



U.S. Department
of Transportation

Research and
Special Programs
Administration

400 Seventh Street, S.W.
Washington, D.C. 20590

**COMPETENT AUTHORITY CERTIFICATION
FOR A TYPE B()
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/5830/B(), REVISION 4**

This certifies that the radioactive materials package design described below has been certified by the competent authority of the United States as meeting the regulatory requirements for a Type B() packaging for radioactive materials as prescribed in the regulations of the International Atomic Energy Agency¹ and the United States of America.²

1. Package Identification - SNAP 21 Thermoelectric Generator.
2. Packaging Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 5830, Revision 5 (attached).
3. GENERAL CONDITIONS -
 - a. Each user of this certificate shall 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 Hazardous Materials Technology, (DHM-23), Research and Special Programs 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.

1 "Safety Series No. 6, Regulations for the Safe Transport of Radioactive Materials, 1967 Edition" published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

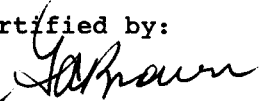
2 Title 49, Code of Federal Regulations, Parts 100 - 199, United States of America.

CERTIFICATE USA/5830/B(), REVISION 4

4. Marking and Labeling - The package shall bear the marking USA/5830/B() in addition to other required markings and labeling.
5. Expiration Date - This certificate expires on November 30, 1995.

This certificate is issued in accordance with the 1967 edition of the IAEA Regulations and Section 173.471 of Title 49 of the Code of Federal Regulations, in response to the June 18, 1991 petition by Department of the Navy, Washington, DC, and in consideration of other information on file in this Office.

Certified by:



George A. Brown, Chief
Radioactive Materials Branch
Office of Hazardous Materials
Technology

FEB 8 1993

(DATE)

Revision 4 - issued to delete Paragraph (d) of the General Conditions.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIALS PACKAGES**

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. PACKAGE IDENTIFICATION NUMBER	d. PAGE NUMBER	e. TOTAL NUMBER PAGES
5830	5	USA/5830/B()	1	2

2. PREAMBLE

- a. This certificate is issued to certify that the 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

a. ISSUED TO (Name and Address)

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION:

Department of the Navy
Naval Support Force Antarctica
FPO San Francisco, CA 96601

Minnesota Mining and Manufacturing Company
application dated June 28, 1968.

c. DOCKET NUMBER 71-5830

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.: SNAP-21

(2) Description

A thermoelectric generator 16 inches in diameter by 30 inches long packaged in a right circular metal protective enclosure 52 inches in diameter by 68 inches high. Main components of the generator consist of an outer Berylco-165 housing with flange; U-8 Mo shielding; thermal insulation; thermoelectric modules; and the heat source. Total weight of the package is 1,900 pounds.

(3) Drawings

The SNAP-21 is constructed in accordance with Minnesota Mining and Manufacturing Company Drawing No. B-SK-37-4014 and Drawings included in 3M Report No. MMM-3691-33.

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5. (b) Contents

(1) Type and form of material

Strontium 90 titanate pellets doubly encapsulated by a thin inner liner and a 0.2-inch thick Hastelloy C primary containment capsule which meets the requirements of special form radioactive material.

(2) Maximum quantity of material per package

33,000 ci

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

- (a) The package must be prepared for shipment, operated and maintained in accordance with Minnesota Mining and Manufacturing Company Report No. MMM 3691-42, "SNAP-21 Program, Phase II, Deep Sea Radioisotope-Fueled Thermoelectric Generator Power Supply System, Shipping and Handling Manual."


7. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12.

8. Expiration date: November 30, 1995.

REFERENCE

Minnesota Mining and Manufacturing Company application dated June 28, 1968.
Department of Navy supplements dated June 8 and October 10, 1990.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

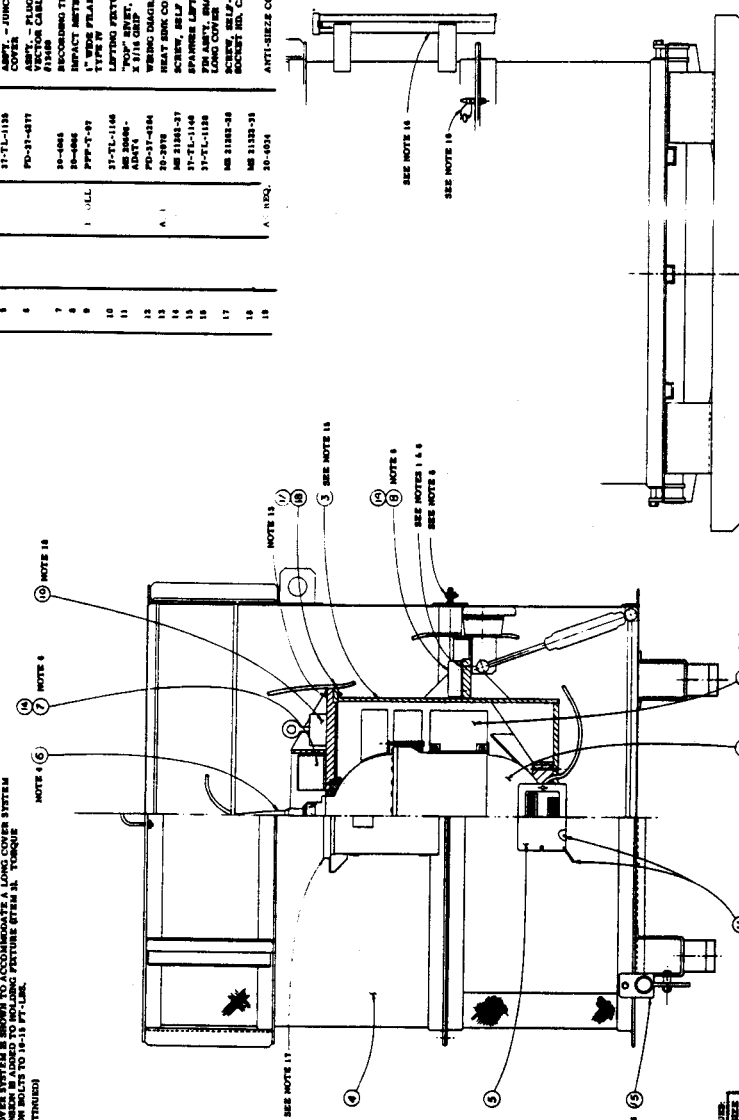

Charles E. MacDonald, Chief
Transportation Branch
Division of Safeguards
and Transportation, NMSS

Date: NOV 2 1990

T.R. NO.	SOURCE	T/C #
1	-24 VOLT SYSTEM	
2	POWER COMPENSER HAS	
3	SHORT VOLTAGE (1)	
4	GENERATOR VOLTAGE	
5	-24 VOLT SYSTEM	
6	NOT FRAME TEMP. (ALUMINUM)	T/C #4
7	COLD FRAME TEMP. (ALUMINUM)	T/C #8
8	EMITTER PLATE (ALUMINUM)	T/C #1
9	EMITTER PLATE (ALUMINUM)	T/C #4
10	FRONT WALL TEMP. (ALUMINUM)	T/C #1
11	OTHER MONITORING PLATE (ALUMINUM)	T/C #9

14. LIFTING FIXTURE ITEM 10 TO BE TAPPED ONTO THE HOLDING FIXTURE COVER AS SHOWN FOR SHIPPING.
 15. HANDLING MANUAL TO BE STORED IN RECORD RECEPTACLE.
 16. LIFTING FIXTURE ITEM 10 TO BE TAPPED ONTO THE HOLDING FIXTURE COVER AS SHOWN FOR SHIPPING.
 17. HANDLING MANUAL TO BE STORED IN RECORD RECEPTACLE.
 18. STONE TAPE ITEM #9 IN TOOL BOX FOR SHIPMENT.
 19. AN EXTENSION IS ADDED TO HOLDING FIXTURE ITEM #1. TORQUE EXTENSION BOLTS TO 10-15 FT-LBS.
- NOTE: (CONTINUED)

ITEM	LOC.	C. A.K.	PART NUMBER	DESCRIPTION
0			PD-31-4319	ASSEMBLY, SNAP-21 SYSTEM & SHIPPING CONTAINER
1			PD-31-4893	HEAT SINK, 10 WATT
2			31-TL-1131	FRM ASBY - SNAP-21
3			31-TL-1138	SHORT COVER
4			PD-31-4876	HOLDING FIXTURE
5			PD-31-4877	COVER ASSEMBLY
6			31-TL-1139	APPLYING TORQUE TOOL, DIAL, SERIAL
7			PD-31-4877	COVER - JUNCTION BOX AND ASBY, - PLUG & CABLE, REF. FACTOR CABLE CO. DMC.
8			31-4886	RECORDING THERMOMETER
9			PPP-21-97	1" WIDE FILAMENT TAPE
10			31-TL-1148	TYPENR FIXTURE
11			MS 32004	"TOP" SECT. ALUM. 1/16 DIA. X 3/16 ODP
12			PD-31-4384	WEING DIAGRAM
13			PD-31-4379	HEAT SINK COMPOUND
14			MS 31881-37	SCREW, SELF LOCK, 6-33
15			31-TL-1136	FRM ASBY - SNAP-21
16			31-TL-1138	LONG COVER
17			MS 31881-38	SCREW, SELF-LOCK 6-33
18			MS 31881-39	SCREW, SELF-LOCK 6-33
19			MS 31881-35	SCREW, SELF-LOCK 6-33
20			MS 31881-35	SCREW, SELF-LOCK 6-33



ITEM	COMPONENT	VALUE	BOLT SIZE
1	SHIPPING CONTAINER COVER	10-15 FT-LBS	1/2
2	HEAT SINK TO SHORT BOLTS	10-15 FT-LBS	6-33
3	IMPACT METER	10-15 FT-LBS	6-33
4	FRM ASBY, TO BE TAPPED ONTO THE HOLDING FIXTURE ITEM #4	10-15 FT-LBS	1/2
5	PLUG LOCATING COVER	10-15 FT-LBS	1/2
6	HEAT SINK COMPOUND	10-15 FT-LBS	1/2

14. CONTINUED ABOVE
15. FRM ASSEMBLY 31-TL-1131 TO BE USED WITH SHORT COVER SYSTEM.
16. TORQUE BOLTS (10) TO BE USED WITH LONG COVER SYSTEM.
17. TORQUE BOLTS (10) TO PROVIDE UNIFORM GAP BETWEEN HOLDING FIXTURE COVER AND BODY.
18. TORQUE BOLTS (10) TO BE TORQUED TO APPROX. 10-15 FT-LBS TORQUE. DO NOT PERMIT USE OF TORQUE WRENCH TO PROVIDE UNIFORM GAP BETWEEN COVER AND FRM SECTIONS TO BE TORQUED.
19. ITEM 4 TO BE DRILLED ϕ .125 DIA. - 1 PLACES ON ASSEMBLY USING ITEM 4 AS A TEMPLATE. 10 ASSEMBLY ITEM 4 IS USING ITEM 11.
20. ATTACH LEAD SECURITY SEAL PRIOR TO SHIPMENT.
21. ATTACH LEAD SECURITY SEAL PRIOR TO SHIPMENT.
22. SYSTEM HANDLING AND STORAGE MANUAL (MS 31881-35) TO BE SPECIFIED IN THE HANDLING AND SHIPPING MANUAL (MS 31881-35).
23. ANTI-SEIZE COMPOUND ITEM 10 TO BE APPLIED TO ALL SCREWS & BOLTS.

Figure 2-1. SNAP-21 10-Watt System in Shipping Container