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Safety in Focus

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Engaging Safety Behaviors

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Safety information comes in various forms including policies, procedures, performance statistics, hazard and incident reports, risk assessments and training. Knowing how to communicate it to employees, who in turn adopt safe behaviors, is key. The process of safety communication is like traffic on a road. You need to plan the route to your destination, respond to signals and signs, take a different route if your path is blocked, modify your approach according to the conditions, and slow down when required. Safety communication is not just how the sender perceives it — or solely the act of sending out such communication. The interpretation and response of the recipient is crucial if safety communication is to be successful and result in a positive behavior change. It takes time and effort to perfect the techniques that help convey safety messages effectively. This makes a critical difference in how such communications are received and acted upon.

Language and words

What matters more: what we intend to say or the actual response to it? Language and words can have a profound influence on the outcome of safety communication; therefore, communicating the right way, with the right words, has a significant impact. Individuals respond differently to different language choices and delivery. "Positive" versus "negative" phrasing is always a more advantageous and effective method. Some examples are given in Table 1.

Negative Phrase	Positive Phrase
What's the problem?	How can I help?
You should have done …	From now on or next time
You don't understand	Let me run through that again
I've told you before not to	How about trying it this way
This will cost money	This is an investment in your health and well-being

Table 1. Negative vs. positive phrasing

Effective feedback is a valuable tool in influencing safe behaviors everywhere, including the workplace. Feedback can be positive or negative, and can influence the quality and frequency of safety behavior. Feedback needs to be given with straightforward and objective words. Ambiguous and subjective language can be counterproductive. Statements like, "It seems you are unaware, careless or disorganized" only add resentment and lessen acceptance of the behavioral message. Instead, use "How about we try this next time …"

Negative criticism undermines people and some are more sensitive than others; therefore, positive feedback will always be a stronger tool when addressing unsafe behavior. Creating a negative exchange serves little or no purpose. When discussing errors or unsafe practices, people undoubtedly make excuses (defense mechanism). Communicate your point positively by highlighting the unsafe act or behavior and suggesting ways to improve it in the future. Encouraging an employee to take preventive actions is far more effective than criticizing, blaming or demeaning them.

To gain more cooperation from others, wherever possible use specific, positive language rather than generalizations. Help your listeners comply by explaining your requests. Use nonjudgmental, noninflammatory language.

Workplace safety

What employees think about workplace safety affects how they act on the job and how involved they become in creating and maintaining a safe work environment. If you want employee-driven safety, you have to know what employees think about their work environment and safety programs, and act accordingly.

A leading global professional services company, Towers-Watson, conducted research that revealed employees' views on how well their companies were doing in terms of:

- Keeping workers safe.
- Providing the tools and processes to work safely.
- Involving them in safety decisions.
- Addressing other related safety and health concerns.

Justine O'Connor, the senior research associate for the study, summed up the research findings this way:

"A lot of empirical data show that employee perception of the work environment's safety is actually linked to strong safety outcomes. If you pay attention to employees and fix those problems, it can help improve recordable rates, days away from work and other metrics."

Four perception categories

The study found that employees' perceptions in four categories correlate with safety excellence:

- Supervision and management. Safety performance is better in workplaces where employees feel good about the quality of their management.
- Teamwork. Workplaces where employees perceive a strong sense of shared purpose and support are safer than those where working as a team is not emphasized.
- Empowerment. For the purpose of this study, empowerment was defined as the extent to which employees are involved in decision making that affects them and whether they're given the knowledge and the tools they need to make safe decisions. In safe workplaces, employees describe themselves as more empowered than employees in workplaces with less impressive safety records.
- Workload. Employees who feel they have too much work and are overwhelmed tend to have more safety problems. However, in workplaces where employees report feeling overloaded but where teamwork is a strong value, the negative effect on safety is less than where there's too much work but no teamwork.

> "If you want employees to demonstrate positive safety behaviors … use positive language"

Employee involvement

One of the most effective ways to encourage safe behaviors among staff is to involve employees in the safety process. Involved employees are more likely to think and act with safety in mind, since they are constantly working to improve their environment. Here are ways to engage your employees in safety behaviors:

1. Educate employees on the dangers of their work environment as well as how to deal safely with those dangers. Hold regularly scheduled safety meetings that cover broad topics as well as specific hazards.
2. Establish an employee safety council made up of volunteers. Have these employees work to build new safety rules based on the hazards they observe each day and train them to help other employees in emergencies.
3. Create an open-door safety policy that encourages employees to report hazards and violations to management without fear of reprisal. If workers are scared of getting in trouble, they may elect to keep some incidents to themselves.
4. Include work "safety share" moments in every safety meeting. Ask employees to volunteer information on something they have done recently to improve safety.
5. Recognize safe behaviors and encourage employees to work as a team to improve the safety of their workplace. Public recognition can go a long way toward inspiring employees.
6. Rotate safety checks through your staff so that each employee has an opportunity to check their environment for potential hazards. This keeps employees involved and provides a fresh set of eyes each day.
7. Lead by example. As a member of management, you will only get the level of safety performance from employees that you demonstrate. Always be a safety role model.

Where Are YOU with Your SMS?

The Saudi Aramco Safety Management System (SMS) places increased emphasis on two primary areas — behavioral safety and process safety management. The corporate SMS sets forth applicable expectations for departments depending on operational risks. It also reflects the principles, beliefs and norms of a modern safety culture. What the SMS does not contain are the prescriptive "how to" details or procedures for managing safety within individual organizations — those details should be included in the aligned departmental SMS programs.

Aligning Your SMS

The corporate SMS applies to everyone yet allows each department the flexibility to develop and implement their own SMS. A department's SMS needs to be aligned with the corporate SMS in three ways:

1) Applicable risks.
2) Applicable expectations.
3) Principles of modern safety management.

Most SMS expectations apply to operations such as a refinery and may not apply for an office-based department. A quick risk assessment can determine the focus of your program that can be tailored to an organization's operational needs.

Developing Your SMS

Your aligned SMS or safety program should be a concise description of how you are meeting the applicable expectations of the SMS principles and not just a reworking of the corporate SMS manual. Remember that all the specific objectives and expectations in your SMS must be met to drive your performance to world-class levels. Most SMS expectations point to safety processes already in place, such as an effective Safe Operations Committee (SOC), New Employee Orientation, or Contractor Evaluation. While some processes are corporate, such as injury reporting and investigation, most are local, such as the work permit and Management of Change (MOC) procedures, and all have to be implemented locally to be successful.

Evaluating Your SMS

Once you have the basic outline or description of your program, implementation can begin. While it is tempting to address everything in a prescriptive compliance fashion, this practice should be avoided. As it is very likely that many of the activities are already adequate, a self-assessment or gap analysis can help you focus on key expectations and processes. Several self-assessment tools are available from the Loss Prevention Department to help you evaluate your program.

Implementing Your SMS

You can then prepare a concise annual Safety Action Plan to chart your course for implementation and improvement. Assign individuals to improve or develop needed processes on a reasonable timeline. For example, upgrading the Contractor Orientation Process or streamlining the emergency response plan are the types of things that should be on your departmental SOC agenda. You can also maintain a background five-year action plan to help sustain momentum.

Along the way, you want to get input from employees on the successes and failures of the implemented processes. Your efforts should be directed at improving your existing SMS or safety program. You must work in an orderly fashion to focus on those activities that have the most impact and can be customized to your department's needs. You want to be forward-looking and never be satisfied with your safety performance. One forum to help you bring your safety program to life is the departmental SOC.

Modern Day Canaries — The MX4 and MX6

By Judith M. Talbot, Planning and Technical Services Division, LPD

There was a time when gas detection came in the form of canaries — small, yellow song birds that were regularly used in coal mines in the 19th Century — not to cheer the workers during their day, but as early gas detection devices. When conditions were safe, the little birds were known to sing; but if toxic gases existed down the deep mine shafts, the birds would die, indicating that conditions were unsafe for the miners.

Fortunately for employees in many industries — and for the canary population at large — we have come a long way since such early forms of gas detection.

Daily monitoring for safety

Atmospheric testing is a daily occurrence in many Saudi Aramco operations and is one of the controls necessary to ensure a safe working environment. The equipment used to test the safe working limits of such environments, and indicate whether additional protective respiratory equipment is needed, is critical. The hazards and immediate effects of gas toxicity in the industry are well known. Its lack of visibility and, in some instances odor, can produce a potentially deadly combination. Every precaution must be taken to ensure the safety of personnel in such environments at all times.

Specific types of activities in restricted areas warrant atmospheric testing with portable gas monitors. Under General Instruction (GI) 2.100, *Work Permit System*, monitoring for the presence of hydrogen sulfide (H_2S), oxygen (O_2) concentration, combustible gases and/or any other toxic substance must be performed prior to issuing work permits, and then either continuously or periodically during work as necessary. The lower explosive limit (LEL) of a combustible gas is also critical for gas monitoring. The LEL of a combustible gas is the point at which the gas will ignite given a certain O_2 concentration and an ignition source, and will be different depending on the gas. Portable gas monitors can be preset to specific LELs accordingly, ensuring notification of approaching hazard levels.

There may be circumstances other than those specifically listed in GI 2.100 that require gas testing, and these are addressed on a case-by-case basis.

Reliability and capability

In 1996 and 2003 respectively, the company began using the LTX310 and TMX412 portable gas monitors to support daily operations. However, early in 2012, two of the latest portable multigas monitors were approved for use in Saudi Aramco; the MX4 and MX6. Neither of these directly supersede the existing models, and although now available and in use, the company will gradually phase out the use of the LTX310 and TMX412 as operational needs dictate. At present, a period of transition is in progress to both introduce and train personnel in the use of the MX models. This will continue until the transition is complete.

What's the difference?

The MX4 has the same detection capabilities as the LTX and TMX models (refer to Table 1) and is a smaller, lighter version than the earlier units. Where the MX4 differs from its counterparts (including the MX6) is that it self-alarms when a calibration check is due and users can calibrate the unit *without* the need to send it back to the manufacturer. Portable gas monitors in Saudi Aramco must be calibrated every three months (as well as function tested daily) and currently, all monitors must be sent off company premises for calibration checks by the vendor at three-month intervals. This has an obvious impact on time efficiency.

The MX6 goes one step further and detects two additional gases — chlorine (Cl_2) and ammonia (NH_3) — and includes an infrared (IR) function for detecting combustibles in low-oxygen environments. Cl_2 and NH_3 are toxic gases commonly present in water treatment operations in Saudi Aramco. Cl_2 has an even higher toxicity level than

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Model	Detection Capability	Additional Functions
MX4	LEL, H_2S and O_2 (basic unit) plus: Carbon monoxide (CO) sensor or: Sulfur dioxide (SO_2) sensor	Self-alarm for three-month calibration check Self-calibration unit for on-site use
MX6	Chlorine (Cl_2) Ammonia (NH_3)	IR detection in low-oxygen (<16 %) environments (No self-calibration availability)

Table 1. MX4/MX6 capabilities

H_2S (with a safe working limit of 0.25 ppm, compared to H_2S at 10 ppm), so the ability to detect this is a significant safety enhancement, as is any detection improvement. So too is the MX6's IR capability. Until now, it was not possible to accurately detect combustible gases in atmospheres of less than 16% O_2 (e.g., during purging). Historically, detection has been performed using Draeger tubes.

Training and use

The new models can be ordered by departments according to their operational needs. However, the MX units require additional training prior to use.

Gas testers certified to operate the LTX and TMX models are not certified in the use of the newer MX models, or the calibration check associated with the MX4. Training and Development (T&D) is conducting training courses to ensure all required personnel acquire the necessary skills to use these units.

For the MX4 calibration check, a docking station and test cylinder are required, as well as a dedicated computer not connected to the company's network. If these requirements cannot be met, departments can still have the calibration checks performed by the vendor.

Use of portable gas monitors

The revised GI 2.709, *Use of Portable Gas Monitors,* has been updated to include the new MX4 and MX6 models, while still retaining information relevant to the LTX310 and TMX412. The GI details the use of all models, limitations in their use and the precautions required.

Gas testing is essential for safe operations. While the introduction of newer capability models is a further safety enhancement, the right hardware is only half of the safety equation — total safety in atmospheric testing can only be realized with the correct use and maintenance of such units. This means that each operating organization has the responsibility to ensure that portable gas monitors are calibrated every three months, function tested daily and maintained in good working condition at all times. Only then can they be counted on to function reliably and accurately.

Figure 1. Ventis MX4 Gas Monitor

Figure 2. iBrid MX6 Gas Monitor

Wake-up Calls!

By Mahmoud A. Khoj, Jeddah Area Loss Prevention Division

Suppose you are in your car and are running late for an appointment. The car is in reverse. You are about to back out of the driveway when suddenly, in your rearview mirror, you notice an unfamiliar child's toy in the driveway. If you had performed the basic vehicle safety rule of walking around the vehicle, you would have noticed not only the strange toy but the neighbor's child sitting in the driveway. Wow, that was a close call.

What about these situations …

- You *almost* fell down the stairs at work because you were in a hurry, but you managed to grab onto the handrail so you were able to stay on your feet.
- You saw two forklifts at work *almost* collide at a corner.
- You saw your coworker drop a hand tool that *just missed* his toes.

How many times have you shrugged off a near miss and never given it a second thought because no one was hurt? They are no big deal, right? Wrong!

What is a near miss?

The above *almost* injury incidents are called near misses. Saudi Aramco General Instruction (GI) 6.004, *Near Miss Reporting Process*, defines a near-miss incident as "an event which did not result in injury or loss, but which had the potential for injury or loss if circumstances had been slightly different." These may include events where:

- Injury or property damage could have occurred but did not.
- A major safety system failed to perform as designed (e.g., fire pump auto start malfunction).
- Potential environmental damage could result.

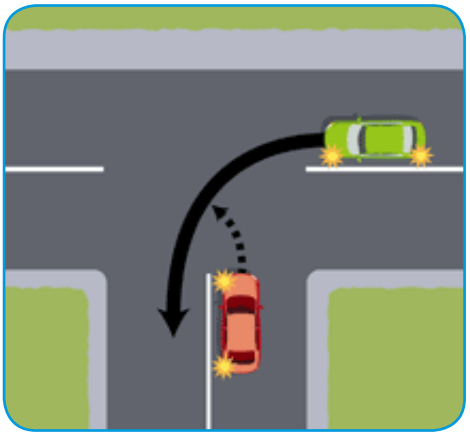
Roles and responsibilities

Missed opportunities to improve safety performance result every time no action is taken to correct unsafe conditions and acts, or no lessons learned are developed from these *almost* incidents. Focusing on incidents with a limited impact, such as near misses, reduces the probability of having major incidents. As we know from the various failure pyramids (the first of which was developed by Frank E. Bird), for every major accident there are numerous preceding minor injuries and incidents.

Addressing potential problem areas as soon as they are recognized enables organizations to reduce the probability of a major incident and minimize the impact or consequences that an incident might have if it actually occur. When managed effectively, such an approach helps identify structural weaknesses in processes and, therefore, not only reduces the incident rates and their intensity but also provides guidance for overall system improvement.

That is why Element 9, "Incident Reporting and Analysis," of the Saudi Aramco Safety Management System (SMS) addresses the need for a formal near-miss incident investigation and reporting process for incidents with apparent potential for more serious consequences so that lessons can be learned and shared with others. In addition, GI 6.004 provides general guidelines, a reporting procedure, requirements for communication and follow-up and a description of responsibilities.

Although the company has a defined system in place, the benefits of the near-miss incident reporting process are being lost as too few near miss incidents are reported by employees. Contractually, all employees (contractor



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and regular) are required to report near miss incidents as stated in Basic Safety Rule 3 of the Saudi Aramco *Safety Handbook:*

"Immediately report any unsafe condition, practice, near miss or incident to your supervisor."

So why do employees hesitate to report near-miss incidents? Here are some of the commonly cited reasons:

- Confusion (e.g., employees do not know what constitutes a near miss and how to properly report one).
- Lack of near-miss reporting training.
- Time not allocated to investigate near misses.
- No incentive to report near misses.
- No injury sustained.
- Just another form to complete; too much paperwork; too much time required.
- Company property damaged — not my problem.
- Corrective actions are frequently not implemented.
- Disincentive for reporting (e.g., reporting near misses hurts the department's safety performance and may reduce safety-related perks/awards).

Near misses are "free gifts"

Letting a near miss go unreported provides an opportunity for circumstances to be corrected and minimizes the potential for a serious accident to occur. Correcting these unsafe acts, behaviors or conditions will enhance the safety within your department and provide a better working environment for everyone involved. The following are actions that you can take to encourage proper reporting of near misses and overcome the obstacles to reporting them:

- Alleviate the fear of potential reprimand by ensuring a non-disciplinary policy is implemented.
- Form employee teams to evaluate near-miss report results. Publicize improvements resulting from reported near misses.
- Motivate personnel to report near-miss incidents by ensuring quick and easy reporting — long complicated forms often discourage reporting.
- Ensure employees are aware that management supports and encourages near-miss reporting.
- Handle near-miss reports seriously and appropriately.

Why are near misses important?

The difference between a near miss and catastrophe is often just a fraction of a second or an inch. Unfortunately, if it happens again that difference may not be there.

Resources

Resources available at Loss Prevention's homepage http://lp.aramco.com.sa:

1. Safety Films available from the LPD Film Library:

- 100.147 – Close Calls and Near Misses
- 901.248 – No Injury, No Accident?
- 901.27 – How to Communicate Effectively

2. E-Learning Courses

- Gas Testing
- Injury Reporting and Investigation

3. Special Publications

- *LTX310 and TMX412 Gas Monitors, Ventis MX4 Gas Monitor* and *iBrid MX6 Gas Monitor* pamphlets

4. SafetySmart™

- You Can Alter the Future with Near Miss Reporting: Part 1
- You Can Alter the Future with Near Miss Reporting: Part 2

5. References

- *Safety Handbook*
- Safety Management System (SMS)
- SMS Self-Assessment Tools

The editorial staff welcomes readers' comments and ideas. Please email your suggestions to SafetyinFocus@aramco.com or mail them to *Safety in Focus*, Saudi Aramco Loss Prevention Department, A-117, Building 3150, LIP, Dhahran 31311, Saudi Arabia or call 872-8868.

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