

Marsh Specialty

Power Deep Dive: Asset Integrity Management

Energy & Power Risk Engineering





A suite of in-depth surveys conducted by specially qualified and experienced Marsh Specialty engineers, designed to provide a better understanding of risk quality and considered insights that result in risk recommendations that deliver real value to your business.

Transforming risk recommendation programs to ensure clients understand their risks and make informed decisions about mitigation and transfer.

What is an asset integrity management deep dive?

Developed in 2019, the deep dive survey is a focused, targeted (towards known areas of improvement) and collaborative exploration of a key issue in systems or processes. Focused critical thinking, beyond that applied during a standard risk engineering survey, emphasize strengths and opportunities for improvement.

The Marsh Specialty risk engineers who conduct these surveys are professionally qualified and experts in the specific area they conduct deep dive surveys.

Their knowledge and skill has been gained through significant practical experience in the power industry including an in depth understanding of the criticality of asset integrity and reliability across the major asset classes integral to the power industry.

Deep dives can be conducted as a stand-alone review or integrated with a general survey visit.

Generally, the in-depth examination takes one day, involving specific departments, field visits, and structured interview sessions.

Bowring Marsh case study (2016): A 100 megawatt (MW) steam turbine generator suffered a severe overspeed event.

The machine accelerated from 3,600 rpm to 6,000 rpm within 30 seconds, resulting in the complete destruction of the turbine and the generator. Solid steel parts of the machine were ripped apart by the centrifugal forces and spread across the turbine deck.

The turbine tripped due to an unknown condition within the hydraulic system, and the emergency stop (throttle trip) and governor valves did not close completely.

The emergency stop valve is designed to close 100%. In this case it remained open by less than one millimeter due to binding in the valve shaft.

One of the governor valves (not required to close tightly) also jammed due to valve stem issues. When the generator breaker opened, the small amount of steam was enough to overspeed the turbine.

Later, it was discovered that the valves had a history of being “sticky” and operations had a work around for this issue.

Why is an asset integrity management deep dive important?

Assets must perform effectively and efficiently to ensure safe and reliable operation, and achieve business objectives.

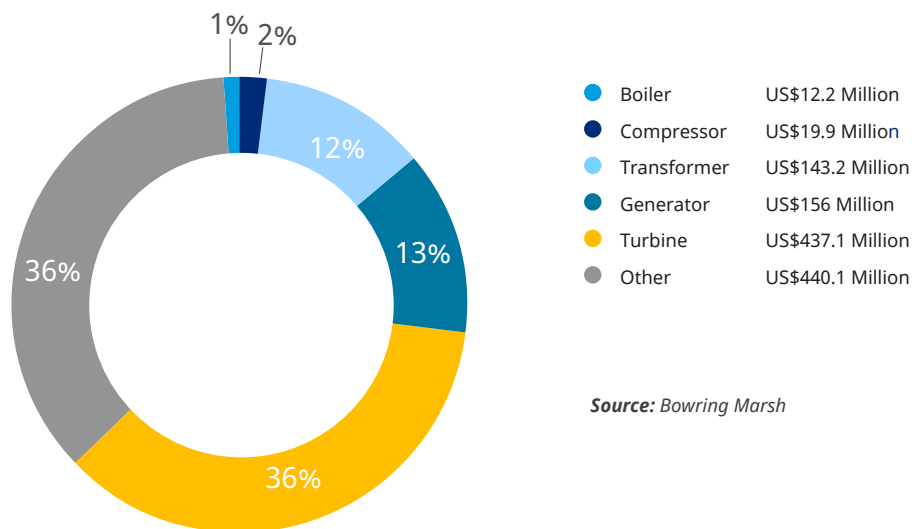
Asset integrity management is critical to ensuring an asset will perform all aspects of its intended function whilst protecting health, safety, and the environment.

The rigorous asset integrity management deep dive is a means to determine and ensure that the people, systems, processes, and resources which deliver asset integrity are in place, in use, and will perform when required, over the whole life cycle of the asset.

This deep dive allows businesses to improve their understanding of performance against the key metrics that have a correlation to losses.

Following the deep dive, Marsh Specialty will provide tailored insights and advice on industry best practices to positively impact the risk profile of the plant.

Equipment Loss by Value 2001-2015



Source: Bowring Marsh

How is a deep dive structured?

An asset integrity management deep dive is a focused review, drawing on the **plan-do-check-act** philosophy, assessing system maturity across seven key performance parameters:

The topics included in the deep dive are ranked and mapped on the basis of system and process maturity to provide a visual representation of our findings.

REVIEW

Review provides the mechanism for organizational learning and continuous improvement. Review and audit key performance indicators (KPIs) are established, tracked, and reported. Closing the loop is deemed critical to the success of learning.

SYSTEMS

Systems provide structured and controlled means of achieving certainty of outcome. Risk thrives in uncertainty.

PROCEDURES

Current, regularly reviewed, controlled documents, available and used. The value of procedures is understood, use of procedures is normal operating behavior and no critical activity occurs without a procedure.

DOCUMENTATION

Documentation not only supports a systematic approach to work but provides auditable evidence of the activity. It underpins audits and is a key element in retaining organizational knowledge.



IMPLEMENTATION

Systems and processes are fully implemented, maintained, controlled, and audited. Evidence of implementation should be widespread and implementation effectiveness is a KPI.

COMPETENCY

Competency is a core strength of the organization; response to emergencies are instinctive, well-rehearsed, and regularly refreshed. Competency assurance is inherent to all position qualification requirements.

TRAINING AND AWARENESS

Training and awareness are integrated into the organization's strategic fabric, the approach is pro-active and student-centric, with rich content. Training and awareness effectiveness KPIs defined, monitored, and reported.

It provides the business with an understanding of its resilience to loss, and allows you to:



Mitigate against potential losses and associated costs, including loss of production.



Protect against exposure of company personnel or third parties.



Reduce the risk of loss of containment of energy.



Reduce property damage and business interruption exposure.



Demonstrate the corporate approach to 'tolerance of risk' and enhance positive safety culture.

What is the output of an asset integrity management deep dive?

Undertaking an asset integrity management deep dive provides a risk-based approach to assess the **system**, **process**, and **people** aspects that are involved in ensuring the systems, processes, and behaviors involved in asset integrity management are **appropriate, implemented, active, and robust**.

On completion of the deep dive, the plant will receive a detailed report describing the strengths of the organization's asset integrity management, including tailored risk rankings and specific recommendations to address identified exposures.

This service can be customized according to the requirements in terms of both depth and length of assessment. Organizational resilience and strengthening barriers to loss are just two of the immediate benefits from an asset integrity management deep dive.

In addition, it strengthens the underwriting information providing an improved, risk engineering focused understanding of the site capabilities, which supports insurance placement.

For further information, please contact: riskengineering@marsh.com or visit the [risk engineering page](#) on our website.

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