



**BUREAU
VERITAS**

FITNESS FOR SERVICE ASSESSMENT

Assessing Degraded Equipment for Continued Service

BUSINESS CHALLENGE

Through in-service degradation, or as a result of deficiencies in original manufacture, equipment is identified as being at risk of failure through cracking or overload.

The most economic Run/Repair/Replace decisions can only be made if a full understanding of the residual strength and life of the equipment is available.

SOLUTION

Bureau Veritas provides analysis services to determine the remaining integrity and life of degraded or defective equipment. This involves analysis of the equipment to determine the remaining strength capacity, based on detailed stress analysis and defect tolerance assessment. Then, combined with data on the rate of ongoing degradation, the remaining safe life can be identified. Detailed calculation of stresses may be undertaken using in-house Finite Element Analysis (FEA) capability and may be supplemented with in-situ stress measurement using strain gauge techniques.

Where components are cracked, computer based defect tolerance assessment will indicate whether the equipment is at risk of sudden failure. In addition, with knowledge of the stress fields in the crack region, it is possible to predict the rate of fatigue crack growth to indicate remaining service life.

Statistical methods may be applied in cases involving distributions of damage (for instance, thinning or pitting), to identify extreme values of damage from a sample of data and to characterise trends in the degradation.

WHY CHOOSE BUREAU VERITAS?

Recognition Founded in 1828, Bureau Veritas is a world leader specialising in conformity assessment services related to Quality, Health, Safety & Environment (QHSE). Certified to ISO 9001 for all of its activities globally, Bureau Veritas is well known for its ability to adapt to changing client environments and situations and for its commitment to providing leading solutions through quality service.

Knowledge & Expertise Through expert local teams and technical knowledge, Bureau Veritas are able to deliver packaged and targeted solutions and information, to support our clients' unique business requirements.

Network With a global network of over 900 locations in more than 140 countries, Bureau Veritas provides tailored solutions to clients throughout the world across a diverse range of industries.

RELATED SERVICES

- FEA to calculate stress profiles in operating plant and to evaluate design or operational changes
- Engineering for Non Intrusive Inspection campaigns
- Strain Gauging for in-situ stress measurement
- Metallurgical analysis and characterisation
- Mechanical testing of materials properties
- Advanced NDT technologies
- Failure analysis

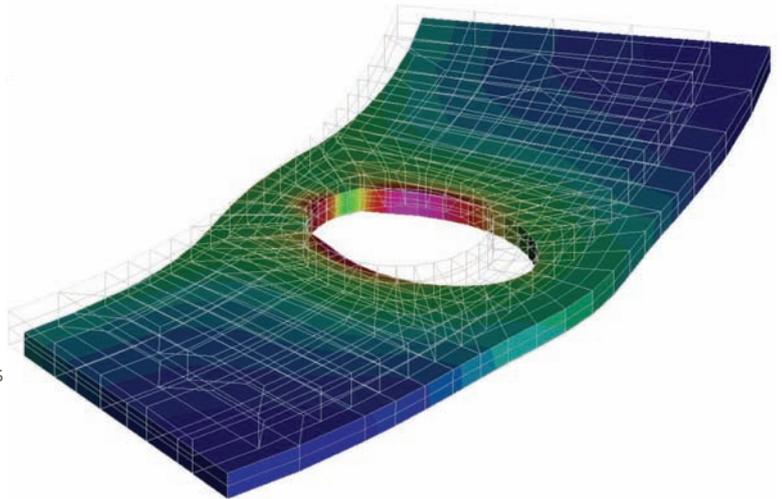


OUR APPROACH

Engineers in our Melbourne and Adelaide offices provide specialised engineering assessment services. We offer in house capability for Strain Gauge measurement, FEA, and defect tolerance assessment.

All work is performed to recognised standards and thoroughly documented. Our knowledge and experience includes damage mechanisms of cracking, thinning and creep.

The damage analysis is supported in-house with competent inspection, materials analysis and advanced NDT methods.



FAQ – FREQUENTLY ASKED QUESTIONS

What is the recognised method of assessment of cracked equipment to determine whether it is safe for continued operation?

A number of standards (Australian, US, British) now allow continued operation of equipment containing cracks on the condition that an appropriate fitness for service assessment is conducted by a competent body.

Technical Software has been developed in accordance with the more quantitative standards for FFS assessment to reliably calculate defect tolerance and failure mode. This allows competent engineers to determine compliance with the standards and provide auditable documentation of the analysis.

CASE STUDY

A ball mill operating in a Queensland gold mine had experienced cracking due to mill shell door openings.

Using FEA, it was determined that the cracking was due to fatigue from cyclic operating stresses and that this cracking would continue to reappear if repaired. Modifications to the door openings were designed and analysed and an acceptable fatigue life of over ten years was achieved.

Internal thinning of CO₂ absorbers in a South Australian gas plant was determined to underwrite continued operation of the plant. The assessment included characterisation of the thinning and establishment of re-inspection intervals.

CONTACT

For details about this service, please contact Asset Integrity and Reliability Services

Phone Australia:

Newcastle: + 61 (0) 2 4967 2788

Perth: + 61 (0) 8 9481 0100

Melb HQ: + 61 (0) 3 9922 0700

FOR MORE INFORMATION

Please Visit: www.bureauveritas.com.au

Email: bvaus@au.bureauveritas.com