



# Mimic saves over \$3,000,000

## Challenge

- A major cruise line operator had a population of around 150 large turbochargers. Of these, just under 100 were of a particular make and design and due to reasons unknown, an average of four of these failed catastrophically each year.
- The financial cost to the company was approximately \$1,000,000 per year but this did not take into account the hidden costs of dissatisfied passengers, or the very real risk of injury to crew and/or an increased fire risk that could endanger the whole vessel.

## Solution

- After conducting a failure modes and effects analysis (FMEA) James Fisher Mimic (JFM) designed and created a turbocharger monitoring unit (TCM).
- Data collection involved vibration signatures, gas inlet and outlet temperatures, scavenge air pressure and rotor speed.
- The units were made with the following capabilities:
  - Automated, self-contained and remotely accessible (both on-board and off the ship).
  - Able to identify rotor deterioration and to indicate this immediately to the vessel's control room watchkeepers.
  - Indicate to nominated personnel ashore whenever a turbocharger alert was initiated.
  - Self-monitoring, such that any failed sensor, inaccurate speed signal, or loss of hard drive had to be flagged to both on-board and shore side users.

## Results

- JFM successfully designed, developed and commissioned the TCM units.
- The units correctly identified the early onset of failure on six occasions within the first 12 months of operation. In following years, a further eight failures were prevented.
- No failures, other than two due to foreign object damage went unreported and the success of the system resulted in an estimated savings in excess of \$3,000,000.
- The 22 units installed across the 100 turbochargers continue to operate and provide early warning, avoiding catastrophic failures.