

CORROSION IN REFINERY INDUSTRY FAILURE ATLAS

CASE HISTORY n° 4 Date April 2012

Process: Fluid Catalytic Cracking
Equipment: Mounting hardware for instrumentation

DATE OF INCIDENT AND/OR INFORMATION: October 2009

NATURE OF THE INCIDENT :

A leak of propane-propylene located on the level sensor of a separator was detected in the LPG washing section by soda in order to remove sulfur compounds (FCC soda washing section).

CONSEQUENCES :

Immediate shutdown of the unit. Nevertheless a large leak of 9.5 T propane / propylene occurred during the intervention time.

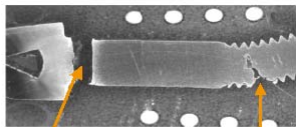
MATERIAL COMPOSITION and REFERENCES

AISI 304 stainless steel

PICTURES AND SCHEMES :



Visserie A2 classe 70. Inox AISI 304



Tête de vis cassée FISSURATION tige

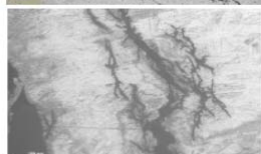
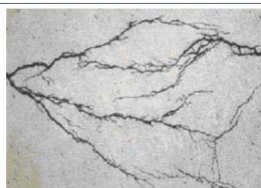


FIGURE 2 - Détail fissure à caractère transgranulaire et large ouverture.

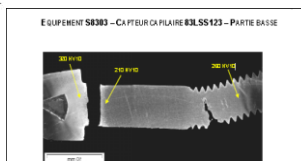


FIGURE 1 - Coupe C1

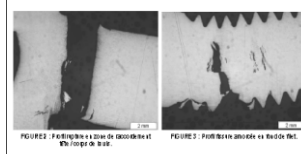


FIGURE 2 - Pathologie à base de microfissures et large ouverture. FIGURE 3 - Pathologie à base de microfissures et large ouverture.

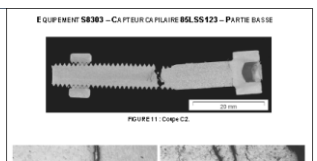


FIGURE 11 - Coupe C2

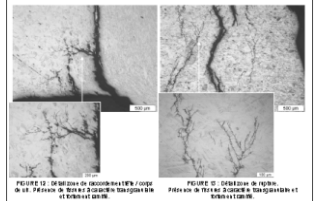


FIGURE 12 - Caractéristiques macroscopiques de la fissure. Présence de fissures à caractère transgranulaire et large ouverture. FIGURE 13 - Caractéristiques microscopiques de la fissure. Présence de fissures à caractère transgranulaire et large ouverture.

ASPECT : transgranular cracking

MEDIA AND OPERATING CONDITIONS:

Stress corrosion in the presence of external chloride (from the driers) on AISI 304 stainless steel screws for assembly of the sensor.

TIME TO DETERIORATION :



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ANSWER

TYPE OF CORROSION : Chloride stress corrosion cracking
API 571 CLASSIFICATION: 4.5.1

CAUSES :

Stress corrosion in the presence of external chloride (from the driers) on AISI 304 stainless steel screws for assembly of the sensor.

REMEDY :

Elimination of the source of chlorides from the purges of dryers containing chlorides of calcium that are above the separator.
Preventive replacement of screws and bolts in another grade of stainless steel: duplex 25 07 (S32750).

PUBLICATION - TECHNICAL REPORT:

BIBLIOGRAPHIC REFERENCES :