

Oil and Gas Industry

CASE STUDY

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Key Facts

Sector	Oil and Gas Industry
Category	Investigation of Jaw Pins on Tong

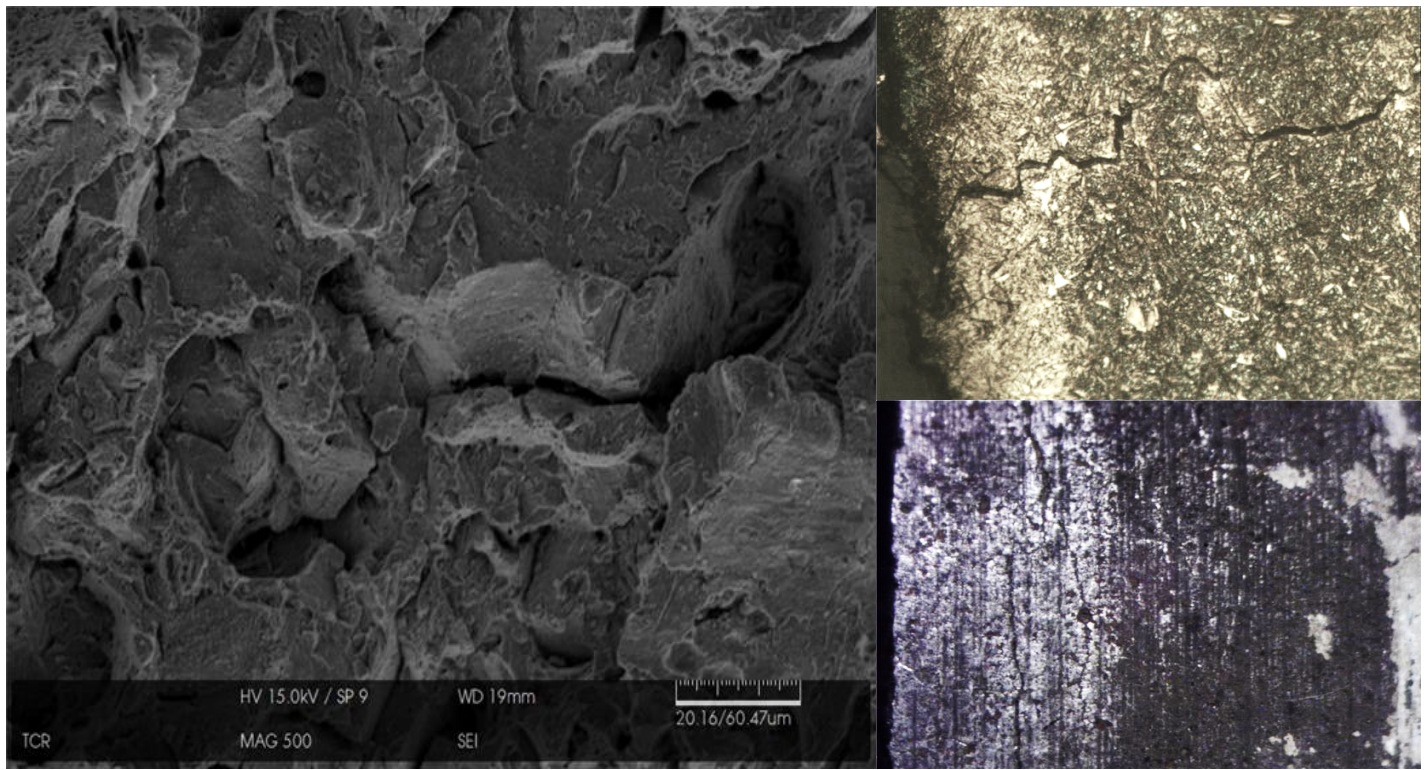
Problem

- Jaw pins of M/U tong failed by way of fracture after about one year of service.
- The failure was noticed when unusual breaking sound was heard by driller.
- Jaw pin from break out tong was found broken and also one more jaw pin from the make-up tong was found broken.

Diagnosis

- The tong pin failure is because of untampered martensite remaining present in the hardened case and having propensity for in-situ brittle cracking under operation.
- MOC of pin matches with AISI 4140. Hardness values are higher at edge. Impact results indicate poor toughness.





Solution/Recommendations

- Intergranular cracks are observed at the surface hardened zone.
- Microstructure of surface hardening zone is untampered martensite.
- The pin should be having good toughness of around 15 Joules with higher hardness. The properties selection shall be done as per the operational requirement in consultation with design expert.
- The pins should undergo multiple tempering treatments to transform all the untampered martensite into tempered martensite and epsilon carbide to avoid any cracking.
- All the incoming tong pins should undergo hardness test along with WFMPI (wet fluorescent magnetic particle inspection).

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