

The Evolution of Emergency Preparedness and Response Capabilities in the Oil and Gas Industry

Emergency Preparedness and Response Survey





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March 1980: The Alexander Kielland drilling rig capsized killing 123 people.

Move forward 8 years to the **6th of July 1988**: The Piper Alpha platform's gas leak and the subsequent explosion killed 167 men. Only 61 people survived.

22 years later, on **20th April 2010**, at the Macondo Prospect, the Deepwater Horizon drilling rig exploded, killing 11 workers, and resulted in a major hydrocarbon release amounting to 4.9 million barrels of crude oil into the Gulf of Mexico.

In addition to the most regrettable consequence - human casualty - major disasters also have serious regulatory, public relations and financial impacts. As exploring for and producing hydrocarbons will become even more challenging, it is vitally important that companies learn (and share) from past incidents in order to mitigate risks, while also preparing for emergency scenarios through practice and rehearsal – so that organizations know what to do both at the time of a disaster and in its aftermath.



A Focus on Prevention and Preparedness

The Oil and Gas industry invests significant time, money and management attention in the prevention of injury, casualty and disaster. There is a healthy obsession with personal and process safety throughout the industry at all levels. After prevention, preparation for emergency response is the next most important consideration so that any negative consequences can be mitigated effectively.

Following the Macondo incident, U.S. regulatory authorities shut down drilling in the Gulf of Mexico until the Oil and Gas industry could demonstrate its ability to contain a deepwater blowout. The industry leaders - Anadarko, Apache, BHP Billiton, BP, Chevron, Conoco-Phillips, ExxonMobil, Hess, Shell and Statoil - formed the Marine Well Containment Company (MWCC). MWCC's mission is to be continuously ready to respond to a well control incident in the Gulf of Mexico and to advance associated capabilities to keep pace with its member's needs.

Based on its work with MWCC, Capgemini Consulting conducted this Emergency Preparedness and

Response survey across 20 Oil and Gas companies. The survey was created to provide a view into the industry's evolving emergency response capabilities, assessing priorities, performance gaps and the development of capabilities. The 20 companies participating in the survey represent 10% to 15% of the daily global Oil and Gas production and are geographically distributed across regions as varied as the Gulf of Mexico, the North Sea, South America, Continental Europe, the Commonwealth of Independent States and West Africa. Our aim with this survey is to codify and quantify best practices and summarize future investment and development plans of companies in the area of Emergency Preparedness and Response.

Most importantly, our goal is to highlight the evolution of solutions and those emerging leading practices that will help mitigate the new challenges being set by both regulators and increasingly difficult operating environments around the world.

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Vice President
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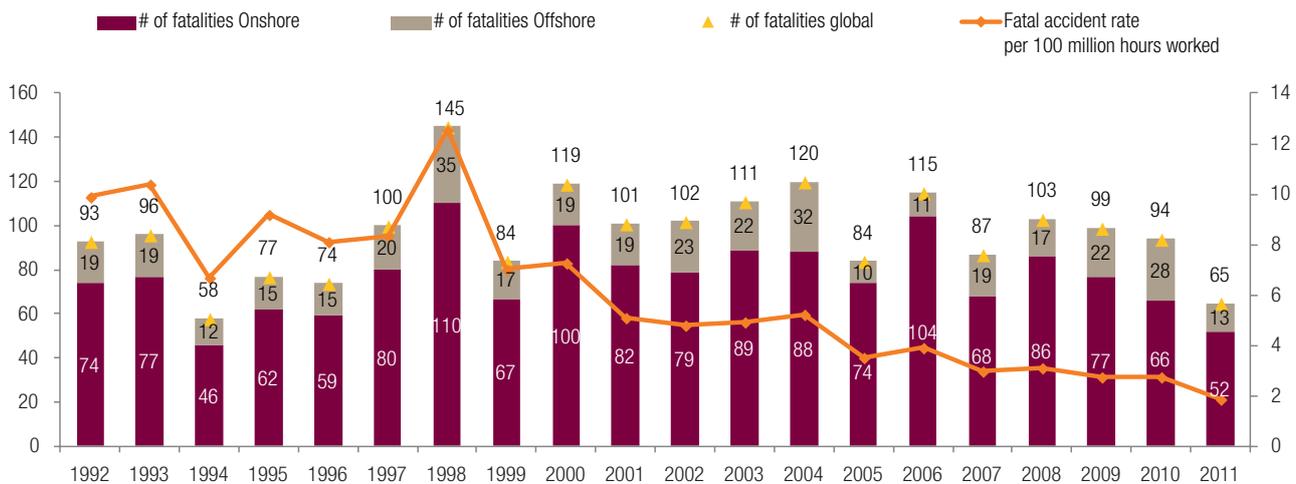
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Historical Improvements in Personal Safety Performance

From 1992-2011, fatalities per 100 million hours worked dropped by 81% (see Figure 1), demonstrating the positive impact of the Oil and Gas industry's focus on safety.

Figure 1: Fatalities Per Hour Worked Have Declined



Source: OGP, Capgemini Consulting analysis

“
Fatalities have decreased over the past 20 years in the Upstream Oil and Gas industry, but more than one person per week continues to lose their life on the job.
 ”

According to the International Oil and Gas Producers Association (OGP), the reasons for fatal incidents range from inadequate risk assessment, supervision, work standards and procedures, improper decisions, unintentional violation of regulations, and inadequate training or lack of competency across workers. Besides this, as much as one-third of these fatalities are caused by vehicles or air transport incidents.

In addition to casualties, the industry faces several major gas leaks and spills each year. As a result, governments of the major Oil and Gas producing regions have either launched reforms or are discussing reforms to industry regulations. Organizations such as the MWCC and the Subsea Well Response Project (SWRP) are the results of such initiatives around the world.



Common Survey Findings Across the Industry

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Leading companies are moving to globally consistent Emergency Preparedness and Response systems and performance management approaches
”

Our Emergency Preparedness and Response survey revealed nine major performance areas that could be improved. The top five performance areas are:

1. Emergency Preparedness and Response Tests, Drills and Performance Measurement: Readiness Assurance

Organizations tended to demonstrate varied execution of Emergency Preparedness and Response testing and performance measurement in an effort to meet regulator mandated requirements. Currently, most tests and drills are conducted at the asset level, however, as a result of the clear trend in the survey towards globally consistent Emergency Preparedness and Response systems and a focus on broader regional and global response capabilities, tests and drills are moving beyond an asset-level focus.

A general shift across the board was seen towards creation of globally standardized and integrated emergency management systems. Many respondents referenced BP's Macondo response and cited the learning that companies must be capable of creating a global, singular focus on managing significant disasters.

One of the greatest challenges highlighted by the companies was ensuring adherence to quality standards and meeting the capability requirements of JV partners.

2. Information Sharing

Although most organizations recognized the need to document best practices, few had a formalized process for doing so. 23% of the organizations surveyed did not have any formalized process to facilitate

sharing of lessons learned and best practice knowledge. The other organizations presented disparate approaches for sharing Emergency Preparedness and Response best practices, ranging from technical support, drills and training exercises, to knowledge sharing sessions. A best practice starting point was the simple creation of slimmed down and pragmatic, user-friendly written Emergency Preparedness and Response guides.

While the majority of companies surveyed use their HSE and safety cases to identify the severity of risks, some emergency response organizations have their own procedures for risk identification and mitigation plans for large scale disaster response planning.

We see an evolving capability maturity with the use of digital Information Sharing tools. Some organizations are using surveillance tools and specialized software for Emergency Preparedness and Response support. Example software packages include the SOLARA application that is used by police forces in their respective emergency response departments. Organizations are also leveraging their Geographic Information System (GIS) teams in response to emergencies such as gas explosions, oil spills, and in response management. Companies on the leading edge of information

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Ad-hoc systems are still the norm for sharing information on best practices and lessons learned
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sharing maturity are integrating multiple tools and data sources to establish a “Common Operating Picture (COP)” displayed through a secure portal. This COP data includes live video, vessel AIS data, field architecture/layouts, remote sensor data, GPS-tagged equipment, etc. to provide a real time view of response status.

3. Training and Competency Assurance

All responding organizations understood the need for compliance with regulatory standards for workforce competency, as non-compliance could result in suspension of operations. To that end, most respondents indicated that their plans were designed to meet, but not exceed regulatory requirements. They also felt the need to have more robust minimum competency standards than those required by regulators to master Emergency Preparedness and Response in a comprehensive manner. Most organizations surveyed also believed that integrating Emergency Preparedness and Response capabilities into individual employee development plans is a better alternative to simply having Emergency Preparedness and Response specialists in place. Leading practices we observed included cross training and the swapping of roles during exercises and drills to ensure that there is always a degree of robustness built into the response plan.

Emergency Preparedness and Response was also seen as a driver of better industry collaboration. An increasing number of organizations are realizing the potential implications of not effectively responding to catastrophic incidents. These organizations also feel that Emergency Preparedness and Response can be a path that drives comprehensive industry collaboration. Organizations such as the MWCC and OGP are

coordinating industry collaboration and investment in this area.

4. Emergency Preparedness and Response Capability Requirements Renewal / Continuous Improvement

It was also found that Emergency Preparedness and Response across organizations is not restricted to catastrophic incidents alone. Emergency Preparedness and Response typically involves a tiered response system that encompasses anywhere between 3 and 5 levels. Emergency management applies to all kinds of incidents, which are then categorized based upon their severity. 90% of the companies surveyed responded ‘No’ when asked if Emergency Preparedness and Response applies only to catastrophic situations. While some companies had small dedicated Emergency Preparedness and Response teams, most companies utilized virtual teams. Also, Emergency Preparedness and Response plans were mostly asset specific, with guidelines provided from corporate management. Unless a low probability risk has high consequence impacts, organizations may not conduct drills and exercises for less than likely risk scenarios. Considering that there are very few low-probability risk scenarios; this makes it difficult for companies to have a proper reference point for a concrete discussion on the same.

5. Contractor Identification Selection and Management

Most Oil and Gas companies do not have dedicated Emergency Preparedness and Response staff. Regardless of whether an organization has a dedicated EP&R team, most

organizations recognize the potential resources needs (and challenges) to support a large-scale sustained response effort. Over 50% of the organizations surveyed indicated that they hire external resources as part of their Emergency Preparedness and Response departments. Top areas where third-party services were leveraged included Emergency Preparedness and Response planning and documentation, as well as usage of specialized equipment. Most organizations follow consistent processes such as vetting contractors, and continuously evaluating performance against organizational standards.

Out of the 20 companies surveyed as part of this exercise, as many as 13 companies did not have a dedicated full-time staff (of over 10 people) working as part of an Emergency Preparedness and Response team. In lieu of dedicated staff, individuals across the organization are tagged with Emergency Preparedness and Response responsibilities in addition to their primary job duties. As a result, most Emergency Preparedness and Response activities are not budgeted as part of a larger cost center which

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Digitizing the oilfield enables closer integration between Emergency Preparedness and Response. experts and local assets.
”

minimizes the ability to focus on planning for larger Emergency Preparedness and Response system upgrades, tests and drills. In the case of smaller organizations, the Emergency Preparedness and Response functionality was typically outsourced to a third-party organization. Most companies were inclined to employ experts in the Emergency Preparedness and Response arena who were well-versed with regulatory compliance issues. Even though most organizations lacked an in-house Emergency Preparedness and Response team, this trend is likely to change as companies evaluate their enterprise risk levels and mitigations that can be put in place.

Other leading themes were identified during our study. We are happy to discuss these in detail with companies at their request.

6. Asset Tracking & Condition Monitoring

7. Demobilization Planning

8. Maintenance of Equipment Readiness

9. Equipment Deployment Operation and Monitoring



How Companies Should Move Forward: Analyze. Prioritize. Fix.

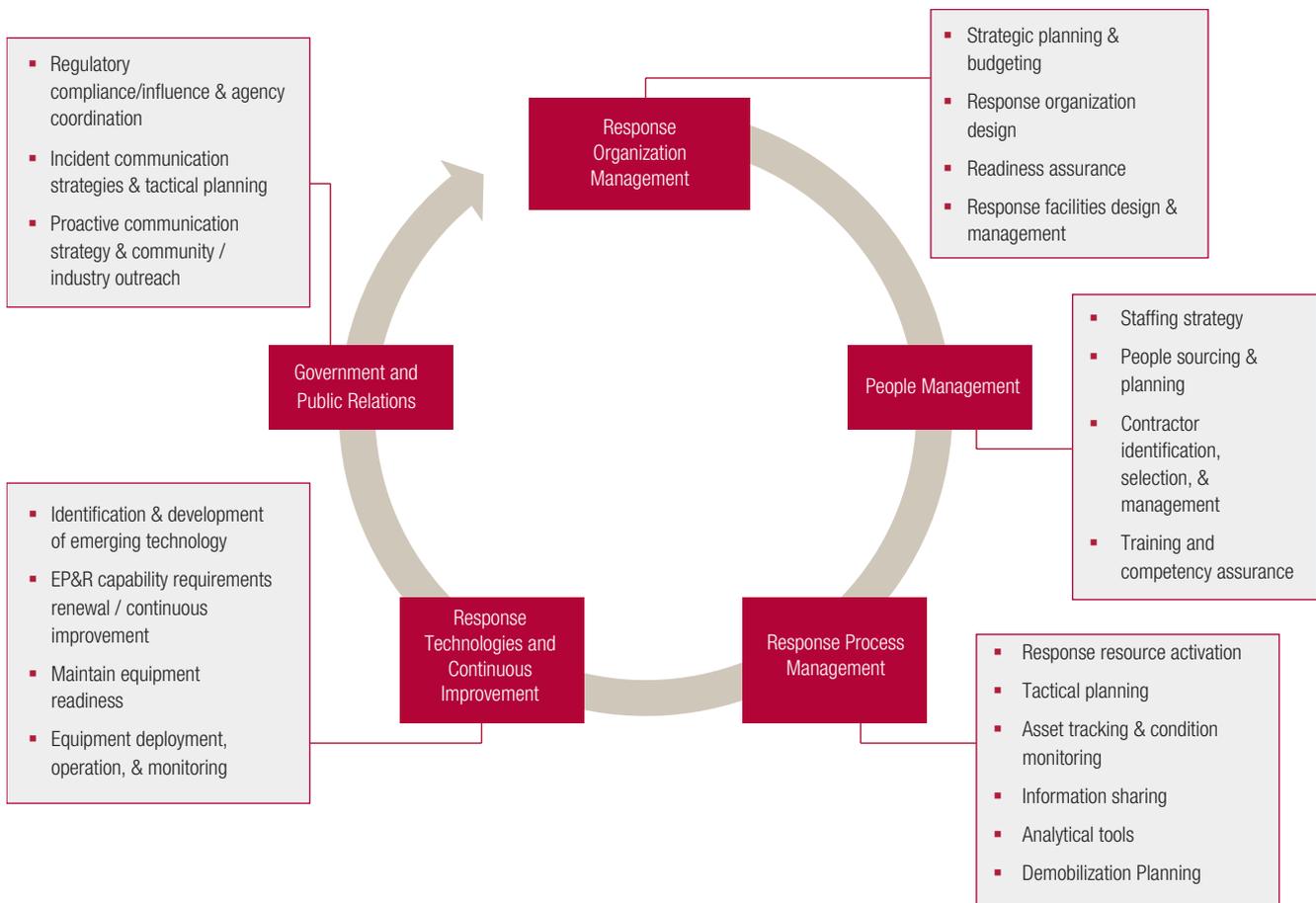


Our Recommended Approach for Emergency Preparedness and Response

Capgemini Consulting has worked with MWCC, other leading Oil and Gas and nuclear companies on Emergency Preparedness and Response topics, as well as conducted a detailed analysis of best Emergency Preparedness and Response practices across other relevant industries. In doing so, Capgemini Consulting has developed a comprehensive approach for analyzing, prioritizing and subsequently fixing the key issues and opportunities faced by Oil and Gas companies.

This framework enables upstream Oil and Gas companies to move toward institutionalizing the best practices in Emergency Preparedness and Response that were defined through our survey.

Figure 2: Capgemini Consulting's Comprehensive Approach to Emergency Preparedness and Response



Source: Capgemini Consulting Analysis

Each element of the model is vital to Emergency Preparedness and Response.

- A well managed and funded response organization enables effective management of Emergency Preparedness and Response processes throughout a company and is critical to overall readiness assurance.
- A properly designed people management system provides critical resources and skills that are needed “on the day” when the company is in response mode.
- Building the right process management capabilities in advance of an actual emergency enables a more seamless engagement of key systems and execution of essential processes when they are needed.
- Ongoing assessment and investment in response technologies and continuous systems improvement allows organizations to maintain ever higher levels of preparedness to more quickly mitigate future emergencies.
- Proactive planning and communication with regulatory authorities plays an important part in building tight response systems that can then be appropriately communicated to the public at large before, during, and after response operations.

Where should you begin?

To move towards the best practices detailed in this study, leading companies should take a systematic approach - analyzing capabilities, planning for targeted improvement in prioritized areas, and strategically investing in programs to develop capabilities.

Analyze.

To lay the groundwork for a successful Emergency Preparedness and Response system, organizations need to assess and diagnose their individual capabilities to determine their current level of readiness and identify improvement opportunities. This analysis should include an assessment of each area in Figure 2. Evaluating performance in each of these areas will ensure a systematic view on a company’s end-to-end Emergency Preparedness and Response capabilities. In addition to this current state assessment, a view of future Emergency Preparedness and Response needs should be developed in order to facilitate longer term program planning.

Prioritize.

Companies should prioritize their Emergency Preparedness and Response improvement programs according to a risk analysis using normal business planning processes – prioritizing basic, required systems elements and larger impact / faster execution projects. The process of identifying and prioritizing required work enables organizations to target implementation efforts where they will be most effective. As an example, one critically important and relatively fast improvement can be implemented when organizations understand how best to incorporate known Emergency Preparedness and Response roles within the existing organizational structure and through third party contractors. In other cases, gaps in essential equipment, mutual aid and logistics and emergency response plans can be identified as very high priorities that must be tackled immediately in part because they may require long lead times to address.

Fix.

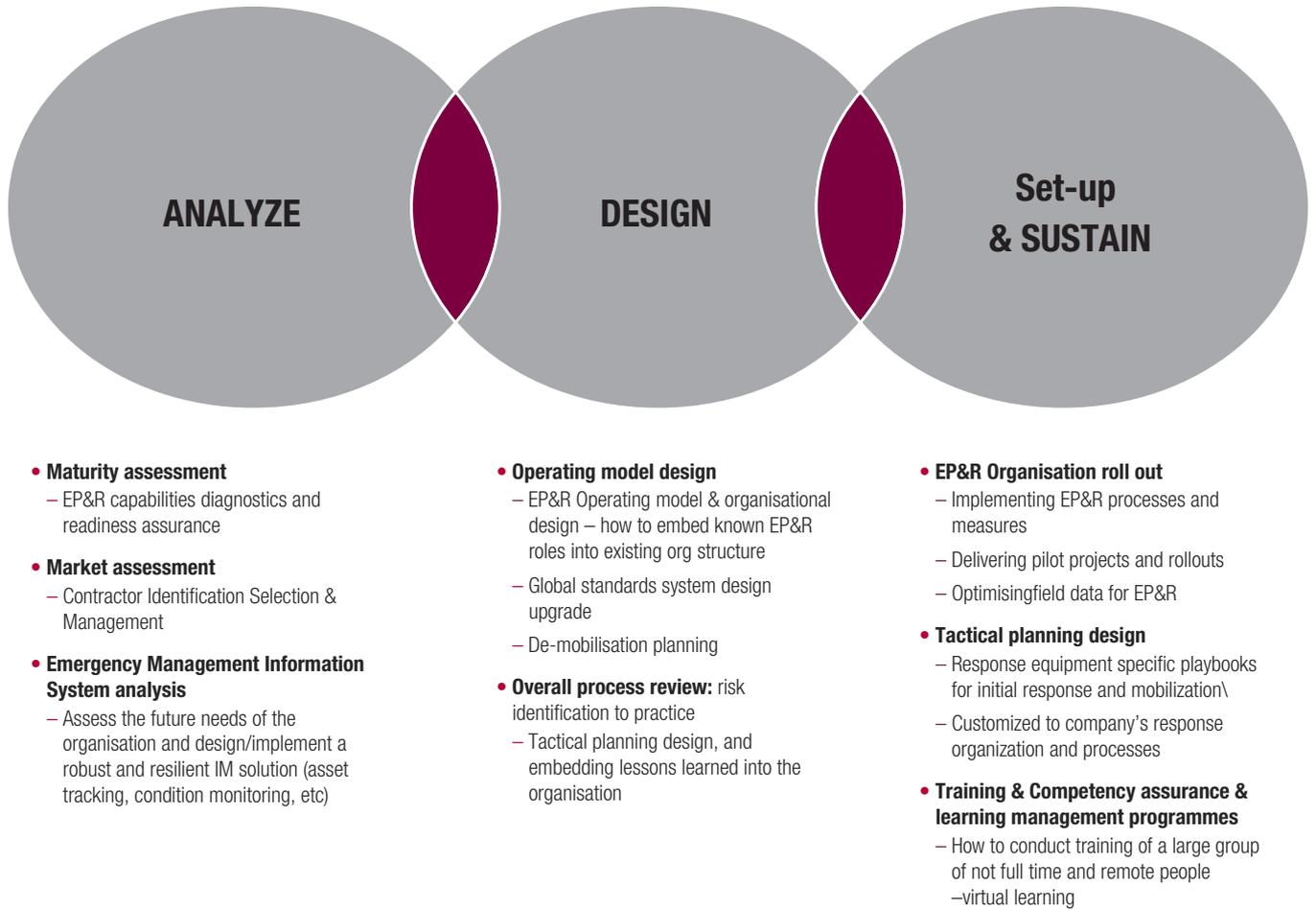
Companies should consider implementing Emergency Preparedness and Response system improvements through pilot projects to test the new programs’ effectiveness. In addition to proving out the efficacy of the new systems, this will optimize the use of scarce company resources. In other cases such as Tactical Action Plans or playbooks for initial response and mobilization, the systematic improvements must be customized on a site or resource specific basis. In these cases, the process of creating and implementing the plans should be treated like a system – design, implementation and ongoing stewardship conducted in a consistent, continuously improving process.

Where can Capgemini Consulting help?

There are three key areas where Capgemini Consulting can work with companies to enhance Emergency Preparedness and Response capabilities.

- First, in a **review of existing Emergency Preparedness and Response capabilities**, we can support benchmarking and evaluation of the end-to-end capabilities or conduct a deep-dive to flesh out requirements in an identified challenge area.
- Second, we work with leading companies **to plan and execute improvement programs** and specific changes to their Emergency Preparedness and Response systems across multiple functional areas. We support the design and implement of response organizations, create tactical action plans, and provide procurement support for specialized equipment, 3rd party contractors and shore base capabilities.

Figure 3: Capgemini EP&R offerings as part of a Digital Transformation journey



- Third, we help companies **augment their existing Emergency Preparedness and Response organizations** during important flex periods such as planning and executing tests and drills or evaluating regulatory requirements and filings.

Typical example projects include:

- Creating tactical action plans in operations and logistics
- Reviewing Emergency Preparedness and Response strategic plans

- Evaluating Emergency Preparedness and Response organizational setup and capabilities
- Creating general and role-based Emergency Preparedness and Response training plans
- Delivering objective driven table top drills to test Emergency Preparedness and Response capabilities



Challenges on the Horizon

We foresee a few major challenges in the future for the Oil and Gas industry. The most significant challenge will be on the regulatory front - ensuring that regulatory changes drive truly improved industry response capabilities and that the industry has the right technical capabilities in development to support future regulatory requirements. New regulations are expected to impact casing and cementing as well as reporting requirements for design, construction, monitoring, plugging....

We also believe Emergency Preparedness and Response capabilities are still in the development stage across the industry. While there is a significant focus throughout the industry on safety performance, there is still much work to be done to bring Emergency Preparedness and Response into core organizational processes from their current role as a part-time support function.

While we are over two years since Macondo, the incident is still fresh in the industry's psyche. There is clear dedication to continue to build on the learnings from this tragedy.. 63% of the organizations surveyed indicate they are still in the building phase.. As the industry gains the distance of time from Macondo, history tells us that focus will begin to plateau. While significant investments and improvements have been made over the last 2+ years, there is still a long way to go to improve all of the components of a comprehensive Emergency Preparedness and Response capability in the industry.

Acknowledgements: Abhishek Gokhale, Frédéric Brosset, Mihaela Onofrei, Cristina Manole, Helmut Schnabl, Philippe Coquet, Olivier Phalippou, Alix Langlais, Gautier Delabrousse-Mayoux, Aude Beuter, Marco Fernandez, Brian Schenck and to all the organisations in the industry who have helped us in this study.

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