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CONDITION MONITORING SERVICES

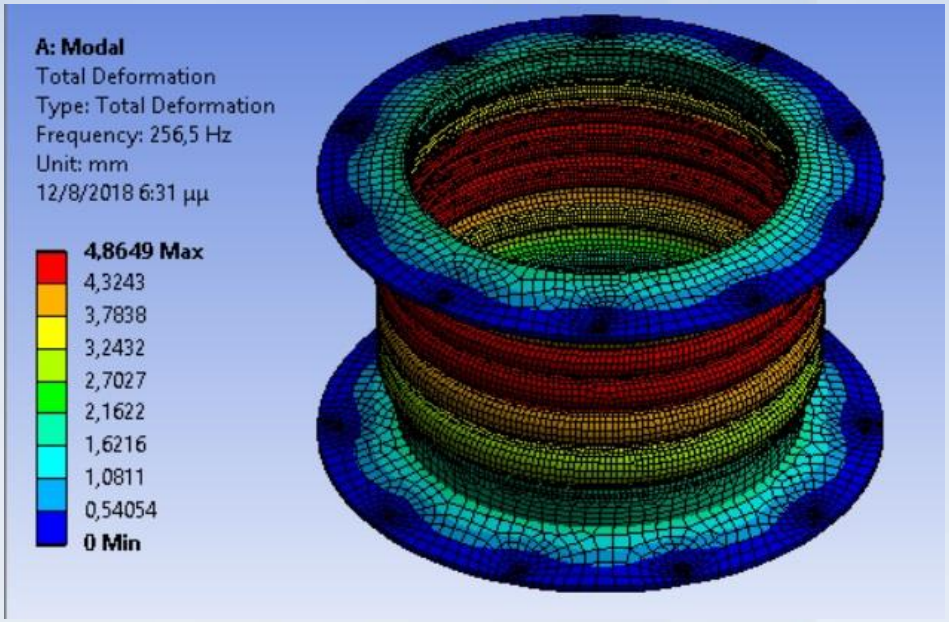
RECOGNIZED ABS SPECIALIST

Lloyd's Register

APPROVED SERVICE SUPPLIERS

Vibration Monitoring & IR Thermography

Finite Element Modeling and Dynamic Analysis of Vibration Related Structure Failures



Exhaust bellow failure case study

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Exhaust bellow failure case study

- Problem: Cracking phenomena in brand new exhaust bellow due to excessive vibrations
- Methodology:
  - Structure 3D modeling
  - Finite Element modeling and Dynamic Analysis (Modal)
- Information required: Geometry, Material

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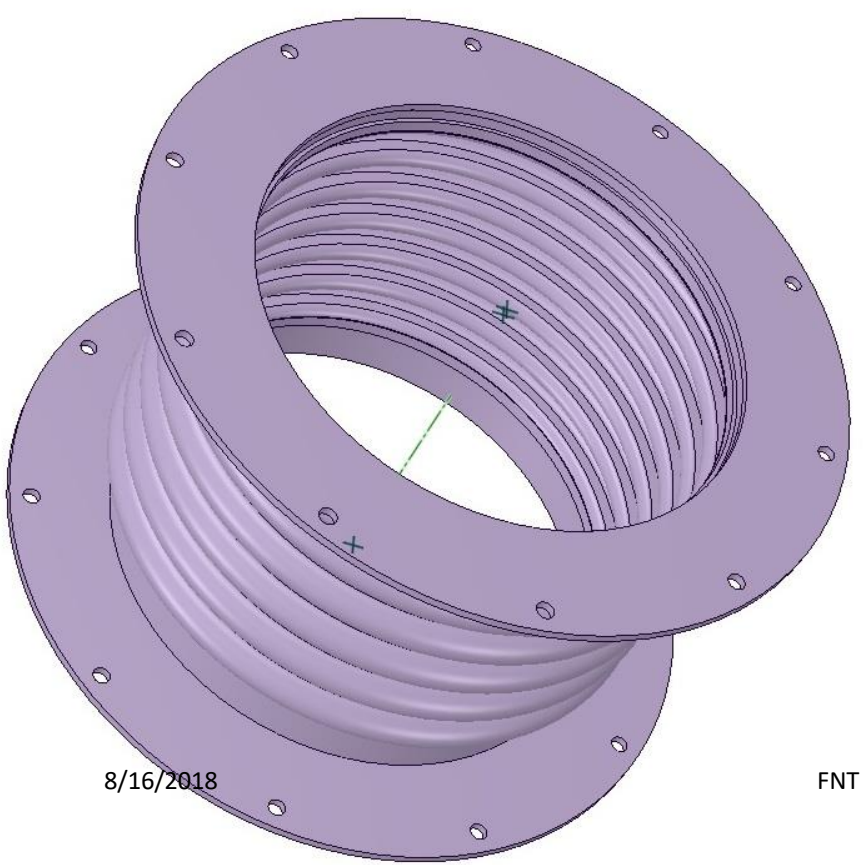
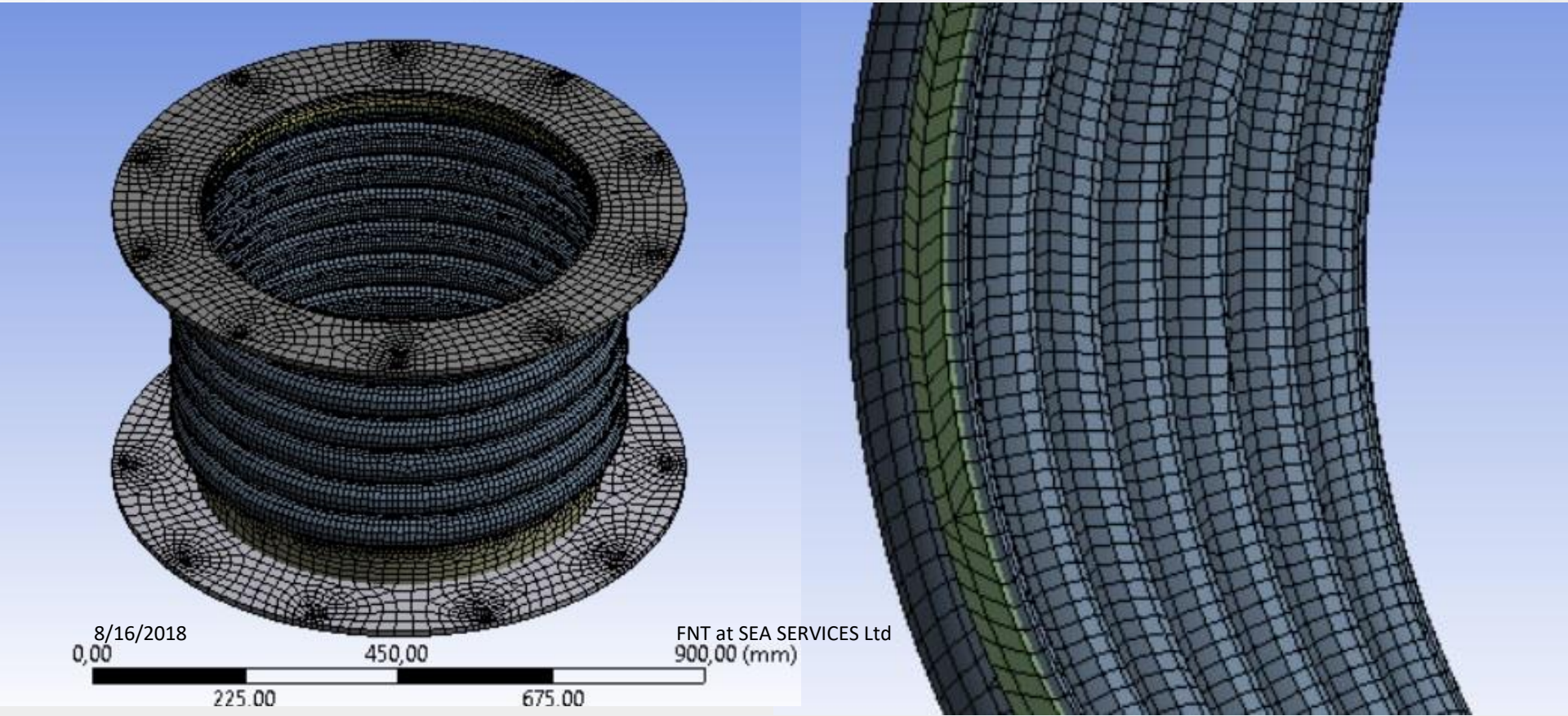
Structure 3D Modeling

- 3D modeling based on exact geometry



Finite Element Modeling - Meshing

- Optimized meshing quality for particular geometry



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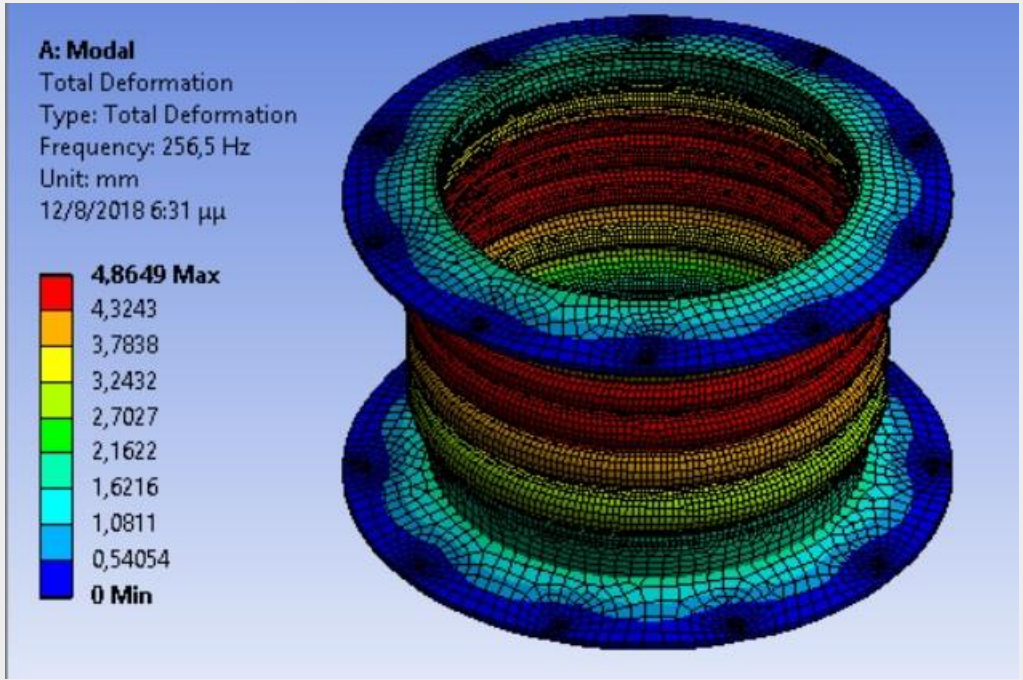
Finite Element Analysis

- Modal analysis is used to determine structure's vibration characteristics:
  - Natural frequencies
  - Mode shapes (shapes assumed by structure when vibrating at specific frequencies)



Solution

- Excitation frequencies matching calculated natural frequencies?
  - Yes: Action required!
  - No: Further analyses possible:
    - Pre-stressed modal analysis
    - Forced vibration analysis