



Trident

Human Factors Assessment of Well Control

Increasing safety and productive time by improving the human factors of decision making and team performance



TRIDENT ADVANTAGES

Broad-spectrum human factors risk assessment:

- kick detection
- hydrostatic pressure management
- pore pressure monitoring
- pit management

Unique focus on cognitive issues that impact decision making and team performance

Increased safety and productivity

Improved decision-making quality and timeliness

Founded in human factors science and risk management barrier analyses

Assessor expertise in:
Drilling management
Human factors
Military human-system integration

Pacific Science & Engineering Group, Inc.

HTK International, Inc.

Lloyd's Register Drilling Integrity Services

Trident® is a broad-spectrum assessment tool for evaluating human factors risks in well control. Trident locates previously hidden sources of human error in procedures and technologies, identifies risks, and recommends improvements to minimize those risks. Because human factors are involved in most well control incidents, improving human factors enhances safety and minimizes nonproductive time.

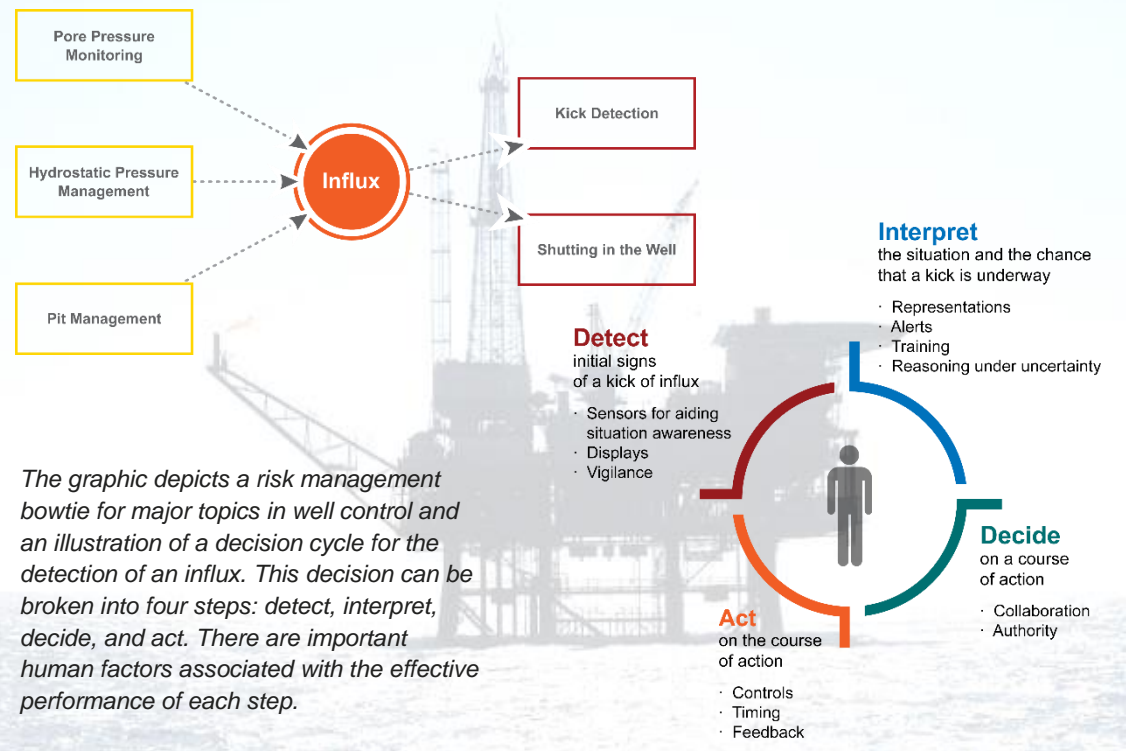
Trident focuses on cognitive issues that impact decision making and team performance, rather than health, safety, and environment issues or safety culture issues. No other tool provides this broad-spectrum approach, and no one else offers this focus on the cognitive aspects of safety and optimal performance.

Trident assesses human factors in the following topics:

- Kick detection
- Hydrostatic pressure management
- Pore pressure monitoring
- Pit management
- Decision making
- Policy
- Training
- Well control equipment

BACKGROUND

The Trident method combines the analytical power of a risk management bowtie analysis with the human factors concept of a decision cycle. A decision cycle breaks down decision making into a series of loops through a cycle of detecting, interpreting, deciding, and acting. The human factors that impact decision making at each stage of the cycle are evaluated using industry and international human factors standards, including API, IOGP, ISO, and the US Department of Defense.



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ABOUT US

Pacific Science & Engineering Group (PSE) is a research, development, and consulting firm that specializes in human factors, cognitive science, and human-system integration for complex military, industrial, and commercial systems. Our products and services improve system effectiveness, reduce error, and enhance user performance and decision-making quality.

HTK International Since 1991, more than 200 oil and gas clients have relied on the expertise of HTK to provide premium petroleum engineering, well site supervision, and project management services for firms ranging from the largest majors to smaller independents. With both onshore and offshore capabilities, we excel at helping our clients overcome the complex operating challenges found in the most difficult environments.

Lloyd's Register Drilling Integrity Services offers a variety of services and subject matter experts for risk management, human factors, asset integrity and management systems for drilling and well control.

CONTACT

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THE TRIDENT ASSESSMENT PROCESS

Assessment

- We provide a team of experts to conduct the assessment
- Many assessment questions can be evaluated from documentation, without access to the rig or crew
- Interviews with key personnel require no more than 45 minutes, per person
- Timeframe: 2 days at the office and 1 day on the rig

Report

- Overall score for the human factors of well control
 - Scores broken out by topic
- Detailed findings and recommendations for resolution
 - Recommendations broken out by safety criticality – resolve immediately, resolve soon, recommended for future upgrades

VALUE TO THE CLIENT

The key benefit of the assessment is a broad-spectrum assessment of the human factors of well control across key topics and across multiple job positions.

Recommendations based on this assessment can help understand the issues, rate their risk and urgency for resolution, and how to address them.

Trident is able to identify:

- Gaps in the human factors posture – items that are not handled effectively or that would benefit from a review
- Inconsistencies between the company-wide, onshore perspective and the offshore perspective – items that would benefit from a review across the crew and with the onshore team
- Inconsistencies among different job positions – items that would benefit from a review across the crew

Human factors are implicated in a majority of well control incidents. One could even argue that human factors are implicated, in some manner, in all well control incidents. Poor human factors can create or aggravate an incident. Conversely, good human factors can mitigate or even prevent an incident. Moreover, they can improve safety and productivity.

