

# Fertilizer Industry

## CASE STUDY

[www.tcradvanced.com](http://www.tcradvanced.com)

### Key Facts

Sector Fertilizer Industry

Category Investigation of Secondary Superheater Tube of Boiler

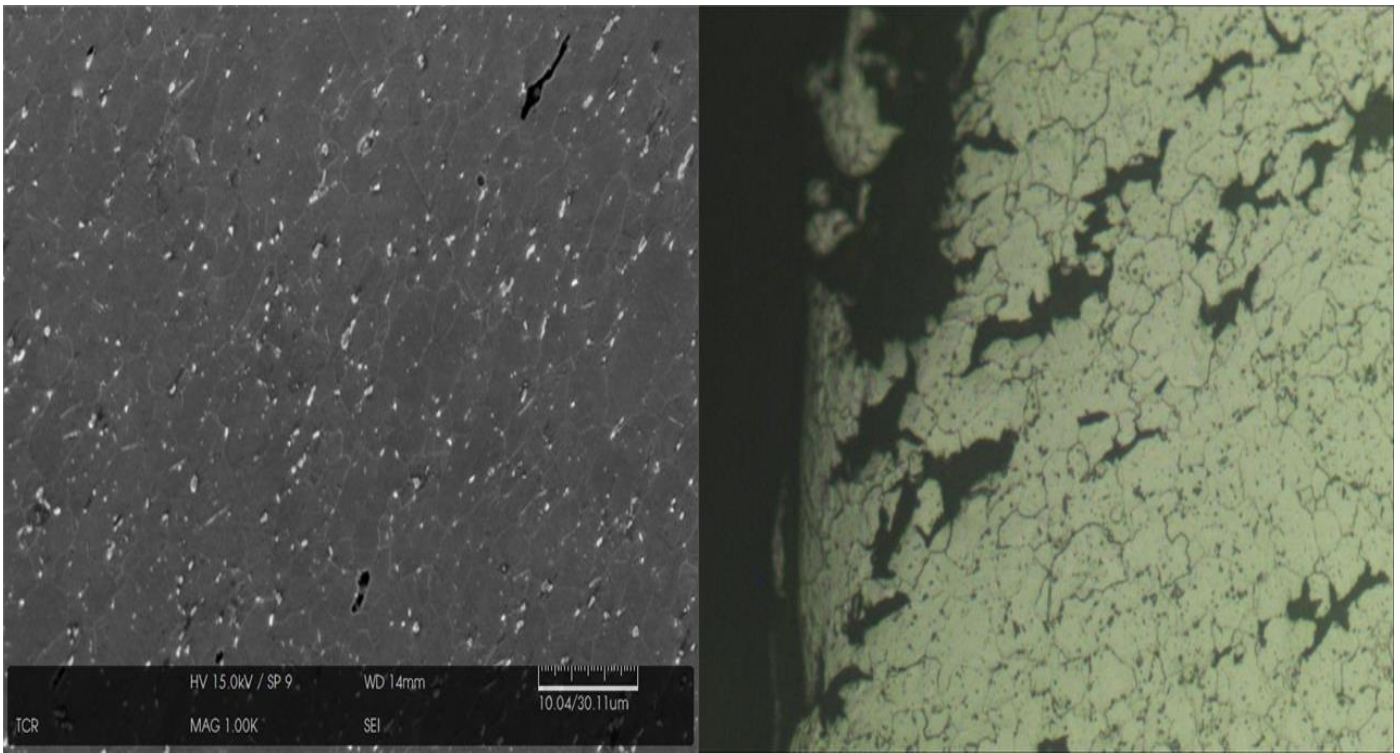
### Problem

- Secondary superheater tube of panel failed by rupture during operation.
- The failure took place within one month from the commissioning of the boiler
- MOC of the tube is A213 grade T11.



### Diagnosis

- The superheater tube failure within a short span of service is because of short term overheating. However, it also indicated overall increase in temperature higher than design conditions.
- The minor degraded microstructure are indicative of rise in temperature level at failure location a little above Ac1 and deformed grains confirm ductile overload failure.



## Solution/Recommendations

- The tube MOC and mechanical properties are acceptable.
- Overall tube is showing indication of exceeding design temperature during its operation as microstructure shows ferrite and spheroidal carbides.
- Failure is in the form of fish-mouth type of opening having bulging as well as thinning on the contours.
- The reason for increased in tube wall temperature is to be deliberated considering the condition of other tubes.
- In situ metallography and life assessment approach is recommended for other tubes.
- Reasons for partial tube starvations need to be examined based on process parameter in consultation with operation experts.

---

## Contact Us

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

**Mr. Sohel Vaidya**

Business Development Manager