

ASS-SG

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3.2 CRACK PRODUCTION IN STAINLESS STEEL STEAM GENERATOR TUBES

The Research Institute of Nuclear Power Operation (RINPO), China, approached Trueflaw in late 2008 for possibility to produce cracked steam generator tube samples to be used for burst tests to qualify the extreme load of defective tube. The tube in question is austenitic stainless steel tube, typical for WWER reactors. It was decided to do production trials to investigate the possibility and suitability of Trueflaw cracks in this case. For this use RINPO send Trueflaw sample tube to be used in the production trials. The interesting crack type was axial cracking.

3.2.1 Production trials

Trueflaw completed altogether nine production tests for this tube. With these tests, it was shown that axial cracking can be repeatably initiated to austenitic stainless steel tubes and size controlled to produce axial cracks with known size. During the limited testing, however, the method was not conclusively validated. The follow-up for this work is currently considered. Typical initiation images are shown in Figure 1. Produced cracks are very tight and thus PT image show very poor contrast. Corresponding images from destructive examination are shown in Figure 2. It can be seen, that the crack is continuous and follows the long-but-shallow aspect ratio specified for these cracks.

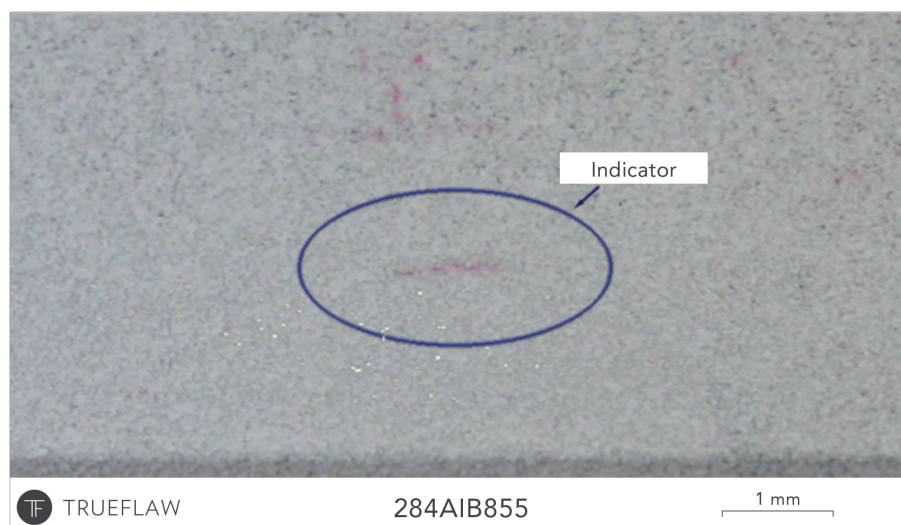


Figure 1
Typical initiation images for axial cracks in austenitic stainless steel steam generator tubes.

3.2.2 Conclusions

Cracks were successfully produced to stainless steel tube samples in both axial and circumferential directions. It was shown that Trueflaw technology is well applicable to the intended use.



Figure 2
Destructive examination results for axial cracks in austenitic stainless steel steam generator tubes.

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1 mm