

Competency Management: An Imperative for Operational Excellence

Programs like Six Sigma, Lean, Agile and Kaizen to improve efficiency are often confused with operational excellence (OE), but there is an important difference. These improvement programs help achieve “process excellence” by eliminating inefficiencies in a process but they do not generally encompass areas like culture, leadership and workforce competency. Process excellence is a worthy and worthwhile organization goal that can deliver numerous improvements to business processes and systems. However, true OE goes beyond isolated improvements to the factors that influence the entire organization and help create a culture of sustainable performance.

While process excellence is required to implement OE, OE is not required to implement process excellence. This paper will explore how competency management can help organizations move from process excellence in programs like HSE and Training, to true OE with a culture built on sustainable and measurable workforce performance.

The OE aspiration

The concept of operational excellence is a strategic aspiration for many companies. In the oil and gas, pipeline and petrochemical industries, these aspirations are common in corporate strategies, mission statements, goals and objectives. Committing to OE is a worthwhile goal, as long as it is viewed as a process, not just a destination. Striving for OE requires delivery and integration of a range of organizational elements and programs depicted as layers in **Figure 1**.



Figure 1: ¹Adapted from Bain & Company

The first of these layers focuses on baseline **performance management**. HSE and Quality programs must produce consistent results; just as HR recruiting, training and career programs need to attract, screen and develop a workforce that can perform and deliver the desired business results. The next layer focuses on the **organization and competency** of individuals and work groups. Once those programs are in place, there need to be systems, procedures and processes that ensure **integrated execution** among the various functions and disciplines.

Systems that support this integration might include formal and informal communication, knowledge management, multi-discipline teaming and computerized workflow management. When used effectively, these systems will align seemingly disparate functions for a common purpose. The next two layers (**strategy & optimization, leadership**) work in concert to ensure that there is a shared strategic initiative for sustaining and optimizing organizational performance. While effective management may deliver performance, it takes effective leadership to sustain it. Such is the case for OE as it requires sustained performance in all of these areas. But why is OE so critical now?

The OE imperative

The media today seems to focus on speculation about the direction of the price of crude oil, but there have also been even more concerning headlines. As recently as December 2015, a fire on an offshore rig in the Caspian Sea resulted in dozens of worker fatalities. That same year, an explosion at a refinery in Torrance, California, was being investigated. In 2014, there were four fatalities at a chemical plant in La Porte, Texas. Just a year before, there were fifteen fatalities at West Fertilizer in Texas. Each year, since the nearly continuous coverage of the Macondo Gulf of Mexico tragedy in 2010, the industry seems to have been in the news for all of the wrong reasons (see **Figure 2**).

Select Major Accidents (1974-2015)

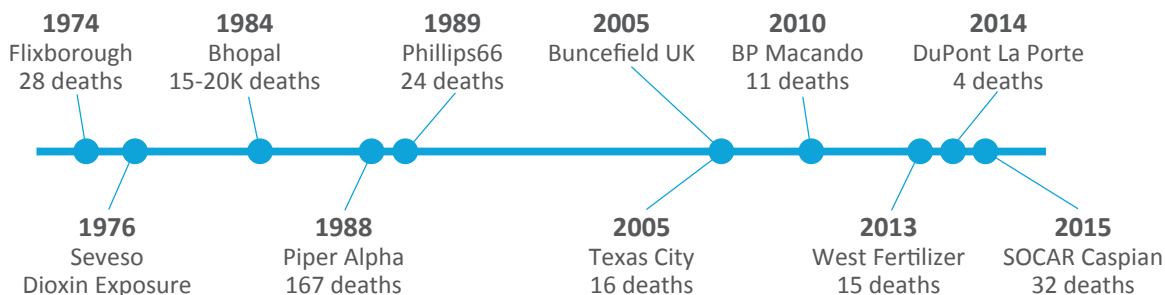


Figure 2

These events and trends, while overshadowed by the price of oil, are concerning and are not limited to any one segment of the industry. In the pipeline segment, the US Pipeline Hazards & Materials Safety Administration (PHMSA) reports that overall incidents have not changed appreciably over the last 20 years and fatalities continue to plague that segment (see **Figure 3**).

More than ever, there is mounting pressure from both the public and government officials for industry to do more. In fact, pending revisions to existing US regulations will soon bring new requirements to the upstream, midstream and downstream segments.

However, there have been safety regulations in effect for many years, right? Yes, there have.

PHMSA Pipeline Incidents: Fatalities (1996-2015)⁸

Incident Type: All Reported System: ALL State: ALL

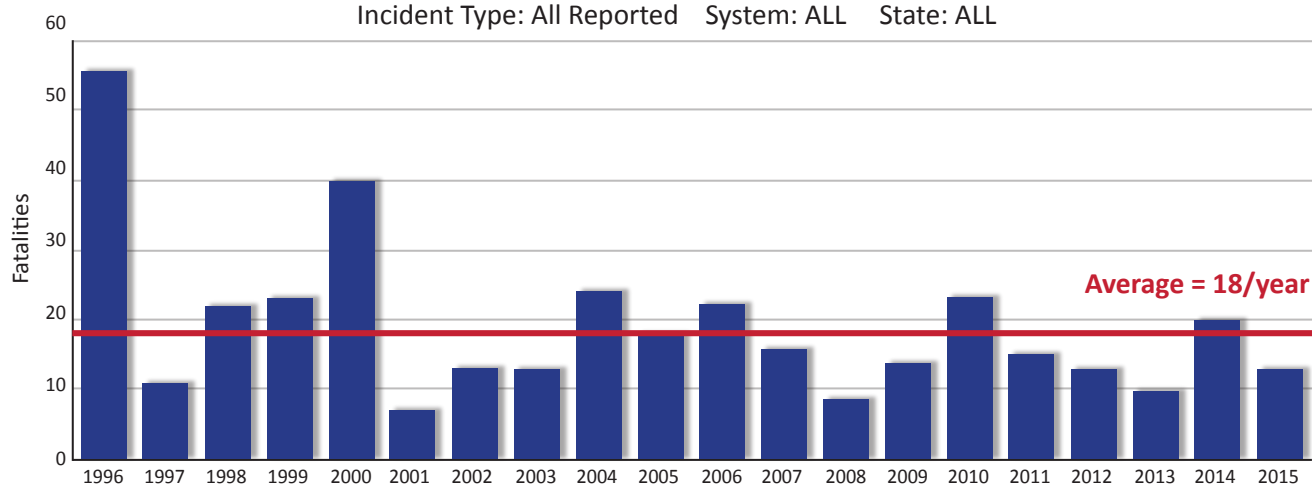


Figure 3

New or Revised US Regulations:

- BSEE SEMS - Offshore
- DOT/PHMSA - Pipelines
- ANSI/API 1173 - Pipelines
- OSHA PSM Revision-response to EO 13650 - Downstream
- EPA RMP - Downstream

Since the Seveso Act in the late 70s, regulations have required ever-higher levels of diligence in managing the safety of process facilities. Because it is theoretically impossible to remove all possible risks in business, in industries like oil and gas, refining and petrochemicals that operate with high pressures, temperatures and hazardous materials, the management of risk is even more critical since the potential for catastrophic events is so great. Programs alone are not the answer and often fail because they are misaligned and do not work together as an integrated system. Program integration is critical and is a core tenet of operational excellence – an operating philosophy that ensures

that systems and processes work together to provide the highest level of protection and redundancy from those inherent risks. OE is what many consider an over-arching, and perhaps long overdue, commitment the industry needs to embrace.

The human role in OE

When experts seek answers to the incidents and accidents that plague the industry, the causal factors are most often related to failures of equipment or systems designed to contain the processes. According to a study published in 2013 by Kidam and Hurme², equipment failures account for 80% of all chemical process accidents including piping (25%); reactors, tanks and vessels (24%); valves and various rotating equipment from pumps to compressors. According to this same study, 1 in 5 equipment failures were the result of human or organizational errors that included poor contractor control; failure to follow procedures; lack of planning; poor management and supervision; and simple misjudgments.

1 in 5

Chemical accidents caused by equipment failures are the result of human error.

Source: Joint research project by Aalto University in Finland and Universiti Teknologi Malaysia, 2013²

If human performance is such a major contributor to process safety, shouldn't programs like training and competency assurance receive even more funding and resources rather than be cut or delayed? In today's climate, overall budget cuts are reaching unprecedented levels. When capital budgets are reduced 30-60%, as many will be once again in 2016, there is little chance that training budgets will remain unscathed. Most likely, training departments will be downsized and additional training will be deferred along with new investments in technology to support training and competency programs. Unfortunately, those programs are sometimes considered non-mission critical when in fact; they are at the core of an OE philosophy that drives sustainable safety and reliability.

Even when training and other development and support programs are not impacted, the facility must accurately know the state of worker competency across the many disciplines and departments, if they strive to achieve OE. A competency management system can provide that type of insight.

What is competency?

Competency is the capability to consistently apply a set of related knowledge, skills and abilities to successfully perform critical job functions or tasks in a defined role or work setting.

"A company should ensure that personnel involved at all levels within their organisation, from operators to managers, understand fully their roles and responsibilities and that they have the necessary competency to carry out those activities."

Source: Buncefield Ten-Year Report³
-COMAH Strategic Forum

Competency management includes the policies and practices that identify, align and optimize the job roles and competencies required to deliver on an organization's business strategy. Competency management provides the foundation for workforce planning; talent recruiting, selection and hiring; and employee career progression and development. Competency management then, is the basis for creating and sustaining a high performance workforce. Most importantly, competency management helps organizations be sure that they have the right people with the right skills to perform the necessary job functions.

Competency management is not a new concept in the oil and gas industry and has been implemented in the offshore and upstream segments for many years. However at least today, it is far less common in the refining, petrochemical and pipeline segments of the business.

As we have discussed, that condition is now beginning to change with increased public scrutiny, pending new regulations and volatile market conditions driving all segments of the industry to look for ways to improve efficiency and ensure sustained organizational performance.

Programs that support competency

What is involved in developing a competent workforce? Many existing programs help support competency management systems. These include formal and informal training programs, on-the-job training, coaching and actual job assignments and experience (see **Figure 4**). These programs can help individuals acquire the knowledge

and experience necessary to develop job competencies. However, in order for training programs to be aligned with specific job roles, those core tasks and competencies must first be identified and written. This competency framework then helps to ensure that training focuses on the critical job-related knowledge and skills. In addition, job assignments should also align with the competency framework and job progressions to allow individuals to experience and practice those skills under supervision and coaching.



Figure 4

Pathway to competency management

Where do you start? What exactly is the scope of the effort? These are only a few of the numerous questions when considering a Competency Management System (CMS). Investment in resources and budget to create training programs, write procedures and conduct training over recent years, often creates a reluctance and perception that competency management is redundant or just too difficult to implement. While training and procedures are

“The wider chemical industry now has in place or is working toward embedding Competency Management Systems within their organisations to ensure that the right people have the right skills to manage and maintain major hazard controls on site.”

Source: Buncefield Ten-Year Report³
-COMAH Strategic Forum UK

essential to support a CMS, they have a very different goal and function from each other and from competency management. Fortunately, there is a practical and scalable approach to building and implementing a CMS.

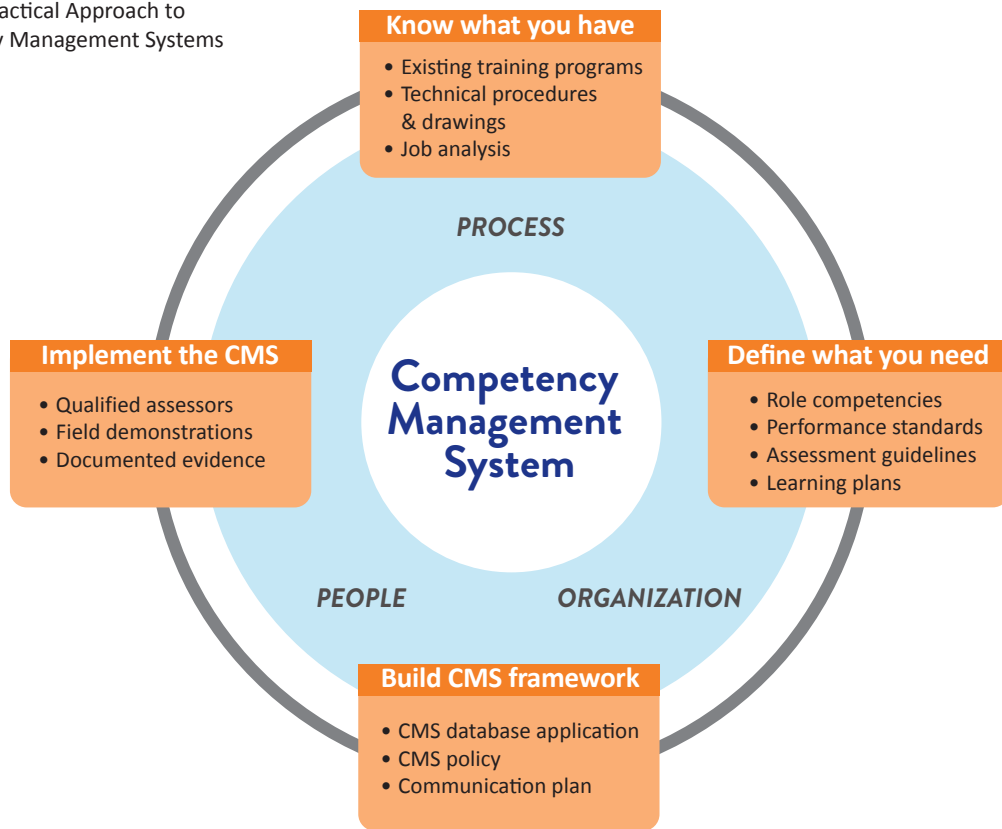
This approach builds on existing program elements and adds processes that clearly define required competencies for selected job roles, develop objective standards for assessment, and train qualified assessors. The approach also includes a change management phase to clearly communicate the purpose, benefits and outcomes of the program to all participants and build understanding and acceptance, thereby increasing the return of investment.

The phases of this approach, shown in **Figure 5**, include:

- **Know What You Have** is the first step to compile and assess all of the existing references, resources and programs currently available that can support developing the competency framework. These include job descriptions and task inventories, as well as training programs, job progressions, procedures, checklists, guidelines, policies, employment selection criteria, performance appraisal factors, business goals and objectives that describe expectations and responsibilities related to key metrics, and any other relevant documentation.

This is also the time to identify job role subject matter experts or SMEs. These individuals will be critical to confirm and validate the job competencies that are developed. Having a resource list or index will help eliminate the costs of unnecessary or redundant development work.

Figure 5: Practical Approach to Competency Management Systems



In addition, job descriptions and task inventories can provide the overall content, sequence and structure for competency maps. Task inventories should identify specific tasks performed by each job role to ensure that the competencies derived from the tasks accurately reflect the actual jobs in the facility. This data should be validated with those individuals who best know the work requirements (e.g., strong performers and supervisors), with input from those who can articulate the long-term strategy for the role, such as management. Additionally, the specific tasks in the inventory may be rated by factors such as complexity, difficulty of learning, criticality, and how regularly they are performed.

The above information is input to job analysis, a process for determining what the employee does on the job, the knowledge, skills and abilities required to perform the duties, and the context in which the work is performed. Having a valid job analysis can eliminate inefficiencies of using generic, off-the-shelf competency maps. Rather, the job analysis provides a basis for modifying these maps to fit the site-specific requirements of the jobs. Further, a thorough job analysis is an effective and efficient means to begin to create, validate, and link the various aspects of workforce performance measurement and support. Examples include:

- Employee selection criteria for recruitment or role modification
- Job structure, roles and responsibilities
- Qualification requirements
- Type and content of initial training required
- Refresher training content and frequency
- Learner evaluation methods and focus

- Personal Protective Equipment (PPE)
 - Applicable job-aids or procedures
 - Workload assessment
 - Performance appraisal and development planning
- **Define What You Need** refers to the initial design of the competency program elements. Elements include the competency maps and performance standards to be built or acquired. At this stage, it is important to define the organizational goals for the program and identify key stakeholder groups with interest in the program, both during the development stages and later during implementation. This includes senior leadership and line managers, in addition to representatives from support groups like HR and Training.

Since competency management often touches recruitment, hiring and job progression processes; appropriate legal representation is also important to ensure compliance with those requirements in all phases of the project. Developing a program policy that describes how competencies will be managed and used in the organization will help ensure consistency and alignment of all subsequent phases and activities with the business objectives and with leadership expectations for the program.

- **Build the Competency Framework** is the phase to develop and organize the specific competencies according to the selected job roles and job progressions. These sets of competency statements are often referred to as “competency maps” since they depict all of the performance expectations of a particular job role. This framework can be organized and divided into competency categories such as **core**, **job-specific** or **advanced**. Within each of these competencies are the actual performance criteria that determine an individual’s proficiency.

In addition to the actual competency statements and performance criteria, the framework should also include assessment guidelines for each competency or category. Assessment guidelines are a series of questions that assessors will ask or evidence they will request when conducting individual competency evaluations. The assessment guide might request **examples of various communications** that the individual has created or presented in order to provide the basis to determine their proficiency.

The rating of individual proficiency varies from one program to the next. Proficiency can be rated based on 3, 4 or 5 levels. The following provides one example of a 5-level proficiency rating scale:

Sample Proficiency Levels

1. Awareness – limited knowledge of the competency
2. Learning - knowledge of competency, but unable to perform skills independently
3. Application - applies knowledge or perform skills independently
4. Expertise - demonstrates highest level of application of the competency, and coaches/supports others
5. Mastery - uses competency skills, knowledge and abilities to optimize processes or troubleshoot problems

30%

of organizations use paper-based spreadsheets as their primary tool for managing performance.

Source: Brandon Hall Group's 2015 State of Performance Management Study⁴

Beyond spreadsheets

When building the competency framework, it is also important to select a system or platform that can manage the inventory of job competencies, assessment guidelines and learning plans; house documentation and evidence; and provide reports and tracking information. While many programs begin using numerous manual spreadsheets, this approach falls short of providing the type of information, visibility and insight into organizational competency that managers need to effectively manage resources and minimize risk.

Fortunately, today several CMS platforms can deliver real time information on the state of the competency across the organization. Each of these platforms uses its own unique approach to information format, user interface and reports.

Like any major software system investment, several different applications and providers should be evaluated to determine the best fit for the current organization, culture and future business goals. Selection criteria for a CMS platform will vary and can be extensive but should include the following factors:

- Data structure and features (importing, reporting, storage)
- Administrator and user interface
- Interoperability with existing systems (e.g., SAP, Learning Management Systems)
- Industry context and relevance
- Organizational process alignment
- Commercial factors
- Useful and usable

The CMS platform selected should be adaptable to the organization's competency process and philosophy, and help support rapid adoption by users while providing dashboards and reporting for administrators and management.

Finally, perhaps the most important key to successfully implementing any new program, like competency management, lies in how the intent, purpose and benefits are communicated to the individuals affected. Competency management is often a new concept to many organizations, or at least one not familiar to many. Often, individuals feel threatened at the thought of being assessed in their jobs and must first understand the full intent of the program before they can begin to accept and support it. Since these communication programs are actually change management efforts, they are more successful with involvement from HR, training, employee communications and marketing.

94%

of respondents believe that effective competency management would prevent safety and compliance issues.

Source: 2015 Survey of 100 US executives and HR professionals conducted by independent research firm, Reputation Leaders⁷

Because the benefits of a CMS far outweigh any initial misconceptions, those benefits should be central to all information distributed about the new program.

- **Implement, Verify & Measure** is the phase during which the CMS program is piloted and prepared for the formal launch. As with all major programs, the pilot portion at this phase is critical to allow a select group the opportunity to test the program and make adjustments before implementing it across the wider organization.

Two important considerations during this phase include confirming the assessment process and training the assessors. While a general policy governing the competency management process may exist, there is also a need for a more detailed procedure that describes the qualification of assessors and directs how the program is actually implemented and administered. This procedure is critical to ensure consistency, as well as to provide a valid basis for how assessment results are captured, will be used, and how any challenges to those results will be resolved.

Certainly, one of the major benefits of any competency management system is the ability to assess individual performance against the established competency requirements.

Processes vary but most will include the following key steps and methods (refer to **Figure 6**):

- **Individual self-assessment** – individuals assess their own proficiency in advance of the formal evaluation. In select cases, certain non-critical competencies may only require a self-assessment. However, the use of self-assessment is usually limited to identifying gaps in proficiency as an input for creating individual learning plans.

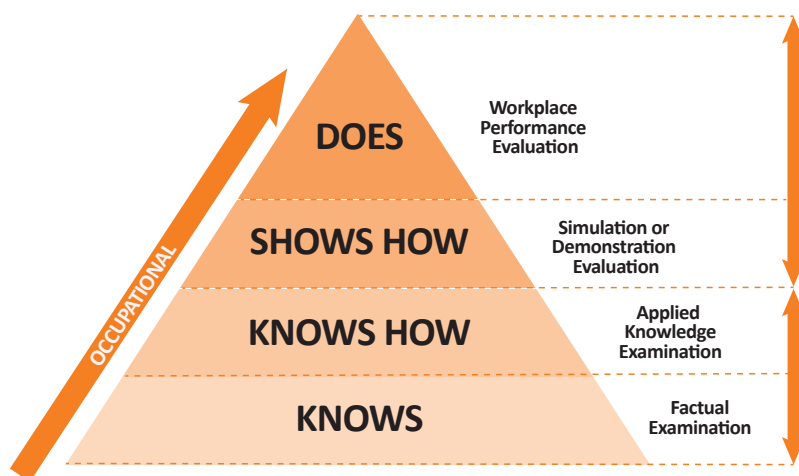


Figure 6: ⁵Miller's Pyramid Adapted from G.E. Miller, 1990

- **Evaluation preparation** – the qualified assessor reviews the assessment guide with the individual, confirms the schedule, and plans the logistics and physical aspects of the performance demonstration.
- **Performance demonstration** – the qualified assessor uses the range of questioning, evidence review and observation to determine the proficiency of the individual against the performance standards.
- **Evidence collection** – the qualified assessor compiles documentation, samples, and actual images which are reviewed during the session and are made part of the individual's record.
- **Documentation & Feedback** – the qualified assessor develops a report of the performance demonstration that is entered into the individual's record; the assessor also debriefs the individual and provides feedback on each session.

Those charged with conducting the assessment should be selected carefully and given the proper training for their unique role as an assessor. Often, assessors are supervisors who have performed the job roles for which the competencies are being evaluated.

While those individuals are qualified in the technical performance of the job, they should also be trained how to properly assess performance in the workplace. Various assessor training courses are available, but most include the following core topics:

- Overall competency assessment process
- Planning the assessment
- Interview & questioning techniques
- Collecting & judging evidence
- Workplace environmental factors & communicating feedback

In addition, many CMS programs include a requirement for internal verification of the assessors and assessments to ensure consistency and quality of the process. The Internal Verifiers should also receive appropriate training since they are performing a critical quality assurance function. Internal Verifier training will typically include:

- Overall quality assurance function
- Planning to observe the assessment
- Monitoring the assessor conducting an assessment
- Documenting the session
- Providing feedback to the assessor
- Standardization meetings across the program so everyone is assessing them the same

With trained and qualified assessors and verifiers implementing the CMS, the program's progress can be measured against organization goals and objectives as competencies are assessed and confirmed for each operating group. These accomplishments can also be compared to other performance indicators that may include quality, safety and production level metrics to identify key benefits of the program. Return on investment (ROI) calculations can be complex, but establishing the starting baseline for key performance indicators is an important first step.

Competency management best practices

When embarking on a new program like a CMS, it is also best to seek out and apply proven best practices. Competency management systems have been in use in organizations in a range of industries for many years and this experience has led to the following best practices [*Partial excerpts adapted from Brandon Hall⁶*]:

- **Automate Competency Management Processes**
Automation increases operational efficiency with improved data and analytics; ease of administration and reduced administration costs; increased visibility and timely reporting of critical skill gaps for mitigation.

- Keep It Simple**
 Be diligent in resisting the urge to identify an excess of competencies; focus on the critical ones. Simplicity allows the program to be more easily explained and understood; provides for more consistent implementation; and increases clarity in reporting across the organization.
- Align Competency with Organizational Goals**
 This alignment is critical to sustain the interest and commitment of senior management and demonstrate value to the stated focus of the organization.
- Communicate, Communicate, Communicate**
 Open and constant communication helps to clarify the intent, goals and impact of the program. It also helps to minimize misconception and suspicion and builds support and acceptance.
- Train Assessors & Internal Verifiers**
 Competent and qualified assessors help ensure program validity, build support, and drives consistency and the ultimate success of the program.
- Link CMS to other Talent Processes**
 As the standard for expected job role performance, competency management is the standard by which all phases of the employee life cycle are managed – from talent acquisition and development to retention and reward.
- Develop, Not Just Assess**
 Focus on individual development and drive experience-building opportunities and career progression to build acceptance and value that the program can ultimately deliver.

Benefits of competency management

At the end of the day, an investment in competency management will return high dividends and key benefits that include:

- Reduced risk** – assurance of workforce competency in critical skills provides a layer of protection against hazards to reduce reported safety incidents by as much as 52%.⁷
- Regulatory compliance** – verified and documented assessment of critical competencies supports current and pending regulatory requirements.
- Enhanced Talent Management** – clearly defined job progressions and performance requirements simplifies recruiting while providing clarity for career development and advancement. This transparency allows the organization to better plan resource needs, maintain a reliable pipeline of new talent, and clear career paths increase job satisfaction of workers.

Respondents performing competency management reported

52% fewer safety and compliance incidents.

Source: 2015 Survey of 100 US executives and HR professionals conducted by independent research firm, Reputation Leaders⁷

- **Improved management visibility** – data and analytics about worker skills and knowledge are essential for leadership performance management, risk mitigation and business forecasting. Improved visibility enhances decision-making related to new investments and needs for training and increased staffing to fill skill gaps.
- **Improved organizational performance** – improved processes for managing workforce competency drive higher performance by eliminating inefficiencies, integrating functional teams, and eliminating rework caused by human error and mistakes.

Achieving Operational Excellence

As we have seen, the aspiration for operational excellence requires the integration of several key organizational elements or programs, many of which are directly related to human performance and individual competency.

For this reason, organizations are increasingly using competency management systems to help ensure that across all levels and functions, the workforce has the skills and abilities to perform reliably and consistently in critical job roles.

Applying a practical approach to build and implement a CMS is the first step to achieve these goals.

About the Authors

TDS, INC. [tdshou.com]

TDS (Training & Development Systems) provides workforce learning and development solutions and has served the oil and gas industry since 1993. TDS collaborates with companies in the oil and gas, pipeline, petrochemical and refining industries to improve workforce performance and bring out the best in their most valuable asset – their people. Expertise in the industry, as well as in adult learning and competency management, provides TDS a keen understanding of your business, and our flexibility allows us to deliver customized solutions quickly and efficiently. +1 281.488.1128

HULA PARTNERS [hulapartners.com]

Hula Partners is the creator of Kahuna and a provider of HR software, strategic consultation, Kahuna Competency Management and SAP HCM & SuccessFactors implementation services. We draw on more than 80 years' collective experience in providing global transformation services to oil and gas, aerospace and defense, among others. Our mission is to empower companies to place the right worker in the right job at the right time to keep operations running smoothly and efficiently, reduce total costs and develop the workforce. +1 844.438.4852

Sources and References

¹*Operational Excellence: Imperative for Oil & Gas Companies*, John McCreery, Ethan Phillips and Francesco Cigala, Bain & Company, 2013.

²*Analysis of equipment failures as contributors to chemical process accidents*, *Process Safety and Environmental Protection*, Kidam, K., Hurme, M., Volume 91, Issues 1–2, January–March 2013, Pages 61–78, doi:10.1016/j.psep.2012.02.001, 2012 Institution of Chemical Engineers.

³*“The Buncefield Major Incident - 11 December 2005, Ten Years On” A report by the COMAH Strategic Forum.*

⁴*2015 State of Performance Management Study*, Brandon Hall Group, 2015.

⁵Miller, G. E. (1990). *The Assessment of Clinical Skills/Competence/Performance*. *Academic Medicine*, 65, S63-S67.

⁶*COMPETENCY MANAGEMENT: CHALLENGES AND BENEFITS*, By Laci Loew, VP and Principal Analyst, Talent Management Research, Brandon Hall Group, *Training Magazine Online*, Posted February 25, 2016. <https://trainingmag.com/competency-management-challenges-and-benefits>

⁷*2015 Survey of 100 US executives and HR professionals*, Conducted by independent research firm, Reputation Leaders.

⁸*Pipeline and Hazardous Materials Safety Administration (PHMSA) Incidents & Graphs.*