

Appendix 1.G. Best Practices in Occupational Safety and Health

There are numerous publications on best practices, or recommended practices in occupational safety and health to guide organizations wishing to improve their record in these areas. One mentioned here was developed at the request of industry (“Driving Toward ‘0’: Best Practices in Corporate Safety and Health”) and another is a recent OSHA publication (“Recommended Practices Safety and Health Programs”). While there are also numerous publications on best practices for pipelines and underground gas storage, most are focused on the integrity of the system and not on occupational health and safety specifically, e.g., Protecting our Infrastructure of Pipelines and Enhancing Safety (PIPES) Act of 2016. The UGS industry is encouraged to tailor the occupational health and safety best practices to protect workers in underground gas storage processes.

In their report, “Driving Toward ‘0’: Best Practices in Corporate Safety and Health” Whiting and Bennett (2003) discuss a direct response to requests by members of the Conference Board’s Townley Center for Environment, Health, and Safety Councils—a long-established networking group of senior EH&S executives from approximately 65 leading US companies—for a benchmark on corporate safety culture and a rating of the policies and best practices that affect corporate safety performance.” Some of the key findings of this report include the following:

Leadership at the top *If the top executive believes in the worth of the strategies, sets expectations for other managers, follows through on those expectations, and commits appropriate resources, shared beliefs, norms, and practices will evolve.*

Confidence on the part of all employees *that the company values safety and health comparably with other values, and an understanding by all employees of how to achieve the expected performance. Everyone must be committed and engaged.*

Creating and implementing a safety and health management system that works for the individual company.

Monitoring performance regularly *Companies must continually assess their norms and provide frequent feedback to all employees and to external stakeholders.*

*Use of the best practices included in the survey is high — 84% of surveyed companies have adopted all 23 strategies listed in the survey. (The complete survey form can be found at the end of the report.) Although comments on preferred practices reveal considerable variation as to what practices companies emphasize most—reflecting a variety of specific risks and challenges, as well as ‘cultural’ differences in approach—certain themes stand out as essential: **Clear management visibility and leadership** Ownership of safety and health by all employees—moving from “involvement” to ‘empowerment’.*

Accountability at all levels of an organization, including positive and negative performance feedback

Open sharing of knowledge and information throughout the organization

If there are similar core principles in play at companies striving toward '0,' there is no common template. Each company faces unique needs and opportunities inherent in the nature of its operations and workplaces, and from whatever company culture is brought to bear.

Operational integration, defined in the survey as “the integration of safety into all facility operations and processes”—and the most highly rated practice in the survey—has been adopted by 90 percent of respondents. The practice was given an effectiveness rating of 8 or better by more than 75 percent of its users, and almost 30 percent gave it a rating of 9 or 10, putting it in the ‘extremely effective’ category.

Ratings for some of the more traditional programs, such as safety committees and training, were less positive than might be expected. This may be because respondents were familiar with these safety and health management tools, since companies have employed them for decades; it may also suggest that respondents viewed these programs more as necessary obligations than best practices.

Strategies to increase employee involvement beyond the established use of safety committees may prove the most fertile ground for further improvement of safety and health performance, especially in light of the current emphasis on employee ownership as a vital component of any safety and health program

More recently, OSHA (2016a) published a report entitled, “Recommended Practices Safety and Health Programs.” In this report, OSHA (2016a) identified seven core elements as recommended practices for managing occupational safety and health; these emphasize a proactive approach, in contrast to traditional approaches, which are often reactive. The following is quoted from the OSHA (2016a) document:

CORE ELEMENTS OF THE SAFETY AND HEALTH PROGRAM RECOMMENDED PRACTICES

1. Management Leadership

- Top management demonstrates its commitment to continuous improvement in safety and health, communicates that commitment to workers, and sets program expectations and responsibilities.
- Managers at all levels make safety and health a core organizational value, establish safety and health goals and objectives, provide adequate resources and support for the program, and set a good example

2. Worker Participation

- Workers and their representatives are involved in all aspects of the program—including setting goals, identifying and reporting hazards, investigating incidents, and tracking progress.
- All workers, including contractors and temporary workers, understand their roles and responsibilities under the program and what they need to do to effectively carry them out.
- Workers are encouraged and have means to communicate openly with management and to report safety and health concerns without fear of retaliation.
- Any potential barriers or obstacles to worker participation in the program (for example, language, lack of information, or disincentives) are removed or addressed.

3. Hazard Identification & Assessment

- Procedures are put in place to continually identify workplace hazards and evaluate risks.
- Safety and health hazards from routine, nonroutine, and emergency situations are identified and assessed.
- An initial assessment of existing hazards, exposures, and control measures is followed by periodic inspections and reassessments, to identify new hazards.
- Any incidents are investigated with the goal of identifying the root causes.
- Identified hazards are prioritized for control.

4. Hazard Prevention & Control

- Employers and workers cooperate to identify and select methods for eliminating, preventing, or controlling workplace hazards.
- Controls are selected according to a hierarchy that uses engineering solutions first, followed by safe work practices, administrative controls, and finally personal protective equipment (PPE).
- A plan is developed to ensure that controls are implemented, interim protection is provided, progress is tracked, and the effectiveness of controls is verified.

5. Education & Training

- All workers are trained to understand how the program works and how to carry out the responsibilities assigned to them under the program.
- Employers, managers, and supervisors receive training on safety concepts and their responsibility for protecting workers' rights and responding to workers' reports and concerns.
- All workers are trained to recognize workplace hazards and to understand the control measures that have been implemented

6. Program Evaluation & Improvement

- Control measures are periodically evaluated for effectiveness.
- Processes are established to monitor program performance, verify program implementation, and identify program shortcomings and opportunities for improvement.
- Necessary actions are taken to improve the program and overall safety and health performance.

7. Communication and Coordination for Host Employers, Contractors, and Staffing Agencies

- Host employers, contractors, and staffing agencies commit to providing the same level of safety and health protection to all employees.
- Host employers, contractors, and staffing agencies communicate the hazards present at the worksite and the hazards that work of contract workers may create on site.
- Host employers establish specifications and qualifications for contractors and staffing agencies.
- Before beginning work, host employers, contractors, and staffing agencies coordinate on work planning and scheduling to identify and resolve any conflicts that could affect safety or health.

Below are definitions of key terms in OSHA (2016a):

Host employer: *An employer who has general supervisory authority over the worksite, including controlling the means and manner of work performed and having the power to correct safety and health hazards or require others to correct them.*

Contractor: *An individual or firm that agrees to furnish materials or perform services at a specified price, and controls the details of how the work will be performed and completed.*

Staffing agency: *A firm that provides temporary workers to host employers. A staffing agency hires its own employees and assigns them to support or supplement a client's workforce in situations involving employee absences, temporary skill shortages, seasonal workloads, and special projects.*

Temporary workers: *Workers hired and paid by a staffing agency and assigned to work for a host employer, whether or not the job is actually temporary.*

The new guidelines call for employers to take proactive steps in seven different areas:

- **Management Leadership** — OSHA recommends employers draft a communication policy to comport management expectations around defined goals, allocate resources for the project, and set a good example for workers through management embrace of the initiative.
- **Worker Participation** — Calls for employers to provide opportunities for workers to participate in a safety program, and to ensure they have access to all information they need in order to participate.
- **Hazard Identification and Assessment** — Prompts employers to collect and review hazard information, identify trends, conduct internal workplace safety inspections, investigate injuries or illnesses, and more.
- **Hazard Prevention and Control** — Calls for employers to proactively identify and evaluate hazard control tools, as well as their effectiveness, and to develop emergency plans for workers.
- **Education and Training** — Calls for employers to train workers on safe practices for their workplaces, to verify that training, and to ensure specialized training is provided for certain unique hazards.
- **Program Evaluation and Improvement** — Calls for employers to establish metrics to determine whether or not their safety programs are effective, and to identify and act upon opportunities for continuous improvement.
- **Coordination and Communication on Multiemployer Worksites** — Sticking with OSHA's recent attention to workplaces with workers from more than one business, this step asks employers to ensure that *all* workers present are brought in on safety initiatives, trainings, assessments, and hazard prevention programs.

Process Safety Management (PSM) Standards Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) Requirements

The PSM Standard, 29 CFR 1910.119, directly references or implies the use of RAGAGEP in three provisions (OSHA 2016b):

- **(d)(3)(ii):** Employers must document that all **equipment** in PSM-covered processes complies with RAGAGEP;
- **(j)(4)(ii): Inspections and tests** are performed on process equipment subject to the standard's mechanical integrity requirements in accordance with RAGAGEP; and
- **(j)(4)(iii):** Inspection and test **frequency** follows manufacturer's recommendations and good engineering practice, and more frequently if indicated by operating experience.

In addition, **(d)(3)(iii)** addresses situations where the design codes, standards, or practices used in the design and construction of existing equipment are no longer in general use. In such cases, the employer must determine and document that the equipment is designed, maintained, inspected, tested, and operating in a safe manner.

As used in the PSM standard, RAGAGEP apply to process equipment design and maintenance; inspection and test practices; and inspection and test frequencies.

“Recognized and generally accepted good engineering practice,” a term originally used by OSHA, stems from the selection and application of appropriate engineering, operating, and maintenance knowledge when designing, operating and maintaining chemical facilities with the purpose of ensuring safety and preventing process safety incidents.

It involves the application of engineering, operating or maintenance activities derived from engineering knowledge and industry experience based upon the evaluation and analyses of appropriate internal and external standards, applicable codes, technical reports, guidance, or recommended practices or documents of a similar nature. RAGAGEP can be derived from singular or multiple sources and will vary based upon individual facility processes, materials, service, and other engineering considerations.

Sources Cited

OSHA (Occupational Safety and Health Administration). 2016a. Recommended Practices for Safety and Health Programs. Available at: https://www.osha.gov/shpguidelines/docs/OSHA_SHP_Recommended_Practices.pdf.

OSHA (Occupational Safety And Health Administration). 2016b. Memorandum for Regional Administrators, Through Dorothy Dougherty, Deputy Assistant Secretary, From Thomas M. Galassi, Director, Directorate Of Enforcement Programs. Subject: Ragagep in Process Safety Management Enforcement. Available at: https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=interpretations&p_id=30785.

Whiting MA and Bennett, CJ. 2003. Driving Toward “0” Best Practices in Corporate Safety and Health. The Conference Board, Inc. ISBN No. 0-8237-0801-2. https://www.osha.gov/dcsp/compliance_assistance/conf_board_report_2003.pdf.