It is hard to imagine a time when safety was not deemed important, when Personal Protective Equipment (PPE) was not used and little was done in the way of prevention. A few decades ago, occupational health and safety was not considered as important for the vast majority of companies. Instead, incidents and emergencies were handled as they occurred, as effectively as possible given the limited technology and resources available. Today, those times have changed. This article explores the progress of health and safety in the dredging industry and QHSSE professionals, Ton van de Minkelis and Christophe Leroy share their experiences in building a proactive safety culture.

History of health and safety within the industry
Health and safety, or HSE (Health, Safety and Environment as it is now referred to) is very different today from 50 years ago. The idea of workplace HSE has advanced tenfold and continues to improve, resulting in the gradual decrease of injury incidents. Recent changes include the introduction of stricter legislation and sentencing guidelines. However, health and safety was not always a priority. What we see as the standard way of working today was not the case just a few decades ago.

Today, company cultures have evolved entirely. A specialised occupational health and safety system combined with a strong company (safety) culture are must-have elements of any organisation in order to improve the safety performance. Relating health issues to occupations and their environments goes back further than you might think. In fact, the first known instance of correlation between health and work was in the 4th century BC when Hippocrates noted lead toxicity in workers of the mining industry. Since then, there has been a long list of professionals...
Improving the culture can not only improve safety, but also efficiency and well-being.

The International Safety Management (ISM) code

Relevance for the dredging industry was the introduction in 1998 of the International Safety Management (ISM) code by the International Maritime Organization (IMO). The purpose of the ISM code is to provide an international standard for the safe management and operation of ships and for pollution prevention. It was born out of a series of serious shipping accidents in the 1980s.

The ISM code was designed to standardize safety management practices, ensuring that vessel operators follow a set of established procedures to prevent accidents at sea. It places a strong emphasis on risk management and the involvement of crew members in decision-making processes.

Health and safety performance

There are three main shifts that improved occupational health and safety performance over the past decades:

1. Improvement of technology and standards
2. Implementation of management systems
3. Change in culture

The theoretical scheme in Figure 1 shows how these three shifts influence the reduction of the accident rate over time. However, it is important to note that today the three topics cannot be separated and continuous effort is given to all three is necessary in order to improve even further. This is especially the case when, for example, new activities are implemented and new equipment is used such as in the renewable energy market.

Safety culture concept: Hearts and Minds model

The Hearts and Minds model originated in Shell and is based on a £20 million research programme carried out in the 1980s. It emphasizes the role of culture in improving safety performance.

An organization’s safety culture is the “way we do things around here in respect of safety.” It is a simplified way of understanding the common attitudes, beliefs and behaviours of a team or project or organization that results in their collective approach to managing safety. Culture improvements are ways of improving safety that do not focus on individual workers, but on an organization as a whole. Ultimately, an organization with a high level of safety has conceived a new mental model that encourages and enables a safe operation. The concept of safety culture was first introduced by the PSAOG (International Nuclear Safety Group) who attributed the cause of Chernobyl Nuclear accident to a lack of safety culture. The concept of ‘safety culture’ relates to a general concept of dedication and personal responsibility of all those involved in any safety related activity at a nuclear power plant. The Chernobyl accident was an example of a weak culture concept and they concluded that not only those involved in the operational stage lacked an adequate safety culture but also those involved in other stages of the lifetime of a nuclear power plant (i.e. designers, engineers, constructors, equipment manufacturers, ministerial and regulatory bodies, etc.)

Safety culture ladder

The safety culture ladder (shown in Figure 2) characterizes different levels of cultural maturity and the change process that is necessary to achieve a lasting change at the personal and organisational culture level. The various characteristics of the cultural levels help organisations to discover the gap between their present level of cultural maturity and the aspiring level.

Experience shows that by using a maturity model a transformation process people become aware of the gap between the aspired level and their current level of cultural maturity and can discover the right culture transformation path. At the lowest level of the ladder, the overall goal being to grow towards a ‘mature safety culture’ that ultimately offers perspective for an organisation to take feasible steps.

In the past decades, all major dredging companies have started a company safety programme with attention to safety awareness and behaviour with the aim of continuously improving safety performance. The overall goal is to grow towards a proactive safety culture. To achieve this goal, genuine attention from senior management is indispensable. The Hearts and Minds model offers perspective for an organisation to take feasible steps.

Gradually, safety is gaining awareness and atitude among management, employees and contractors. Companies are building a mature safety culture that ultimately influences a safer working environment in day-to-day operations.
Since 2013, QHSE Director Torvaas de Mirkas has been involved in the safety journey of Van Oord. Responsible for continuously developing the safety culture to a higher level, he did not depend solely on the existing rules and the key interventions that have proven successful in continuously reinforcing safety awareness and behaviour within the organisation.

Safety in practice
In the years 2003–2010, Van Oord set up a fully integrated management system certified at the time against the well-known international quality, environment and safety standards. It is noticeable that the number of registered accidents within the organisation increased in the first few years (Figure 3). This is explained by the fact that an organisation going through an incident procedure must learn to report procedures in themselves do not actually improve safety in day-to-day operations.

As a result, Van Oord made a start on putting the paper management system into practice. A QHSE department was set up to develop practical instructions and training tailored to the inexperienced employees who were recruited and deployed locally. In retrospect, this effort and supervision of the construction site paid off. A fact also reflected in the accident figures.

Management attention to safety
In 2011, senior management became acquainted with the Hearts and Minds Management attention to safety project. The consultants explained to senior management the dilemmas encountered in practice in an interdisciplinary manner. When the programme began, the plan was to train all managers and vessel captains of the company within two years. However, back in the first period, the active involvement of the CEO and CDO was extremely important. They emphasised the importance of safety at the start of each training programme and received the improvement proposals from the group at the end of the day, which they then discussed in the evening.

Later, the target group was expanded to include all key personnel within the organisation including staff departments. After a two-year break due to the COVID-19 pandemic, the 100% SLT will be held this spring. During the course, participants are introduced to the safety culture of Van Oord and learn what is expected of them as leaders. It also provides an opportunity for people to meet new colleagues from other departments and to discover that everyone can contribute to safety from their own discipline. It became clear that the success formula of the Safety Leadership Training programme is interdisciplinary and involves the top 40 vessel captains of the company within two years. Looking back on this first period, he describes his experiences, the dilemmas encountered in practice in an interdisciplinary manner.

In 2016, the measurement was repeated amongst all employees of the organisation. The awareness of the new corporate safety campaign had also increased. The results of this survey indicated that most departments and areas score quite well on the proactive safety level. The extent to which staff feel safe to speak out and give feedback was also measured. This showed that giving feedback to each other and being open to feedback still remains a challenge within Van Oord. In 2018, the decision was taken to certify the safety culture on the basis of the NEN Safety Culture Ladder (SCL) Certification Scheme. Van Oord has been certified at level 4 SCL from that time on.

Monitoring the safety culture
Safety culture is intangible and difficult to capture in objective measures. However, it is important to test a safety culture programme for its effectiveness as well as to evaluate which aspects should receive more attention in the programme. In 2014, TNO was commissioned to measure the effectiveness of the Safety Leadership Training (SLT) programme and to investigate the safety culture among the top 450 managers within the company. The way they showed that the safety culture had transformed into the calculative stage (see Figure 2), In tradition, the safety behaviour of supervising who had participated in the SLT was assessed more positively by their colleagues and direct reports.

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Corporation safety campaign:
Say YES to safety
It is important for a large company to develop an appealing safety campaign that is in line with the company values. Derived from the company values “caring” and “working together”, five safety principles were defined as guidance for personal behaviour expected of all Van Oord staff and contractors. The safety principles are about taking responsibility for health and safety, leading by example, giving feedback and being familiar with the procedures and reporting incidents.

Nine life-saving rules (see Figure 4) have been defined on the basis of the analyses of serious accidents from previous years. The common safety icons used in the industry were used where possible for the campaign materials.

Risk management
The basic principles for managing and mitigating project risks are contained in a well-organised process covered by the HSE risk-management flowchart (see Figure 5). Hazard Identification and Risk Assessment, Job Safety Analyses (JSA) and Permit to Work (PtW) and the Last Minute Risk Assessment (LMRA) are used.
CASE STUDY 2: SAFETY CULTURE OF JAN DE NUL

With over 23 years as a QHSSE specialist, Christophe Leroy has worked on many international dredging and offshore projects. He has seen many changes and transitions in the approach towards occupational health and safety in the dredging industry over that time. He shares his experiences in his role as QHSSE Manager for Jan De Nul, having built the company’s safety management system and culture.

The importance of training
My first few months as QHSSE advisor working for a joint venture (JV) onshore project was a challenge. For a start, I was the first QHSSE advisor working on international projects for Jan De Nul Group. As a result, no one in the company was able to train or guide me in my new function, except for some external persons with oil and gas experience who had been hired for the project.

Slowly but surely, the mentality towards occupational health and safety in the maritime industry changed.

Today, QHSSE professionals are an integral part of project teams.

The changing role of a QHSSE advisor
Going back to my first assignment within the company, the JV’s tasks and responsibilities were not clear – not to me, nor to my colleagues. A QHSSE advisor was a kind of nuisance on site. An obstructor under the contract with the oil and gas client and as such a benefit to improve the overall process. Some examples: the instructions that I received from the JV project management was “to keep the client satisfied with reports without causing too much trouble for the people carrying out the work.” After an incident investigation, it was stated “we use our equipment until it breaks” versus planned maintenance. On my second project, the primary tool of a QHSSE advisor was a camera to “catch people.” Oil spills, large or small, were not considered an important issue.

Fast-forward 23 years and it’s a different story. Today QHSSE professionals are an integral part of project teams. Working together to assess and control all aspects of the work. Incidents are thoroughly investigated and preventive actions are put in place to prevent recurrences. Assets are subjected to rigorous planned maintenance systems. Spills of any type, large or small, are taken seriously and even more important is the mentality that “prevention is better than cure.” Needless to say the education of occupational health and safety professionals has improved tenfold over the years. For instance, in Belgium, the Masters programme in Prevention and Environmental Management, which did not exist 20 years ago, is widely popular and a huge success.

Occupational health and safety ambitions and subsequent performance used to be client or auditor driven. However, slowly but surely, the mentality towards occupational health and safety in the maritime industry has changed. The initial task to do so came from oil and gas clients, as well as government legislation. At a later stage, renewable energy clients also set the standards. QHSSE in general became more professional and had a larger contribution on the safe way of working. Companies now have the maturity to define their own values and ambitions. Companies striving for safety management excellence because it is important for themselves, not because a client or auditor asks them to do so.

Safety standards and certification
Besides the influence of clients, the implementation of the ISM code on board of vessels resulted in a large shift in mentality and performance. When started in 1999, all a few vessels of the Jan De Nul fleet had gone through the complete process of ISM certification. One of my tasks was to assist the last remaining vessels for their intermediate audit. During the preparation of these vessels, it was obvious that safety management systems were not sufficiently organised or implemented on board. For example: regarding fire drills, fire drills were found in non-global packaging, there were no assigned firefighting teams and crew had not even been trained on how to put on the fire suits. The situation today is that the implementation of a safety management system as per ISM has been a huge lever to raise the safety performance on vessels. This includes creating safe working practices and working environments, making suitable safeguards against potential risks and continuously improving the safety management skills of personnel as well as the development of emergency response plans for both safety and environmental protection. By adopting the Offshore Vessel Management and Self-Assessment (OVMBA) Jan De Nul aims for the higher level of safety.

in all companies within the dredging industry. Within Van Oord safety tools are explained in a practical training programme which is mandatory for all project employees. The success of such safety tools strongly depends on how effectively the training is conducted. The role of the direct supervisor is therefore decisive in this regard. This is why active supervision and the openness and trust to stop the job are integral parts of the model.

New role of HSE professionals
Getting the company’s HSE staff involved in the transformation of the organisation’s safety culture should not be forgotten, as they too must change their approach and behaviour. An unplanned approach and use of the safety procedures by all HSE professionals is itself a challenge. However, if an organisation shifts to a proactive safety culture, HSE professionals must learn how best to ease the transformation process. The role of project managers will remain incalculable responsible for safety and well will demand more and different requirements from the HSE professionals in that projects. The role of HSE staff is shifting from a hands-on safety officer on site to a sparring partner who has to provide safety technical support in the design and project preparation phase and a more coaching role in the execution phase of a project.

Continuous attention to safety culture
Experience shows that after a few years of a declining trend in the number of accidents, the safety performance of Van Oord remains at a plateau (see Figure 3). This is a critical moment. It is the phase in which safety management is quite satisfied with the outcome of the culture programme. The sense of the “new” is gone and the top of the organisation is occupied with new issues that require priority such as sustainability and digitisation.

Complacency is lurking and the chance that the safety culture will fall back is a real danger. In 2018 a number of serious accidents occurred within Van Oord in a short period. This served as a wake-up call and prompted the company to organise a large-scale safety event, the Safety News Alert. Following its success, another major event was organised in 2020 with the theme Thanks to Safety where the subject of mental health and well-being was explicitly discussed.

Maintaining and improving the safety culture of an organisation is a long-term process. Constant attention to safety at all levels, with a focus on learning from mistakes and improving processes is necessary in addition to training and educating newcomers is essential to the company’s safety performance. It is vital that they know what is expected of them and understand the importance of their contribution to safety for the company as a whole.

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In the 1990s, many large companies had already ISO9001-certified. The standard for
This open culture is a clear sign that the dredging industry as a whole has developed to a higher level of safety culture.

This article explores the progress of health and safety in the dredging industry and HSE professionals, share their experiences in building the safety culture within marine contractor organisations. Having suited the safety management system (SMS) and culture of Jan De Nul CNI, Christophe Leroy shares his knowledge and lessons learned during his career within the dredging industry. And Ton van de Minkels describes the systematic approach he has successfully applied to raise the safety culture at Van Dord to another level.

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