

Senate Standing Committee on Economics
ANSWERS TO QUESTIONS ON NOTICE
Innovation, Industry, Science and Research Portfolio
Budget Estimates Hearing 2010-11
31 May 2010

AGENCY/DEPARTMENT: AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION

TOPIC: Opal Reactor

REFERENCE: Question on Notice (Hansard, 31 May 2010, E16)

QUESTION No.: BI-7

Senator LUDLAM—As a follow-up to a question that Senator Heffernan raised before, my understanding is that your weld testing was done using ultrasonics and that it was not X-rayed at all. I think we covered some of this terrain last year or maybe the time before last. If you could confirm, for both of us, that they were not actually X-rayed, I would appreciate that.

Dr Paterson—We will take that on notice and provide the reasoning for the post-weld inspection procedures and what they revealed

ANSWER

As stated in the Parliamentary Question on Notice (PQoN) 1380 response of 11 March 2009, the welds connecting the wall of the reactor pool liner to the base of the pool were tested using ultrasonics. All non-destructive inspections of the core OPAL components were performed in accordance with, or exceeded, the requirements of the international pressure vessel standards used in the construction, specifically the American Society of Mechanical Engineer's (ASME) Boiler and Pressure Vessel Code, Section III. All the welds in the reflector vessel were examined using dye penetrant testing. In addition, x-radiography was used where appropriate, gamma-radiography was used where additional penetration was required because of thick sections, and ultrasonics were used where the joint geometry precluded the use of radiography (as in the case of the weld in question), or as an additional method where required. The non-destructive testing was undertaken in accordance with ASME Boiler and Pressure Vessel Code Section V.

The post-weld inspection procedures did not reveal any problems with the welds in question. As stated in the response to PQoN 1380, there probably would have been no defects to detect at the time of testing. The defect was very probably caused by delayed hydride cracking. As this term indicates, delayed hydride cracking occurs some time after the weld is made. ANSTO cannot determine exactly when the cracking occurred, but it is likely to have been many months after the welding was performed. It is known from replicas of the cracks taken from the fabricated reflector vessel that their size and position would have made detection straightforward, reinforcing the likelihood that they appeared some time after fabrication and inspection.