

Metallurgical Evaluation & Failure Analysis

Background

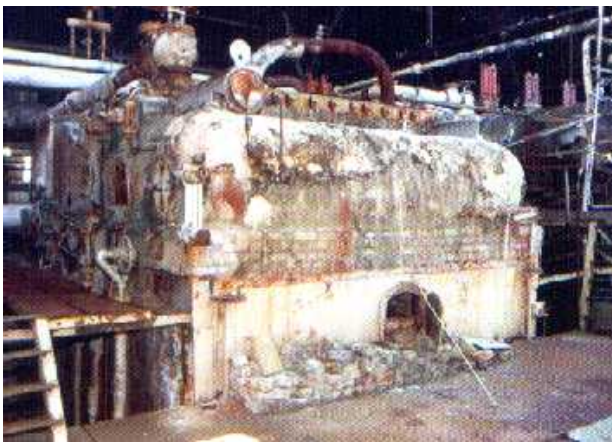
JOHN THOMPSON, with headquarters in Cape Town, South Africa, has been designing and manufacturing both firetube and watertube boilers for 50 years. Over this period we have earned a worldwide reputation for quality and reliability.

As part of our commitment to industry our expertise and technology in both designing and operating heavy plant is available to the end-user. With the spiralling costs of capital equipment it is essential that optimum use is made of existing facilities.

JOHN THOMPSON has developed methods and procedures to assist operators in that decision making. In addition JOHN THOMPSON's Engineers are available to assist in failure analysis and life extension programmes.



JOHN THOMPSON Head Office & Works
Cape Town, South Africa



Decommissioned plant reassessed by JTB

As a leader in the field of boiler technology, JOHN THOMPSON has extensive materials engineering facilities for both in-plant and on-site investigations. These facilities enable detailed investigations to be conducted to establish the metallurgical condition of materials and failure analysis. The methods involved range from hardness inspections and thickness checks to detailed metallographic examination using replication techniques.

On Site Investigation

Major processes plant such as boilers have a given life expectancy based on operational parameters and the original material used. Therefore failure to monitor this ageing can result in unexpected major outages or even catastrophic failures. Old plant can be assessed to ascertain recommissioning viability.



On site inspection of a steam drum

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Replication techniques involve on-site non-destructive examination of metals and are indispensable tools in equipment life assessment and extension decision making. Replication is an essential tool in the effective cost management of all watertube boiler installations.

FIGURE 1 shows a replica taken from a steam drum heated to over 650°C and viewed at 200x magnification. On site examination of the vessel's microstructure enabled JOHN THOMPSON Engineers to make an accurate assessment of the damage sustained by the material resulting in huge cost savings to the client.



FIGURE 1
Replica of a steam drum steel subjected to overheating 200x

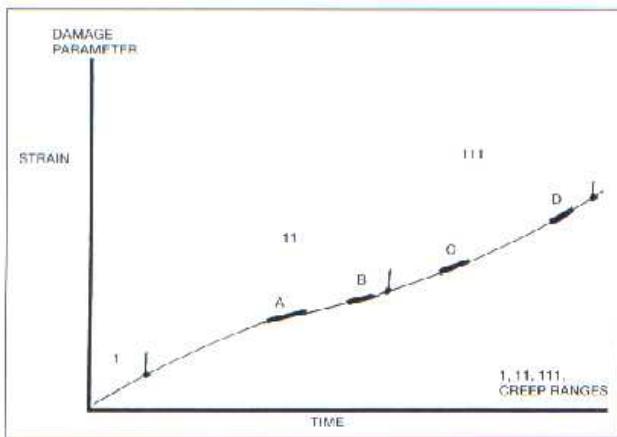
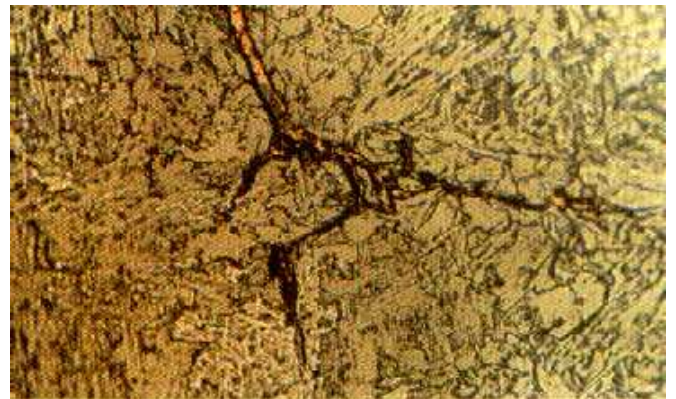


FIGURE 2
Typical creep graph for boiler steel

Using these and other analytical techniques, JOHN THOMPSON engineers can establish the metallurgical condition of materials and relate this to life cycle data such as creep graphs etc. (FIGURE 2)



Failed boiler tubing showing copper intrusion

JOHN THOMPSON's extensive materials testing facilities at Bellville enable detailed failure analysis to be carried out using the latest laboratory techniques. This includes material analysis, tensile testing and metallographic examination, which can be used to pin-point micro defects in materials not otherwise detectable.

JOHN THOMPSON appreciates that every user has problems peculiar to their own environment but the depth of knowledge and experience accumulated by the personnel at JOHN THOMPSON, together with the analytical techniques developed by us in Africa, for use in African scenarios puts us in a unique position to provide advanced technological backup to our clients. To take advantage of these services or merely discuss your problem, please contact us.

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