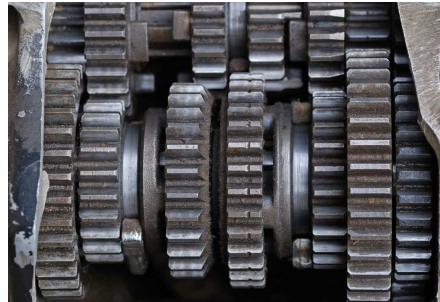


Allen Gears

Gearboxes for Power Generation & Marine Industries

End of Line Production Test Facility
Advanced Engineering and Signal Analysis Usage



Ian Foxley, MEng MSc AMIMechE, Research & Development Engineer
For and on behalf of Allen Gears



Allen Gears is a designer and manufacturer of gearboxes for the Power Generation industry (Steam Turbine, Gas Turbine Generator Sets, Oil & Gas, and Hydroelectric power, Marine Propulsion and Wind and Tidal Energy). The company was first founded in 1948 as part of WH Allen Sons & Co Ltd, before being amalgamated into Allen Power Engineering in 1968, and then Rolls-Royce Industrial Power in 1989; finally the company had a management buyout in September 2008. Allen Gears also has a Services subsidiary on the same site which services and re-engineers both Allen Gears and non Allen Gears gearboxes in being used around the world.

www.allengears.com

Allen Gears Industrial Gearboxes

Introduction

OR36 16 channels

- Made for the field
- Rugged
- Rough
- Reliable
- Portable



NVGate

- Modern and user-friendly software with specific modules:
- Synchronous Order
 - FFT
 - Recorder
 - 1/n Octave modules

We use an **OROS OR36** analyzer and **NVGate software** as an integral part of our production critical end of line test facility. We also use NVGate software licenses within our Advanced Engineering Department to analyze investigative data taken from gearboxes in the field. This data can be produced by numerous manufacturers' analysis equipment and NVGate enables us to import it as a text or universal file format so that we can make full use of NVGate's powerful analysis modules.

End of Line Production Test Facility OR36 and NVGate Usage

At our end of line production test facility we conduct no load and low load full speed tests of production and services gearboxes. We also conduct loaded back to back tests of gearboxes and run down tests to API (American Petroleum Institute) 613.



We have recently updated the FFT analyzer from taking one channel of signal data at a time to now using the full 16 channels of the OROS OR36 and NVGate Software synchronously. The OR36 analyzer and NVGate is an integral part of a new end of line production testing facility. OROS works alongside a data logging system taking temperatures, pressures, flows and speeds, and a report compiler software taking the output from NVGate and the data logger to produce a report to the customer.

Fig. 1: The OROS OR36 and NVGate in use at our end of line production test facility

The OR36 is used to capture:

- Eddy Current Probe shaft vibration spectra & 1st order shaft rotation orbits
- ICP Accelerometer casing vibration spectra
- Sound Pressure Level Spectra and Octaves
- Time data recordings

In order to capture this data we use the Synchronous Order, the FFT, the Recorder and the 1/n Octave modules. **The analysis modules have proven to be very robust and powerful.**



We use the macro writing capability within NVGate to automate the collection of data for our Test bay staff. The level of automation available has simplified the test engineers task significantly, enabling them to focus on the test output and quality of the product.

We use the NVGate report writing function along with a Microsoft Word Visual Basic Program to compile test reports of Spectra, total levels and marker values from the OR36 with the output of the data logger producing a test report to the customer. This has proved to be a successful and robust solution.

Fig. 2: Shaft Displacement Screen with Macro Buttons

For the majority of our testing we take FFT data at steady state conditions; however we do conduct system accelerations and run downs making use of the tachometer inputs. We use the Synchronous Order Module and waterfalls with color maps to conduct these run up and run down tests to API 613.

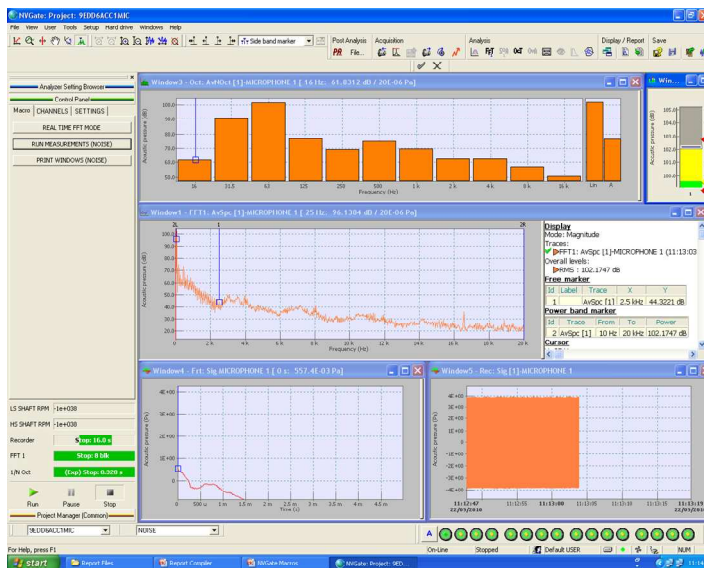


Fig. 3: Microphone SPL Screen with Macro Buttons

The 16 channel capability of the OR36 coupled with the extensive **NVGate analysis modules and macro capability has enabled us to increase testing efficiency dramatically.** With the additional report printing function we have been able to output the NVGate testing results along with test log results from our data logger and produce an in-house programmed automated test report compiler to produce a report for the customer. The OR36 analyzer and NVGate software has enabled us to produce a bespoke data testing system for the end of line production test facility, which because it is programmed in house and uses standardized hardware and software. It is future proofed to the companies testing needs.

Advanced Engineering NVGate Signal Analysis Usage

The Advanced Engineering department analyze shaft vibration, shaft orbit, casing vibration and microphone noise data from customer's gearboxes at their sites located all around the world. This data could have been captured on devices produced by other NVH equipment manufacturers, NVGate enables us to import text and universal file format signal files so that we can fully interrogate the data.

The Synchronous Order, FFT and 1/n Octave modules along with waterfalls, colour maps, and orbit analysis available in NVGate have proven to be powerful tools, and enable us to fully investigate vibration and noise issues on our gearboxes in the field.

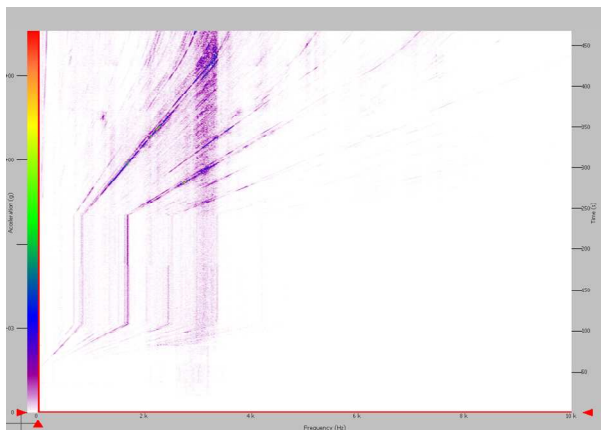


Fig. 4: Typical Investigative Color Map of a Gas Turbine Gen Set Run Down

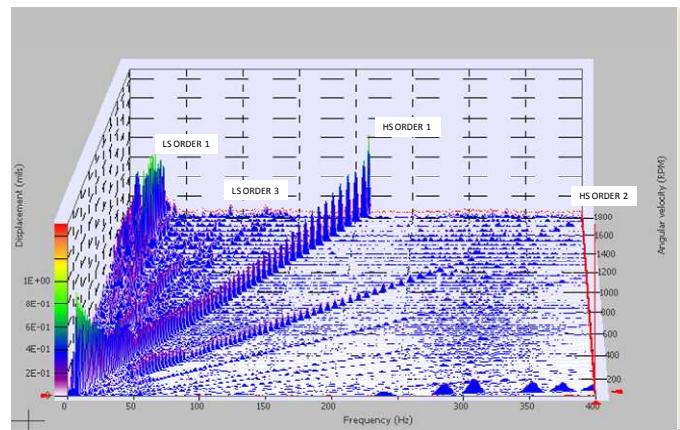


Fig. 5: Typical API 316 Waterfall of a Gas Turbine Gen Set Run Down

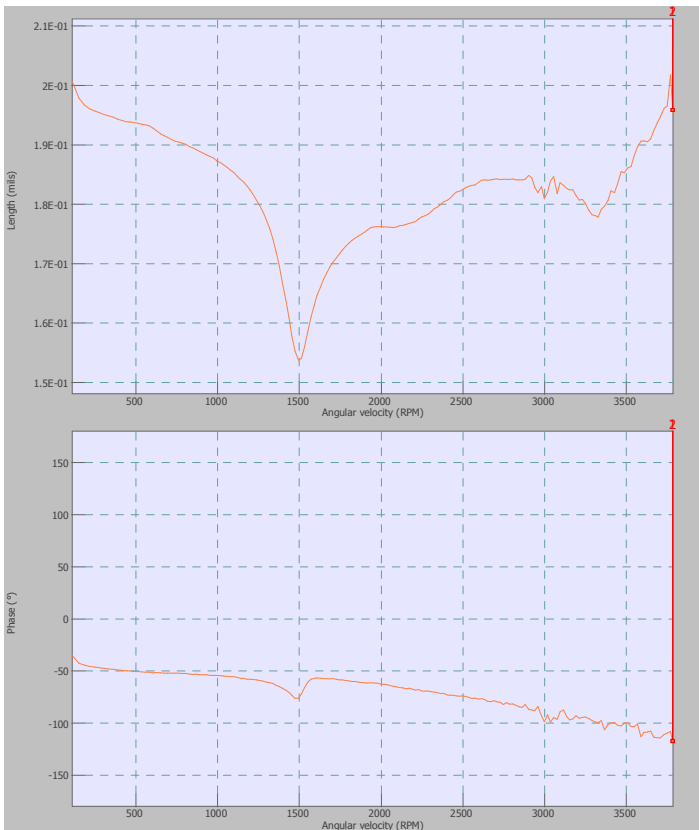


Fig. 6: Typical API 316 Synchronous Order Amplitude and Phase Plots of a Gear Box Run Down

The OROS NVGate software and OR36 hardware have proven to be very powerful and robust tools in what can be pressurized situations for both our end of line production test facility and investigative analysis within our Advanced Engineering department. The OROS OR36 and NVGate provide a very competitive product and OROS themselves have given us a very good level of support.

OROS, Leadership through Innovation

About Us

For over 25 years, OROS' designs and manufacturing have been renowned for providing the best in noise and vibration analyzers as well as in specific application solutions.

Our Philosophy

Reliability and efficiency are your ambition everyday. We know you require the same for your measurement instruments: comprehensive solutions providing performance and assurance, designed to fit the challenges of your demanding world.

Our Emphasis

Continuously paying attention to your needs, OROS collaborates with a network of proven scientific affiliates to offer the latest of the technology, always based on innovation.



Worldwide Presence

OROS products are marketed in more than 35 countries, through our authorized network of representatives, offices and accredited maintenance centers.

Want to know more?

| | |
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