch diameter x 14.5-inch in height. A 0.25-inch thick stainless steel plate is welded to the bottom of the pipe and a 0.25-inch thick stainless steel mounting plate is welded to the inner surface of the pipe. The DU gamma shield assembly is laterally supported by eight short stainless steel channel sections that are welded to the inner wall of the pipe. The DU gamma shield assembly is also supported vertically by a 4-inch diameter Schedule 40S stainless steel pipe and a 1-inch diameter stainless steel bar that are welded to the inner surface of the bottom plate. Copper shim stock is installed between the DU-stainless steel interfaces to preclude a galvanic reaction between the two metals. The void space between the DU gamma shield assembly and the pipe shell is filled with rigid polyurethane foam which provides moisture protection for the DU gamma shield assembly. Ten lock box assemblies, which are located on top of the mounting plate, secure the special form capsules within the DU gamma shield assembly. A 0.375-inch closure lid is bolted to the package by eight 0.375-inch diameter bolts. Three stainless steel channels, which are positioned at 120 degree intervals, are welded to the bottom plate exterior surface for supporting the package during transport. The maximum gross weight of the Model No. Ten Hole Source Changer package is 340 pounds.

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(3) Drawings

The packaging is constructed in accordance with the following Industrial Nuclear Company Drawings: THSC-SAR-TA, Sheet 1 (Rev. 1); THSC-SAR-TA, Sheet 2 (Rev. 1); THSC-SAR-TA, Sheet 3 (Rev. 1); THSC-SAR-TA, Sheet 4 (Rev. 1); THSC-SAR-TA, Sheet 5 (Rev. 1); THSC-SAR-TA, Sheet 6 (Rev. 1); and THSC-SAR-TA, Sheet 7 (Rev. 1).

5. (b) Contents

(1) Type and form of material

Iridium-192 or selenium-75 as sealed sources that meet the requirements of special form radioactive material.

(2) Maximum quantity of material per package

Ten special form capsules. The maximum amount of material per capsule shall be 150 Ci (5.55 TBq).

Output curies are determined in accordance with American National Standard N432-1980, "Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography."

(3) Maximum decay heat: 10.55 Watts

6. The sources shall be secured in the shielded position of the packaging by the source assembly lock box. The source assembly lock box must be fabricated of materials capable of resisting a 1475°F fire environment for one half-hour while maintaining its positioning function. The ball stop of the source assembly must engage the source assembly lock. The flexible cable of the source assembly and shipping plug must be of sufficient length and diameter to provide positive positioning of the source in the shielded position.

7. The name plate on the overpack must be fabricated of materials capable of resisting a 1475°F fire environment for one-half hour and maintain its legibility.

8. In addition to the requirements of Subpart G of 10 CFR Part 71:

(a) The package shall be prepared for shipment in accordance with the Operating Procedures of Chapter 7 of the application and

(b) Each package must meet the Acceptance Tests and Maintenance Program of Chapter 8 of the application.

9. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

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10. Expiration date: August 31, 2024.

REFERENCES

Industrial Nuclear Company application dated October 2, 2018.

Supplements dated: March 18, 2019.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

  
John McKirgan, Chief  
Spent Fuel Licensing Branch  
Division of Spent Fuel Management  
Office of Nuclear Material Safety  
and Safeguards

Date: August <sup>20</sup>, 2019



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**CERTIFICATE NUMBER:** USA/9360/B(U)-96

**ORIGINAL REGISTRANT(S) :**

Industrial Nuclear Company, Inc.  
14320 Wicks Blvd.  
San Leandro, CA, 94577  
USA