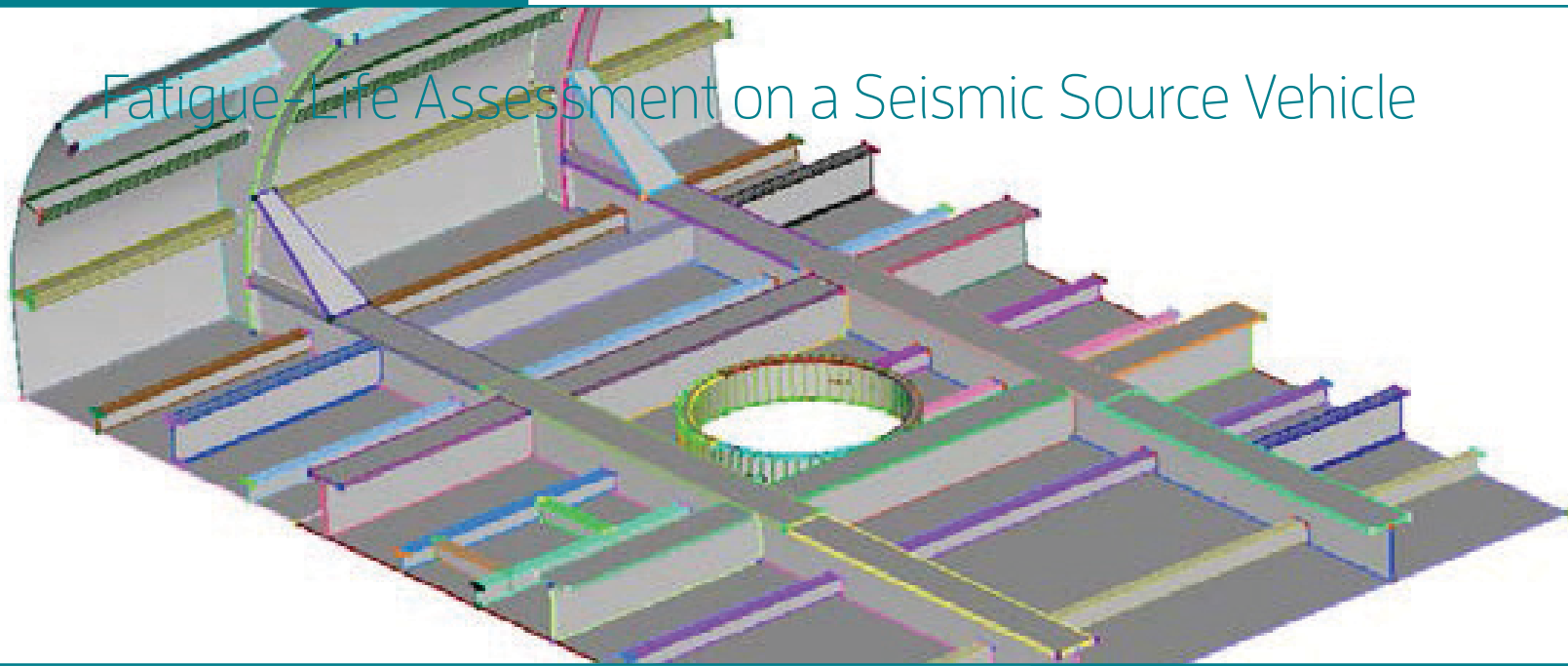


# Fatigue-Life Assessment on a Seismic Source Vehicle



## Case Study

### OVERVIEW

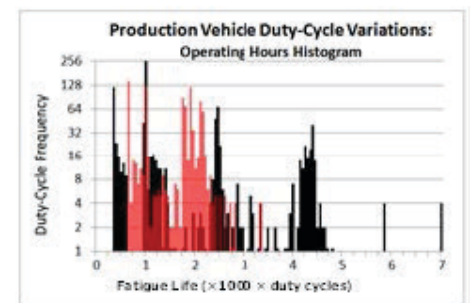
Inova Geophysical manufactures the UNIVIB™ (PLS-326) small vibrator vehicle used for vibroseismic operations during oil and gas exploration. ATA provided operational test services for three variations of the UNIVIB vehicle. Over the course of multiple days, the vehicles were driven over a rigorous course to simulate various operational conditions while a robust SoMat data acquisition system was employed to acquire critical strain and acceleration data. Data was reviewed in near real time to quantify the severity of the events and make qualitative assessments on the integrity of the various vehicle configurations. ATA's support proved valuable in validating the robustness of the vehicle design and ensuring that Inova's customers receive the highest-quality vehicle products that minimize maintenance and maximize productivity during their extensive exploration operations.

### TASKS PERFORMED & KEY INNOVATIONS

- Close collaboration with Inova to develop a detailed test plan.
- Installation, calibration, and verification of all strain gage and accelerometer instrumentation on three UNIVIB variations at Inova's production facility.
- Performance of all operational test run sequences simulating field-operational conditions—both normal and harsh operational events.
- Postprocessing of test data with MATLAB and Siemens I-deas software, including data conditioning, filtering, and strain-to-stress scaling.
- Use of I-deas Durability software to conduct rainflow counting and fatigue-life prediction using the linear damage rule (Miner's rule) for each of the measured strain time histories.



ATA's portable HBM SoMat data acquisition equipment was used for rigorous onboard test applications



Operational test events were expanded into hundreds of simulated duty-cycle combinations to assess fatigue life