

Driving Operational Excellence



**An Information Management
Maturity Model For EHS**

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An independent study produced by
Verdantix on behalf of CMO Software



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Executive Summary

TRADITIONALLY a de-centralized, compliance-focussed area, EH&S is increasingly directed from the center and is concerned with supporting operational risk management and driving operational excellence. Globalization, increasing legislation, advances in technology and the emergence of social media have combined to shift EH&S management from a tactical, compliance focused discipline to one which is more strategic and aligned with Operational Risk Management and Operational Excellence.

In practical terms, this is seeing the EH&S function move beyond departmentally siloed audit work towards enterprise level monitoring and analysis aimed at reducing overall business risks and improving operational performance. Central to a strategically focused EH&S function is one which can provide relevant, timely and accurate visibility of performance across the operational footprint of a firm. In order to achieve this, it is critical firms establish an appropriate

EH&S information management strategy.

Reviewing evidence from detailed global research over the last five years, this study identifies six phases of maturity for EH&S information management. Each of these phases can be described through six dimensions which include digitization, deployment sites, company culture, user adoption, usage scenario coverage and analysis and reporting. For different firms, the most appropriate landing point for EH&S information management will vary due to differences in operating landscape, legislative requirements and industry standards.

After presenting the maturity model, five key steps are introduced to help firms determine their current level of maturity, the maturity phase that is most suitable for their firm as well as how to execute this transition in their EH&S information management approach.



Firms Must Upgrade EH&S Information Management Strategies To Enable Operational Excellence

Leading Firms Transform EH&S Into An Operational Excellence Focused Function

THE MANAGEMENT of environment, health & safety (EH&S) is undergoing a radical transformation. Traditionally a de-centralised, compliance-focused area, EH&S is increasingly directed from the centre and is concerned with operational risk management and driving operational excellence. This current emphasis is clearly visible when looking at results from the 2015 global survey of EH&S directors across the world from independent analyst firm, Verdantix. From the 312 people interviewed, only 12% categorized their current EH&S strategy as 'compliance-focused and reactive'. The remaining 88% of respondents categorized their current EH&S strategy as either 'prevention-focused and proactive', 'industry best practice' or 'global best practice' (see *Figure 3*).

The terms 'operational risk management' and 'operational excellence' are used

with increasing frequency around the EH&S agenda but what do they actually mean and how do they relate to EH&S? Operational Risk Management (ORM) is defined as the management of risks resulting from inadequate or failed processes, people and systems or from external events. Fundamentally, it's about managing the risks associated with conducting core business activities. EH&S factors carry operational risks which extend far beyond compliance. Taking a risk-based approach to EH&S has emerged as essential for any firm seeking to embed a credible ORM strategy.

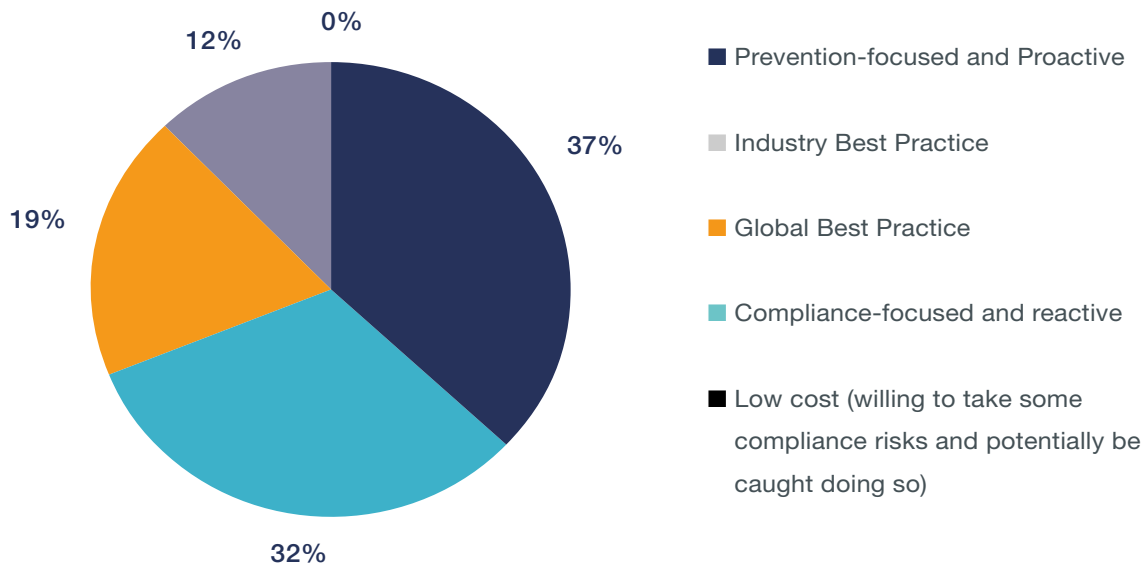
Operational Excellence (OE) describes the process of optimising the execution of core business activities. EH&S can support a firm in achieving OE by ensuring the execution of core business activities is completed with greater reliability and with a lower level of risk. It



FIGURE 3

Most EH&S Leaders Categorise Their Firm's Strategy As Prevention-Focused And Proactive

Q How would you categorize your firm's current EH&S strategy? (*select one*)



Source: Verdantix

→ is through this process that EH&S feeds into ORM which in turn helps drive OE programs.

What has been the trigger for applying this risk based thinking to EH&S and transforming the function into an OE focused discipline? Detailed research from independent analyst firm Verdantix over the past five years into the EH&S market reveals a whole series of factors are driving this transformation in EH&S from a tactical to a strategic function. These drivers include:

■ INCREASED GLOBALIZATION

Firms are more global than ever before and this creates a major challenge around EH&S management. As firms have expanded across the globe, de-centralized EH&S management processes have started to unravel. Large global firms need to convince shareholders they have a handle on the operational risks across the entire business and that they are adopting best practice across their facilities. Without a centralised system of governance and control, it is near

impossible to have the required level of visibility over the firm's operations and thus provide credible assurances on the management of the associated risks.

■ **GROWTH IN VOLUME AND COMPLEXITY OF LEGISLATION**

The legislative landscape for EH&S is continually evolving but the overall trend is for growth in both the volume and complexity of compliance requirements. Looking ahead to 2016, it looks likely that the US will introduce some major revisions to the Toxic Substance Control Act (TSCA) impacting thousands of product manufacturers. Switching to Europe, the EU is set to introduce its own version of the US Conflict Minerals legislation in 2016 which the EU expects to impact in excess of 800,000 firms. In China, tougher new air emissions standards will be introduced from the 1st January 2016 and Australia is expected to modernise its health and safety regulations during 2016/2017. Such shifts in legislative requirements creates a significant EH&S risk for organizations and an effective ORM strategy helps ensure appropriate mitigation of these risks.

■ **ADVANCES IN TECHNOLOGY**

In the extractives industries in particular, developments in technology have created new opportunities. These developments have allowed firms to operate in new territories (e.g. oil and

The legislative landscape for EH&S is continually evolving but the overall trend is for growth in both the volume and complexity of compliance requirements

gas firms into the Arctic) as well as deliver new techniques for accessing previously inaccessible resources (e.g. horizontal drilling to extract shale gas). Operating in extreme environments and deploying new extraction techniques opens up a whole series of new EH&S risks. It is therefore critical firms can demonstrate these risks are being appropriately managed.

■ **GREATER SCRUTINY THROUGH SOCIAL MEDIA**

The explosion in social media means the actions and statements of firms are scrutinised with greater intensity than ever before. It is increasingly difficult to conceal poor operational practices and firms can be particularly exposed if brand marketing efforts fail to align with the operational realities of the business. While social media also presents opportunities to increase the profile of an organisation, it also presents a risk of significant reputational damage if operational standards are not up to scratch.



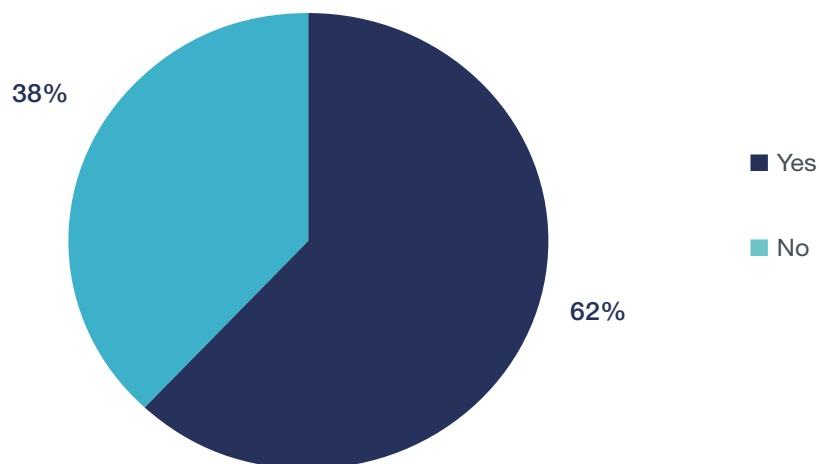
Effective EH&S Information Management Explodes In Importance For Global Firms

GLOBALIZATION, increasing legislation, advances in technology and the emergence of social media have combined to shift EH&S management from a compliance focused discipline to one which is aligned with ORM and OE. In practical terms, this is seeing the EH&S function move beyond departmentally siloed audit work towards enterprise level monitoring and analysis aimed at reducing overall business risks and improving

operational performance. Central to a strategically focused EH&S function is one which can provide relevant, timely and accurate visibility of performance across the operational footprint of a firm. In order to achieve this, firms are increasingly looking at investments in EH&S information management. For a significant portion of firms, this investment targets purchases of EH&S management software (see figures 10 and 12).

FIGURE 10
Need a headline to go in here to create continuity

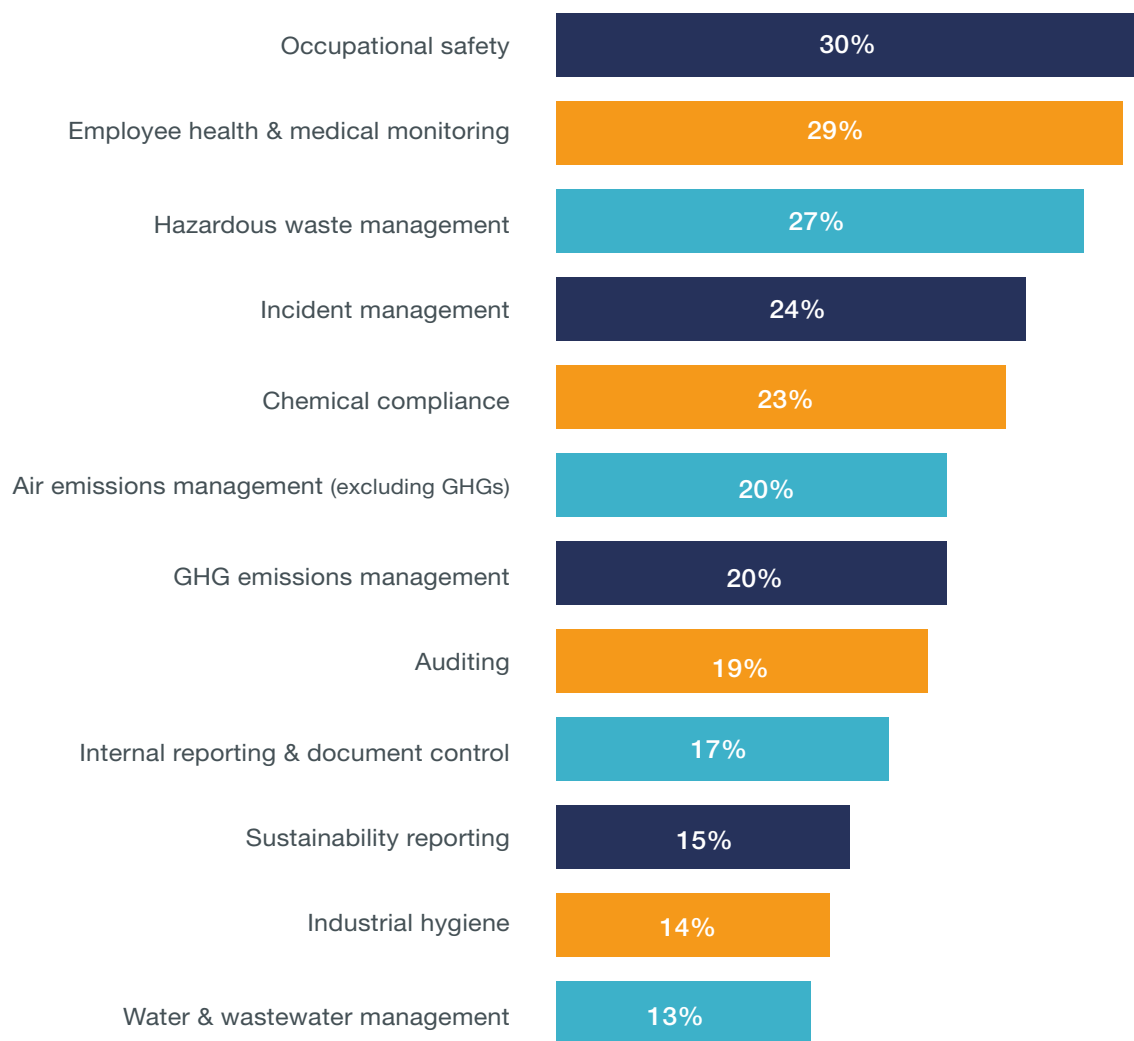
Q Do you use commercial EH&S management software? (*select one*)



Source: Verdantix

FIGURE 12
EH&S Software Penetration Among Survey
Respondents Varies from 13% To 30%

Q Do you use commercial EH&S management software for the following?



Source: Verdantix





A number of factors are shaping the business case for investment in this type of software. This theme was explored as part of the Verdantix report, Green Quadrant: EH&S Management Software 2014 (see Figure 11). The most prominent factors to emerge include:

- Saving time on data collection and reporting. When 15 buyers of EH&S software were asked to rate the importance of eight different factors in shaping the business case for purchasing the software, 93% said that saving time on data collection and aggregation was either important or very important. Despite the sophisticated analytics that are available in EH&S software packages today, it is still this most fundamental functionality which is most highly valued. This helps to demonstrate the challenge firms face in using more traditional paper-based or Excel-based tools to carry out this task.

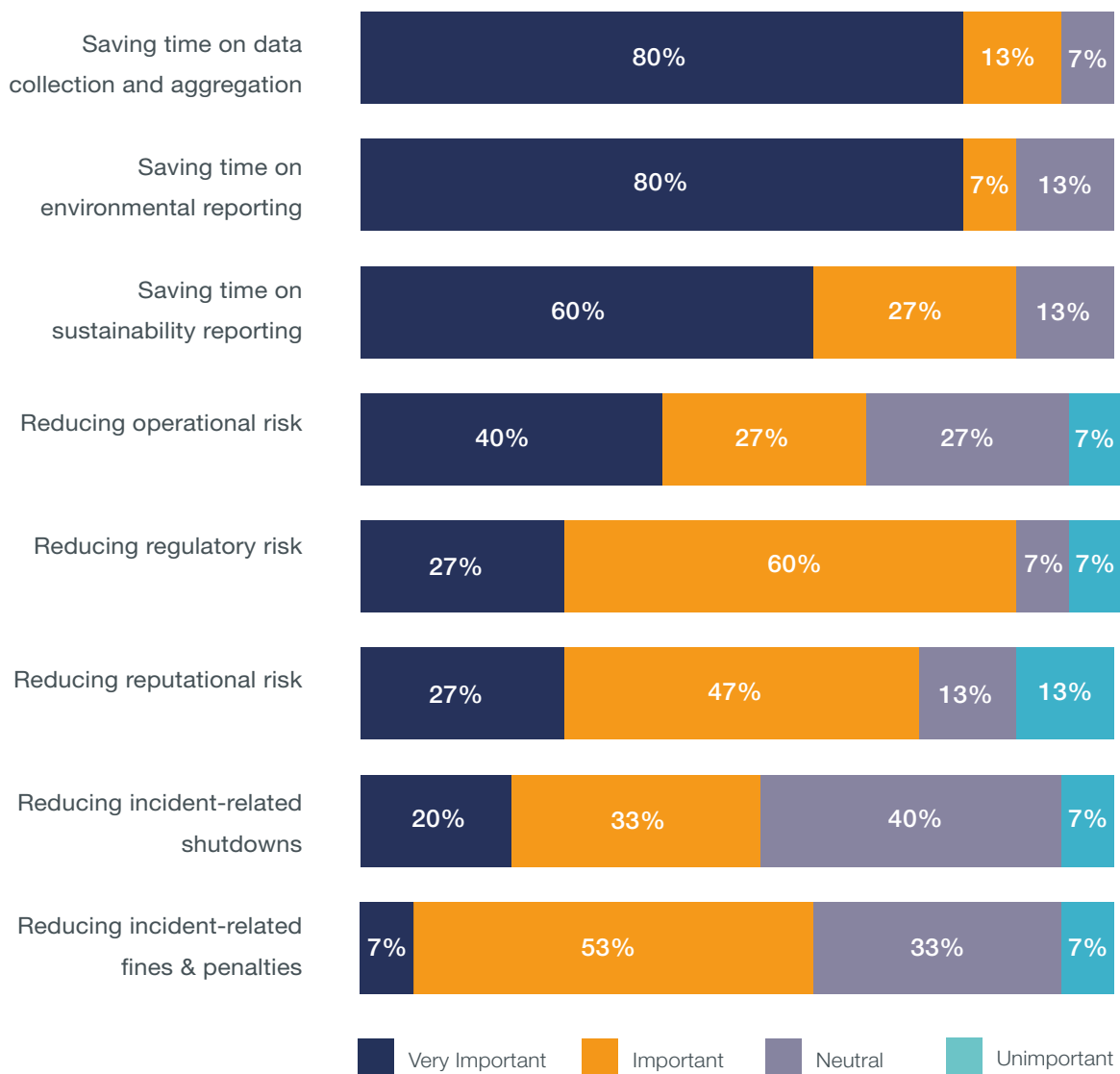
- Reducing operational risk. For 67% of firms interviewed, reducing operational risk was an important or very important factor shaping the business case for EH&S software. Only 7% of firms considered this unimportant. This result shows a number of firms believe EH&S software can serve as an effective tool in reducing operational risk.

- Reducing regulatory risk. A total of 87% of interviewees said reducing regulatory risk was either important or very important in shaping the business case for EH&S software. While other factors, such as reducing operational risk, have emerged as increasingly prominent within EH&S, reducing regulatory risks will always be a key objective for the EH&S function and for shaping the business case for EH&S software.



FIGURE 11
Business Drivers for Investing in EH&S Software

Q How important are the following factors in shaping the business case for EH&S software?



Source: Verdantix



Huge Variations Exist In The Maturity Of **EH&S** Information Management Strategies

FIRMS recognise the growing importance of effective EH&S information management to support risk-based EH&S strategies. They are aware that putting in place appropriate information management solutions will save time on data collection and reporting, reduce operational risk as well as support ongoing compliance efforts. The appropriate EH&S information management strategy for a firm will depend on the overall EH&S strategy which it has defined. This in turn will

depend on the sector in which the firm operates, the territories in which it operates and the overall vision of the executive team.

In recognition of this, we have developed an EH&S information management maturity model (see figure 13). This model charts different phases of maturity according to six dimensions (see *table 1*):

TABLE 1
Six dimensions of the EH&S Information
Management Maturity Model

DIMENSIONS	DESCRIPTION
Digitization	Type of technology firms are using to manage EH&S data
Deployment Sites	Types of facilities or sites which are in scope for the EH&S function
Company Culture	Attitude and approach of the broader organization to EH&S
User Adoption	Extent of organizational involvement in aspects of EH&S
Usage Scenario Coverage	Degree of coverage of different EH&S usage scenarios
Analysis & Reporting	Level of sophistication of the EH&S analysis and reporting

Reviewing evidence from detailed global research over the last five years, this study has identified six phases of maturity for EH&S information management and these have been defined in terms of the dimensions described previously:

■ **PHASE 1 – ADHOC ISSUE MANAGEMENT**

This is the lowest level of maturity in the model. Firms that fall into this phase are still taking a paper-based approach to EH&S information management. Information is only collected and managed for a small number of sites and only a limited number of employees are part of the process. Firms that fall into phase 1 are only covering the most basic EH&S usage scenarios and there is no formal analysis and reporting of the data. There is no awareness of the benefits a more sophisticated EH&S solution could deliver for the firm.

For firms at this level of maturity, there may come a point where this approach is no longer fit for purpose and it is necessary to consider advancing to a different phase. The signals for this can be multiple and wide ranging but a common factor could be concerns from the firm’s leadership team at the lack of transparency from the EH&S function and an inability to understand EH&S compliance performance across the organization.

■ **PHASE 2 – DATA MANAGEMENT**

Firms in phase 2 have adopted basic

digital tools for EH&S information management with Microsoft Excel and custom databases replacing the paper-based system in phase 1. The number of sites covered is expanded as is the coverage of usage scenarios as small pockets of the business begin to identify the benefits of recording EH&S information in a more systematic manner. User adoption extends somewhat from phase 1 but remains low while there is limited amount of reporting on selective EH&S issues

What are the triggers firms should look for that this maturity phase is no longer appropriate for the business? With data captured in basic digital format across multiple sites, this phase delivers some visibility of EH&S compliance performance. This limited snapshot may reveal instances of non-compliance and lead to question marks about other sites currently outside of the EH&S assessment. Effectively addressing these concerns and managing compliance across all sites in a consistent way will not prove possible without moving to a new level in the maturity model.

■ **PHASE 3 – COMPLIANCE MANAGEMENT**

Firms in this phase have a strong handle on their compliance exposure and have aligned their EH&S information management strategy to ensure they meet compliance requirements across the business. Investments have been made in software point solutions which are used alongside Excel. The





firm has put in a place a structured process for achieving compliance and is starting to conduct some rudimentary EH&S-related risk analysis at critical facilities. User adoption of these information management tools is low to medium but the usage scenario coverage is expanded from phase 2 as comprehensive reporting is established against all compliance requirements.

While firms in this phase are effective at identifying areas of compliance and non-compliance, they may decide that simply meeting compliance requirements for occupational safety or hazardous waste management exposes the business to unacceptable risks. In this scenario, a firm will require their information management solution to deliver some basic risk analytics as well as guidance on appropriate performance improvement measures. This shift in emphasis will demand a firm moves beyond phase 3 in the maturity model.

■ PHASE 4 – PERFORMANCE OPTIMISATION

While still focused on compliance, in this phase, firms seek to improve their performance against the various compliance requirements. All EH&S data is managed through software point solutions which provide some limited analytics capabilities. User adoption of these point solutions is moderate and around 60%-70% of relevant EH&S usage scenarios are covered. These analytics are used to monitor, evaluate and identify performance improvements opportunities in compliance performance.

Many firms face a complex array of EH&S risks which extend beyond compliance. For example, maintaining plant assets is a critical operational procedure for a power generation firm. Failure to adequately maintain assets could result in a serious environmental and/or health and safety incident. By the same account, each maintenance event exposes the maintenance team to certain health and safety risks while also impacting operational productivity. Understanding, balancing and managing these myriad of risks requires broader employee involvement and deeper analysis of the risks associated with a firm's operational footprint. At this point, phase 4 in the maturity model is no longer consistent with a firm's objectives.

■ PHASE 5 – ACTIVE RISK MANAGEMENT

There is a significant shift in thinking from phase 4 to phase 5 as firms apply an ORM lens to their EH&S efforts. A detailed assessment has been made across all sites which extends beyond compliance in order to identify and target all sites where EH&S risks exist. The company acknowledges the need to manage operational risks which extend beyond compliance and engages the entire organization by making incident reporting accessible to all employees and contractors. The EH&S information management tools have been rationalized to facilitate advanced enterprise-wide analytics which deliver deep and targeted risk analysis and reporting.

Understanding, balancing and managing the myriad of risks requires broader employee involvement and deeper analysis of the risks associated with a firm's operational footprint.

While this is one of the most advanced phases of the model, firms should be aware of the signals indicating this level of maturity for EH&S information management is no longer sufficient to support the broader objectives of the business. For example, while a firm may have a clear handle on its major EH&S risks, it may still be seeing too many repeat accidents across multiple sites. To prevent or reduce such repeat accidents, firms need to determine which hazards, or combination of hazards, lead to such accidents. Critically, this understanding must then be applied to HSE policies, training and corrective actions which are easily accessible to the entire workforce. This ability to look across the

entire business, understand the risks posing the greatest threat to business productivity and support employees in changing behaviour to minimize these risks is not adequately supported by this level of EH&S information management maturity.

PHASE 6 – OPERATIONAL EXCELLENCE

In this final phase in the maturity cycle, firms are looking to not only manage risks but also to identify opportunities to enhance operational performance and productivity. Not only can all employees get access to the incident reporting tool but they also have access to HSE training and policies, including while in the field, to help understand how to better mitigate the risk in the future. Operational Excellence is a priority for the entire business and best practice processes are put in place across the firm. All relevant EH&S usage scenarios are covered and the information management tools are consolidated and integrated to facilitate identification of trend and performance improvement opportunities.



FIGURE 13
EH&S Information Management Maturity Model

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	
	Adhoc Issue Management	Data Management	Compliance Management	Performance Optimisation	Active Risk Management	Operational Excellence	
Digitization	Paper-based	Excel & custom databases	Software point solutions used in conjunction with Excel	Software point solutions with basic data analytics	Consolidated software solutions with advanced data analytics	Consolidated and integrated software solutions with advanced data analytics	
Deployment Sites	Isolated discrete sites	Multiple sites	All sites with compliance requirements	All sites with compliance requirements	All sites where EH&S is material	All sites where EH&S is material	
Company Culture	Company is unaware of the need or benefit of a structured EHS solution	Benefits of basic EHS recording recognised in small pockets of the business	Company commits to a structured process for achieving compliance	Company targets improvements in compliance performance	Company recognises the need to manage operational risks which extend beyond compliance	Operational excellence is a priority objective for the company. Best Practice processes are standardized throughout the company	
User Adoption	Minimal	Low	Low-Medium	Medium	High – universal ability to report an Incident for all employees.	All employees have access to incident reporting and easy to consume HSE training & policies	
Usage Scenario to Coverage	Occupational safety Employee health & monitoring Hazardous waste management Incident management Chemical compliance Air emissions management, excluding GHGs GHG emissions management Industrial hygiene Waste & wastewater management Auditing Internal reporting & document control Sustainability reporting	15%-20%	20%-40%	40%-60%	60%-70%	70%-85%	85%-100%
Analysis and Reporting	No reporting	Limited reporting on a small number of issues	Reporting in line with compliance requirements with some limited risk analysis at critical facilities	Compliance reporting supported by broad-based risk analytics which facilitates identification of performance optimization measures for compliance	Deep and targeted risk analysis and reporting across all sites where EH&S poses a material risk to the firm	Deep and targeted analysis and reporting focused on the identification of EH&S measures which enhance operational performance and productivity	

Five steps to reach the optimal EH&S IM phase for your firm

Six phases of maturity have been identified for EH&S information management. Each of these phases can be described through six dimensions which include digitization, deployment sites, company culture, user adoption, usage scenario coverage and analysis and reporting. For different firms, the most appropriate landing point for EH&S information management will vary due to variations in operating landscape, legislative requirements and industry standards.

A shifting set of drivers demands firms take a fresh look at EH&S information management. Firms should follow the five steps below to optimise the execution of their EH&S information management (IM) journey:

1 DETERMINE THE IM MATURITY PHASE WHICH BEST ALIGNS WITH YOUR EH&S STRATEGY

Phase 6 is not necessarily the correct landing point for all firms. This is the most advanced stage in the model and is best suited for firms exposed to the greatest EH&S risks. Each firm should consider its overall EH&S strategy and review each phase in the maturity cycle to determine the phase which offers the best alignment with the broader

strategy. For example, the exploration and drilling activities of oil and gas firms exposes their employees, contractors and the environment to some of the most serious risks from any sector. In this scenario, taking an operational excellence approach (phase 6) makes sense as it helps ensure best practices are standardized across the entire business.

2 AGREE YOUR CURRENT EH&S IM MATURITY PHASE

Having established a landing point, firms need to conduct an assessment of their current approach to EH&S information management. (It is important this step is carried out subsequent to step one to prevent the introduction of any bias into the landing point selection. For example, if a firm was to first evaluate its current state and conclude it was in phase 2, it may be less willing to select phase 6 as a landing point due to the perceived transformation effort.). This will provide an understanding of the level of transformation required. For a small single site manufacturing firm, this should be a relatively straightforward task but for a large multi-disciplinary utility, simply getting an accurate picture on the current approach can be challenging.





3 DESIGN THE JOURNEY FOR TRANSITIONING FROM THE CURRENT PHASE TO THE TARGET PHASE

How a firm elects to move to its target phase will also vary. Some firms may elect to jump directly to their target phase whereas others may elect to move through different phases in order to reach the end objective. In terms of firms moving directly to their target phase, this scenario could be triggered by an external event. Consider a food and beverage firm which has incurred significant fines and been forced to recall an entire product line due to violations in its product composition. In order to minimise the risks of a repeat incident and to win back the trust of its customers and the regulators, the firm may determine that a rapid upgrade to the target EH&S maturity phase is the most appropriate option. Firms without such obvious near-term pressures may have concerns about the business disruption and cost implications of a similar radical shift in EH&S approach. For these firms, a more gradual approach may be preferred involving moving through one or more intermediate maturity phases before reaching the landing point.

4 SELECT THE TOOLS NECESSARY TO FACILITATE THE JOURNEY

As a firm moves up through the maturity phases, it will be necessary to invest in different software tools to assist in the more sophisticated analysis that is required. These tools may be as basic as Microsoft Excel (Phases 2 and 3) but may also take the form of

dedicated EH&S management software applications with built-in analytics to support operational risk management and operational excellence (phases 5 and 6). Each firm must determine the tools it will need to support in its journey and run a robust selection process to ensure the most appropriate application(s) are selected.

5 ENSURE RELEVANT STAKEHOLDERS ARE GUIDED THROUGH THE TRANSFORMATION

If a firm wishes to change its culture, upgrade its processes or introduce new technology, it will need to bring relevant stakeholders with it. Implementing organizational, process or technological changes without a structured engagement and training program is likely to lead to failure. For example, a chemical firm wishing to move from phase 4 to phase 5 in the maturity model will require employees to start thinking more actively about EH&S. A compliance-centric focus on EH&S will need to be replaced by a risk-based approach. Almost all employees will become responsible for recording identified EH&S risks in an incident reporting application. To successfully deliver this change, employees will need to understand the reasons for the change and the benefits it will bring. Subsequent to this, the relevant training programs can be deployed and the new approach can start to be implemented. This final step is a critical component in minimising the risks associated with transforming the EH&S function.





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