Small Controlled Area Radiography (SCAR)
Safer and More Productive RT Inspection
SCAR utilizes a compact exposure device with built-in collimation to enhance the ability for radiographic inspection to be performed more safely and with equal, if not higher, levels of productivity compared to traditional gamma exposure devices. SCAR allows for smaller restrictive barricades, eliminates flash dose to radiographic personnel, and may increase the overall productivity of radiography crews when utilized in congested areas where increased manpower is present, such as plant shutdowns. The Model 989 device, also known as the “Baby SCAR,” is the latest advancement in SCAR systems.

SCAR uses relatively low curie radioactive sources that are always shielded or under collimation and never physically exit the exposure device. Since smaller restrictive areas are possible with SCAR, the ability to conduct simultaneous operations involving radiography is increased. In the past, restricted areas were too large to allow radiography to be performed in the immediate area of other types of work or in the vicinity of the general public. Higher levels of productivity are now achieved because the need to radiograph during windows of opportunity or non routine work periods can be greatly reduced or eliminated. Other craft work benefits from SCAR as well, because it can continue uninterrupted. The main principle of radiation safety, ALARA (as low as reasonably achievable), can now be implemented with more assurance than ever before.

**SCAR has been developed with safety and productivity as the main objectives, and has simply set the precedent for safer radiography in the industry.**

**Model 989 Features**

- Highly directional beam
- Reduces radiation dose and restricted area
- No risk of source detachment
- 24 Hour radiography
- Can help to reduces shutdown duration
- More production time for all trades
- Inspection through insulation for corrosion
- Reduces or eliminates effect on nucleonic level alarms
- Locks to prevent unauthorized operation

**The reduction of unwanted radiation scattering effects around the film by effective photoelectric absorption also improves radiographic quality.**
Applications

Decreased downtime, increased production and higher safety levels are found in all of the below applications.

- Pipeline
- Turnaround
- Elevated Work
- Confined Space
- Weld Quality
- Simultaneous Operations
- Wall Thickness

Technical Specifications

- **Primary Application:** Directional beam industrial gamma radiography.
- **Model Number:** Model 989 radiographic exposure device
- **Length:** 7.9 in. (20.1 cm) without storage cover
- **Diameter:** The main body is 3.5 in. (8.9 cm) diameter & the Posilok actuator protrudes 0.375 in. (1 cm)
- **Mass:** 16 lbs. (7.3 kg) max
- **Shielding:** 5.7 lbs. (2.6 kg) of tungsten plus 3.8 to 5.4 lbs (1.7 to 2.5 kg) of lead or tungsten for the collimator
- **Construction:** Tungsten shielding is encased in a welded tubular stainless steel shell. The collimator shielding contains lead or tungsten metal to shape the emergent primary beam when the source assembly is in the exposure position. The shell is partially sealed to prevent the ingress of mud, sand, moisture, and liquids during use. The exposure device should not be submerged in liquids during use.
- **Device Mounting Provision:** Manufactured with six ¼-20 UNC thread mounting holes, ½” deep, which permits secure attachment to positioning-fixtures.
- **Max capacities of the Model 989 exposure device:** 20 Ci (740 GBq) of Selenium 75 as special form.
- **Source assembly model number:** Sentinel Model 97941
- **Sealed source capsule:** Designed for Sentinel Model X540/1 only
- **Sealed source exposure device certifications:** Special form: USA/0502/S-96. The exposure device contained in the transport package meets the requirements for a Type A transport package under IAEA TS-R-1 (1996); USNRC 10CFR71, USDOT 49CFR173, and was designed to meet the applicable specification of ISO 3999:2004(E) for Category X exposure devices.
  **Inspection requirements:** A daily inspection if the device for obvious defects is required. Complete annual servicing and/or collimator replacement can be performed at Sentinel or at one of its authorized service centers.
- **Operating temperature range:** -40 degrees F to 300 degrees (F -40C to 149C)
- **Sentinel Model 989 actuators for radiographic exposures:** The Model 989 exposure device is compatible for use with Sentinel manufactured crank-out remote controls or air pressure actuators (part number ELE 027). For designed radiological safety, the only crank-out remote controls and air pressure actuators that can be used with the exposure device must be authorized by Sentinel.
For more information, visit www.petrochemintl.com or call 1-800-747-4099.

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