

Engineering Services

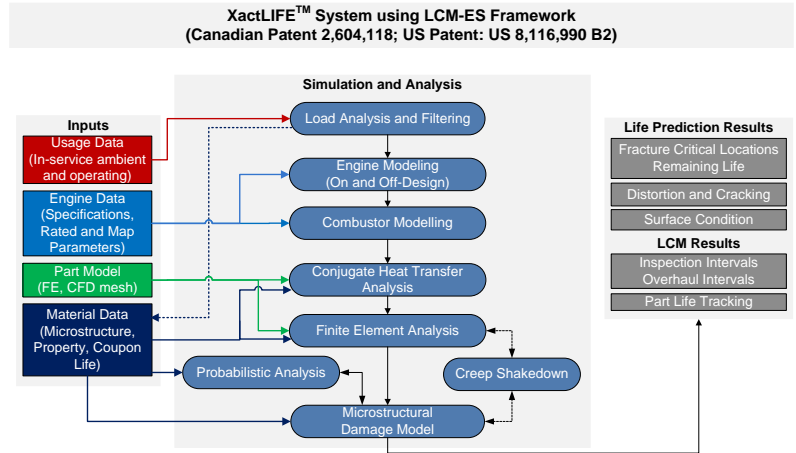
Patented Technology: CA 2604118/20, US 8,116,990 B2



Life Prediction Technologies Inc. (LPTi) offers customized engineering consulting services to gas turbine life cycle managers, MROs and designers as well as users of other complex engineering systems using advanced simulation and analysis techniques. The physics based XactLIFE framework uses military standard guidelines for temperature prediction, structural analysis and damage evolution enabling quantitative residual life assessment (RLA) of critical parts as a function of actual usage to provide an alternative to OEMs recommendations. Component design changes can also be assessed using this framework. LPTi offers a range of specialized engineering services to several industrial sectors.

Benefits

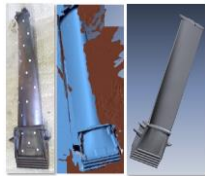
- RLA of failure critical parts under actual/intended usage, predictive analytics and risk assessment using probabilistic analysis
- Predictive maintenance based planning/assessment for improved operational readiness and reduced ownership costs
- Up front asset reliability assessment using limited usage and failure data
- Customized analytical services to guarantee uptime and asset availability at a fixed cost
- Support MROs using predictive analytics at contract bidding stage
- Accurate residual value analysis as an alternate to selling at net book value



Simulation and Analysis

Reverse Engineering and CAD Modeling

- Reverse engineering of components on-site using handheld laser scanners, off-site using CT scanning
- Point Cloud generation, Model cleaning and Parametric 3D CAD model generation

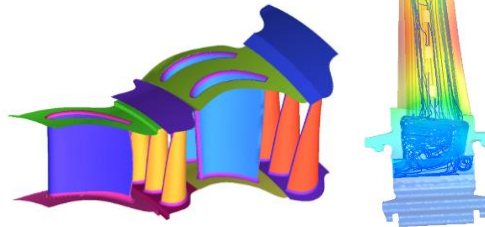


Load Severity Analysis

- Impact of different operational profiles and missions on the damage accumulation in failure critical parts are quantitatively analyzed
- Identify the operative load types, intensities and sequence and mapping them to select damage accumulation modes
- Adaptive thresholding and probabilistic analysis to provide sensitivity analysis and consider uncertainty of the operating parameters on load severity

CFD based Temperature Predictions

- Perform computational fluid dynamics (CFD) modeling and analysis of complex engineering systems with complicated geometry and fluid flow mechanisms
- Optimal CFD mesh generation with grid convergence
- Expertise in conjugate heat transfer, multiphase, particle tracking, fluid structure interaction

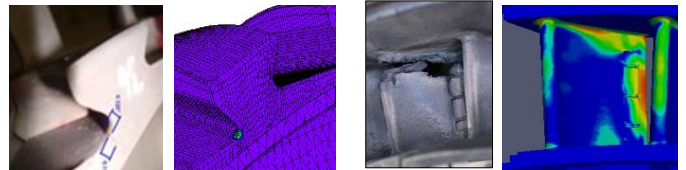


Structural Analysis

- Services including mechanical, thermal, coupled analyses using optimal mesh and accurate representative loads and boundaries
- Structural analysis considering material non-linearity and stress redistribution under creep shakedown to provide accurate stress-strain states
- Capabilities for performing dynamic analysis, fluid-structure interference (FSI) and transient analysis

Damage Modeling and Life Prediction

- Use validated damage models for creep, LCF, thermal and mechanical fatigue, CCG and FCG using material microstructure based constitutive laws
- Coupon level mechanical test results used for part level life prediction
- Actual usage based life prediction to identify the fracture critical locations and time to crack nucleation and growth for safe life and damage tolerance assessment

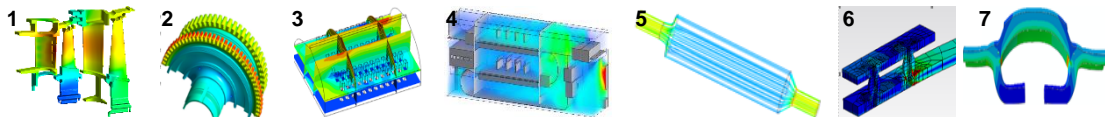


Component Level Validation

- LPTi uses world class facilities that are resident at the National Research Council of Canada (NRC) to conduct material, coupon life and qualification tests as required [ISO 9001 certified, ASTM]
- Validations of the simulation results are performed at different levels like system level engine performance to part level like rig test and field observations

Industries Served

1. Aerospace
2. Power Generation
3. HVAC & Building
4. Industrial Product
5. Automotive
6. Avionics
7. Marine or Nuclear



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