

Fabrication Industry

CASE STUDY

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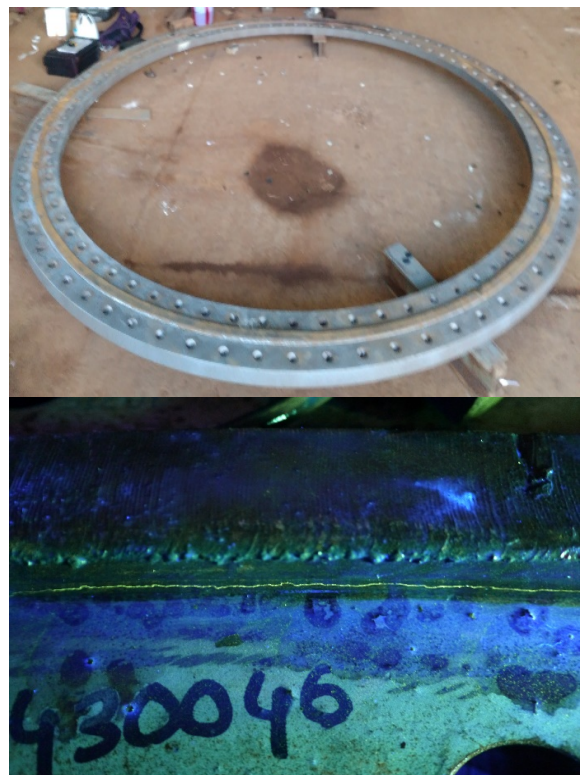
Key Facts

Sector Fabrication Industry

Category Failure Investigation of Tubular Tower Base Flange

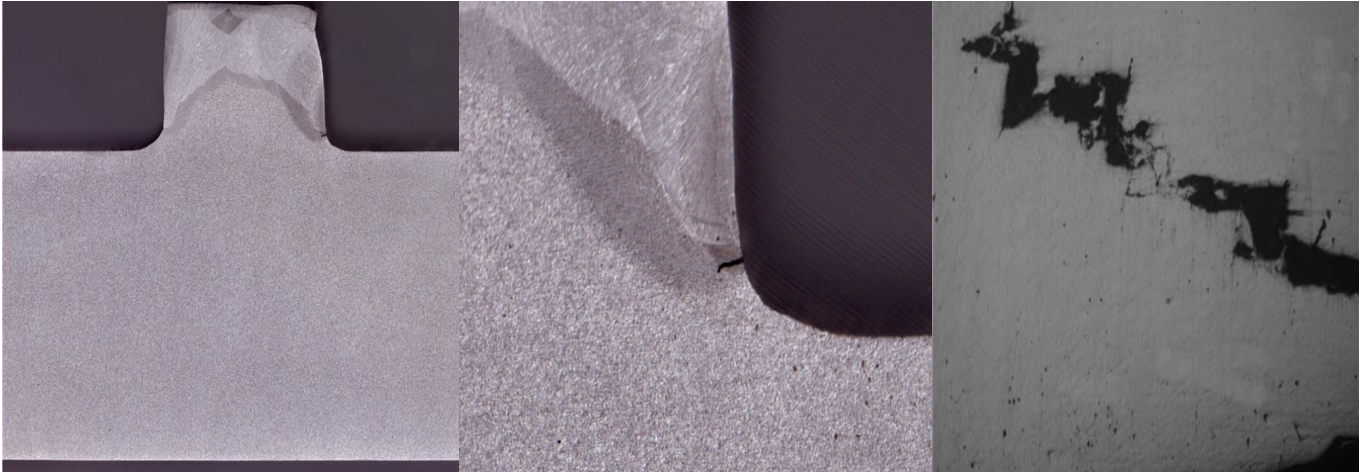
Problem

- The base flange of vertical wind mill tower structure failed by way of cracking.
- The failure was noticed after welding base flange with shell of bottom section.
- Crack was seen on the inner side of weld neck radius of flange at the flange side toe of the weld.
- MOC of flange is S355NL Z35



Diagnosis

- The cracking seen on the flange HAZ region is because of damage mechanism referred as 'delayed cracking' caused by high hydrogen level in the weld region. The most likely source of hydrogen can be from the flux.
- The hydrogen content in weld pool is to the tune of 22ppm which is excessively high



Locations	Measured Hydrogen
Parent metal	2 ± 0.25 ppm
Weld	21.50 ± 2 ppm

Solution/Recommendations

- Both flange and weld metallurgy in terms of MOC, microstructure and mechanical properties is satisfactory.
- The cracking is noticed precisely in heat affected zone (HAZ) on the flange with inter-granular tendency.
- Care requires to be taken to prevent moisture ingress at the time of SAW. The flux used required to be properly dried.
- Appropriate preheating and PWHT would mitigate the problem of higher level of hardness in HAZ region. This is very important for long term integrity of weld joint.

Contact Us

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

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