

Power Industry

CASE STUDY

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Key Facts

Sector Power Industry

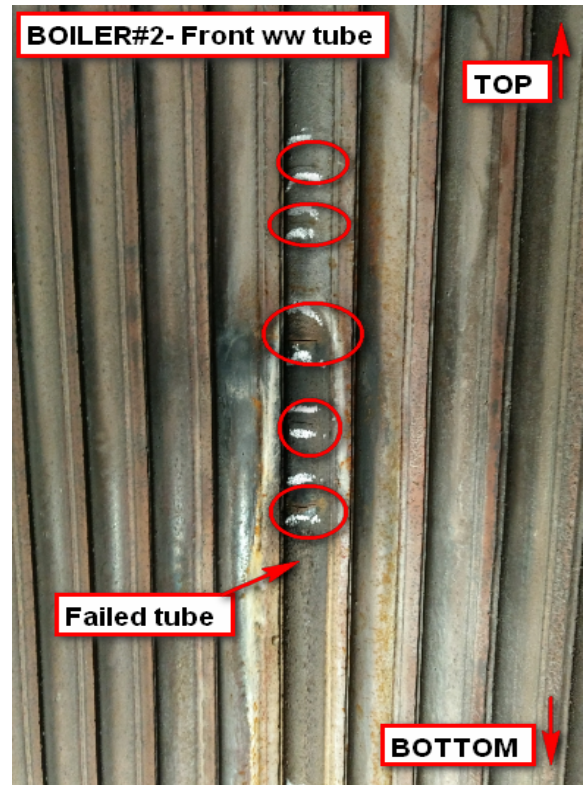
Category Investigation of Front Waterwall Tube of Supercritical Boiler

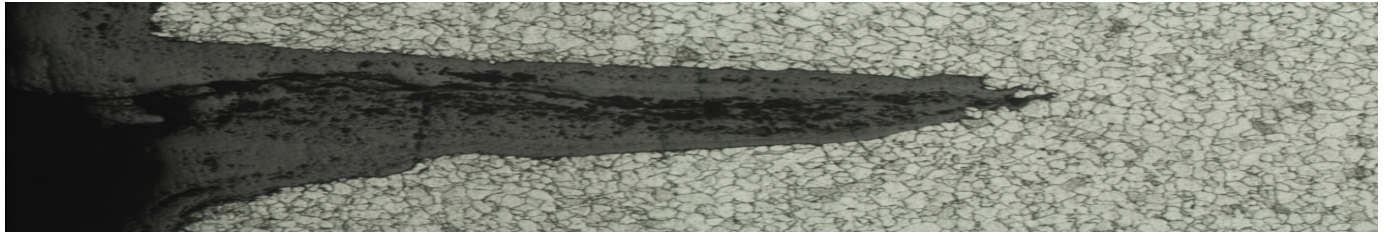
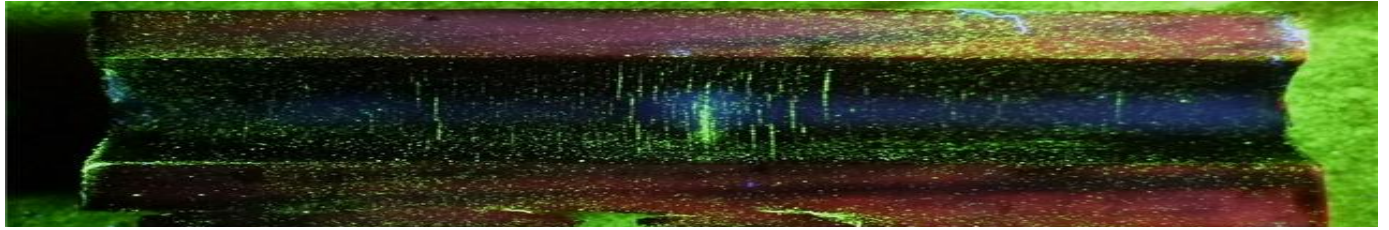
Problem

- Front waterwall vertical tube failed by leakage during hydrotest. The location of failure is about 64 meters from the ground level. The service life of tube is 16,918 hours.
- MOC of tube is as per SA 213 grade T12

Diagnosis

- The front waterwall tube failure is because of thermal fatigue mode of through and through cracking.





Solution/Recommendations

- While MOC of tube conforms to the stipulated requirement, microstructure and mechanical properties indicate service degradation.
- The crack initiation from multiple locations is from both OD and ID. The crack morphology is transgranular with wide opening at initiation and blunt tips.
- Microstructural degradation indicates persistent and wide temperature fluctuations over a range.
- The possibility of secondary burning taking place in the subject region of tube failure that cause wide temperature fluctuations and temperature rise needs to be studied by process design expert.
- If the damage is limited to only one tube, then possibility of throttled flow in this particular tube maybe responsible for temperature fluctuations. Detailed internal examination with videoscopy may be done during next opportunity to the connecting header and tubing to find out any obstacle to the flow.

Contact Us

If you are interested to learn more about TCR Advanced,
please send an email to: sohel@tcradvanced.com

Mr. Sohel Vaidya

Business Development Manager