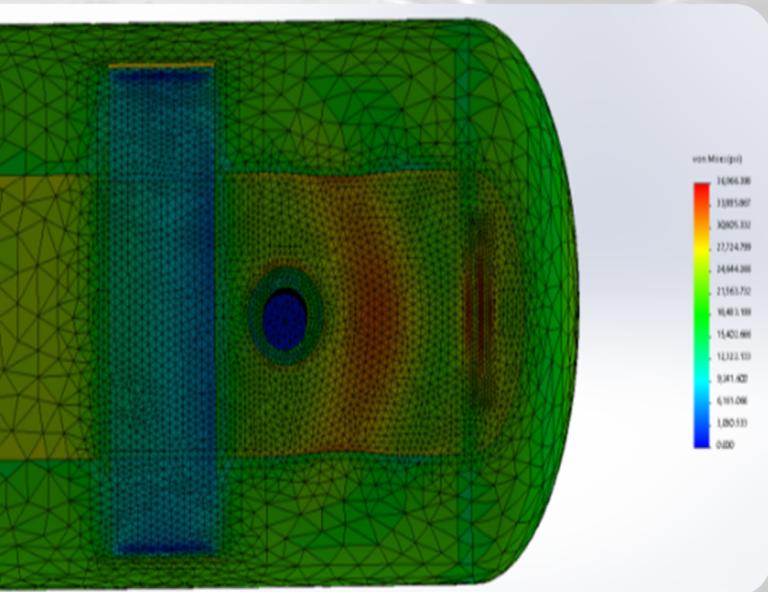


## Completion of In-Service Inspections of Pressure Equipment During Catalyst Unloading to Save Time and Money.

**CANEIL** provides multi-ticketed inspectors (API/NDT) to conduct internal inspections of pressure equipment in inert atmospheres. By collaborating with the catalyst handling team, these inspections are performed efficiently without the need for scaffolding, rope access, or excessive personnel in confined spaces. This streamlined approach minimizes delays, allowing vessel loading to begin promptly, preventing reactors from becoming a critical path during outages.

Any defects or conditions affecting the vessel's integrity are identified during unloading, providing additional time for repair planning, mobilization, or fitness-for-service (FFS) assessments if needed. Third-party inspection ensures that repairs or alterations meet the owner's specifications, maintaining transparency and avoiding conflicts of interest.

This comprehensive process enhances safety, reduces downtime, and ensures vessel reliability during critical operations.



- With in house Fitness for Service (FFS) and Finite Element Analysis (FEA) assessments can be completed quicker to prevent the need for repair.
- With Engineering working directly with the inspectors rework is prevented
- Final reports are provided after the lower head is inspected so vessel closures can be signed and loading can commence.
- Minimal inspection crew size typically three inspectors with 24 hour coverage.
- All NDE may be completed in an inert environment
  - UTT - Ultrasonic Testing Thickness Readings
    - Cladding Thickness
    - Shell / Head Material Thickness
    - Cladding Dis-Bondment Checks
  - UTSW - Ultrasonic Testing Shear Wave
  - PAUT - Phased Array Ultrasonic Testing
  - LPI - Liquid Penetrant Inspection
  - MPI - Magnetic Particle Inspection
  - Copper Sulphate - Cladding Degradation
  - PMI - Positive Material Identification XRF/LIBS
  - HT - Hardness Testing

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A Tradition of Excellence in Providing Complete Asset Integrity

## Engineering Services:

- Risk Based Inspection (RBI) Assessments
- Process Circuitization Development
- Failure Mode and Damage Mechanism Analysis
- Remaining Life Assessments
- Overpressure Protection by System Design (OPPSD) Assessment
- Over Pressure Risk Assessment
- Welding Procedure Review and Development
- Reliability Engineering Support for Multiple Disciplines (Mechanical, Process, Civil and Electrical/Instrumentation)
- Design, Alteration and Repair
- Equipment Re-Rating
- Fitness-for-Service
- Stress Analysis
- Integrity Management Services
- Inspection and Test Plan Services
- Corrosion Mitigation
- Material Selection
- Project Management
- Pipeline Risk Assessments
- Visual Inspection and NDE Report Quality Review
- Corrosion Under Insulation (CUI) Assessments and Programs

## Non-Destructive Examination (NDE):

- **Conventional NDE (MT/PT/UT)**
  - Magnetic Particle Inspection (MPI)
  - Liquid Penetrant Inspection (LPI)
  - Ultrasonic Thickness Testing (UTT)
  - Shear Wave Ultrasonic Testing (SWUT)
- **Advanced Ultrasonics**
  - Phased Array (PAUT)
  - Time of Flight Diffraction (TOFD)
  - Automated Corrosion Scanning (AUT)
  - Hydroform Corrosion Scanning
  - Guided Wave Ultrasonic Testing
  - Short Range Guided Wave Inspection
- **Other Advanced NDE**
  - Tubular Inspection (ET/RFT/NFT/MFL)
  - Surface Eddy Current Inspections
  - Pulsed Eddy Current (PEC)
  - MFL Tank Floor Scanning
- **Material Testing**
  - Hardness Testing
  - Ferrite Testing
  - Positive Material Identification
    - X-ray Fluorescents (XRF)
    - Optical Emissions Spectrometry (OES)
    - Laser-Induced Breakdown Spectroscopy (LIBS)

## Visual Inspection Services:

- API 510 Inspections (Pressure Vessels)
- API 570 Inspections (Pressure Piping)
- API 653 Inspections (Above Ground Storage Tanks)
- API 1169 (Pipeline Construction Inspections)
- API 1184 (Pipeline Facility Inspections)
- API 982 (Refractor Inspections)
- Power and Heating Boiler Inspections

- National Board In-Service Inspectors
- Fabrication/Repair Quality Surveillance
- NACE Coating Inspections (Level I, II and III)
- CWB/AWS Welding Inspections (Level I, II and III)
- Right of Way (ROW) Inspection and Vegetation Removal
- Remote Visual Inspection
- Aerial Drone Inspection

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