Catastrophic industrial accidents have been frequently associated with breakdowns in Safety Culture. Statistical analysis performed in BP showed evidence of the relationship between Safety Culture and incidents. In June 2005 a project was started in BP to identify a Safety Culture model applicable to all activities and across the entire Group. The applicability and validity of the model was tested through assessments in 5 pilot sites and the data analysed using basic statistical analysis (median, mode and standard deviation). In parallel, best-in-class organizations were visited and an extensive review of the theory was carried out. The knowledge acquired was the basis to construct the Safety Culture model proposed for BP. In summary, an organization with outstanding Safety Culture needs to be: informed (leaders know what is going on and are competent), mindful (everybody thinks of what might go wrong), continuously learning (all events are seen as opportunities to learn), fair (everybody knows the rules and are held accountable for their actions) and respectful (people feel included, treated fairly and their personal circumstances are important). Some elements of the model are innovative and emphasize the importance of inclusiveness and trust also with respect to Safety.

LEVELS OF SAFETY CULTURE
Many efforts have been made to understand and influence Safety Culture due to its well-established relevance in the overall performance of organizations.

Every organization has a safety culture, at one level of development or another. To improve that safety culture, it is necessary to: determine the level at which the safety culture currently operates, determine the ideal level to operate, and then implement changes in order to reach that ideal level of safety culture.

Researchers studying safety culture have classified company cultures into several levels—based on how they deal with safety-related information. Westrum (1991) proposed a three-level classification scheme for communication flow in an organization (pathological, bureaucratic and generative). Based on this model, Hudson (2001) expanded it and proposed a 5 level continuum:

- **Pathological** Safety is regarded as a problem caused by workers, the main driver is the business and a desire not to get caught by the regulator. The organization cares less about safety than about not being caught.
- **Reactive** The organization starts to take safety seriously but there is action only after an incident has taken place.
- **Calculative** Safety is driven by management systems, with much collection of data. The focus is on the collection and analysis of the data, rather than learning from it.
- **Proactive** There is the realisation that with improved performance the unexpected is a challenge; workforce involvement starts to move the initiative away from a purely top-down approach.
- **Generative** in which safe behaviour is fully integrated into everything the organisation does, there is active participation in safety at all levels, and safety is an integral part of the business. Organisations at this level are characterized by the term “Chronic Unease”

UNDERSTANDING THE CULTURE IN BP
BP has taken several steps to strengthen its organizational Safety Culture, amongst those: implementation of behavioural safety observation programs for leaders and supervisors; implementation of Group Standards for Driving, Integrity Management and Control of Work; a more rigorous, uniform and consistent Safety and Operations
Management System across the whole group; addressing the competencies of workforce; creating a robust Audit process; and emphasizing the importance of Safety in the reward system for high level leaders.

THE OPPORTUNITY OF THE DATA IN BP
In specific relation to Safety Culture and behaviours, a study was undertaken in 2005 using statistical analysis tools to identify which were the most significant factors that drive Safety performance. The data analysed was obtained from different sources within BP: tr@ction (the BP global Incident Reporting engine, which included: incidents, man hours, safety observations, kms driven), Major Incident Announcements, High Potential incidents, People Assurance Survey, Countries Culture, High Reliability Organization Assessments and a Safety Culture assessment using the Oil and Gas Producers (OGP) Model.

Amongst all factors considered in the analysis, some specific questions of the People Assurance Survey related to the quality of Leadership and Safety Culture showed the strongest significant correlation with Safety Performance. This was not only the case for incidents related to personal or behavioural safety but also for major incidents. These findings were in concordance with the established theory, and invited further enquiry.

To understand better the essence and the key components of a strong safety culture, field visits were undertaken in high-risk organizations with exceptionally few accidents and an extensive review of the literature was carried out.

VISITS TO HIGH RELIABILITY ORGANIZATIONS
Recent studies of large, formal organizations that perform complex, inherently hazardous, and highly technical tasks under conditions of tight coupling and time pressure conclude that most will fail at some point, causing very serious accidents to occur. There is a small group of organizations that appear to succeed under such testing circumstances with fewer than “normal” or expected accidents. These are sometimes termed high reliability organizations (HROs) (Weick & Sutcliffe, 2001; LaPorte 1996). The signature of an HRO is not that it is error free, rather that errors do not disable it. HROs put a premium on expertise, and look for personnel with extensive experience, skills and training. Decisions are pushed down the line of command to where expertise resides.

HROs do not operate in a command and control world as this works only when there is a stable environment but not when the unexpected happens. HROs cannot afford to be wrong - an accident on an aircraft carrier or in air traffic control can be catastrophic.

In order to understand better how HROs operate, field visits included nuclear plants, flight operations aboard an air craft carrier and a chemical plant. (See Figure 2 – Photo of aircraft carrier flight deck)

DEFINING THE IDEAL SAFETY CULTURE
With the information gathered from the pilot studies in different parts of BP, the field visits, and the theory, it was defined with more detail how the Generative level of the safety culture ladder would look for a company such as BP and this was considered as the way in which BP assets want to operate.

In this ideal safety culture, the organization displays the following characteristics:

Informedness
Communications are fluid in both ways, so the workforce tells management bad news and management is willing to listen. Management knows what is going on and is prepared to provide positive and/or negative feedback. Everybody is prepared to report their errors and near-misses, and attention is paid to details and small events. Managers know what questions to ask because they are competent and they make sure their workforce is competent as well. Managers listen to those who know.

Mindfulness
Weak signals are reported and seen as opportunities to see into the system. Information is not discarded or simplified. Everyone thinks about what might go wrong. People can deal with the unexpected, and they are well prepared to deal with it. People listen to those with knowledge, and decisions are delegated to the level in the organization where the expertise resides.

Learning
There is learning from incidents which is acted upon quickly. Organizations seek new ways of understanding and working, and procedures are under constant scrutiny. Training and more training creates competence, while cross-training supports effective communication between functions and specialists. There is a clear process for continuous improvement.

Fairness
Everyone knows what is acceptable, as they helped define the standard and it has been properly communicated. Everyone is aware of the consequences of their actions, both positive and negative, and communications are clear in this sense. There is not a blanket no-blame approach, but blame is reserved for truly egregious behavior, involving recklessness or malice.

Respectfulness
The workforce is involved in all aspects related to safety and they are encouraged to participate. People’s ideas are listened to and taken into consideration. Workers are treated with respect and safety messages take in consideration the local culture within which the organization is operating. Workers personal circumstances are taken in consideration.

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Table 1. Example of questions and possible answers in the safety culture assessment tool relating to risk assessment and risk tolerance

<table>
<thead>
<tr>
<th>How are risk assessment tools used?</th>
<th>Risk assessment is done in isolation by the person responsible for safety.</th>
<th>The organisation builds risk assessment tools around the incidents that it sees.</th>
<th>Many risk assessment tools are used in a systematic way with frontline staff formally involved but not really engaged</th>
<th>There is an understanding of the need to practise informal risk assessments on a day-to-day basis in addition to scheduled ones.</th>
<th>People practise day-to-day risk assessment in both formal and informal ways to effectively watch out for each other as well as for themselves.</th>
</tr>
</thead>
<tbody>
<tr>
<td>How tolerant are individuals of risk?</td>
<td>They have to tolerate the risk if they want to get paid.</td>
<td>They don’t take chances with things they know have hurt people in the past.</td>
<td>They don’t take chances with the things that can obviously hurt them.</td>
<td>They look at the job ahead and don’t take chances that they think could hurt them.</td>
<td>They think through every activity well in advance and don’t take chances with their own or others’ safety.</td>
</tr>
</tbody>
</table>

ASSESSING THE SAFETY CULTURE

Based on this model a Safety culture assessment tool has been devised to:

(1) Assess safety culture strengths and weakness in the Business Unit/site/platform,
(2) Learn how perceptions vary among organizational elements and hierarchical levels (including contractors), and
(3) Identify areas of opportunity for material improvements in Safety Culture.

The assessment tool covers 12 elements of Safety Culture as follows:

- Management commitment
- Two-way communication
- Workforce behaviors
- Learning culture
- Production or cost vs. safety
- Management systems
- Attitudes towards procedures
- Relationships with contractors
- Local cultures
- Team leader trust and respect
- Major incidents
- Attitudes towards risk

These are comparable with commonly cited important elements of safety culture from academic and industrial literature, the regulator and include elements inspired by internal BP studies. Two to three safety culture survey questions were devised for each element as listed above. For each question, there were five responses relating to each of the levels of safety culture. Table 1 shows examples of the question and answers relating to risk assessment and risk tolerance.

The assessment is completed on paper or in an electronic format and in the local language(s). As well as English, the assessment tool has been translated to Azeri, Russian, Arabic, German, Dutch, Danish and Spanish. The tool is reviewed by the Business Unit, Asset or platform before starting the assessment process to make sure that the language is understandable and compatible with the specific activity of the Business Unit (e.g. Marketing, Lubricants, Upstream, etc.) The full assessment cycle consists of a 12 Step process. Each step is described by a procedure and all the procedures are available on an internal web site.

Although simply carrying out the safety culture assessment helps raise the awareness and enables a conversation around the safety culture in the organization, the most critical phase of the cycle is related to the improvement plan. Once the gaps have been identified (see Figure 4: Example of results from a safety culture assessment) the leadership team of the unit agrees upon and commits to implement the necessary changes to move to the next level of safety culture.

The improvement program is based mostly on a coaching framework where coaches are identified in the business unit and trained to support their own leaders to improve the safety culture of their organization. Best practices from other parts of BP and other organizations, training programs and a continual support from the central organization are also made available to the business units where the assessment and improvement process is taking place.

The importance of the global approach is emphasized by having a cross culture – cross business operating model.

CONCLUSIONS

The project has raised awareness of the importance of group and individual behaviours, social interactions at work, values, beliefs and the relevance of local culture in the way organizational safety is managed. In some cultures the act of challenging one’s superior is more difficult than in others and challenge is crucial when safety is being compromised. The project also helped to emphasise the importance of credibility and trust in being able to deliver an
outstanding culture. These are “perishable goods” within an organization, and as such they have to be continuously nurtured and renewed. Every day is a new day in forging and maintaining these relationships; it never gets institutionalized.

The assessments completed so far point toward both barriers and enablers, on a local and organizational level, to improving organisational safety. The assessment acts as a “mirror” for the organizations involved in them, enabling them to reflect in an objective way on how people at all levels in the organization perceive their safety culture. The understanding of what a safety culture is and how it is experienced are used in the assessment tool and support the coaching program. It takes such a difficult concept as an organizational culture from the realms of the ‘Black Arts’ into forms people can recognise in their everyday activities.

The improvement tools and coaching program based on the findings are helping business units/sites to develop and enhance their Safety Culture. Additionally, some interventions have been made at organization level to support the improvement of overall BP Safety Culture. The changes that can be introduced form a paradigm shift as the organization moves up the safety ladder.

REFERENCES AND NOTES