SPEC Incident

Croft Model No. 2835A

January 2, 2002

B-1

Description of Incident

- On January 2, 2002, Source Production and Equipment Company (SPEC), a State of Louisiana licensee, discovered high radiation levels on a package shipped to them from Studsvik Nuclear, a nuclear facility in Sweden. The package had left Sweden December 27, 2001, and went through Paris on it's way to a Fed Ex facility in the New Orleans airport.

Description of Incident

- The SPEC employee loaded the package on his truck, and drove it back to SPEC. Surveys read 1 roentgen per hour (r/hr) at 15 feet from the sides of the package and 300-400 milliroentgen per hour (mr/hr) at 75 feet from the top.

- The package contained 9400 curies of iridium-192 (Ir-192) in the form of small wafers (about 2.5 mm (0.1 inch) in diameter). The wafers are usually contained within 3 small, screw-top capsules which are placed within a shielded cask and an outer overpack for transport. SPEC uses the Ir-192 to manufacture industrial radiography sources.

Description of Incident

- The package was a Type-B container, manufactured in Great Britain by Croft, and leased by Oracle, a Canadian company, Croft Model No. 2835A.
- There was no visible damage to the package and the tamper seal was intact.
- The package was placed in a shielded and secure area constructed on the SPEC site specifically for handling and safe storage of this package.

Investigation of the Incident

- SPEC constructed a hot cell facility on their site, and on February 7, 2002, SPEC personnel opened the package to determine the source of the high external radiation. Personnel from the State of Louisiana (agreement state), NRC Region IV, and DOT observed the unloading. DOT had the federal lead for the investigation of the incident.

- It was discovered that the screw caps were off of 2 of the 3 capsules inside the inner container of the package, and that the Ir-192 wafers were out of the capsules and spread out within the cavity of the package.

Investigation of the Incident

- These wafers were no longer in a fully shielded configuration, which caused the resulting high radiation levels. Some of the wafers had oxidized and were stuck to inside of the inner container and to each other.

- SPEC released the outer package components, and shipped them to Oak Ridge National Laboratory for inspection and evaluation. SPEC retrieved the usable Ir-192 wafers, and decontaminated the inner container for shipment to Oak Ridge for evaluation as well. The actual capsules were returned to the Studsvick facility.

Investigation of the Incident

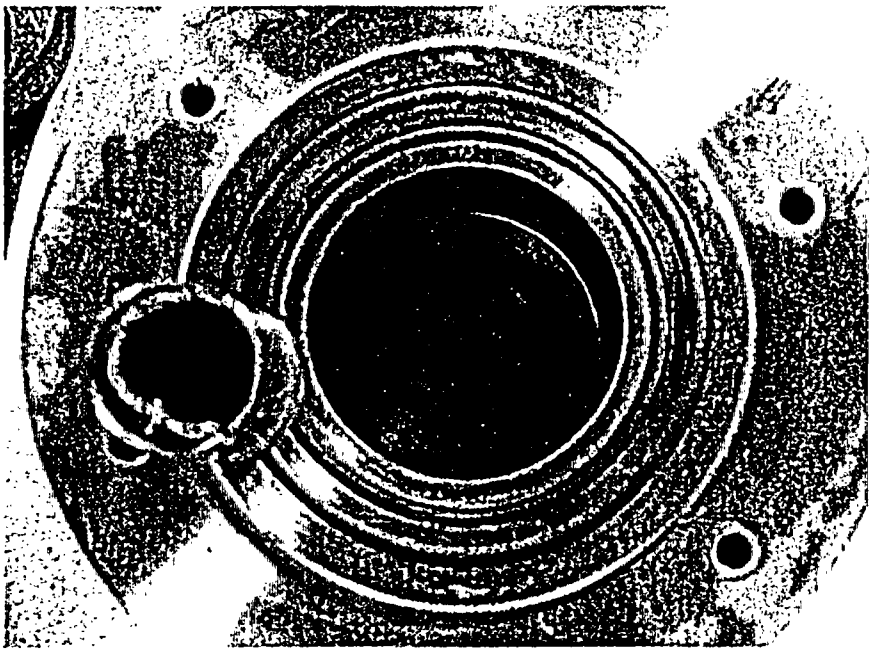
- DOT amended the certificate for this package to require that the capsule lids be welded in place for shipment, and conducted an investigation for enforcement action.

- NRC and DOT had ORNL perform a detailed evaluation of the package for conformance with the SAR drawings.

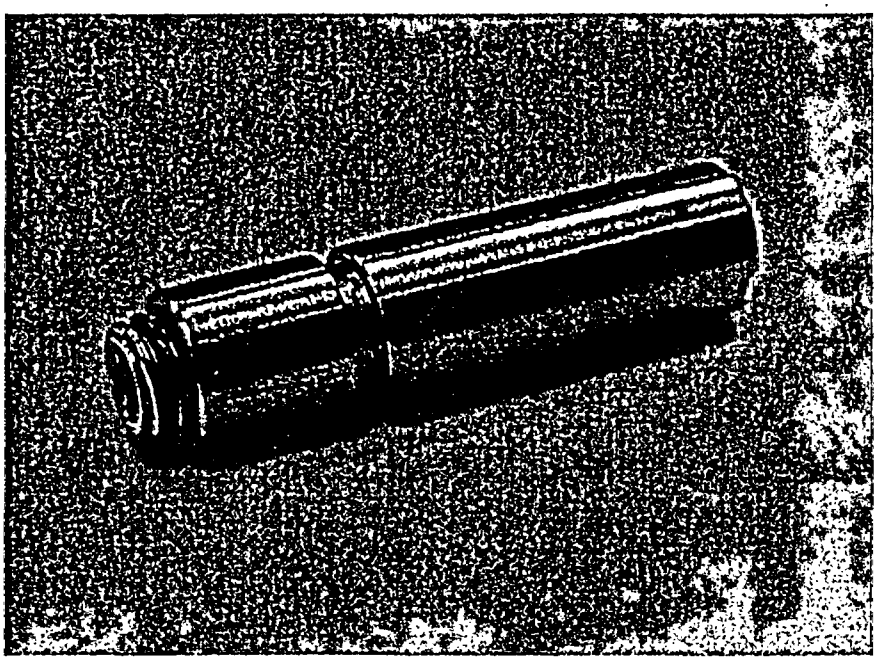
Ramifications of Event

- Dot had the lead for enforcement actions against Studsvick.

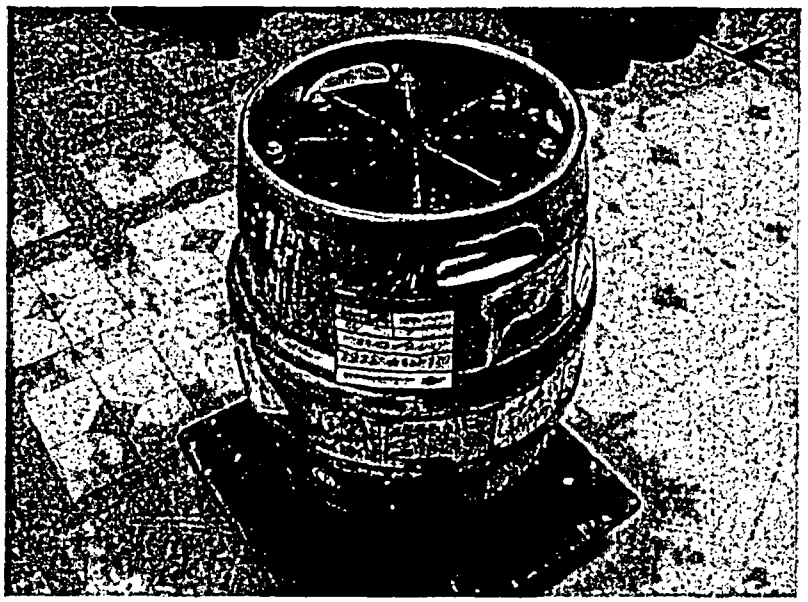
- Congressman Markey is leading an investigation into what doses were received, how could this have been prevented, what actions can be taken now. He has sent in several inquiries, and there is to be a congressional briefing in the near future, involving IMNS and SFPO.



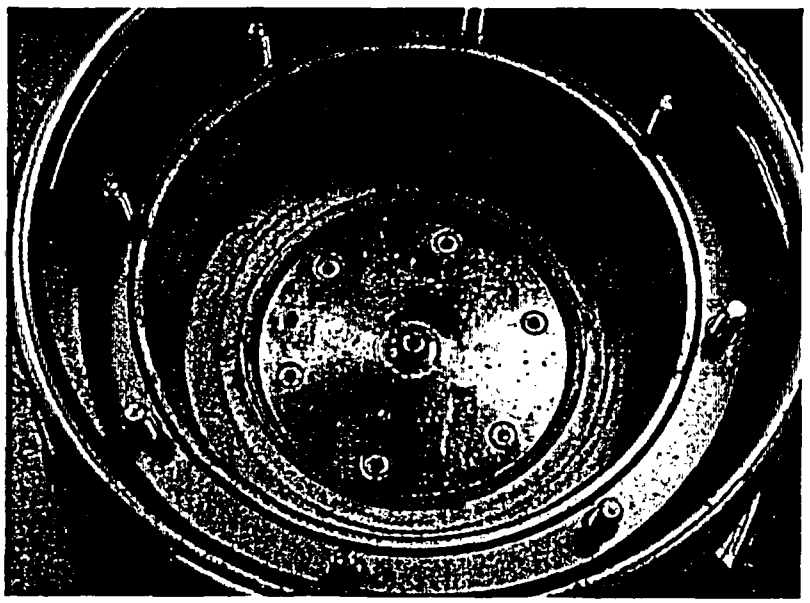
Prototype package - View into containment vessel. Vessel lid and shield plug removed. Capsule basket sitting on flange. Note double O-ring seals in vessel flange.



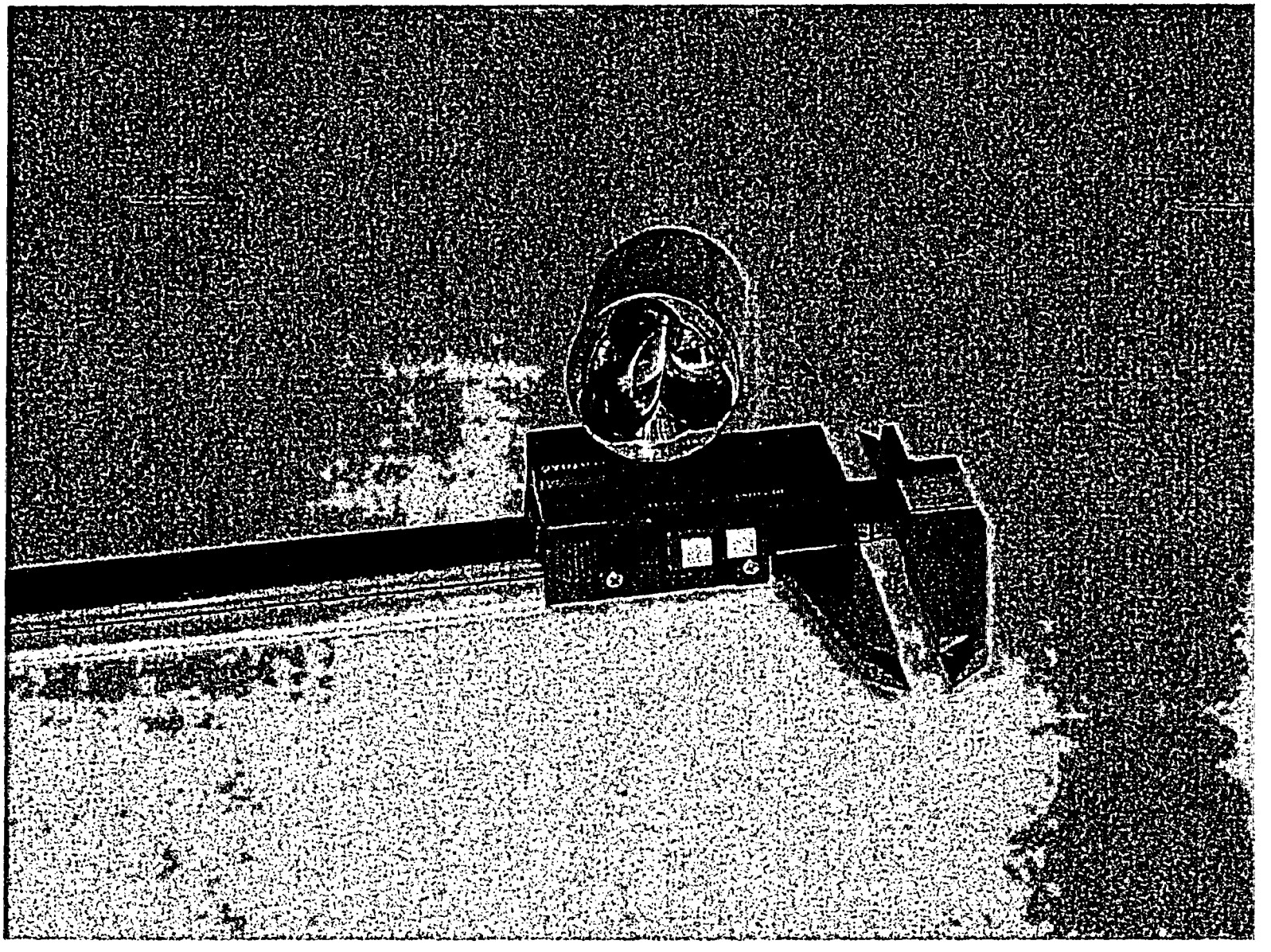
Prototype threaded capsule.

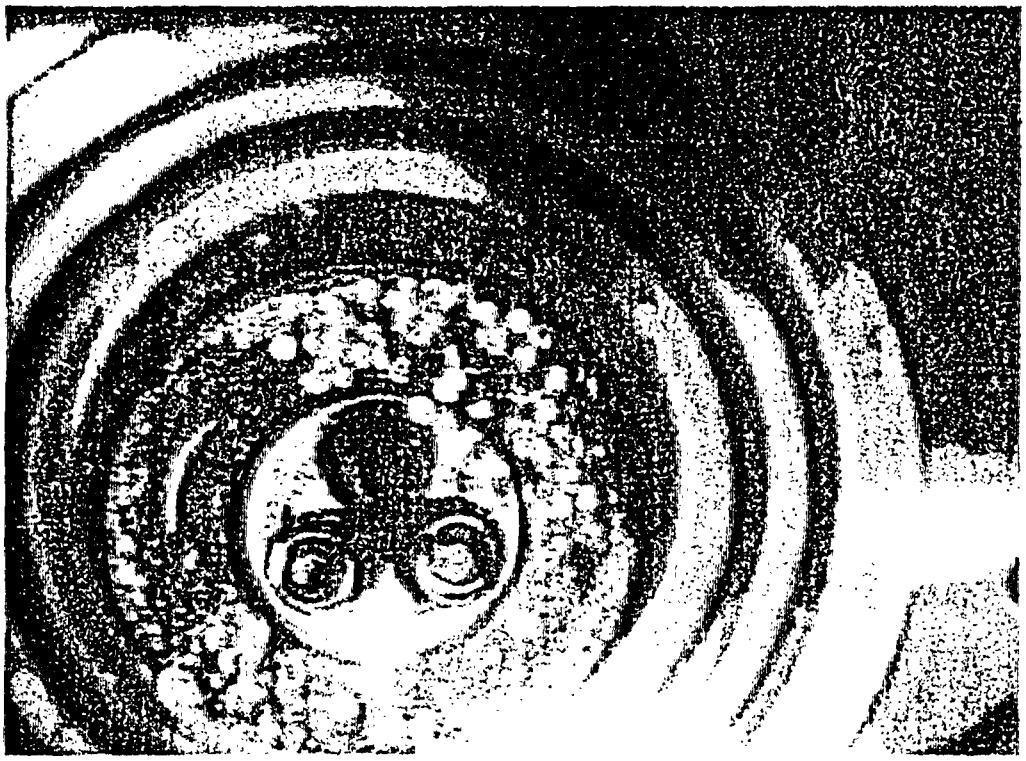


Photograph of a *Croft Model* 2835A transport package. Photographed as a prototype package.



Prototype package. View of containment vessel lid, after keg lid and cork plug removed.





Actual package after opening at SPEC facility on February 7, 2002. The small bright discs are the iridium wafers that have been released from the capsules. Two of the three capsules have come open (the capsule lids are the dark areas in center).