

a book about learning —
~~Textbook~~

Name: _____

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What does learning involve?
What can be learnt?



What cannot be learnt?

Do we learn what we already know?

Do we learn to improve the same types of problems?

Do we learn to ignore the same types of problems?

— Do we learn to fail again?

What is evidence of learning?

Do we learn?

Interest in the concept of organisational learning builds on a view that constant changes in the outside world and tougher competition require an ability to innovate and develop expertise in order to succeed. Organisational learning also represents a key requirement for developing a robust health, safety and environmental (HSE) culture. But the question of learning – or lack of it – arises most frequently in connection with incidents and accidents. Causes of accidents often have features in common, and an obvious question is why important insights and experience appear to have gone missing.



Requirements for learning in Norway's petroleum regulations relate to such aspects as management, continuous improvement, ensuring that key processes and procedures are in place, expertise, worker participation and development of a positive HSE culture. In order to comply with the regulations, therefore, organisational learning is a necessary condition for safe operation. The regulations also require that the organisation's knowledge is communicated and applied.

Often, the challenge appears to lie in the dynamic between formal and documented learning on one hand and network-building and culture on the other.

This publication deals with the concept of organisational learning, learning mechanisms, and the forces which can promote or constrain positive learning results. It concentrates first and foremost on how organisations learn, and devotes less attention to individual learning. The primary concern is with the learning required to ensure safe operation as well as risk reduction and management.

The goal is to inspire players in the Norwegian petroleum industry to find good learning solutions for themselves, on the basis of their own ambitions and assessments. These pages accordingly provide no simple explanations of or recipes for learning, but aim to challenge, involve and encourage reflection and action.



if something is gnawing
at your roots,
you might take a look...

CAN WE LEARN FROM THE WORLD ASH?

According to ancient Norse myth, the world ash Yggdrasil loomed over Midgard – Middle Earth. It was said that the state of the world could be read from its leaves and crown. If the tree was sick, so was the world. Similar metaphors are used about organisations incapable of learning – they are said to have “learning disabilities”. Typical examples are organisations which fall into expertise traps, have problems escaping from existing practices or ways of thinking, or are unable to adjust to external changes.

A well lies at each of Yggdrasil’s three roots, the myth records. Guarded by the giant Mime, the one at the first root is the source of wisdom and knowledge. Mime drinks from the well daily, and is regarded as the wisest of all beings. Chief god Odin also wanted to acquire this wisdom, and begged Mime for a draught. He was refused – only the guardian could sup these waters. Finally, Odin gave one of his eyes to Mime for a drink from the well.

The three Norns (Fates) sit at the second well. Urd (Past), Skuld (Future) and Verdandi (Present) shape the fate of men and gods, and tend the tree. At the third well lie a quantity of serpents headed by the frightful Nidhogg, who is said to gnaw constantly at the root and thereby threatens to kill Yggdrasil.

A number of other creatures inhabit the world ash. An eagle perches on the topmost branches with a hawk between its eyes to keep watch, while the squirrel Ratatosk scampers up and down to convey gossip and hateful messages between eagle and serpent.

The fable of Yggdrasil provides us with a picture of a system and an insight into how life and the world are organised. It incorporates forces which can both promote and constrain learning, sources of knowledge, growth and decline as indicators of system condition, the significance of past, present and future, monitoring functions, and – not least – a “living” system. Perhaps it would make sense to look at your own organisation from this perspective?

A black and white photograph capturing a powerful storm. A tree stands on the left side of the frame, its trunk and branches partially obscured by a dense, swirling mass of water or debris that dominates the right and center. The scene is characterized by high contrast and a sense of intense, chaotic movement. The word "interpretation" is printed in a simple, lowercase, monospaced font across the middle of the image, centered horizontally and slightly below the vertical midpoint.

interpretation

BOUNDLESS LEARNING

Organisational learning has traditionally been defined in two ways: 1) as a process whereby organisations and their sub-units change as a result of experience, and 2) as a change in organisational knowledge. Learning embraces both acquiring and applying new knowledge. A company which has suffered an accident does not necessarily learn anything by conducting an investigation. The new knowledge must be put into effect and make the organisation more resistant to accidents.

Individuals, groups and organisations can all learn – but the mechanisms for doing so differ. The term “learning” has traditionally been used about individuals who change their behaviour in the light of experience. However, talking about groups and organisations learning is common practice today. That is meaningful as long as we take account of the differences in the way individuals, groups and organisations learn.

Individuals largely learn through intuition and spontaneous adaptations. When climbing a flight of stairs, we unconsciously adjust our movements to the height and depth of the steps. A chess master will spontaneously recognise many different patterns and opportunities in a game on the basis of their experience from playing many thousands of them. An experienced process operator can often hear from the noise in the plant if anything is wrong. The result of such learning is “silent” knowledge. It is ingrained, and difficult to put into words.

Both individuals and groups learn through interpretation. Interpretation involves describing circumstances and incidents in words. A process operator who reacts to an abnormal sound in the plant can seek to identify its source, discuss it with a colleague and notify the control room. The outcome of an interpretation process may depend on the experience and existing knowledge which is available in the circumstances. Interpretation in a group can also depend on the climate for discussion.

Discussion topics

Do you know of an undesirable incident from your own daily work which could have been avoided with better knowledge sharing?

Do boundaries exist within and around your organisation where knowledge sharing could improve? If they do, what needs to be done to achieve better sharing of knowledge?

The figure on the right is based on Crossan, M, Lane, H W & White, R E (1999). *Academy of Management Review*, 24, pp 522-537.

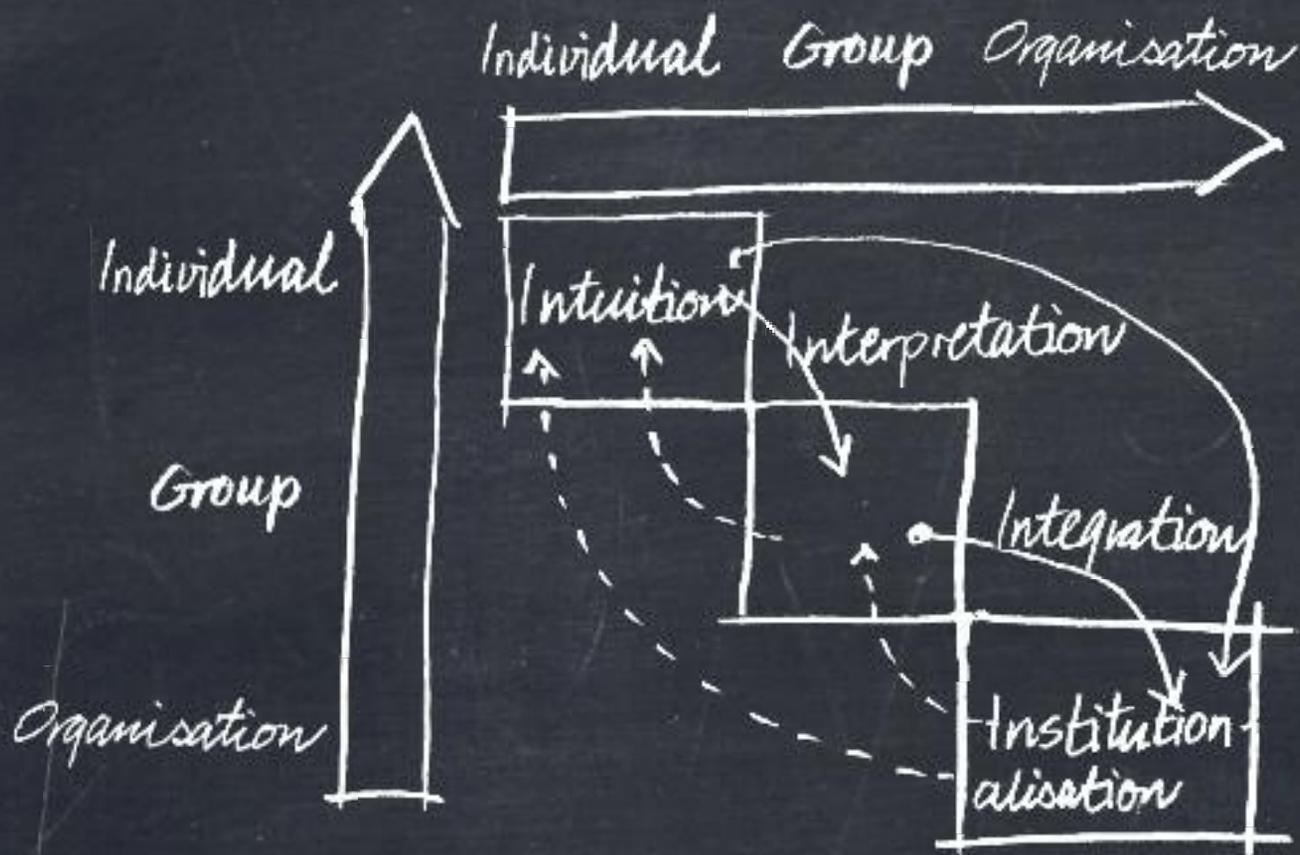
Groups also learn by their members mutually adapting their behaviour and developing a shared understanding. This is termed “integration” in the literature, and is essential if a group is to work smoothly and efficiently. Interaction can occur not only through physical collaboration but also through sharing experience. A mechanic can tell colleagues how they solved a technical problem, allowing the group to reach a shared understanding of the nature of the challenge and how similar problems should be handled in the future.

Organisations utilise all the processes referred to above, but can also learn by incorporating knowledge in various systems, and in new solutions and technology which influence behaviour and collaboration. This is known as “institutionalisation”. *Institutionalisation is a means of spreading a desired practice, establishing it as durable behaviour and showing that it is backed by management.*

“If only we in organisation X had known what we in organisation X know”. This comment demonstrates the core challenge for organisational learning. Major accidents almost always take everyone completely by surprise. In retrospect, it usually turns out that somebody in the organisation suspected danger was afoot. The knowledge which could have been used to prevent the accident existed in the organisation, but had not reached the right decision-makers. Concerns failed to attract sufficient attention or were misinterpreted. Challenges related to sharing and interpreting information become greater when several organisations are involved in an activity.

Boundless learning means that knowledge crosses internal boundaries in the organisation. A large number of boundaries have to be crossed in the petroleum industry – between sea and land, management and operational personnel, operators and suppliers, and enterprises and regulators. Many interfaces and a high tempo can create challenges for knowledge sharing. Differences in languages and mental models may also complicate the exchange of knowledge between specialist teams.

"ORGANISATIONS CAN LEARN
THROUGH INTUITION, INTERPRETATION,
INTEGRATION AND
INSTITUTIONALISATION."





heart-to-heart

HOME OR AWAY?

Model monopoly. Sharing knowledge between different specialist teams can be a challenge. They differ not only in language, but also in the mental model used to understand how things work and people think. As long as we can discuss within the confines of our own model, we are on our “home ground” and feel secure. Being compelled to communicate on the basis of a mental model we are not familiar with leaves us feeling uncertain and powerless. Even if we know a lot about the subject under discussion, we are unable to draw on this knowledge because we do not know how to fit it into the unfamiliar model governing the debate. Both sides lose from this. While the “away team” feels a sense of powerlessness, the home side could be trapped by its own model even though it may win the argument. Its model then blocks alternative ways of understanding the real world. This condition is called a model monopoly, because a specific model has acquired the sole right to describe and explain reality.

The best way of ending such a monopoly is often to change the terms of the discussion, so that both sides find themselves partly on their home ground. If we are discussing the design of a new control room, user representatives may end up on the sidelines if the discussion concentrates solely on the technical specifications. Devoting attention instead to the way specific scenarios – such as handling a gas leak in the process plant – will play out in the new control room puts the user representatives more on their home ground. At the same time, the technical specialists get an opportunity to learn how the equipment is used in practice.

Discussion topics

Have you been involved in circumstances where you learnt a lot from people with a specialist background which differs from your own? Why do you think knowledge sharing worked well in these cases?

Are you aware of conditions where people with different specialist backgrounds are having problems getting on the same wavelength with each other? What can be done to achieve better knowledge sharing?

SEPARATE OWNERSHIP – OR SHARED?

A key challenge in the petroleum industry is learning between organisations. The work is often organised in operator, contractor and sub-contractor chains. When many assignments are outsourced to contractors and sub-contractors, effective knowledge sharing is crucial for safe and efficient operation. This is an important reason why many operational managers want long-term collaborative relationships with capable suppliers. It takes time to build the trust required for sharing knowledge.

Cross-organisational sharing and collaboration are important in a reality characterised by a complex player picture. Companies vary from big global enterprises to small firms which are more comprehensible and where relationships are often closer. Some companies are in competition with each other, which can encourage a desire to “protect” in-house knowledge. This can counteract openness and knowledge sharing.

Important advances in HSE work have occurred when HSE knowledge has become common property. Many examples can be found in Norwegian and international petroleum operations of HSE knowledge being incorporated into requirements, standards and guidelines. Similarly, arenas for exchanging knowledge and experience have been established at national and international level, such as Norway’s Safety Forum and Working Together for Safety.

FLEXIBLE AND TRANSFERABLE?

Employees face greater demands for flexibility today than in the past. Many employees do not work permanently on a particular offshore facility or at a specific plant or office on land. They may participate in rotation schemes, form part of an activity-based staffing arrangement, be on a temporary contract, or have a more “nomadic” existence which means that they work wherever they are required. Such flexibility often calls for a higher pace of learning and the ability to become quickly familiar with new work processes, systems and technology. Ensuring that personnel possess an understanding of specific facilities and plants is a key management responsibility. So is laying the basis for inclusion and thorough integration.



companionahio

FORESIGHT AND HINDSIGHT

Discussion topics

Who must know what, at what level and at what time?

Does your company have systems and processes in place to ensure planning and risk management?

Are people alert for danger signals during the operation?

Are they able to change course if surprises occur?

Are people able to reinforce positive aspects of current practice? Are lessons from earlier incidents converted into changes and improvements?

The model to the right combines insights from studies of organisational learning and safety. Research in this field has often been confined to the learning which takes place within the organisation's boundaries, with less attention paid to how lessons are learnt across these interfaces. Organisational learning is developed at many levels and in different phases, both within your own company and in its encounters with others. Our surroundings, organisational culture and leadership provide pointers to what is regarded as important and appropriate knowledge and as robust working practice. You must have foresight and learn from hindsight. Insight and oversight must be secured.

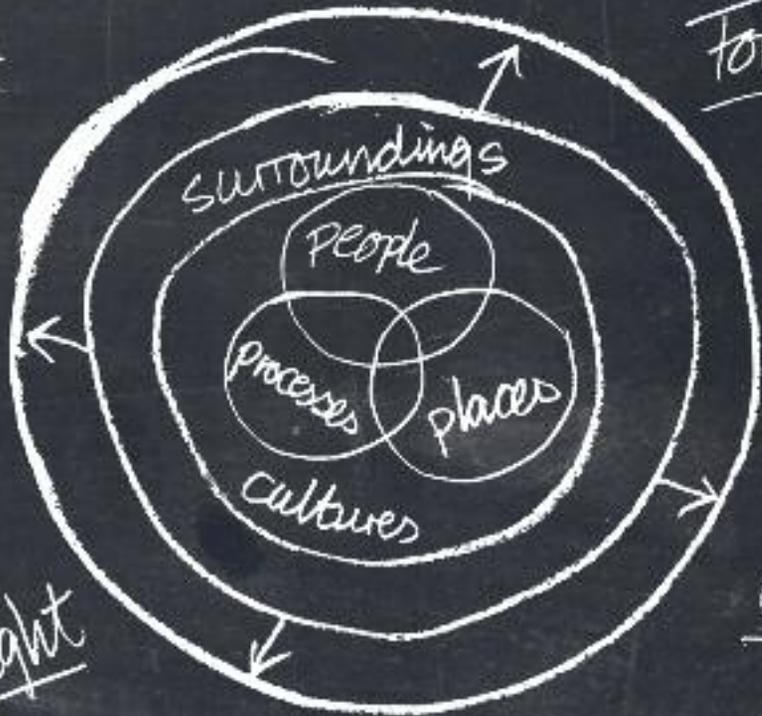
In this system, employees from different types of companies collaborate at many levels, in various places and on the basis of many different processes. The aim is to establish a common understanding and safe practice. However, everyone does not need to have everything in their own head simultaneously. Many players will be involved during a drilling operation, to take a case in point. These include the drilling and well contractors, the rig contractor and the operator. The mud logger and driller, for instance, monitor the fluid balance in the well. These two, but not everyone else, need a specific and shared understanding of early danger signals and the threshold values they must respond to. They must be familiar with the technology around them, the risks involved in the operation and the barriers which must be in place.

It is important in this integrated system that safety-related knowledge and information are known, that roles and responsibilities are clarified, that the monitoring is thorough and that capacity is available to change course along the way if conditions require that.

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Insight

Foresight



Hindsight

Oversight



challenge

THE MAP AND THE TERRAIN

Following procedures is not just a matter of compliance. Institutionalised procedures do not always accord with what happens locally or in practice. The question is whether these two aspects are “on speaking terms”.

The figure on page 11 introduced various learning levels and mechanisms. The challenge is often to get these to function together. Institutionalised learning – usually in the form of written strategies, procedures and processes – often cover key HSE requirements. They must be learnt and used as well as being readily accessible, understandable and useful.

As part of the PSA’s annual RNNP process on trends in risk level in the petroleum activity, a questionnaire-based survey is conducted every other year among all personnel offshore (from 2001) and at land-based plants (from 2007). One aspect measured is employee perception of how easy they think it is to find the right governing documents.

Although responses from offshore workers have developed positively over time, more than a third in 2011 still disagreed wholly or partly that using these documents was straightforward. Results from the land-based plants show a slightly negative trend, with the proportion disagreeing wholly or partly rising from 2007 to just under a third by 2011.

Discussion topics

How could the negative trend at land-based plants be interpreted?

What could be good measures for improving these results?



surprise

TREE OF LEARNING OR TANGLED SCRUBLAND?

Procedures are important “containers” for knowledge. They can be an aid to documenting, maintaining and disseminating desired working practices. A good procedure can provide operational personnel with important information on hazards, operational limits and the HSE requirements to be met. The work of writing, checking, maintaining and amending procedures can create good arenas for discussing positive working practices and identifying potential improvements.

The petroleum industry is bursting with procedures and this might be for good reasons. Accidents can occur because activities clash with each other. Procedures can help to coordinate work and prevent hazardous surprises. Britain’s Piper Alpha disaster in 1988, for example, occurred because the process plant on the platform was started up before a maintenance job in that part of the facility had been completed. Procedures can also identify hazards and define limits for what is sufficiently safe. They can justify the time taken, the priorities set and the resources required to do a job safely. Good procedures can also help to ensure that the job is done properly.

Less positive reasons can also be found for the large number of procedures. If an HSE problem is discovered during an accident investigation, adjusting procedures is often quicker and cheaper than implementing technical measures. This may represent a challenge if problems related to deficient technical barriers, poor reliability or user-unfriendly technology remain unresolved. Developing and maintaining good procedures are also difficult and resource-intensive, not least when many procedures must be coordinated with each other and when great local variations exist in jobs, equipment, working conditions and working practices.

Procedures can have many aspects. A good procedure can help operational personnel to do their work correctly, safely and efficiently. It also assists line managers in coordination and management, including ensuring



basis

compliance with company and official HSE requirements. In efforts to reduce risk, procedures can provide the answer to a challenge where good and reasonable technical solutions cannot be found. Accident investigators may find them useful as a basis for identifying nonconformities, forming a picture of causal chains and formulating recommendations. They can be significant for allocating liability and responsibility in legal actions. To experienced workers, however, constantly revised procedures may seem like tangled scrubland growing out of control.

Who is the procedure written for? The fact that procedures are meant to meet many requirements also has its problematic side. Writing texts suitable for very different purposes, different disciplines and employees at different levels is a difficult job. A procedure written to be unambiguous for a lawyer is not necessarily an optimum aid for the person who will be doing the job. An enterprise which wants to give priority to safety must also give priority to tailoring procedures to the applications crucial for ensuring safe work. This usually means that the text must be written for the people who are to carry out the procedure, with other uses taking second place.

Discussion topics

How should a procedure be written to provide the best possible support for operational personnel?

Who writes and maintains procedures in your enterprise? Can operational personnel influence the content of these procedures? Do you have meeting places where employees can exchange experience related to procedures?

Find an example of an important procedure in your enterprise. What is its purpose?

PROCEDURES AND PRACTICE

The relationship between procedures and practice is not only a question of leadership and compliance. It involves a complex interaction between different learning processes and levels. On the one hand comes local learning and on the other lies “official” learning, which takes place through documentation and institutionalisation of what the enterprise regards as good practice.

Local learning involves operational personnel trying out various ways of doing the job. New practice is established when a new way of doing a job is repeated so many times that it comes to be regarded as “normal” and correct. Knowledge acquired in this way may be “silent” – people do things in a specific way without putting it into words. In other cases, practice can be something discussed between operational personnel who may write it down on Post-It notes, in a checklist or in a notebook.

It is neither possible nor desirable to eliminate local learning. For a start, we humans are predisposed to trying new things. Second, workplaces, equipment and jobs are constantly changing. Nor is it always possible in practice to amend procedures as quickly as jobs change. Local learning contributes to making the organisation adaptable. Instead of seeking to eliminate it, we should ask ourselves how we can see it as a resource and make it less silent and local.

An organisation willing to learn is conscious of the tension between procedures and practice, and regards this as a source of learning. Procedures do not always allow for local variation. Many operations are so complex and diverse that it would be impossible to incorporate all the variations in a single procedure. Operational personnel may find that they face expectations and requirements which make it difficult to follow procedures to the letter.

The gap between procedures and practice can increase over time. Local learning processes could lead to operational personnel gradually developing a practice which deviates from the procedures. This could be a problem if they lack sufficient knowledge of the hazards – how activities can come into conflict with each other, for example. Over time, too, a working practice can change gradually and imperceptibly in such a way that the safety margins vanish. The management believes that everyone is complying with the procedures, and nobody notices the problem until an accident occurs.

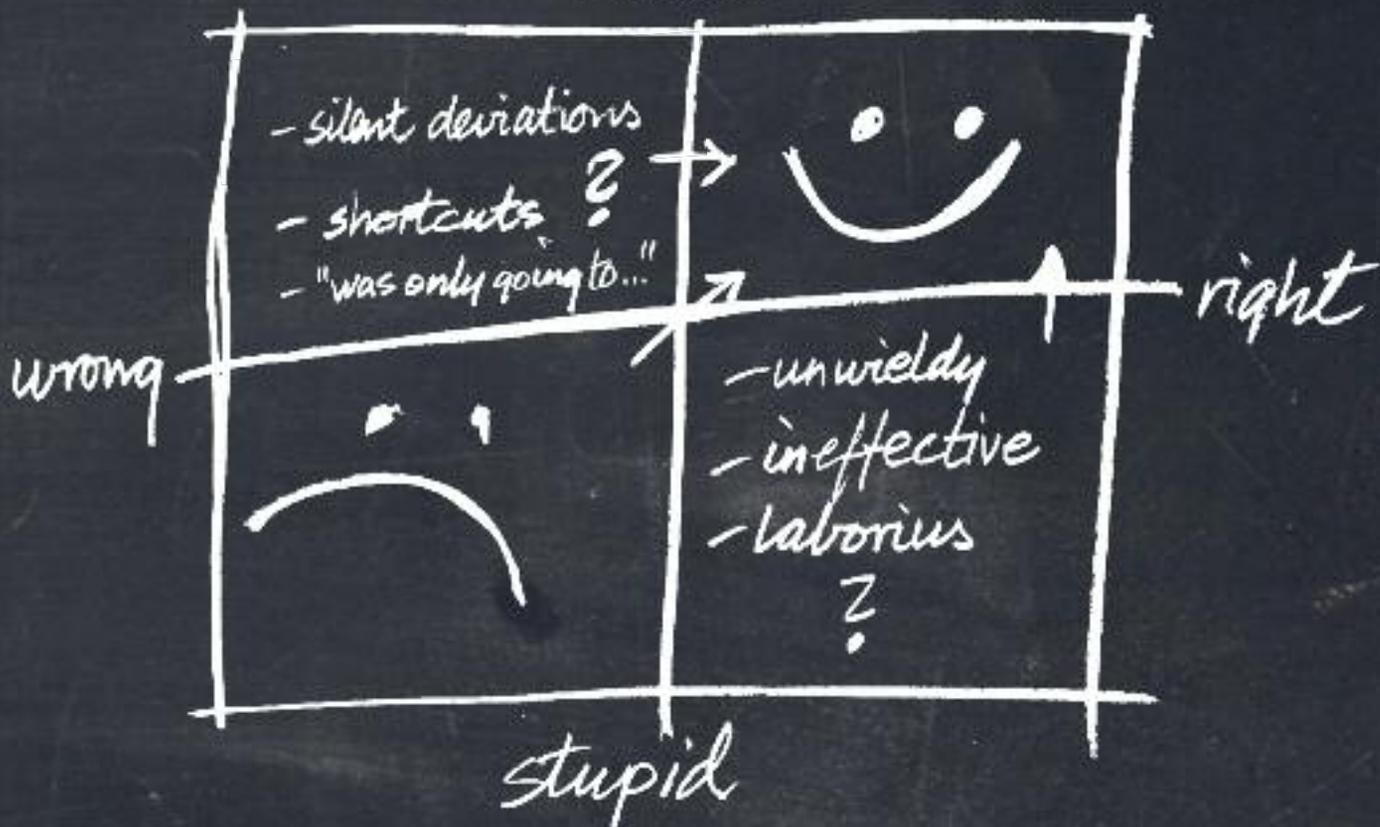
The main challenge for the enterprise is to ensure that procedures and practice are compatible. Local learning processes could lay the basis for continuous improvements to the procedures, which become “living” and tailored to practical reality. Ownership of procedures is strengthened when operational personnel are able to influence their content. If procedures and practice are “on speaking terms”, management has better opportunities to intervene should a working practice develop which weakens safety. Management thereby needs to obtain insights into how procedures are used and complied with.

Achieving good interaction between procedures and practice demands time, trust and suitable meeting places. If the procedure writers and operational personnel have differing specialist backgrounds, extra time could be required to translate and reach a shared understanding of the position. Trust is necessary if the operational personnel are to talk openly about their own working practice. A one-sided concentration on compliance with procedures is a blind alley.

Discussion topics

Do you have examples which show that procedures and practice are “on speaking terms” in your organisation?

smart



RIGHT-WRONG AND SMART-STUPID

The drawing on the left is intended to illustrate the dynamic between the formal and informal aspects of learning, and the consequences which this interaction could have for safety and risk. While the smart-stupid axis reflects informal local learning and practice, right-wrong refers to formal, institutionalised learning.

The box at top right (smart-right) is where one wants be. This is where the map corresponds with the terrain – in other words, what appears on paper accords with practical everyday working.

In the (wrong-stupid) bottom left corner can be found a type of practice which both deviates from the formal requirements and which is also inflexible, ineffective and even hazardous. Examples found here will involve failure to comply with procedures and local practice which lacks insight into and understanding of HSE consequences.

The most challenging conditions are found in the boxes smart-wrong and right-stupid. Smart-wrong illustrates a local, informal practice which is perceived to be effective, but which represents a breach with formal knowledge. Typical examples will be circumstances where somebody takes short cuts, or a practice which is perceived as smart locally and which develops over time into accepted “silent deviations”.

The right-stupid box at bottom right will contain examples where the formal guidelines are followed, but are perceived as unwieldy or ineffective. This could mean that employees follow the procedures blindly, and may prompt them to find other ways of doing the work – putting them in the smart-wrong or – in the worst cases – wrong-stupid boxes.

Discussion topics

Can you think of examples where the safest way of doing the job is not the quickest?

Can you find examples where working solutions are right, but are regarded as stupid at your workplace?



probably

LEARNING ON THE WRONG TRACK

Most of us think of learning as something positive. When we learn, we become wiser, cleverer, more efficient and better adjusted to our surroundings. The same perception can be applied to organisations. Knowledge and acquired experience are stored, adjusted, standardised and spread – via systems, training and shared solutions for work to be done. But could learning nevertheless undermine HSE?

Learning can get onto the wrong track. Organisations are not always able to find, see or arrive at optimum solutions for HSE. Learning on the wrong track could involve a nonchalant attitude, complacency and being blind to weaknesses in one's own practice. Pressure of time or production, incentives or performance goals may conflict with HSE. Learning on the wrong track may also involve failure to share experience, lack of communication, inability to take critical voices seriously, or the fact that some people have more power than others to decide what is right or wrong.

When investigating incidents, the PSA finds that danger signals have fallen “below the radar”, that signals have been misinterpreted, that risk has been insufficiently understood, that good management has not been ensured along the way, or that a halt has not been called when it should have been. Cases are seen where poor design and choice of technology may have increased the probability of errors in operation or interpretation. Nor is it always the case that we find in retrospect that the organisation(s) lacked understanding. Many people have often known, but what they have known has either not been taken seriously or been given insufficient weight.

Cultivating diversity, continuous monitoring, alertness and involvement can represent good ways of ensuring that learning does not get onto the wrong track.



naive

Accidents can happen even if you follow procedures to the letter because learning gets on the wrong track. The Space Shuttle Challenger disintegrated shortly after take-off because hot combustion gases leaked from a booster rocket. This leak occurred because O-rings between the booster sections could not cope with the low temperatures prevailing on that morning. After earlier launches, Nasa had repeatedly observed failures in the O-rings. These observations were handled in accordance with the space organisation's safety routines. The problem was that they were interpreted on each occasion in such a way that continuing the shuttle programme was found to be acceptable without having to change the booster design. Over time, engineers and managers in Nasa had built up a shared understanding which meant that they no longer regarded O-ring failures as a deviation and a danger signal. This erroneous understanding made an important contribution to the accident.

Learning on the wrong track is normally invisible to those involved. The engineers responsible for the booster rockets in the shuttle programme acted in good faith. Their approach to interpreting deviations had become part of the culture, and nobody questioned it. A dangerous effect when learning gets on the wrong track is that conditions and actions earlier regarded as deviations come to be considered normal.

Many working conditions exist where the safest way to do the job is not the quickest. Time might be saved by skipping a safety measure, by using a riskier working method, by using tools at hand rather than obtaining special ones, or by working at a slightly faster pace than is optimum for safety. In virtually every case, perhaps, no accident will happen even if you depart from the safest way of working. The individual or work team may thereby learn by experience that "this works fine", without discussing the consequences for safety. The result is a "silent deviation".

Examples from investigations show that nobody is immune to learning getting on the wrong track. This can happen for managers, engineers and operational personnel. It occurs not only because people deviate from procedures, but also because they follow them slavishly. These examples nevertheless display some common features.

spontaneous
learning

managed
learning

learning which
promotes
HSE

What is done to
facilitate spontaneous
learning which
promotes HSE?

What is done to
ensure that managed
learning processes
promotes HSE?

learning which
undermines
HSE

What is done to
ensure that
spontaneous learning
does not undermine
HSE?

What is done to ensure
that managed learning
does not undermine
HSE?

Learning gets on the wrong track most frequently when people encounter conflicting requirements or find themselves subject to incompatible pressures. A company's management has its share of responsibility for HSE, for example, but is simultaneously expected to secure a good return for shareholders on their investment. Operational personnel are expected to work not only safely but also efficiently. The engineers responsible for the rocket boosters were under pressure to avoid delays to the space shuttle programme while also being expected to safeguard the astronauts.

No simple recipe exists to prevent learning from getting on the wrong track. Modern working conditions are often affected precisely by incompatible pressures and conflicting goals. Nevertheless, something can be done to identify that learning has got on the wrong track and to bring it back on track.

- Create space for reflection and objections.
- Keep attention concentrated on limits which must not be exceeded.
- Invite a critical gaze from outside.
- Assess the critical effects of incentives.

Discussion topics

Do meeting places exist in your workplace which are suitable for identifying whether learning has got on the wrong track?

Has your organisation laid a basis for customers, suppliers and other outsiders providing feedback about learning on the wrong track in the organisation?

CARROT AND STICK

“Incentives” are a common term for everything which can be perceived as a reward or punishment, and thereby influence the behaviour of an individual, a group or an organisation. They can be financial – a personal pay rise, for example, a reduced rate for a drilling contractor in the event of downtime, performance pay for managers or a bonus for suppliers who meet deadlines. The aim is usually to influence the attention given, the commitment made or the behaviour shown. Symbolic incentives also exist, such as a little extra attention, positive feedback or a reprimand. Improved opportunities to obtain further assignments can be a strong incentive for a service provider. Incentives are used to promote learning and guide attention.

Actions or conditions can sometimes be perceived as a reward or punishment, even though that was not the intention. A cumbersome reporting system can be perceived as negative by those reporting undesirable incidents. Failing to receive feedback on reports submitted can have unintended side-effects. The impact of incentives depends on how they are perceived and how they “relate” to reality.

Incentives provide guidance on setting priorities. When an incentive prompts somebody to concentrate their attention and commitment on an area, other areas will necessarily receive less notice. A number of examples exist of enterprises where managers rewarded for low personal injury figures have devoted less attention to the risk of major accidents. A company management may note that the number of lost-time injuries is declining and conclude that good care is being taken of safety. However, the major accident risk could have increased in the same period – because of inadequate maintenance management, for example.

Incentives may prompt people to adapt to the things they are measured on, and not to the purpose of the incentive system. Baggage handlers at many airports used to be rewarded if little time elapsed between the landing of

a plane and the appearance of the first suitcase on the conveyor belt. This often prompted the handlers to take one case off a plane and drive it directly to the conveyor. They got their bonus, but passengers found that an isolated case turned up on the conveyor long before the rest of the baggage appeared. Incentives teach a lesson, but not always the one desired.

Rewards and punishments can have a major effect on the organisation's ability to share information and to interpret the information correctly. Senior executives receive most of it through staffs and subordinates. Should top management signal that it only wants to hear good news or to receive information on progress and financial matters, challenges related to safety and risk may be downgraded. Middle managers who believe that their careers may be affected if they criticise their superiors could elect to keep their objections to themselves. On the other hand, managers may use symbolic rewards to promote the flow of information and to encourage people to speak openly.

Extensive use of external rewards and punishments can also affect relationships between people and between employee and organisation. Many people find that knowing they do a good job and being respected for it is a reward in itself. External rewards can divert attention from such inner satisfactions.

No organisations exist without rewards and punishments. When operations are disrupted or equipment is damaged, somebody usually loses money and someone must accept responsibility. Most people would take the view that deliberately exposing others to serious danger should have consequences for the person concerned. In addition, the players themselves can be subject to official reactions if regulations are breached. In other words, it is neither possible nor desirable to eliminate everything that can be perceived as reward or punishment. But one can seek to change the circumstances where reward or punishment could have undesirable side-effects.

Discussion topics

Does your organisation have incentive schemes which affect HSE?

Has your company changed or removed incentive schemes because they were suspected of having undesirable effects?

Is the effect greater if material rather than symbolic rewards are used?

ROOM FOR MANOEUVRE

Creating room for manoeuvre involves finding opportunities for making a difference. Those who want to create change must identify their room for manoeuvre and make use of it.

Many of the subjects and discussion topics in this publication provide hints on how you can seek room for manoeuvre in order to improve HSE by developing learning processes in and around the organisation. Some examples are provided on the right.

Another way of seeking room to manoeuvre is to start from the meeting places which already exist in order to share knowledge of HSE. These might include HSE, departure or morning meetings, or safe job analyses. Are the opportunities offered by these meeting places fully exploited? How can learning be improved in them?

Another starting point is provided by the conditions known to constrain or promote learning. This is covered in the next section.

- Can we create better interaction between local learning and knowledge which is enshrined in procedures and other governing documentation? Could we find new ways to discuss "silent nonconformities," for example?



- Can we get better at sharing good solutions with our partners, and perhaps with our competitors as well? Can we get better at benefiting from good solutions which others have come up with?



- Can we create better learning by changing the use of incentives?

PROMOTERS AND CONSTRAINTS ON LEARNING

Discussion topics

Do promoters of learning exist in your organisation which could be reinforced?

Do constraints on learning exist in your organisation which could be eliminated?

A good starting point for companies wishing to improve could be to look at constraints on and promoters of organisational learning. Promoters are all the conditions which encourage learning and help to keep it on the right track. Constraints are conditions which prevent desired learning or cause it to get on the wrong track.

Power can both promote and constrain learning. Leadership and the ability to implement are necessary to achieve improvement. Concentrating considerable power in one place could lead to people in other areas feeling powerless. The latter see no point in seeking to create changes for the better. If two people or groups come up with solutions jointly, the result could be that the ability of one to act is increased without diminishing the other's power.

Support from top management is crucial for spreading knowledge and innovation in the organisation. Most improvements arise among employees who do not have decision-making authority. They need support from senior management to spread knowledge to other parts of the organisation.

A good learning climate is characterised by openness and tolerance. People must dare to make critical observations, and must not fear being ridiculed if they express concerns. Managers at all levels have a special responsibility to promote openness. Critical voices and constructive criticism should be rewarded and promoted. Complacency and "groupthink" represent mechanisms which constrain safety and learning. The same danger threatens in groups which seek validation rather than invalidation.

Learning demands time and patience. Pressure for swift action after an undesirable incident can concentrate attention and help to ensure that something is done. But haste can mean that quick and easy solutions are preferred, instead of getting to grips with the stubborn problems. Learning demands a minimum of stability in the organisation. It takes time to build trust and share knowledge. On the other hand, excessive stability could mean that the organisation receives fewer fresh impulses and loses the ability to renew itself.

PROMOTERS OF LEARNING

- adjustable and flexible
- user-friendly systems
- open and tolerant
- trust
- creative and imaginative
- alertness and curiosity
- robust solutions
- seeking invalidation
- respectful
- courage to challenge established truths and authorities
- variation and diversity
- procedures and practice "talk to each other"
- open communication, employee participation and sharing
- clarity, management and coordination

CONSTRAINTS ON LEARNING

- static and rigid
- complicated and inaccessible systems
- closed, sanctions and punishment
- mistrust
- stagnation, opposition and power
- "blindness" and nonchalance
- capacity under pressure and conflicting goals
- seeking validation
- complacent
- respect for authorities and severity
- "groupthink" and culture of unanimity
- "silent deviations"
- closed, monopolisation of knowledge
- lack of clarity and weak management

The petroleum industry is associated with major accident risk. Risk shall be reduced. Special attention must be paid to operations involving high risk and a major accident potential. Organisational learning represents a key requirement for succeeding in these efforts. This publication has emphasised that learning can both constrain and promote safety, and that it can get on the wrong track.

So what can be done to ensure that learning is on the right track? What signs can be looked for?

It is important to stay one step ahead. Starting organisational learning-processes only after incidents have occurred has proved both very expensive and hazardous.

Organisational learning is not something extraordinary, which only takes place after incidents or accidents. Learning goes on all the time.

Organisational knowledge must be adopted and directed onto the right track. Strengthening promoters and restraining constraints could be a good place to start.

Finally, let us return to the metaphor of the forest and the tree. A forest is also threatened by major disasters and by smaller incidents with the potential to develop into bigger ones. So it must be guarded and protected, with local care and with a watchful eye from positions which provide both insight and oversight. Everyone must contribute to ensuring that the system as a whole is robust and sustainable.



A photograph of a misty forest. The ground is covered in a thick layer of fallen, brown leaves. Several trees with dark, textured bark stand in the foreground and middle ground. The background is hazy and filled with more trees, creating a sense of depth and atmosphere. The word "wonder" is written in a simple, lowercase font in the center of the image.

wonder



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Sintef report (2013. A24120):
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"I have been impressed
with the urgency of doing.
Knowing is not enough; we must apply.
Being willing is not enough;
we must do."

Leonardo Da Vinci.



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