



Case Study: Million Dollar Decision

You own a gas turbine that would cost \$9 m (USD 6 m) to replace; you know that it has been mishandled and that the bearings may be damaged as a result. What do you do?

- A Install it, run it and hope that it's ok;
- B Air freight it back to the depot and replace the bearings, cost \$700,000; or
- C Something quite different.

As a responsible asset owner you report the mishandling to your insurers. What's their response:

- "If the bearings are damaged the transit insurance will respond and pay for the replacement of the bearing, but if there is no damage, there is no policy response, i.e. no payout";
- "By the way, thank you for advising use of the potential bearing damage, we hereby exclude any cover of bearing failures or consequential losses arising from a bearing failure under your machinery breakdown insurance"

So if you install the engine and run it, the insurer will not payout on any bearing related event, or consequential loss should one occur. If you air freight the unit back to the states and replace the bearings, the costs of that will be to the asset owner unless damage is proven.

Anecdotal evidence suggests that the engine will probably be ok, but do you want to role the dice on that risk, do you want to go forwards with a permanent exclusion on your machinery breakdown insurance?

The Solution

We did not know what forces were applied to the GT, but we could recreate the same conditions and measure the results. Using those results, we should be able to infer if the bearings are likely to be damaged or not. This concept was tested with the stakeholders concerned and GE, and from that a testing plan was developed to rule out as far as possible any possibility of bearing problems.

What followed was a large scale experiment where a dummy load was built, installed in the shipping can (container) with multiple recorders fitted. The whole assembly was loaded on the same tractor/trailer that delivered the engine, and route was run three times.

The results were analyzed and sent to GE for comment. GE stated, that based on the recordings, that bearing damage was unlikely. Additional precautions were taken after the unit was installed in the form of specific vibration analysis and daily oil testing. On the conclusion of this exhaustive programme the underwriter agreed to remove the

bearing exclusion from the policy, and the unit was returned to unrestricted service. This unit has shown no signs of bearing distress to the present day.

The Costs

The cost of shipping the unit back to the US and replacing the bearings was in the order of \$700,000. During the period that the engine would be away, the lease engine would have cost the owner around \$400,000.

The actual costs of running the trial, subsequent analysis and special recommissioning tests, all came to less than \$50,000.

An innovative, creative solution to a painful expensive problem? We think so!