Durability testing and evaluation of life expectancy

Legal regulations and increasing competitive and cost pressures mean that operators of industrial plants have to face considerable challenges. How can a good balance between safety requirements and the need for maximum plant availability be achieved? Both factors, safety as well as availability, are determined by - among other things - the way operation influences the materials from which the plant is made. Careful and systematic assessment of the condition of these materials is essential in order that operators can prepare for upcoming repair work and avoid unwanted downtimes.

As early as the installation stage, plant quality tests (so-called pre-service assessments) are recommended, which will then serve as a basis for inspections over the entire plant lifetime. In particular, the new generation of 600° C and the planned 700° C power plants need to be comprehensively assessed before operation begins.

Many questions must be answered in connection with lifetime assessment and evaluation. Which components can be expected to suffer safety-relevant damage or damage that can impact on operation? Which test methods can be used to detect such damage at an early stage? What assessment and comparison criteria are available in order to evaluate findings and form a basis for decisionmaking and appropriate actions?

TÜV NORD - Making our world safer.

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Our services

The following mechanisms combine in different ways to cause damage to plant components:

- Material fatigue caused by overloading and/or vibration,
- Material loss through corrosion, abrasion, erosion etc.
- Change of material characteristic values through thermal overload,
- Long-term creep as a result of thermal loading over an extended period in association with mechanical stresses (e.g. internal pressure),
- Additional loads not taken into consideration in the design, and plant operation which is not according to plan (operating parameters).

We provide a wide range of services for plant endurance testing and evaluation - for new installations and throughout the lifetime of the plant:

- Non-destructive testing
- Geometric component measurement (wall thickness, circumference, cross-section)
- Metal testing
  - Surface condition and structure assessments (surface impression/replication method)
  - Evaluation of the microstructure, using optical and scanning electron microscopes as appropriate
  - Investigation of damage, material sampling as appropriate
- Advisory services
  - Recording of the current state of plant and equipment
  - Safety-related assessment (e.g. stress analysis of pipelines)
  - Evaluation of test results (in cooperation with the TÜV NORD Accredited Inspection Body acc. BetrSichV)
- Development of individual testing and inspection concepts and programmes

The benefit to you:

- Targeted tests where they are needed
- Early identification of weak points
- Planned action based on secure findings
- Reliable statements and test results
- Better availability of your plant and equipment
- Safety and availability of industrial plant

Our expertise:

- Many years of experience (accredited and certified)
- Knowledge of many different industry and product sectors
- Direct access to further areas of specialist knowledge (Engineers from the fields of materials/welding technology, materials testing, NDT, large-scale power plants, material and plant design and calculation, strength analysis and fracture mechanics, also damage assessment and analysis)
- Available when and where you need us

We would like to hear from you.
Why not contact us.

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