



## Abstract

### Session 41: Pulsations & Vibrations II

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#### Title

**41-3: Torsional Vibration Case Study Highlights Design Considerations**

#### Summary

A large compressor installation in a remote location of Russia experienced rapid crankshaft failures. Due to the very high costs and logistics involved, a root cause failure analysis was conducted. Field measurements obtained at site identified an unexpected situation where the first two torsional natural frequencies (TNFs) occurred at essentially the same speed. This resulted in a double resonance condition – something very rare in the field of Torsional Analysis. Detailed modeling using the field data confirmed the cause of the failure and was instrumental in finding a quick solution.

This technical paper highlights a number of important considerations for the torsional system in new or revamped compressors, as well as design philosophies to assess and mitigate the risk of torsional failures.

Referring to the following subjects: Vibration, Drive Train, Compressor Design