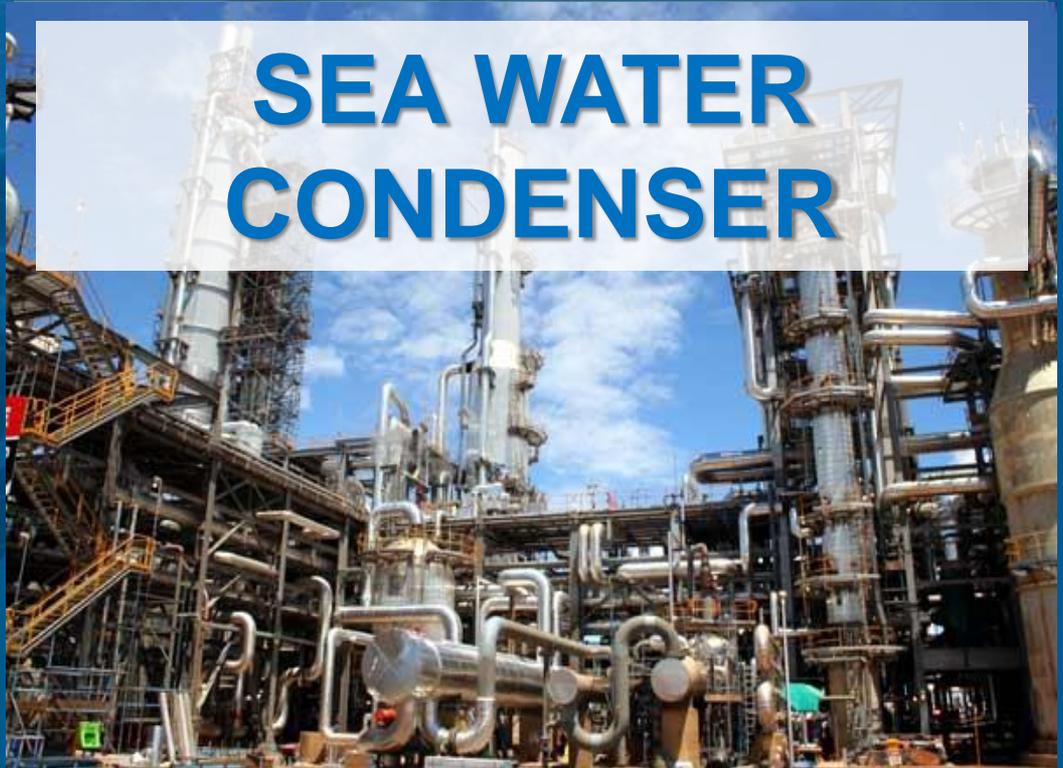


SEA WATER CONDENSER



CASE HISTORY

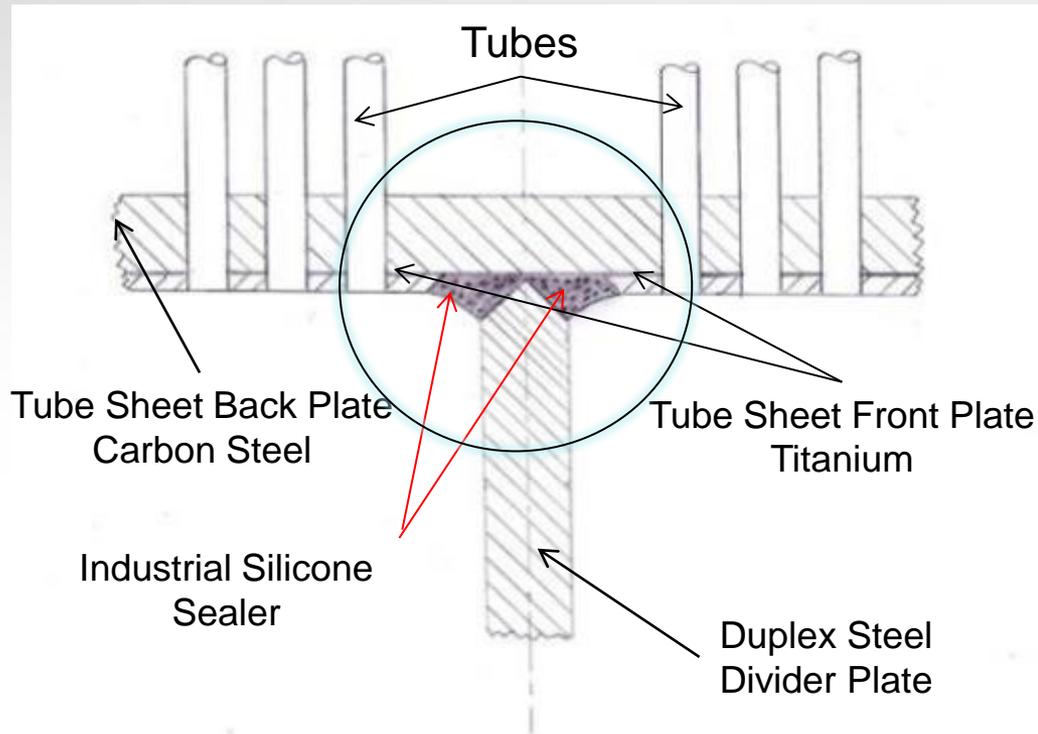
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SUMMARY

- INDUSTRY** : Liquid Ammonia Fertiliser Plant
- PRODUCT** : ARC 855 HT, ARC 858 Tubes & ARC BX2
- EQUIPMENT** : Sea water condenser
- LOCATION** : Karratha, WA, Australia
- SUMMARY** : Severe sea water corrosion had caused a “blow-out” on the tube face of the electrical power plant condenser; causing unplanned stoppage and maintenance.
- ROI** : The damage was repaired with specialised welding and sealed with ARC products to ensure there would be no problems for at least 5 years.

PROBLEM DESCRIPTION



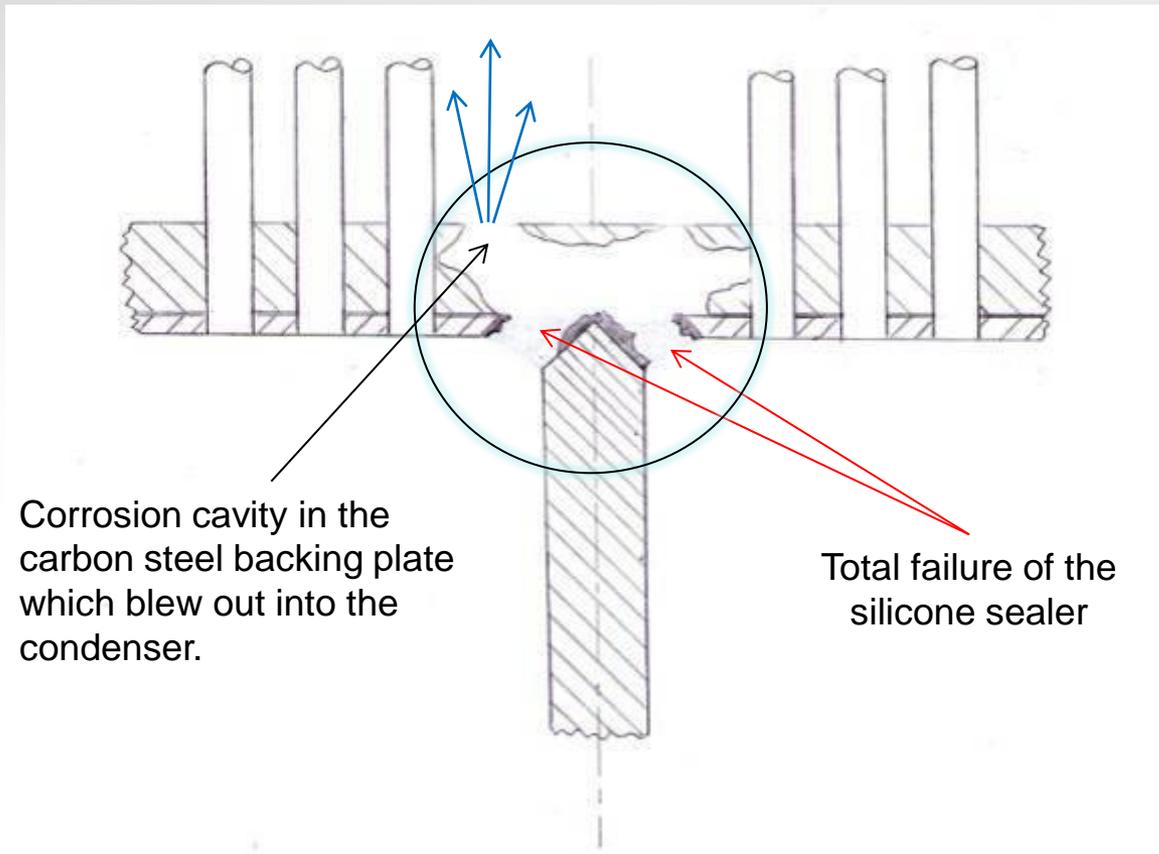
Original Design

The condenser was fabricated from 3 different metals:

1. The shell and divider plates were all made from duplex steel.
2. The tube sheet had a carbon steel backing plate.
3. The front plate of the tube sheet was made from titanium.

The part where the 3 metals came together could not be welded and it was decided that the corners would be sealed off with an industrial silicone.

PROBLEM DESCRIPTION



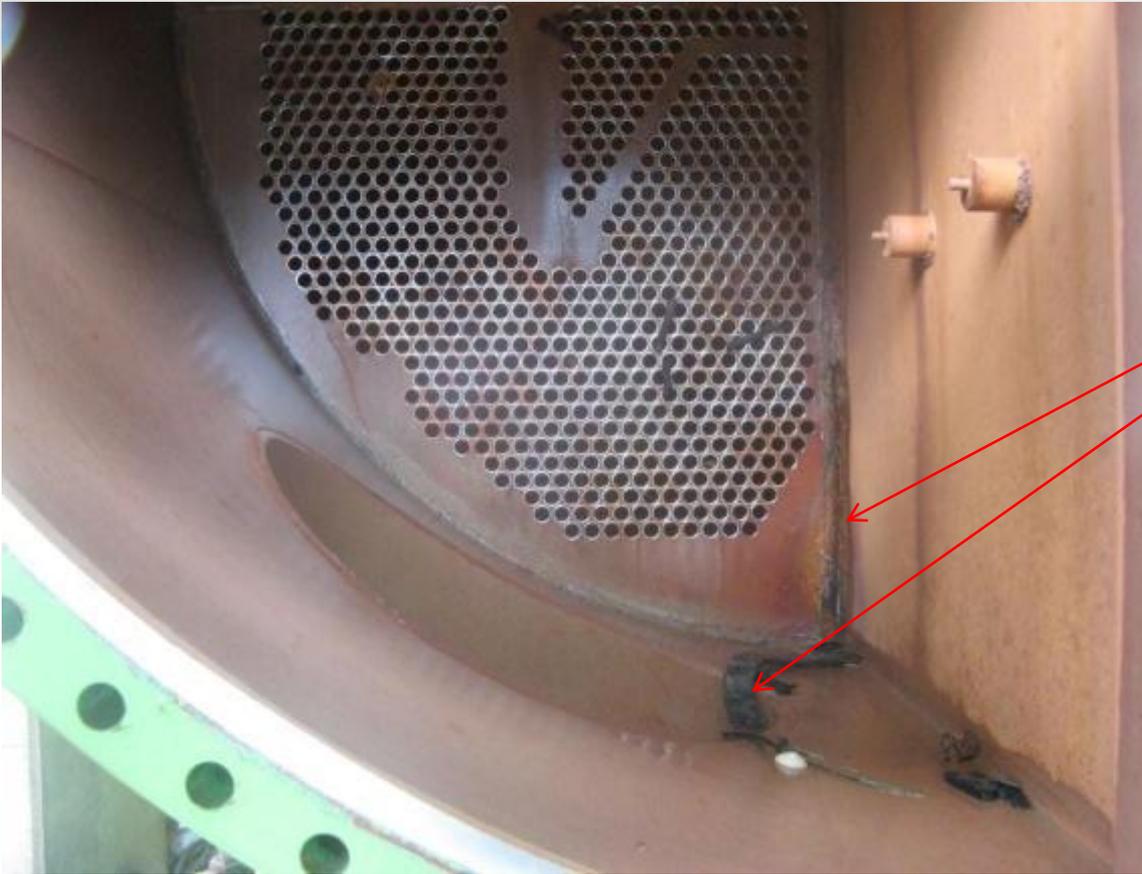
Corrosion cavity in the carbon steel backing plate which blew out into the condenser.

Total failure of the silicone sealer

Tube Sheet Failure

Due to the total failure of the silicone sealer, the carbon steel backing plate severely corroded from the sea water, to the extent that it 'blew out' into the body of the condenser; causing total failure and unplanned shut down.

PROBLEM DESCRIPTION



The water box showed pieces of silicone still evident after delaminating from the corners of the tube sheet.

PROBLEM DESCRIPTION



- Blow-out of the carbon steel backing plate

Absolutely no silicone was found in this chamber where the carbon steel backing plate had completely corroded through.

Titanium tube face

Duplex steel divider plate

SOLUTION



Specialised welders were brought in to close the holes and build up as much metal on the carbon steel as possible.

SOLUTION



After welding, all surfaces to be ARC coated were abrasive blasted to SA 2½, with an angular profile between 75 – 125 microns. The welders could not reach behind the titanium plate, so ARC 858 was “injected” into the cavities and around the edging of the tube sheets.

SOLUTION



To ensure the corners were totally sealed, a 20 mm edging of ARC BX2 was applied over the ARC 858.

SOLUTION



Finally, 2 x 350 micron coats of ARC 855 HT were 'sprayed on' to ensure total corrosion protection from the sea water, which operated in temperatures up to 120⁰ C.

RESULT



The titanium tube face had shown no corrosion, so no coating was necessary.

The Finished Product



RESULT

The Finished Product



Finally, the end caps were also coated with 2 coats of ARC 855 HT. A four year warranty was given to insure them against product and application failure.

CONTACT US

Let us help you find out how our ARC composite coatings can improve your operations and save you time and money.

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