

CASE STUDY — MARINE & OFFSHORE OPERATIONS

Loss of Position During a Dynamic Positioning Operation

Matter type	Property damage and business interruption claims following an offshore drilling incident, with cross-claims between the operator, the vessel owner and the control system supplier
Retained by	Counsel for the vessel owner
Issue	Whether the loss of position resulted from operator decision-making, a control system deficiency, or a failure combination the design was required to withstand
Role	Testifying expert — probabilistic risk and reliability analysis

Background

A dynamically positioned drilling unit lost station during operations, resulting in equipment damage and an extended shutdown. The control system supplier attributed the event to operator response during the escalation window. The operator contended that the system presented ambiguous information under a degraded condition and that the design should have tolerated the initiating failure without loss of position.

Scope of work

- Reconstruction of the event sequence from control system logs, alarm history, thruster and power management data, and bridge records.
- Event sequence diagram development and simulation-based reconstruction of the escalation, including branches that did not occur.
- Common cause failure assessment of the redundant power and thruster groups, testing whether redundancy delivered genuine independence.
- Dynamic probabilistic risk assessment of the operation, quantifying the likelihood of loss of position given the initiating failure.
- Analysis of the decision window available to the operator, and of what the interface presented during it.
- Review of the design-stage failure modes and effects analysis against the failure combination that occurred.

Findings

The initiating failure was within the class the system was specified to withstand without loss of position. Quantitative analysis showed, however, that a shared dependency between two nominally redundant groups meant the single initiating event degraded both — a common cause path that the design-stage failure modes and effects analysis had not identified. Simulation of the escalation established that the interval between the first indication available to the operator and the point of unrecoverable position loss was shorter than the response time the operating procedures assumed, and that the alarm presentation during that interval did not distinguish the degraded condition from a less critical one. The operator's response was consistent with the information presented. The loss of position was substantially more probable, given the initiating failure, than the design analysis had represented.

Deliverables and use in the case

- Quantified probability of loss of position under the as-built configuration, with explicit treatment of uncertainty.
- Event sequence diagrams and a simulation-based reconstruction suitable for presentation at mediation.
- Common cause failure analysis identifying the shared dependency and the point in design review at which it was identifiable.
- Rebuttal of the opposing expert's operator-error analysis, addressing its treatment of the available decision window.
- Deposition testimony.

WORKING WITH FORWARD THINKING

How We Support Counsel

Early case assessment	A candid technical read before you commit to a theory. If the engineering does not support the claim or defense, we say so early, while that information is still useful and inexpensive.
Data preservation	Log files, condition monitoring archives and control system records overwrite on a schedule and are frequently lost before anyone asks for them. We identify what must be preserved, and how, in the first days of a matter.
Defensible methodology	Our methods are published and peer-reviewed rather than developed for the case. Models are delivered in reproducible form, with assumptions and uncertainty stated — the standard Rule 702 actually asks about.
Clear communication	Quantitative results are translated into terms a judge and jury can follow, without losing the precision that has to survive cross-examination. Uncertainty is stated plainly rather than hidden in a point estimate.
Rebuttal work	We are frequently retained solely to evaluate an opposing expert's risk, reliability or causation analysis, and to identify where the conclusions outrun what the model and the data actually support.
Conflict checking	Prompt conflict clearance and a written engagement scope before substantive work begins.

Practice areas

Energy, power and utility infrastructure · Industrial equipment failure and maintenance adequacy · Marine, offshore and autonomous systems · Cyber incidents and business interruption · Root cause and complex system accident analysis

Discuss a matter

Initial consultations to determine whether a matter is within our expertise are without charge. Contact us with the case posture, the technical question at issue and your key deadlines.

Tara Parhizkar, Ph.D., P.E. · 310.408.6750 · expertwitness@forwardthinkingsolution.com · www.forwardthinkingsolution.com

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