

UPGRADING INFLATABLE DOOR SEALS

by

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SUMMARY

Inflatable door seals are used for airlocks allowing personnel and fuel to enter the reactor vault in CANDU® stations. They were a significant source of unreliability and maintenance cost when the CANDU Owners Group (COG) approved a program to upgrade them in 1993. The target was for improved performance and reliability, to be backed by environmental qualification testing to show that the doors would still seal during a loss of coolant and main steam line break, even after many years of use.

Only commercial products and suppliers existed in 1993. For historical reasons, these "existing products" did not use the most durable material then available. In hindsight, neither had they been adapted or optimized to combat conditions often experienced in the plants—sagging doors, damaged sealing surfaces, and many thousands of openings and closings per year.

Initial attempts to involve the two existing suppliers in efforts to upgrade these seals were unsuccessful. Another suitable supplier had therefore to be found, and a "new," COG-owned seal developed; this was completed in 1997. This paper summarizes its testing, along with that of the two existing products. Resistance to aging has been improved significantly. Testing has shown that an accident can be safely withstood after 10 years of service or 40,000 openings-closings, whichever comes first.

AECL's Fluid Sealing Technology Unit (FSTU) has invested in the special moulds, test fixtures and other necessary tooling and documentation required to begin commercial manufacture of this new quality product. Accordingly, as with FSTU's other nuclear products such as pump seals, the long-term supply of door seals to CANDU plants is now protected from many external uncertainties—e.g., commercial products being discontinued, materials being changed, companies going out of business. Manufacturing to AECL's detailed specifications is being subcontracted to the new supplier. FSTU is performing the quality surveillance, inspection, testing, and customer service activities concomitant with direct responsibility for supply to the plants.