Creating and Protecting Business Value Through Integrated EHS&S Systems

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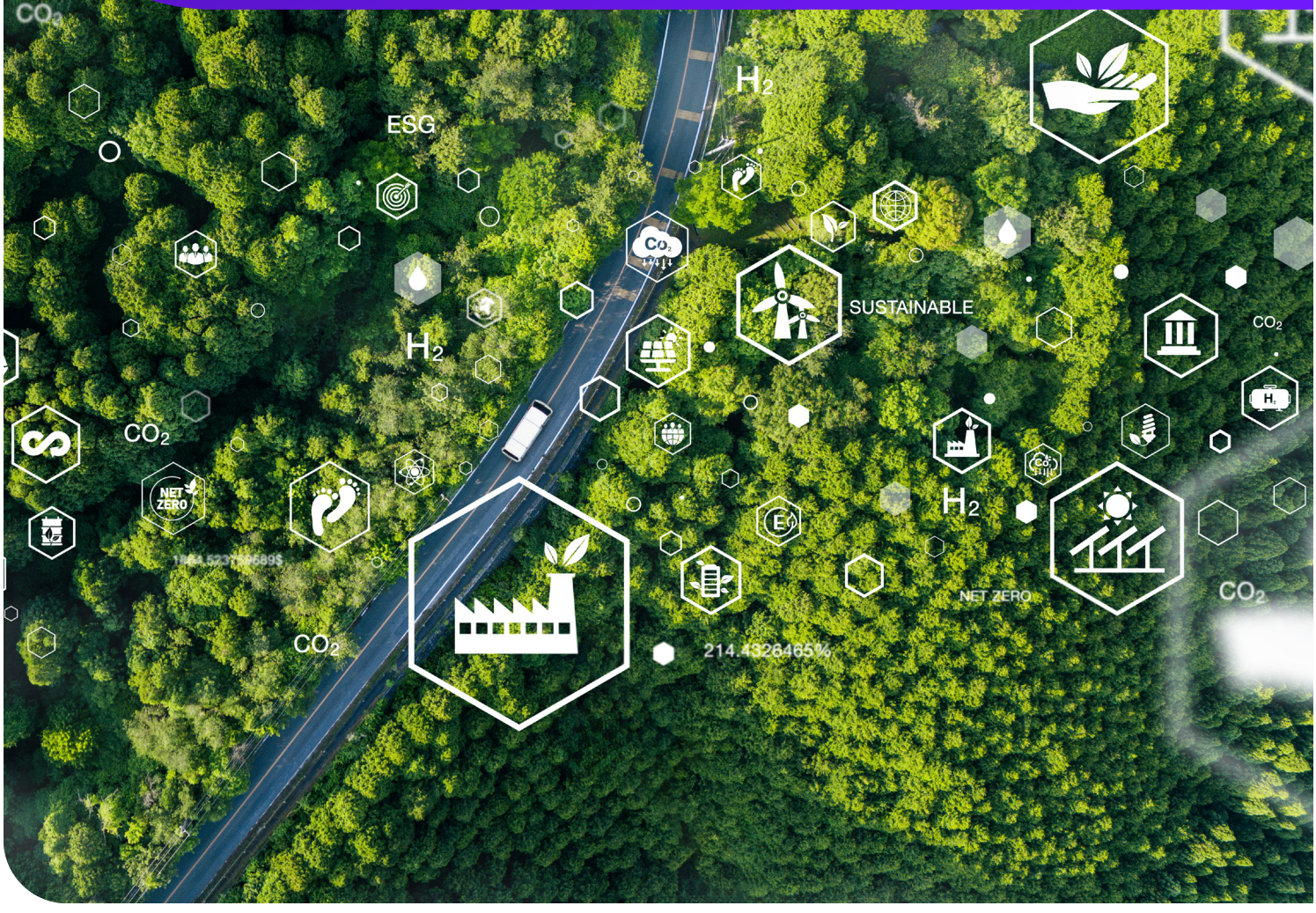
WHITE PAPER



Setting the Stage for EHS&S Performance Excellence

Today, U.S. businesses and governmental entities (e.g., Department of Transportation [DOT], local publicly owned treatment works [POTWs], cities and counties, etc.) are expected to operate within a highly structured and complex regulatory framework that has been built on preventing negative impacts to the workplace and the environment. Whether through the Environmental Protection Agency (EPA) or the Occupational Safety and Health Administration (OSHA), we as a society have learned how to improve the expected outcomes through prescriptive regulations and incentives to eliminate recurrence, improve performance and receive recognition of achieving higher standards (e.g., ISO management system certification, high Carbon Disclosure Project [CDP] score, OSHA VPP, etc.). Both required and voluntary programs have enabled businesses to better manage their Environmental, Health, Safety and Sustainability (EHS&S) risks. Companies that have recognized this nexus have created more business value and protecting it has become a competitive advantage in the marketplace.

Effective EHS&S programs have common ingredients for success: (1) informed and engaged leadership to effectively deploy support and enable resources to address EHS&S risks and regulatory obligations; (2) innovative application of technologies to ensure regulatory compliance performance and the recognition, elimination/minimization and effective control of EHS&S risks; and (3) objective evaluation of EHS&S system performance in achieving targets and objectives, as well as seeking continual improvement. Companies and governmental entities that implement and maintain these three important program pillars are more successful in managing their EHS&S program requirements and obligations.

In return for engaged leadership, through planning and investments made to achieve important targets and objectives, these businesses may experience lower implementation costs over time, fewer EHS&S incidences, and consistency of positive performance.

EHS&S professionals are setting and pursuing key performance indicators (KPIs) of success, while designing and implementing management systems, integrating performance standards, utilizing technologies to manage data and information, managing resource needs and changes and deploying expertise to meet and exceed the applicable regulatory requirements. Companies integrating these various programs recognize they will significantly contribute to business success.

These expectations and resulting accomplishments are typically enabled by integrating information management platforms with the proven structure of a management system to confidently meet EHS regulatory requirements. In addition, these efforts also contribute to sustainable solutions that help position a business to effectively address the challenges facing the environment and our workplaces.

Key components of a strategy to achieve EHS&S performance excellence are highlighted in the following three sections.

I. Building an EHS&S Foundation

At a minimum, an effective EHS&S system must be designed and developed with the following three key elements: (1) consistent senior leadership engagement and support; (2) a clear understanding of the applicable compliance and legal obligations; and (3) recognizing, identifying, prioritizing and addressing EHS&S risks. Let's review each of these foundational elements in greater detail.

Consistent Senior Leadership Engagement and Support

Over the last several years, businesses and government entities have paid greater attention to the qualifications and expected performance of their EHS&S organizational structure. There are many examples of how poor EHS&S performance has significantly impacted business performance and required unplanned and additional capital costs over years of future performance (e.g., to comply with an environmental damage consent order, or assist the community in restoration after an explosion or toxic gas release). These unseen business risks were present, but leadership may not have engaged deep enough into the organization to recognize and understand the EHS&S risks and verify that adequate controls were in place to mitigate these business risks; especially moderate to high EHS&S risks.

Those organizations that have sustained high-level engagement and support from senior leadership routinely perform better than organizations lacking any involvement of senior leadership, or involvement only when there is a serious issue or crisis – indicating a reactive business environment. Organizations that consistently perform well in both business goals and EHS&S performance have well-informed leadership engaged in the planning, execution and routine performance review of the EHS&S systems/programs. These leaders range from the Chief Executive Officer (CEO) to the Vice President of Operations to the Director of the EHS&S organization. These leaders help ensure that effective systems exist to drive expected outcomes that are not highly reliant on the performance of a few unique individuals. Instead, they engage with the organization to confirm a sound structure is in place and the organization has what it needs to be successful achieving its EHS&S targets and objectives. These engaged and competent leaders independently verify the systems are appropriate and being properly implemented through the use of independent evaluators. They take appropriate actions to address concerns and improve performance.

Clear Understanding of Compliance and Legal Obligations

As stated, the legal and regulatory framework that exists in the United States typically is based on some negative historical event that caused injuries and/or environmental impacts that led to new laws and regulations to prevent recurrence. Generally, these new laws and regulations inherently include the basic structure of a management approach to raise awareness of the requirements, how to comply with the specific requirements and how to document compliance with the regulations (e.g., compliance certification of a Title V operating permit; compliance audit of the PSM program; annual reporting of health and safety performance; etc.). Following these regulations generally will prevent or minimize injuries to employees, the community and negative impacts on the environment.

In addition to the inherent compliance features that help protect the workplace and the environment, regulatory non-compliance poses a business risk. Federal EPA, OSHA and associated state agencies recognize that regulatory enforcement tends to reinforce compliance even for those facilities not being inspected. Frequent and impactful enforcement of occupational health and safety regulations, as well as environmental regulations, presents financial and reputational risks to businesses and organizations. As a result, having a clear understanding of the compliance and legal obligations of an organization is foundational to its EHS&S success.

Recognizing, Identifying, Prioritizing and Addressing EHS&S Risks

The effective management and control of EHS&S risks is critical for organizational success. Over the last 60 years, we as a society have witnessed serious accidents that have devastated communities and financially crippled businesses that did not effectively understand and/or manage EHS&S risks.

To help eliminate or significantly reduce the probability of a serious environmental and/or workplace accident, companies are wise to perform a comprehensive risk assessment of their operations and activities from an EHS&S perspective. This critical analysis can be performed whether the company or facility is new, or whether it has been operating for more than 50 years. This risk assessment process includes:

1. Recognizing and establishing the scope of the EHS&S risk review related to the operations and activities of the organization.
2. Identifying the possible EHS&S risks that could occur if they were "uncontrolled." Viewing these EHS&S risks in an "uncontrolled" state helps illuminate the operational controls needed to properly manage these risks.
3. Carefully and methodically identifying EHS&S risks posed by operational activities within the defined scope and rank each risk by priority (highest to lowest risk) using a standardized scoring process. "Uncontrolled" EHS&S risks represent those risks that exist within activities, processes, operations and equipment use that do not benefit from any form of controlling the risk. Examples of "uncontrolled" risks include: no control technologies in place for air emissions or wastewater discharge (untreated emissions and discharges); no work procedures or training for workers to follow (relying solely on experience); no machine guards in place (exposing workers to dangerous conditions); no pressure relief valves installed on tanks (relying solely on equipment structural integrity); no emergency response procedures to follow (relying on local management to know what to do during a serious event); etc. This evaluation will highlight the most significant EHS&S risks (i.e., those that can lead to the most significant negative outcomes – property damage, injury or death, contamination to the environment and/or reputational damage) to the organization when operational controls are not in place.
4. Identifying the most significant "uncontrolled" EHS&S risks to the organization provides the focus needed to ensure these risks are known to the leadership and workers of the organization and prioritizes the resources needed to address these EHS&S risks so they can be consistently and properly managed at all times. This is a necessary step in designing, building and maintaining an effective EHS&S management strategy to successfully control the organization's risks.
5. For each of the possible "uncontrolled" EHS&S risks identified (highest score to lowest), evaluating and scoring the strength of the currently implemented operational controls for risk mitigation. This effort will identify whether the current EHS&S risks are being appropriately controlled or not. This evaluation is critical for protecting workers, the community and the environment. It highlights the weaknesses in the currently implemented operational controls (if any) and provides the opportunity to identify, prioritize and apply more effective operational controls for these risks. Operational controls represent the equipment, structures, written procedures, competencies, training, testing, maintenance, etc. that have been applied to each recognized EHS&S risk to help ensure it is appropriately controlled. Initially, focus on the "controlled" high EHS&S risks that could impact employees, the community and the environment, and then work through the moderate and lower ranked EHS&S risks.
6. Considering additional controls to those currently implemented to eliminate or lower the EHS&S risks to a level that prevents injury to the workers, community or the environment, and can be effectively implemented and managed using technologies, equipment, training, procedures, etc. Then, work through the moderate and low EHS&S risks using a similar approach through completion. Based on the re-evaluation of the current operational controls in place for each EHS&S risk, determine whether additional operational controls are needed to provide the confidence and assurance that the

EHS&S risk is appropriately controlled using a scoring system that now ranks the revised "controlled" EHS&S risks (if changed) to low – the lower the risk score, the more effective the operational control(s) in place.

7. Based on the evaluation of which EHS&S risks require further operational control(s) to confidently prevent or effectively manage these risks, addressing the higher risk scores first, as previously noted. Examples of existing or additional operational controls needed to appropriately manage the EHS&S risks may include:
   - Material replacement/substitution from highly hazardous chemicals to less hazardous/non-hazardous materials (i.e., the best solution for addressing an EHS&S risk is elimination; removing the risk from occurring by eliminating the hazard).
   - Discharge control and treatment technologies and prevention programs for air emissions, chemical releases and wastewater discharges that could impact the environment (i.e., treatment, filtration, recycling, etc.).
   - Process safety management activities that eliminate or minimize hazardous chemicals used and prevent releases or accidents within the covered process (i.e., routine inspections, testing and preventive maintenance).
   - Use of engineering controls to eliminate industrial hygiene exposure concerns (i.e., engineering controls such as isolation of hazards; proper ventilation to establish a healthy and safe work environment; etc.).
   - Technical procedures for the deployment and use of effective safety management systems and associated programs for the protection of the workers (i.e., well-written and comprehensive standardized work procedures for workers to follow when engaging in work activities such as ergonomics, lockout-tagout, confined spaces, hazard communication, etc.).
   - Designing, implementing and maintaining an effective EPA's Risk Management Planning (RMP) program for the protection of the community from the release of a highly hazardous chemical (i.e., well-trained workers operating and maintaining processes that are critical for the protection of the workplace and the community).

The results of applying the necessary operational controls will establish confidence that the EHS&S risks are thoroughly understood, efforts are adequately funded and the risks are being properly controlled. In addition, the results position the organization to conduct routine and thorough evaluations of their highest and moderate EHS&S risks to further reduce or eliminate workplace injuries and impacts upon the community and the environment.

II. Innovative Application of Technologies and Performance Standards

Before the development and adoption of national industry standards and international organizational standards, companies primarily relied upon the knowledge, experience and talent of their EHS&S teams to protect their workers, the community and the environment from recognized, unrecognized, controlled and/or uncontrolled EHS&S risks. Typically, these efforts were focused primarily on regulatory compliance requirements to successfully manage these risks.

For more than 25 years, we have benefited from the design, implementation and continual improvement of the management system concepts and related structures from the International Organization for Standardization (ISO). Specifically, for EHS&S risks, the standards that have guided many organizations to establish, implement and maintain an EHS&S management system have included the ISO 14000 series (focusing on Environmental Management System standards) and the ISO 45000 series focused on the Occupational Health & Safety Management System standards. These global standards have been used to establish, implement, manage and improve upon EHS&S management system performance and risk management with nearly one million organizations certified under the ISO 14001 and/or ISO 45001 standards globally according to a survey conducted by ISO in 2022.

Various industry groups have established and provided management system program standards and/or guidance for their members, such as the American Petroleum Institute (API) Recommended Practices (RP), including RP75 and RP1173 for specific industry segments. These management systems and industry standards have elevated our understanding of the most effective processes to identify and recognize EHS&S risks that can negatively impact our workplace, communities and environment. This has been critical in the establishment, implementation and maintenance of an EHS&S risk management structure that can be routinely improved upon.

We now have the experience and proven benefits of a well-designed, implemented, maintained and continually improved EHS&S management system. The structure and discipline that a comprehensive management system establishes a clear understanding of organizational EHS&S risks and how to effectively manage them. We have learned over the last 25 years that the establishment of a comprehensive and well-functioning management system for any organization must include the following activities:

- **Design, implement and maintain a management system** with robust programs to effectively eliminate and/or manage, and routinely evaluate the EHS&S risks for the protection of employees, the workplace, the environment and the community. Ensure that these management systems are implemented and maintained to track EHS&S risk management performance. This information is critical to help leaders understand changes required to prevent future injuries to employees, releases into the community and impacts on the environment.
- If the organization has multiple plants and/or facilities, **establish and implement a consistent and integrated EHS&S risk strategy at all operating plants and/or facilities**, that includes:
  - Expectations and objectives;
  - Common well-developed and appropriate tools for managing EHS&S risks;
  - Well-structured and comprehensive management system and associated programs;
  - A robust information management system (IMS) that is designed and implemented to support the overall EHS&S risk strategy, management system structure and ability to accurately monitor its performance;
  - A well-established Management of Change (MOC) program to proactively manage changes that affect the EHS&S risks for the organization;
  - An ongoing leadership engagement process to ensure EHS&S risks are recognized, properly addressed, objectively evaluated on a regular basis and well-

managed and reported throughout the organization; and

- Proper funding for a successful outcome and ongoing maintenance and improvement of the management system and IMS.

- **Implement strong EHS&S programs using an integrated EHS&S management system.** Demonstrate best-in-practice approach and performance of the management system to effectively control EHS risks.
- **Design, implement and maintain a consistent Information Management System (IMS) across the organization** that includes each plant and/or facility, and is led by EHS&S senior leadership. This IMS must be able to monitor and verify compliance and conformance with applicable requirements and standards – whether through direct measurement or verified data entry. Where possible, automate monitoring, recordkeeping and reporting requirements using an integrated IMS (i.e., daily, weekly, monthly, quarterly, semi-annually, annually and biennially) to improve accuracy, awareness, communication, response and efficiency. The IMS provides compliance management support to ensure ownership, accountability and visibility to leadership for the completion of critical tasks/activities (driven by the EMS, permits, regulations, etc.) and ensuring escalation to appropriate leaders when activities are not being completed on time, or reassignment of tasks/obligations when staff turnover occurs to ensure business continuity.
- **Identify, assign, train and support** the resources managing the EHS&S management system, as well as the IMS, with the appropriate competencies, responsibilities and duties to effectively manage these EHS&S risks.

  Where the need for resources is periodic or short-term in assignment (e.g., specialized and trained resources, temporary replacement of an employee or filling of a position, increase need for EHS&S resources through the implementation phases, etc.), utilize outsourced resources with the proper experience and expertise to address unique circumstances. More organizations are evaluating or selecting an EHS&S outsourced model to manage their day-to-day resource needs. This approach aligns experienced resources at a lower cost. Hire resources with the required competencies, certifications and expertise for the applicable EHS&S risks. Ensure the outsourced resources are properly trained on the EHS&S management system and IMS as it pertains to their assignment to continue to properly control the applicable EHS&S risks.

A key component to EHS&S performance and the design and deployment of an effective IMS will be the application and use of artificial intelligence (AI) to evaluate information and data to monitor compliance and progress to achieve EHS&S targets and objectives. AI has the advantage of analyzing significant amounts of information and data to identify patterns (either positive or negative), evaluate potential hazards and possible impacts, monitor information and data for "early warning" concerns in risk and/or performance, automate EHS&S reporting based on information and data being gathered, and provide insight to improve the effectiveness of risk management techniques that improve EHS&S performance.

Several examples where AI may be applied to improve EHS&S performance include:

- **Advanced Risk Detection:** AI algorithms can analyze data from various sources like sensor readings, historical incident reports, and monitoring employee behavior that may identify underlying risks and predict potential accidents or outcomes before they occur.
- **Real-time Monitoring:** AI-connected sensors can continuously monitor environmental conditions and information such as air quality emission rates and/or concentrations, noise characteristics and levels, and hazardous chemical concentrations and migration, providing immediate alerts when safety thresholds are approaching or exceeded.
- **Employee Behavior Analysis:** AI has the ability to monitor work conditions and employee actions through video recordings and identify unsafe behaviors and identify the necessary targeted training content to achieve compliance and improve performance.
- **Predictive Maintenance:** AI can be used to analyze equipment usage data to predict potential failures, allowing for preventative maintenance to eliminate accidents and workplace downtime.

- **Compliance Monitoring:** AI can be used to continuously check for compliance and/or conformance with EHS&S requirements, identifying potential concerns, advising immediate intervention to address the issue, and generate and distribute necessary reports as needed. AI can be a useful tool in support of audits and inspections for compliance and conformance requirements.
- **Optimized Resource Management:** AI can analyze water and energy consumption and other resource usage to identify areas for improvement and optimize operations for environmental sustainability.
- **Data-driven Decision Making:** By analyzing large datasets, AI can generate insights to better inform senior leadership and EHS&S team members on improved strategies, including targets, objectives, training programs and preventative measures.

An integrated approach to identify and manage EHS&S risks will provide a strong foundation and the consistency needed to manage operations and activities proactively and effectively across the organization.

The use of information management systems and AI technologies will help identify and/or eliminate EHS&S risks that could be harmful to the workplace, the community and/or the environment, as well as assisting with the evaluation of the effectiveness of risk controls.

III. Objective Assessment and Improvement of the EHS&S System

The development, implementation and maintenance of an effective EHS&S management system and aligned IMS to manage an organization's risks is a significant and a critically important investment for its future. To properly protect and nurture this investment, the EHS&S management system must be carefully evaluated initially, and then routinely assessed to ensure it is properly managing and controlling EHS&S risks. Without this initial and periodic assessment, it may not provide the protection expected to control significant EHS&S risks for the organization or business.

When evaluating the health and effectiveness of the integrated systems to manage EHS&S risks, an organization must perform specific tasks, including:

- **Initial verification that the EHS&S management system has been incorporated and appropriately addresses all elements against the standard** (whether a specific ISO standard or a modified standard to suit the organization's needs and interests). If all required elements of the standard have not been developed and implemented, focus on completing the work necessary to ensure conformance to the standard.
- After the EHS&S management system has been confirmed to be complete and aligned with the standard, **confirm the IMS has been appropriately designed and implemented** to effectively manage all the EHS&S risks. If the IMS does not align with or provide the necessary information and data, ensure these issues are addressed as soon as possible. It is important to have confidence and reliance of the EHS&S management system and the IMS before deployment.
- After confirming that the EHS&S management system and IMS are properly aligned and complete, **determine the frequency of an independent evaluation of the EHS&S management system and the IMS** based on the potential severity and resulting consequences if the high and moderate EHS&S risk scenarios were to occur. It is recommended that the frequency of the independent evaluation is performed at least on an annual basis, but the frequency may need to be increased to carefully evaluate the highest EHS&S risks until the confidence is established that the EHS&S management system and IMS are operating as designed. Independence in the people performing this review is important to eliminate bias in the system evaluations, as well as current operations and maintenance activities.
- **Assemble an independent and competent team to evaluate the effectiveness of the EHS&S management system and IMS**, including their components. Deploy the team to evaluate whether the existing EHS&S management system and IMS are appropriately managing the high and moderate EHS&S risks through specific operational controls and prevention measures in place.
- The team will generate an **actionable findings report** and work with the organization to create a corrective and preventive actions (CAPA) plan with priority level, targeted completion dates, expected outcomes and assigned resources. The CAPA report will be routinely updated by the assigned plant and/or facility personnel and carefully reviewed and confirmed by applicable leadership representatives.

Independent and timely evaluations of the EHS&S management system and IMS are critical activities that organizations must employ to ensure their EHS&S risks are being properly managed and effective to prevent injuries to workers, impact on the community or damage to the environment. Leading organizations understand the importance of these evaluations in successfully managing EHS&S risks and learning new solutions to continually improve upon EHS&S risk management and performance. By engaging senior leadership and being proactive in managing EHS&S risks, these organizations have confidence in their systems which allows opportunity for improved performance and growth.

Creating Pathways for EHS&S Success

Integrating well-designed, executed and consistent EHS&S systems and associated programs at the plant-level with a corporate-level vision, objectives, planning, resources, systems and execution activities will provide the momentum to lead the entire organization successfully into the future. EHS compliance and conformance systems must remain a priority for a business coupled with addressing sustainability issues. We cannot lose sight of these EHS regulatory requirements as we aggressively address climate change effects and challenges, social and labor workplace standards and expectations and sustainable policies for improvement.

It is essential to establish, integrate, maintain and revise systems, programs and technologies to confidently manage and address the current and future effects on the environment and ensure healthy and safe workplaces. The reward of this pursuit is a well-organized business that has integrated its EHS&S systems in a consistent manner across all aspects of its operations. This allows the organization to experience profitable outcomes and the benefits of a healthy and safe workplace with engaged employees, a thriving community and a sustainable environment.

The strategy and actions necessary to improve upon the organization's EHS&S performance is associated with recognizing, addressing and effectively managing the risks from its operations and activities. We can enhance our strategy to improve our EHS&S systems and programs by identifying, selecting and integrating appropriate artificial intelligence (AI) and other digital technologies. Selecting the applicable AI and digital technologies may help achieve higher EHS&S performance at a lower cost over time. These ingredients help organizations to achieve and maintain performance excellence for the life of the business.

Delivering in the Market

TRC stands for adaptability. With direction setting perspectives and partnerships, our 8,000+ tested practitioners in advisory, consulting, construction, engineering and management services deliver unique resolutions that answer any built or natural imperative. By creating new pathways for the world to thrive, we help our clients adapt to change and achieve long-lasting results while solving the challenges of making the Earth a better place to live — community by community and project by project.

Location and Size:

~8,000 employees

140+ offices globally