<u>NO.:</u> NC-585-D-105-G DATE: July 26, 2007

**DEVICE TYPE:** Self Luminous Fixed Markers

Marker DB 145/SM 145, Marker MP 166/SM 166, Marker MP 182/SM 182, **MODEL Nos.:** 

Marker MP 107/SM 107, Marker MP 152/SM 152, Route/Defile Marker

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**DISTRIBUTOR:** SRB Technologies, Inc.

2580 Landmark Drive Winston Salem, NC 27103

**MANUFACTURER** SRB Technologies (Canada), Inc.

SRB Technologies, Inc. 320-140 Boundary Road 2580 Landmark Drive

Pembroke, Ontario Winston Salem, NC 27103

**K8A6W5** 

**ISOTOPE:** Hydrogen 3 (Tritium)

### **MAXIMUM ACTIVITY & SOURCE DESIGNATIONS:**

Marker/Device DB 145 / SM 145	Sealed Source One Type MH Source, or mb- microtec USA, Inc. Type 400/1 Source	Housing Components Polycarbonate	Activity 5 Curies (185 GBq)
MP 166 / SM166	One Type C Source, or mb- microtec USA, Inc. Type 400/1 Source	Polycarbonate	5 Curies (185 GBq)
MP 182 / SM 182	One Type C Source, or mb- microtec USA, Inc. Type 400/1 Source	Polycarbonate	5 Curies (185 GBq)
MP 107 / SM 107	One Type F Source, or mb- microtec USA, Inc. Type 400/4 Source	Polycarbonate & Rubber Housing	5 Curies (185 GBq)
MP 152 / SM 152	One Type CD Source, or mb- microtec USA, Inc. Type 400/4 Source	Polycarbonate & Rubber Housing	5 Curies (185 GBq)
Route / Defile Marker	Three Type C Sources, or mb- microtec USA, Inc. Type 400/1 Sources	Polycarbonate	5.13 Curies (190 .GBq)
LEAK TEST FREQUI	ENCY: None Required		

**PRINCIPAL USE:** (W) Self luminous light sources

**CUSTOM DEVICE:** YES X NO

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**DEVICE TYPE:** Self Luminous Fixed Markers

### **DESCRIPTION:**

The devices covered by this SS&D Registry consist of a sealed boro-silicate glass capsule internally coated with phosphor and filled with Hydrogen 3 gas, which activates the phosphor to produce light. Each sealed source is housed within a lightweight, rigid, shock resistant casing. The maximum Hydrogen 3 activity for the Route Defile Marker is 5.13 Curies, and 5 (five) Curies for the remaining five devices.

The devices are fixed (with permanent fasteners) either to metal, wood, stone, or concrete bases to mark routes or indicate obstructions in low-light situations. The active life for these devices is approximately 10 years. The sources and devices are manufactured to rigorous manufacturer's tolerances.

### **LABELING:**

Labeling of each device is in accordance with the requirements of Rule 15A NCAC 11.0328 of the North Carolina Regulations, and complies with 10 CFR Part 32.51. The labels contain the radiation symbol, isotope, activity, and the words "CAUTION-RADIOACTIVE MATERIAL."

#### **DIAGRAMS:**

See Attachment 1 for the drawing of the Marker DB 145/SM 145.

See Attachment 2 for the drawing of the Marker MP 166/SM 166.

See Attachment 3 for the drawing of the Marker MP 182/SM 182.

See Attachment 4 for the drawing of the Marker MP 107/SM 107.

See Attachment 5 for the drawing of the Marker MP 152/SM 152.

See Attachment 6 for the drawing of the Route/Defile Marker.

### **CONDITIONS OF NORMAL USE:**

The Fixed Markers are used for interior and exterior industrial environments to mark routes or indicate objects and obstructions in low light situations. Although the devices are manufactured for use in industrial environments, the devices should be protected from being crushed.

### **PROTOTYPE TESTING:**

Tests of the sources were made in accordance with American National Standard N540 – Classification of Radioactive Self-Luminous Light Source. Date of approval was January 1, 1985, test serial No. 2257.

### **EXTERNAL RADIATION LEVELS:**

No external radiation levels should be detected.

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#### **QUALITY ASSURANCE AND CONTROL:**

The manufacturer maintains full quality control over the assembly of the devices in that each stage is controlled by a production specification computer printout that requires assembly and testing in a specified frequency and at pre-determined stages. The lamps are tested for leakage prior to assembly. There is a final test for contamination and proper lumination.

A brief description of the quality control procedure used for the manufacture of the devices covered by this Sealed Source and Device Registry is given below.

- A. All sources used in the manufacturer of the devices must:
  - 1. meet all American National Standards N540 specifications,
  - 2. be listed on the U. S. NRC Sealed Source Registry,
  - 3. have sealed source certification issued by a recognized international competent authority.
  - 4. be leak tested before shipment and have the results reported in units of microcuries and to have removable activity of less than 0.005 microcurie (µCi).
- B. All device material type, dimensions, and assembly procedures be as specified on the attached manufacturer's drawings.
- C. All critical components are inspected before and after assembly to verify acceptability.
- D. Device is inspected to verify:
  - 1. the device is labeled in accordance with 15A NCAC 11.0328.
  - 2. visual checks are made to verify correctness of labels and information is stamped thereon.

### **LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:**

<u>Distribution</u>: These devices will be distributed in accordance with the requirements of section .0300 of 15A NCAC 11 and/or applicable regulations of the NRC or an Agreement State. This shall not preclude the exportation of this device to a foreign entity following the applicable regulations. These devices, with their fixed mounting brackets, shall be distributed to general licensees only.

**Leak Testing**: None required for the end user.

Servicing: None authorized or required.

**Dosimetry**: None required.

<u>Operating and Safety Instructions</u>: The device shall be installed in accordance with the written operating and safety instructions given in the device manual. The distributor/manufacturer provides a radiation safety manual to the customer that describes each type of device, and the necessary precautions of handling, storing, installing, and using the devices.

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### LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE (continued):

**Training:** None required for installation.

<u>Use</u>: The devices should be installed according to the instructions indicated in the radiation safety manual. If any damaged components are found, the device should be returned immediately to the manufacturer for disposal.

### **Reviewer Notes:**

- 1) This registration sheet and the information contained within the references shall not be changed without the written consent of the North Carolina Radiation Protection Section, Radioactive Materials Branch.
- 2) The manufacturer will accept these devices for disposal.

### **SAFETY ANALYSIS SUMMARY:**

The exterior housings of the devices are constructed of polycarbonate material and are mounted to a fixed surface, or press fitted into a rubber, shock-absorbing mount, and then mounted to a fixed surface. The front faces of the devices are covered by transparent polycarbonate material. The lamps used in the respective devices are SRB Technologies, Inc., Type C, MH, F, or CD sources, or mb-microtec USA, Inc. Type 400/1 or Type 400/4 that have been used for years by the manufacturer. Each device assembled is tested at pre-determined frequencies for leakage and acceptable construction. There should be no detectable radiation levels outside the completed device. The distributor/manufacturer provides a radiation safety manual to the customer that describes each type of device, and the necessary precautions of handling, storing, installing, and using the devices. The manual indicates what to do if a device is broken, and a list of do's and don'ts. The sources meet ANSI N540 requirements.

Based on this information we find the devices suitable for general licensure.

### **REFERENCES:**

The following supporting documents are hereby incorporated by reference into this SS&D registry document:

- 1. SRB Technologies, Inc., documents, drawings, test specifications and results, quality control procedures, and NC Radioactive Materials License.
- 2. Completed questionnaire dated March 30, 2004, and April 19, 2004, both signed by Jim Roberts, President and RSO.
- 3. Letter dated February 15, 2007, signed by Brian Pullen, President SRB Technologies, Inc.
- 4. Letter dated July 23, 2007, signed by Brian Pullen, President SRB Technologies, Inc.

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### **ISSUING AGENCY:**

State of North Carolina
Department of Environment and Natural Resources
Radiation Protection Section
1645 Mail Service Center
Raleigh NC 27699-1645

Principal Reviewer  Surald a Speight	Date:	July 26, 2007
Gerald A. Speight, Health Physicist	Date.	July 20, 2007
Concurrence Reviewer:		
- July so	Date:	July 26, 2007
J. Marion Eaddy III, Health Physicist		

<u>NO.:</u>

NC-585-D-105-G

DATE:

February 19, 2007

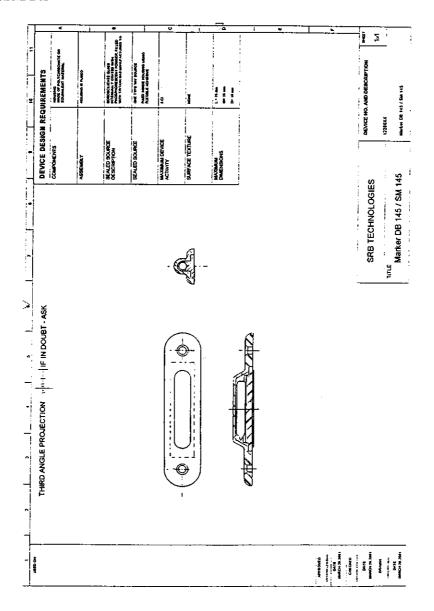
**ATTACHMENT:** 

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**DEVICE TYPE:** 

Self Luminous Fixed Markers

### Marker DB 145/SM 145



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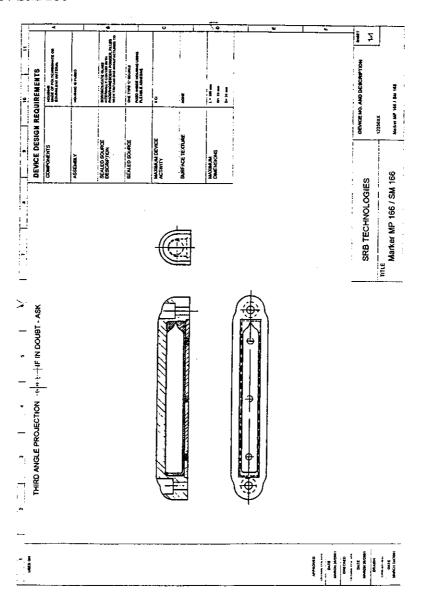
**ATTACHMENT:** 

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**DEVICE TYPE:** 

Self Luminous Fixed Markers

### Marker MP 166 / SM 166



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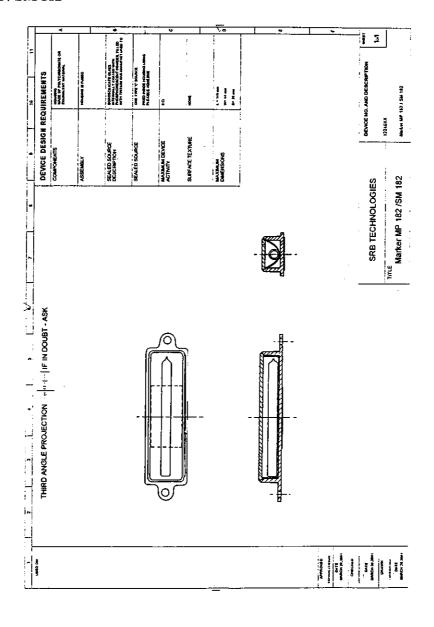
**ATTACHMENT:** 

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**DEVICE TYPE:** 

Self Luminous Fixed Markers

### Marker MP 182 / SM 182



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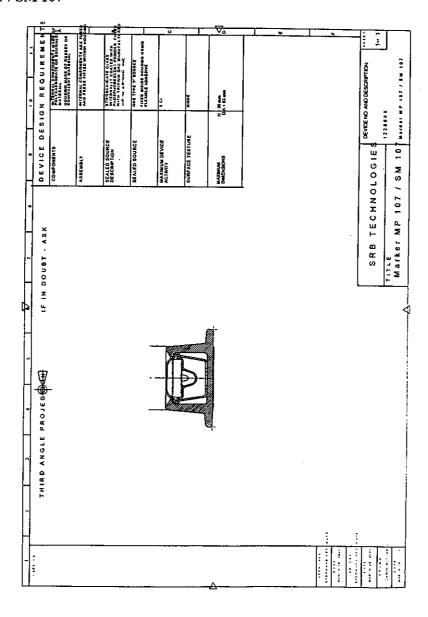
**ATTACHMENT:** 

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**DEVICE TYPE:** 

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### Marker MP 107 / SM 107



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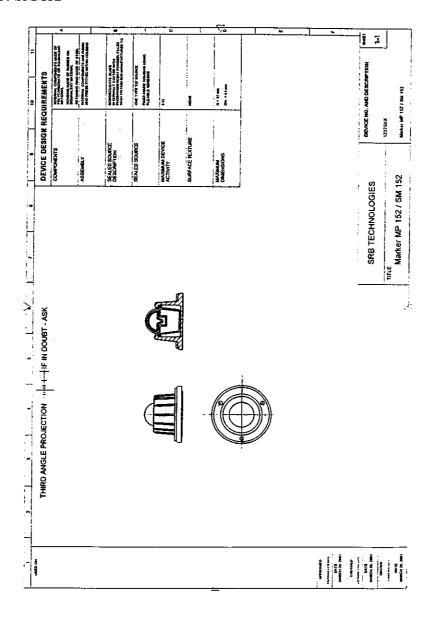
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**DEVICE TYPE:** 

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### Marker MP 152 / SM 152



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**ATTACHMENT:** 

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**DEVICE TYPE:** 

Self Luminous Fixed Markers

### Route / Defile Marker

