

Forced outages – Cost implications

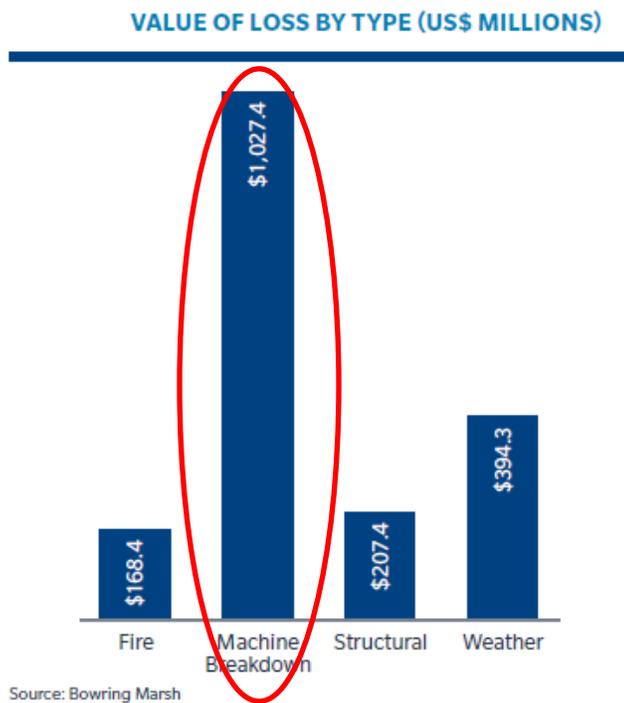
Industrial Data Analytics

Introduction

Most industries follow best practices in Operations and Maintenance. Various RCM techniques are adopted to maintain high reliability of critical equipment.

Despite adopting various best practices and RCM techniques, many industries experience failure of expensive equipment often resulting in significant losses.

Typical cost of failure/year



Cost of Forced Outages

- Cost of Replacement of Parts*
 - Failure of critical components may have a cascading effects on upstream or downstream systems
- Cost due to loss of Generation / Production
- Cost due to any associated penalties
- Cost due to increase in insurance premiums
 - Typical cost of insurance is around 1-1.5% of insured value and could usually be of the order of \$200-300k USD/year
- Cost due to delay in restart (depends on the availability of Spares)
 - Delivery lead time for big equipment like GT, Generator and Transformers etc. is ~12 months. For boilers it is higher.
- Safety Concern
 - Failure of high energy equipment => Accidents

Cost of failure of any critical equipment in power or process industries usually runs into millions of dollars

“Electric Power Research Institute (EPRI) estimates the cost benefit of preventing a failure of a GE 7FA or 9FA gas turbine compressor at USD \$10 to \$20 million”



Some reasons for failures

- Available RCM programs in the market do not look at live data on a continuous basis
- 'Condition monitoring' is often limited to rotating equipment
- Original Equipment Manufacturers often limit data analysis to their own equipment
- Setup of dedicated 'Reliability and Performance Analysis' centers is too expensive for individual plant owners
- DCS (Distributed Control Systems) are not equipped to understand complex correlations that exist between process variables.
- Some industries lack historians that can store and retrieve data for analysis

Anomaly Detection

Our software and solutions have the capability to detect anomalies at the onset and prevent catastrophic failures.

We employ hybrid modeling techniques that comprise of **Artificial Intelligence**, **Statistical methods** and **Thermodynamics** for anomaly detection.

Types of anomalies that can be detected by our software -

- Equipment Anomalies
- Process Anomalies
- Sensor Anomalies
- Data Anomalies

