

Petrochemical Industry

CASE STUDY

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Key Facts

Sector Petrochemical Industry

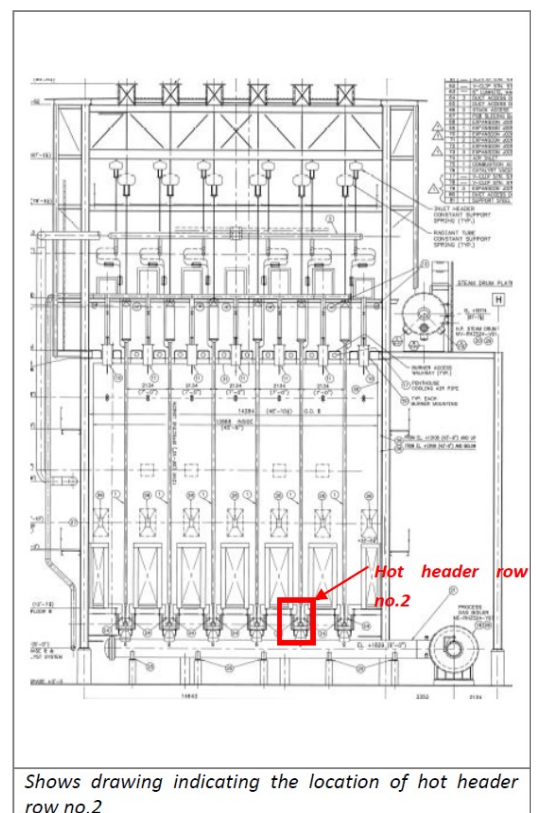
Category Investigation of Hot header in Reformer

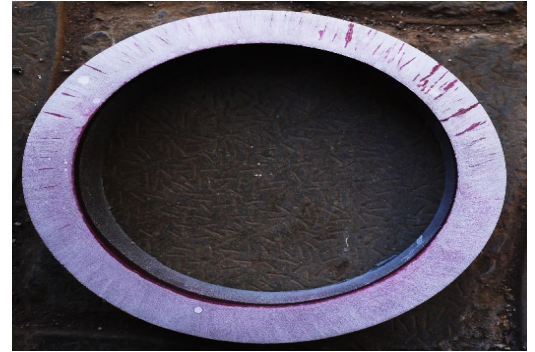
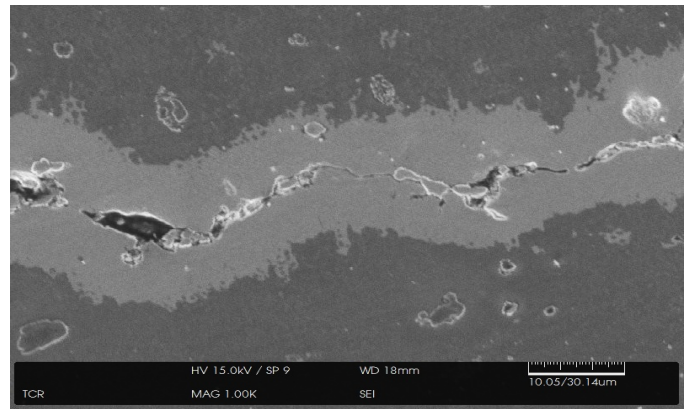
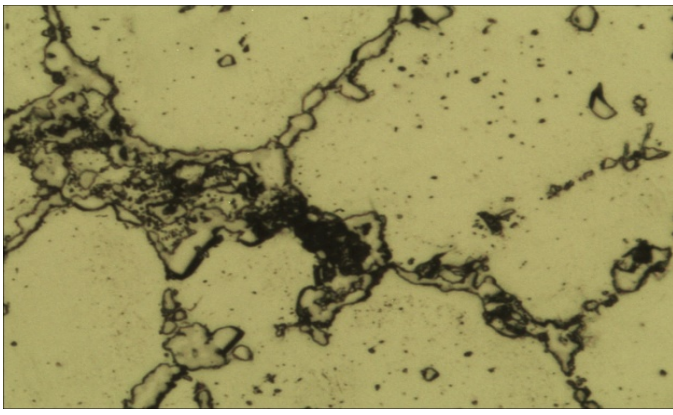
Problem

- Failure of 2nd row hot-header of Hydrogen production unit occurred. On inspection, crack was observed between weldolets 94 and 96.
- The failure was noticed through rising trend of one of the temperature transmitter of flue gas temperature placed at exit of the reformer.
- This was confirmed by detection of hot spot at south end, 2nd row hot header along with paint peel off on panel covers.

Diagnosis

- On inspection, multiple cracks were noticed at 6'o clock position of around 400mm.
- Nature of failure indicates mid-wall fissure development and damage in terms of creep.
- About 2% creep strain is observed at areas where no (OD) surface detectable cracks.
- The failure of the hot header is essentially because of the creep indicating ageing in view of prolonged high temperature exposure which resulted as rupture in form of longitudinal cracking.





Solution/Recommendations

- Rest of the headers shall be checked by radiography, DP and in-situ microstructural examinations to detect presence of creep voids/fissures.
- Ultrasonic attenuation measurement may be carried out at available opportunity on all headers to ascertain the possibility of onset of creep damage.
- All other headers need to be checked with diameter measurements and creep strain in excess of 2% may be subjected to destructive remaining life assessment.
- Reason for any prolonged temperature excursion requires to be deliberated from furnace design and process point of view to increase the life of new headers.

Contact Us

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

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