

Assuring Personnel Safety at Remote Customer Sites

GE Oil & Gas – PII Pipeline Solutions is a global pipeline services company providing pipeline inspection, integrity and remediation services, primarily to the oil and gas industry. Our services usually involve contracted services for higher risk activities such as lifting, excavations or welding, often in regions without a strong health and safety regulatory framework. These factors ensure that personal safety in an already challenging environment is further complicated by the remoteness of many customer sites and the very short service durations typical of our operations (often only a matter of hours), preventing us from establishing site-specific safety programs. The key to assuring personal safety in this challenging environment is a strong safety culture, with clearly defined programs, operating practices, training, supervision and communication.

Safety Culture

To establish a strong safety culture it is necessary to understand the factors affecting personal behaviour, these factors can be segregated into three “buckets” - Organisation, Job and Personal, each influencing the other as outlined in Figure 1 opposite (taken from HSG48 – Reducing Error and Influencing Behaviour).

Organisational factors include: long held cultural beliefs, management style and commitment, and company “heroes”. These factors are rarely defined or documented, but exist almost as folk law or legend and therefore take time to change.

Personal factors include: personal experience, education and upbringing – these factors can often be identified and placed into “buckets” such as social class. Individuals are, however, complex and rarely fit into a single category. Personal factors cannot truly be changed, but they can be influenced over time through education, training and organisational beliefs.

Job factors include: workplace activities, equipment, instructions, training, supervision and ergonomics – these factors are usually tangible or defined, and are therefore more easily managed or changed.

It is clear from the descriptions of the various factors affecting safety culture and influencing personal behaviours, that those associated with Job Factors are the easiest to change or manage, and often from a regulatory point of view a requirement. However, unless organisational factors are appropriately aligned to the job and supported by management style and commitment the resulting affect on personal factors in assuring personal safety will not be optimised.

The question then is what needs to come first in “designing” a safety culture that protects and promotes personal safety – is it organisational factors or job factors? Clearly organisational factors set the style or culture of the organisation, so by driving these it would be expected that job and personal factors would fall in line. However, without a suitable program in place addressing job factors, good intent may be misguided and ineffective in assuring personal safety, particularly in higher risk environments requiring systematic controls.

The true answer is therefore more complex requiring a multi-factor approach achieve an optimal solution. Strong management commitment (organisational factors) is a critical success factor supporting the development and implementation of an effective health and safety program. This commitment needs to extend to addressing operational practices that make be well established and cost effective, but that need challenged to support an effective and healthy safety culture.. With this commitment you are free to design a strong safety program, involving operational personnel to ensure that the program is both reasonable and achievable. This approach also ensures that staff assume ownership for the health and safety program and in turn that personal factors and culture (organisational factors) are influenced in a positive way. Finally, once the program is established with clear practices and norms, it is necessary to support the program and drive culture through management commitment and “style”.

Approach to Job Factors to Influence Personal Safety at Remote Customer Sites

As outlined in the introduction, PII Pipeline Solutions activities often have very short cycle times, maybe only 2 hours at any individual work location. This inevitably means that it is not possible to establish a strong site safety program with the expected hierarchy of controls for identified hazards – Elimination, Substitution, Isolation. Instead it is more often necessary to rely on Personal Protective Equipment and procedural compliance – hence the need for a strong safety culture driving personal behaviour. These problems are further challenged by the fact that work is undertaken in remote locations around the world, giving rise to the following additional risks to normal work activities in an industrial environment:

- Varied site environments
- Unknown exposure risks from pipeline products
- Access to communications
- Limited direct supervision

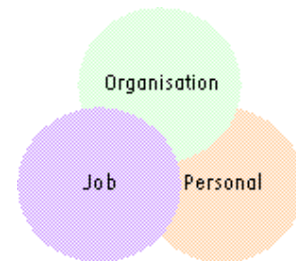


Figure 1 – Factors affecting behaviour

- Security concerns
- Poor access to medical services
- Transportation safety
- Differing standards, regulations and customer requirements
- Language difficulties

The basis of a strong safety culture with regards to ensuring personal safety is clearly defined operating practices, supported by appropriate training with a refresher program and regular communications regarding safety hazards and precautions, near miss and accident events. At PII Pipeline Solutions routine operating practices are assessed for their risk using detailed risk assessment (or job safety analysis) involving experienced operational staff. This ensures that in-field risks are identified and practical operational controls defined to



Figure 2 – Sample of a clear instruction from one of PII Pipeline Solutions Procedures

mitigate the risk. These assessments form the basis of our written programs and training. Lessons learnt from accident and near miss events are also used to refine risk assessments, written programs and training. To ensure that written programs are clear our aim is to use flow charts and pictures (see Figure 2) wherever possible to communicate the necessary controls in order to avoid misunderstanding of requirements. Procedural controls are reinforced with training and weekly EHS briefings (see Figure 3) covering essential program requirements, accidents and near misses.

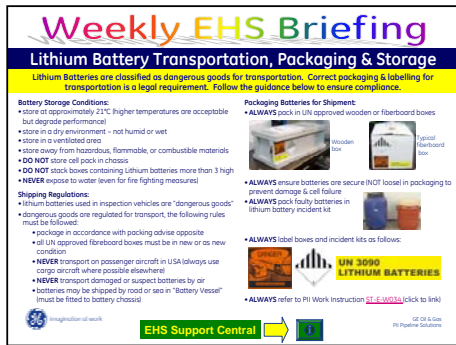


Figure 3 – Sample of a Weekly EHS Briefing

The process described in the previous paragraph is ideal for routine activities, however, for the additional risks listed above job specific assessment and planning is necessary to identify any additional risks, implement appropriate mitigations and communicate additional controls to field technicians. This task is accomplished through site surveys, site-specific risk assessments and associated method statements, and pre-mobilization briefings for field technicians. This pre-site planning activity is complete by experienced Project Managers with appropriate health & safety qualifications, consistent with those of a safety officer, and hazard spotting and risk assessment training. A detailed checklist containing possible additional risks aids with preparation of risk assessments and method statements.

To ensure that no hazards are missed all Field Technician Supervisors conduct and record a “tool box talk” at the work site prior to starting work with the client supervisor to ensure that hazards have been correctly identified and mitigated and that nothing has changed. Should further mitigation be necessary all staff are empowered to suspend work pending further assessment and the implementation of suitable additional controls as necessary.

Supporting Personal Safety Through Organisational Factors

The most detailed written programs and extensive training will do little to support personal safety if the organisation does not value its safety culture. In order to ensure that written rules are not just that, and that training is effective in improving personal safety it is necessary to build an environment in which staff are encouraged to engage in risk assessment and program development, and to challenge existing practices. This engagement will ensure that the health and safety program is valued and effective.

Another key element is to encourage near miss or concern reporting in a blame free environment in order to identify potential problems before they escalate into a more serious event. An element of this is the empowerment of all staff to suspend work should they be concerned about the safety of the activity they are, or are about to undertake. At PII Pipeline Solutions we have documented and communicated this responsibility to ensure that the policy is clear to all staff – this is also a fundamental GE value.

To ensure that staff recognise that the safety culture in PII Pipeline Solutions is valued from the top of the organisation, Senior Managers undertake regular documented inspections of facilities and occasionally field activities. These inspections are recorded and corrective actions implemented in the same manner as all health and safety inspection and audit findings. Management commitment therefore is clearly visible to all staff, further reinforcing the organisations values and beliefs.

Influencing Personal Factors to Improve Personal Safety

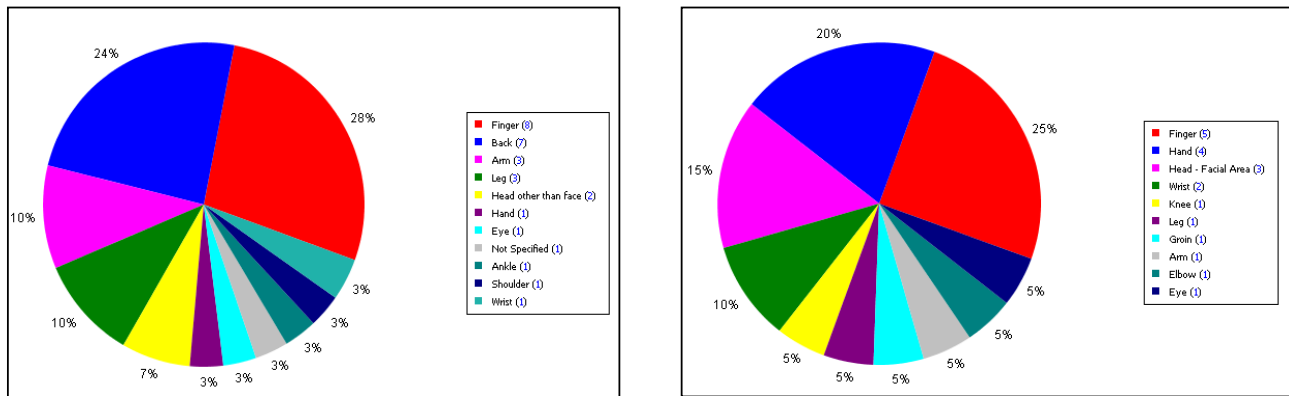
Influencing personal factors requires a fine balance between supervision, training and communication. Getting this right is the key to success. However, all of these factors can either lack intensity or be over bearing resulting in the safety rules either not being understood or effectively enforced in the case of a lack of intensity, or the message being ignored if it is over bearing. This is further complicated by more experienced staff who by nature tend to be more aware as a result of experience and maturity. The reverse is true of inexperienced staff, who often believe they know it all because they have just passed their training and are less mature in their risk evaluation. One way to capture all staff is to draw on the organizations experience with real life examples of near misses and accidents. This gets the attention of both staff groups as the more experienced staff understand the personal impact of an accident and empathise with their colleague, whilst less experience staff are more able to assimilate the risk.

At PII Pipeline Solutions a regular weekly EHS briefing is issued covering program requirements using flow charts, checklists and pictures as much as possible in order to make the message as easy to digest and remember as possible. Monthly, the weekly EHS briefing covers a real event from the field with an appropriate picture (obtained as a result of an EHS audit or inspection, field technician concerns or client feedback). These particular briefings always result in some lively debate, which is a great way to drive personal involvement and influence behaviour.

Improvements in Personal Safety at PII Pipeline Solutions

Over a five-year period PII Pipeline Solutions has reduced its recordable accident rates by 59% and associated days away from work by 87% percent. The total number of accidents (including first aid incidents) has also been reduced by 31% over the same period.

As can be seen from figures 4 & 5 below, significant progress has been made in addressing injuries associated with hands, fingers, head and face area, and the back. These improvements are directly attributable to: improvements in training (with appropriate refresher periods), regular EHS communications regarding policies, accidents and near misses, a focus on manual handling risk assessment and improved usage of PPE.



Our aim of course is to achieve zero injuries, in order to achieve this we are modifying our risk assessment process to incorporate an element of behaviour based safety. It is hoped that this approach will drive a deeper understanding of risks and engage all parties involved to identify novel process and / or equipment improvements to drive towards zero injuries.