



Review of Well Control Incidents

This Info Sheet briefly summarizes the results of a review of 172 Well Control Incident (WCI) reports submitted to IOGP by its Members through 2019. The objective of the review was to extract common findings, identify areas to focus attention and to steer the Wells Expert Committee (WEC) agenda, communicate and share the information with industry. Our aim remains to reduce the well control risk and improve performance based on these submissions.

The full results of this review are presented in IOGP Report 637R – *Review of Well Control Incidents*, available to employees of IOGP Member Companies through the [IOGP Resources page](#).



Background

In July 2010, in the aftermath of significant well control related incidents, the International Association of Oil & Gas Producers (IOGP) created the Global Industry Response Group (GIRG) to identify and disseminate the lessons learned and influence future industry practices. The GIRG's work covered three core areas:

- **Prevention:** developing better capabilities and practices in well engineering design and well operations management in order to reduce the likelihood of future incidents
- **Intervention:** improving well capping response readiness (in the event of an incident) and to study further the need for, and feasibility of, global containment solutions
- **Response:** delivering effective and fit-for-purpose oil spill response preparedness and capability

Within the area of prevention, the key recommendation was to form a new and permanent committee, the Wells Expert Committee (WEC), with the remit to share industry learnings by analysing incidents, communicating good practice, and promoting continued research and development.

To address the first of these activities, the WEC established a task force to create a system and database to allow IOGP Members to share their experiences and learnings arising from Well Control Incidents (WCIs) and near-misses.

Both a reporting system and associated database were established, allowing IOGP Member Companies to submit their WCI reports on a voluntary basis. Following detailed

analysis, the reports that have relevant or new learnings are distributed within IOGP Membership and, where appropriate, to a wider audience.

Methodology

The reports were reviewed to identify contributing and influencing factors and identify trends. Contributing factors were organized into the categories below:

- Risk assessment flaws
- System failures
- Supervision failures
- Human factors
- Competence and resources
- Barrier failures
- Procedures
- Technical Operational Issues
- Equipment

The team identified which contributing factors were applicable for each WCI reported, where adequate information was provided. The categories were not considered mutually exclusive for each incident; therefore, multiple categories were often selected for a single WCI.

Note that IOGP does not control the quality of the data submitted, which is provided by Member Companies on a voluntary basis. Where information was limited from an incident submission, the team applied their collective experience to develop an analysis.

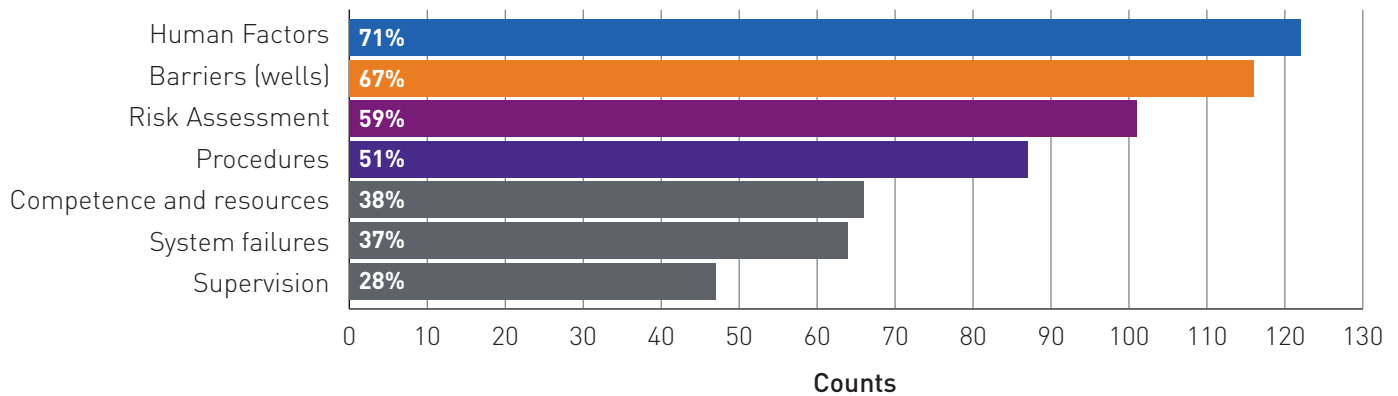


Figure 1: Main contributing factors

Results

The most common contributing factor, identified in almost three-quarters of all incidents (71%), is human factors.

Barrier failures (67%), shortcomings in risk assessment (59%), and procedures (51%) are identified as the second, third, and fourth most common contributing factors.

Inadequate capability (competency and resources) and failures in work systems or supervision were less frequently observed to be contributing factors.

The analysis and observations are derived from 172 well control incidents reported to IOGP. The analysis revealed that these incidents represented all geographic areas and all types of well operations, and we are confident that the findings are relevant across our industry. However, there is no inferred nor stated assertion that the reported WCIs are representative of the number and nature of all incidents occurring within the industry.

Human factors

Analysis of the data reveals human factors to be the leading cause across all WCI reports submitted.

Given the frequent reliance on the interdependency between people and equipment for a barrier to perform correctly, verification of effectiveness should consider both aspects.

Examples include ongoing inspection and testing programs, well control drills (see IOGP Report 628 - *Recommendations for Enhancements to Well Control Drills in the Oil and Gas Industry*), and leadership engagement with crews to test understanding and inform possible 'what if?' scenarios.

Standards, procedures, work instructions, and checklists are all important to a safe working environment. It is



equally important to recognize when circumstances change, making a procedure no longer appropriate, to intervene and to instigate a process to safely manage the change. **The awareness that any person has the authority to stop a job to verify barriers – in process safety as well as personal safety – is key to reducing the number of WCIs and the significance of their outcomes.** It is fundamental to establish a culture of trust that empowers workers to speak freely about potential issues.

The industry has made progress in recent years to address human factors issues. Nevertheless, the observations from this and previous reports show that there are still opportunities for improvement.

Management of barriers

'Management of barriers' is the second most significant contributing factor to incidents reviewed in this report.

Disabling (i.e., not maintaining) a barrier which was initially in place is the most common subcategory, and this ties in with 'Human Factors' being the leading cause. Ensuring that sufficient safety discussions are held before changing or removing any barrier is a key behaviour and practice that can mitigate the effects of unforeseen consequences.



Verification through conversation, intervention or discussion, toolbox talks or detailed work instructions, can significantly reduce the likelihood of barrier-failure categories such as failure to maintain a barrier, inadequate barriers, failure to use barriers, barrier maintenance and testing, and insufficient number of barriers in place.

Risk assessment

To safely manage the hazards in our industry, organizations must have a robust risk assessment process supported by a strong internal process safety culture. The presence of both components is essential - the absence of either one is likely to result in failure to manage risks effectively.

The risk assessment process should have the ability to identify unwanted future events, like a loss of well control, detail strategies to prevent the event from happening, and to mitigate the consequences if the event occurs.

For the risk assessment process, it is important that organizations develop an environment where individuals are competent and encouraged to recognize change. The risk assessment process supports safe management of change.

An organization's safety culture is made up of shared beliefs, practices, and mindsets that create a distinctive organizational attitude toward safety and define how work is done. The creation of a strong positive safety culture environment should be considered a continuous, and not a one-off effort.

Procedure

The objective of a procedure is to describe in appropriate detail how a job will be executed in the workplace, in alignment with defined boundaries and standards set by an organization's policies.

It is essential for an organization to have well-defined policies and document management systems in place to produce quality procedures that are written in a way that a job can be executed safely with proper change management.

Conclusions

It is critical that the industry continues to share well control incident reports, so that the lessons can be analysed, structurally incorporated in industry-wide guidelines and training, and swiftly implemented. Sharing well control incident reports is a key enabler for IOGP in our mission to reduce the likelihood of similar well control incidents recurring. Sharing lessons learned is integral to risk reduction across our industry.

Previous IOGP Reports, 531R and 574R – *Well Control Incidents Review* examined well control incident data for 2014 and 2015 respectively and identified similar contributing factors. This lends weight to maintaining focus on human factors, barrier management, risk assessment and procedures.

IOGP's Wells Expert Committee continue to reduce the risk of major accident hazard releases relating to well control.

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