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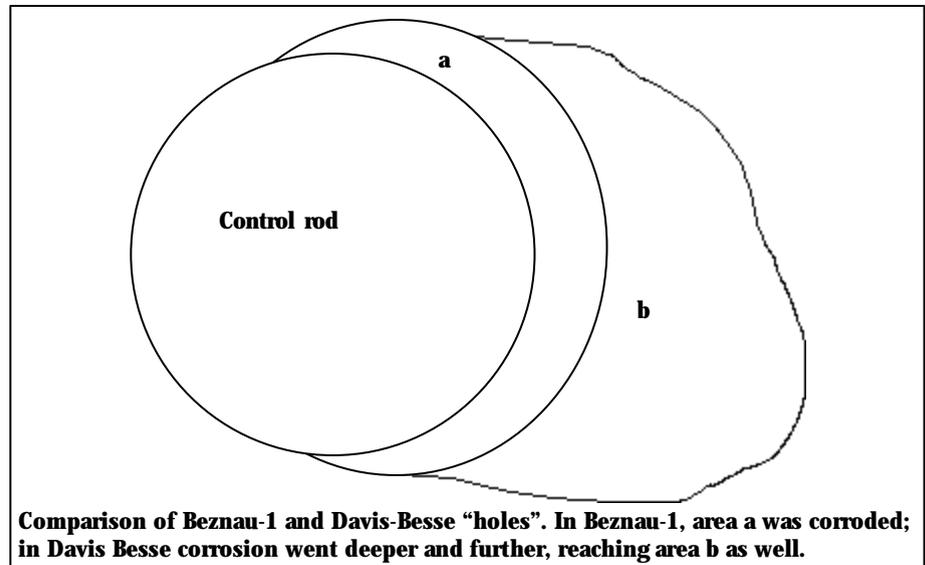
SWISS INCIDENT SHOWS DAVIS-BESSE HOLE IS NOT UNIQUE

In 1971, thirty years before a hole was found in the reactor vessel head at Davis-Besse in the US state of Ohio, a similar hole was found in Beznau-1 in Switzerland. This is revealed in a Westinghouse internal report on file at the U.S. Nuclear Regulatory Commission, whose chairman Richard Meserve continues to say that the Davis-Besse hole was “unexpected”.

(581.5477) NIRS/WISE Amsterdam – The Westinghouse report (1) was one of the documents in a twelve-inch (30cm) stack of documents obtained by the Union of Concerned Scientists (UCS) in 1977 under the Freedom of Information Act (FOIA).

The stack of documents, detailing accidents and safety deficiencies in nuclear power plants, had been collected over more than 10 years by Dr. Stephen H. Hanauer, a senior official of the U.S. Nuclear Regulatory Commission (NRC). The existence of Dr. Hanauer’s collection, which he nicknamed “The Nugget File”, only came to light after the UCS noticed a handwritten comment on a slip of paper obtained under the FOIA.

Intrigued, the UCS telephoned Dr. Hanauer, who told them about his “Nugget File”, a copy of which was eventually placed in the NRC Public Document Room as a result of



another FOIA request. The UCS published excerpts from the collection in their classic 1979 book *The Nugget File* (2).

Page 28 of this book describes an “indentation” found in the reactor

vessel head of Beznau-1, Switzerland in 1971 – just 2 years after the reactor was started. “As a result of a leak in the seal weld of a control rod drive mechanism, an appreciable accumulation of boric acid residue was found on the reactor vessel head. The volume of this boric acid ‘snow’ was estimated at 1 to 2 cubic meters [35 to 70 cubic feet]”.

It continues: “After completion of the weld repair, inspection of the reactor vessel head uncovered a crescent-shaped defect having maximum approximate dimensions of 1¾ inches in depth, 2 inches in width and encompassing 180 degrees around the adapter joining the control rod mechanism to the reactor vessel”.

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“Tests were begun in Pittsburgh and Europe to try and determine the exact attack mechanism that caused the indentation”, according to the report. The outcome of these tests is not mentioned.

Nevertheless, as a result, “superintendents of all operating Westinghouse pressurized water reactor plants were immediately notified of the situation. They were cautioned to eliminate any accumulation of boric acid in contact with primary system components.”

Since Davis-Besse was a Babcock & Wilcox reactor that did not begin operation until 1977, this 1971 notification was not sent to Davis-Besse.

Comparison with Davis-Besse

In the main “hole” at Davis-Besse, corrosion did not just affect the “crescent-shaped” area next to the control rod, but extended over a much larger area (3). It was also much deeper, extending right through the vessel wall as far as the stainless steel clad. (However, at Beznau-1 the reactor vessel is only 166mm thick with 5mm clad, whereas the Davis-Besse reactor vessel is 214mm thick with 4.8mm clad).

Yet in the 30 years that passed since the Beznau-1 incident, it seems that boric acid corrosion was almost forgotten. In his 8 January 2003 response to the Inspector General’s damning report on the NRC’s

handling of the Davis-Besse affair, NRC Chairman Richard Meserve still talks of “unexpected head corrosion” at Davis-Besse. That no-one at the NRC could have predicted that a crescent-shaped hole as found at Beznau might grow bigger (as at Davis-Besse) seems incredible.

Still, even if a NRC staff member had made such a prediction, they may well have kept quiet about it. Nearly half the NRC employees do not feel that it is “safe to speak up in the NRC” on concerns about safety and other issues, according to an internal survey (4).

All of this comes on top of last year’s revelations in documents obtained by NIRS under the FOIA, showing how operator FirstEnergy had gambled safety for profits (5).

Cracking ignored

The boric acid corrosion at Beznau apparently came from a leak in the seal weld. At Davis-Besse, the leak came from cracking that the NRC had predicted might be present – indeed, they drafted a shutdown order for 31 December 2001, but never issued it, and allowed the reactor to operate until February 2002.

The cracking was also not new: in 2001, the UCS criticized the NRC for ignoring this widespread problem for 10 years (6). Yet the “Nugget File” shows that the NRC has also ignored the problem of holes due to boric acid corrosion for an amazing 30 years!

Yet the cracking problem is probably even more widespread than the NRC admit, as WISE Amsterdam revealed last year. There is evidence that hundreds of cracks in the world’s PWRs go undetected because best available inspection technology is not used (7).

Back in Switzerland, the situation is not much better. For 23 years up to 1994, Beznau only had a provisional license because of “serious faults established at the end of its construction in 1971” – presumably

the “hole” was one of them (8). It also has design defects such as a lack of protection against airplane crashes and earthquakes. Nevertheless, the reactor is still operational.

Immediately after last year’s Davis-Besse incident, WISE Amsterdam faxed details to three nuclear power stations with histories of cracks similar to those at Davis-Besse (9). Beznau was one of these; another was Zorita in Spain, for which the authorities have now set a definitive closure date (10). The third was Sendai-1 in Japan – a country where a big scandal has since broken out over cover-ups of reactor defects (11). None of the utilities responded.

References:

1. Westinghouse Service Information Report 1-71, *BEZNAU I Reactor Vessel Head Defect*, January 1971.
2. *The Nugget File*, Union of Concerned Scientists, January 1979
3. *WISE/NIRS Nuclear Monitor* 565.5385, “Millimeters from disaster”
4. AP, 7 January 2003
5. *WISE/NIRS Nuclear Monitor* 575.5448, “Davis-Besse: gambling safety for profits”
6. *WISE News Communique* 553.5309, “US: NRC ignores widespread safety flaw for decade”
7. *WISE/NIRS Nuclear Monitor* 568.5402, “Large numbers of undetected cracks in the world’s PWRs”
8. *WISE News Communique* 415/6.4116, “Beznau: Safety deficiencies”
9. *WISE/NIRS Nuclear Monitor* 565.5385, “Millimeters from disaster”
10. *WISE/NIRS Nuclear Monitor* 575, “In brief”
11. *WISE/NIRS Nuclear Monitor* 573.5436, “Japan: whistleblowing turns into tornado” and 578.5471, “Update on the TEPCO falsification scandal”.

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