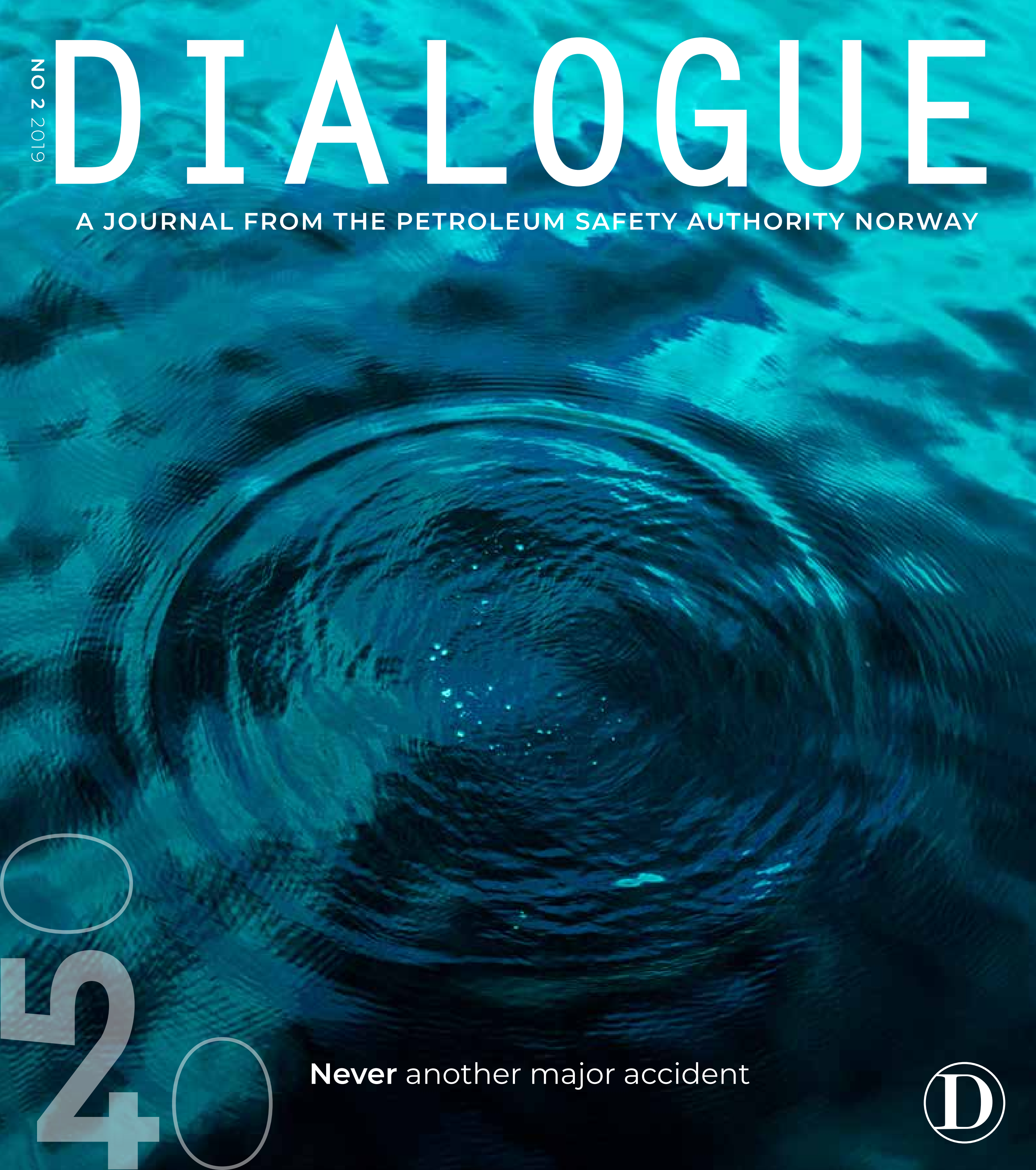

NO 2 2019

DIALOGUE

A JOURNAL FROM THE PETROLEUM SAFETY AUTHORITY NORWAY

50 40

Never another major accident

50 YEARS SINCE EKOFISK WAS DISCOVERED

40 YEARS SINCE *ALEXANDER L KIELLAND* CAPSIZED

"I can cover the North Sea from here to the North Pole with oil."

This exclamation is attributed to the chief driller on *Ocean Viking* when he and his crew made the discovery which initiated Norway's Oil Age 50 years ago.

The Ekofisk find brought with it jobs, engineering achievements and the start of a big new industry. That is worth celebrating.

But oil has not only meant prosperity and growth. The new industry also had a dark side which put big burdens on individuals and society in the form of accidents and serious incidents.

"Mayday, Mayday – *Kielland* is capsizing."

It will be 40 years this spring since that distress call was sent from the *Alexander L Kielland* flotel. That disaster by the Edda platform in the Ekofisk area cost 123 lives and ranks as the worst accident in Norway's oil history.

However, stricter requirements and regulations followed in the wake of this and other accidents in order to make the industry safer and more secure.

With a clear allocation of responsibility and a strict government regime, a good basis was created for the level of safety we have today.

But the price we had to pay was high.

This issue of *Dialogue* covers both Ekofisk at 50 and *Kielland* 40 years on.

We look at safety developments on Norway's first commercial field, what can be learnt from serious incidents and – not least – why it is important keep the memory of Kielland and other accidents alive.

Enjoy!
Øyvind Midttun
Editor

Cover photo: Morten Berentsen

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"I sincerely hope that we never experience another major accident in our industry. To avoid that, we must develop – at all times. We must learn, analyse, implement and make safety the highest priority. Responsibility rests with the companies, which must show that they accept it – every day."

Anne Myhrvold, director general, PSA

BY **INGER ANDA**

Common past, common future

The years 2019-20 have a key place in Norwegian petroleum history, marking 50 years since Norway became an oil nation and 40 years since its worst offshore disaster respectively. These milestones are being used by the PSA to challenge the industry – *Never another major accident* is its main issue for 2020.

A lot changed for Norway in the winter of 1969. Finding Ekofisk, one of the world's largest offshore oil fields, laid the basis for a new petroleum nation.

This discovery has contributed huge revenues to the country for half a century – but was also the setting for major accidents. The biggest of these occurred on 27 March 1980.

That was when the *Alexander L Kielland* flotel overturned on the Edda field near Ekofisk – a disaster which claimed 123 lives, changed the industry and made its mark on safety work ever after.

How can new accidents be prevented? This question is central to the PSA's main issue for 2020. (Photo: Marie von Krogh)

Crashed Major accidents – as defined on page 22 – have occurred in the Norwegian oil sector both before and after *Kielland*, starting with a helicopter crash on Ekofisk which killed four people.

The latest occurred in 2016, when a helicopter working for Statoil (now Equinor) came down off Turøy near Bergen at the cost of 13 lives. See the overview of major accidents on pages 26 and 27.

Such incidents impose a heavy burden, especially on the individuals and families directly affected. The industry also feels the pain when colleagues, friends and employees are lost at work.

Many near-misses have also occurred during these 50 years. Such events can be very serious and close to disastrous, and leave people traumatised and deeply stressed.

Anne Myhrvold, director general, PSA

Response The question then is how to avoid new major accidents. This subject will be raised and made a topic of discussion by the PSA in its main issue – and it will be demanding a response.

PSA director general Anne Myhrvold wants to see Norway's ambition of continuous improvement in HSE converted into specific plans.

"Our choice of main issue for 2020 is intended to challenge the companies," she emphasises. "We want to know what they're going to do – and how.

"I sincerely hope that we never experience another major accident in our industry. To avoid that, we must develop – at all times.

"We must learn, analyse, implement and make safety the highest priority. Responsibility rests with the companies, which must show that they accept it – every day."

Myhrvold says the PSA is posing three questions in connection with its 2020 main issue. These are primarily directed at managers and decision-makers.

- **How can we continue to learn the lessons – and apply what we've learnt?**
- **What changes and new measures are being implemented by *your* company and *your* organisation to reduce the threat to life?**
- **How should we work to prevent a new major accident?**

"The answers take centre stage here," Myhrvold stresses. "How are the companies discharging their responsibility to operate safely, and how are we reducing risk to the lowest possible level?

"How are we doing this in practice? How do we ensure that companies, unions and government are pulling in the same direction?

"The PSA will initiate the debate and seek solutions – in every context. This industry has a common history, and we also shape the future in common."

Never another major accident

Norway became an oil nation in the winter of 1969 with the discovery of Ekofisk. The following five decades have brought the country great success – and major accidents. It will be 40 years since the biggest of these in 2020.

Over half a century, the Norwegian oil industry has learnt a lot about risk. And it knows that good safety depends on its ability to *reduce* hazards.

The country's ambition for continued improvement in HSE both must and will characterise the future for its oil sector. That is a collective responsibility for companies, unions and government.

MAIN ISSUE 2020

Safeguarding the **heritage**

Ekofisk was the first Norwegian oil field to become a museum piece. Curator Björn Lindberg and senior historian Kristin Øye Gjerde at the Norwegian Petroleum Museum in Stavanger have ensured that its industrial heritage is well documented. (Photo: Jonas Haarr Friestad)

BY ØYVIND MIDTTUN

The 50th anniversary of the Ekofisk discovery in the Norwegian North Sea was celebrated this autumn. But the giant field has already been a museum piece for many years.

“Ekofisk is unique,” says curator Björn Lindberg at the Norwegian Petroleum Museum in Stavanger. “It was Norway’s first commercial find, and one of the very largest.

“It’s been on stream for almost 50 years, but still has a long future. The field is special in many ways, so preserving and documenting its history is important.”

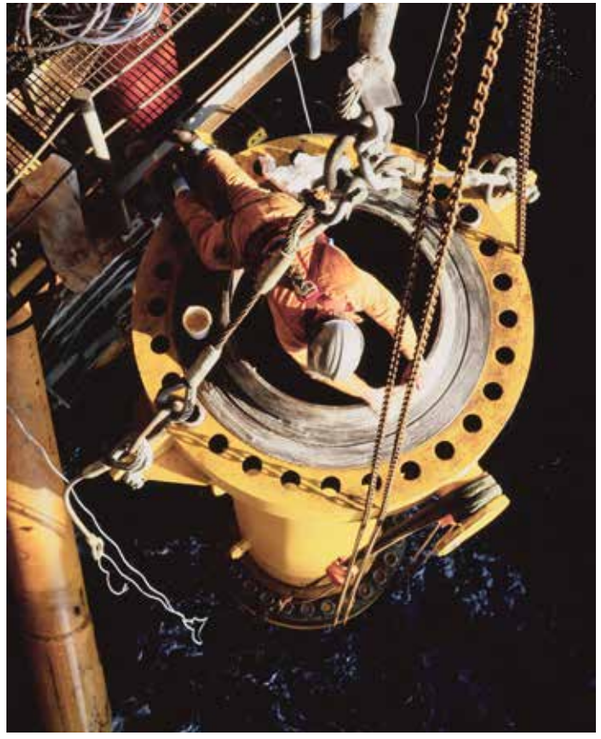
This work began in the early 2000s, in connection with a redevelopment of the field with new platforms and the removal of 14 old facilities from the greater Ekofisk area.

In line with Norway’s Cultural Heritage Act, the Directorate for Cultural Heritage called for the field’s industrial heritage to be documented. That job was given to the petroleum museum.

Giant This was a demanding assignment, since developing Ekofisk and the other fields in the vicinity represented a giant industrial undertaking.

It has included more than 30 platforms, a concrete storage tank, long export pipelines, and big terminals for crude oil, natural gas liquids and gas in the UK and Germany.

All these facilities have been in operation to recover hydrocarbons from the chalk reservoirs in the Ekofisk area and bring them to market.



Jacking up the Ekofisk 2/4 R riser platform in 1987. Raising this and other facilities was a key technological achievement in the field’s history. (Photo: Ekofisk industrial heritage)

“We couldn’t preserve any of these installations in full scale,” explains Kristin Øye Gjerde, senior historian at the museum and manager of the Ekofisk industrial heritage project.

“They’re too large for that. But what can’t be conserved can nevertheless be documented.”

Updated The heritage project originally ran until 2004. As part of the 50th anniversary celebrations, however, the museum has updated and expanded it with new material.

Installing the Ekofisk 2/4 K water injection platform in 1986. Water flooding has helped to maintain reservoir pressure. (Photo: Ekofisk industrial heritage)

This collection details the technological progress made, important sub-projects, historical incidents and milestones, and developments in HSE.

In addition come materials covering a good deal of the debate conducted over the field as well as key decisions and political choices.

A great many written sources, such as books, reports and journals, have been digitalised and made available over the internet along with more than 5 000 photographs.

The latter document various aspects of the field’s history from the pioneering days to the present. Film materials have also been conserved.

Iconic The museum's Ekofisk-related exhibits include a number of iconic objects, including the bit used by *Ocean Viking* when its drill string penetrated the reservoir on 25 October 1969.

Among others are an original Xmas tree – set of valves – used for the test production phase in 1971 and an authentic driller's cabin from the Ekofisk 2/4 A platform.

On the quay outside the shoreside museum can also be seen one of the giant jacks used in 1987 to raise a number of Ekofisk facilities threatened by seabed subsidence over the field.

Interviews Another large and important part of the collection comprises interviews conducted by Gjerde and her colleagues with eyewitnesses high and low.

These range from old drill floor workers and union leaders to offshore installation managers and office workers. Collectively, they relate a colourful history of pioneering work, comradeship, engineering achievements and serious incidents.

"These accounts provide a picture of the work culture which has prevailed out there, and a good insight into how things have changed," says Gjerde.

She highlights such aspects as the way safety thinking has become integrated and ingrained for employees today.

"Documenting Ekofisk has been an important assignment," notes Lindberg. He points out that the field has played a central role in Norwegian history over the past half-century.

"This is also Norway's oil story in miniature. The discovery of Ekofisk initiated an era without compare, and has since made its mark on virtually all aspects of Norwegian society.

"As the first field to be developed on the NCS, it has become a symbol. It's also a significant part of our history in purely monetary terms."

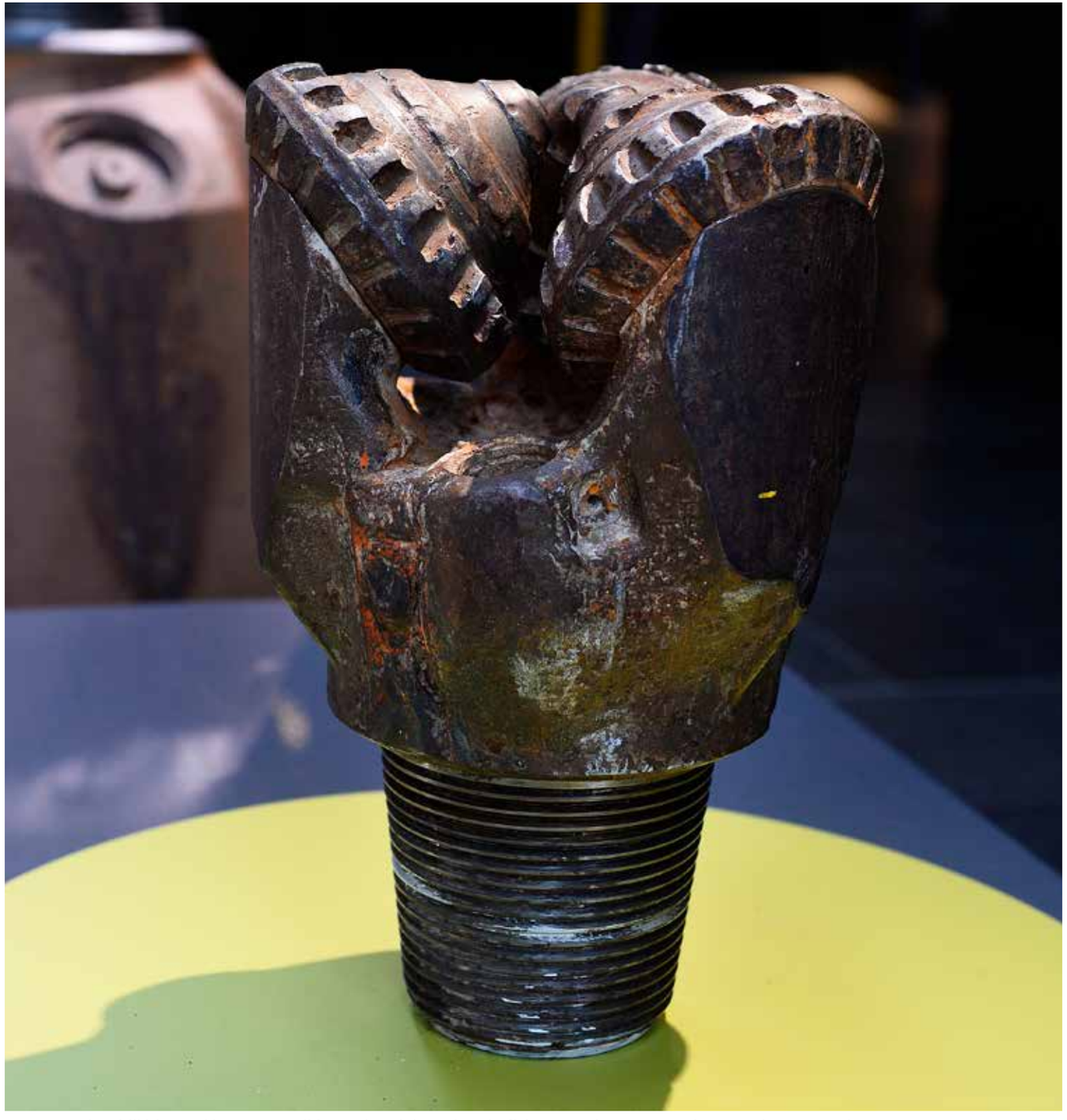
Documented Ekofisk was the first industrial heritage project at the museum, but has since been followed by Frigg, Statfjord, Valhall and Draugen – all documented both digitally and physically.

Apart from Frigg, all these fields are still on stream, and Lindberg emphasises the importance of getting the work started early enough.

"We're not writing obituaries for these fields. The documentation work needs to start at the right time, preferably while they're still producing and the sources are available.

"If we get involved too late, when only a few people are left and the field is shutting down, it's much more difficult to tell the whole story and provide a correct picture."

Read the whole story of Ekofisk in English at https://ekofisk.industriminne.no/en/



The drill bit used by *Ocean Viking* to break into the Ekofisk reservoir on 25 October 1969 is now on show at the Norwegian Petroleum Museum. Previously in private ownership, it was donated to the museum in 2018. (Photo: Jonas Haarr Friestad)

Five decades of **getting better**

Stig S Kvendseth (left) and Bjørn Saxvik in front of the *Alexander L Kielland* monument at Smiodden in Stavanger. (Photo: Jonas Haarr Friestad)

BY ØYVIND MIDTTUN

When Norway's offshore "grand old lady" reaches 50, attention naturally concentrates on the value and prosperity it has created. But the Ekofisk story also includes important steps towards the present level of safety for the whole Norwegian oil sector.

A number of accidents and serious incidents occurred during the first decades of petroleum operations on the NCS, and the Ekofisk area was hard hit.

Occurrences there included several helicopter crashes, a fire on the Ekofisk 2/4 A platform in 1975, with three deaths during the evacuation, and the major Bravo blowout two years later.

Then came the *Alexander L Kielland* disaster in 1980, when 123 people lost their lives. All these incidents are part of Norway's oil history. Read more about the *Kielland* accident on page 22.

"It's important that we don't beautify the story of Ekofisk, because it's had a cost," says Stig S Kvendseth, head of communication and government affairs at operator ConocoPhillips.

"Phillips was the operator when *Kielland* capsized, and that accident left deep traces in the company. When I joined [the following year], it hung over everything.

"It made a strong impression. Everyone was affected by what had happened, which left them both humbled and determined to learn the lessons."

Influenced "When we look back, it's easy to see how accidents have influenced progress with safety and the regulations," says Bjørn Saxvik, who has been with ConocoPhillips since 1984 and is now HSE manager for the Ekofisk area.

"During the early years, unfortunately, it was the accidents which prompted the big advances in this area. New solutions were found *after* things had happened."

He points to several examples of this, such as the Bravo blowout. That led to Norway's oil spill response system and the Norwegian Clean Seas Association for Operating Companies (Nofo).

Helicopter accidents made wearing survival suits obligatory on flights. And *Kielland* prompted changes in training, protective equipment, rescue gear and regulations as well as mandatory risk analyses.

"Things are different today," Saxvik acknowledges. "Over the years, we've become much better at looking ahead, calculating what might happen

Automation and new technology mean that much of the manual work which exposed drilling personnel to safety challenges has now gone. (Photo: Ekofisk industrial heritage)

Stig S Kvendseth says that ConocoPhillips has achieved good safety results over many years. "At the same time, we're very respectful about this. We know that safety's a perishable commodity." (Photo: Jonas Haarr Friestad)

and taken action on the basis of potentials.

"This approach has helped to ensure that it's a long time since we had a major accident. The goal today is zero accidents in the industry.

"That's done something with our mindset. We're more proactive, always in the forefront and work very differently from before. It's important not to lag behind is the safety sphere.

"Analyses initially focused primarily on technology, but the human and organisational aspects have secured a stronger place over time. Their interactions are more and more important."

Injured Occupational injuries were not unusual for oil workers once. But Kvendseth says the image of dirty overalls on the drill floor and hands missing two fingers is a long way from today's reality.

"Automation and new technology have meant that many of the jobs which called for manual work with a big exposure to risk are now gone.

"One example is the drill floor, where we've gone from manual handling of heavy equipment in constant motion to a high degree of automation. You can now sit in a chair and operate remotely."

He also cites remotely operated subsea vehicles and drones as examples of the way technological progress has helped to reduce risk exposure for personnel.

Challenge The risk level on the NCS is very different today from the 1960s and 1970s. But that will only last as long as it is maintained. The challenge is to ensure that people are always alert and aware.

"Highlighting earlier incidents and accidents is important for maintaining attentiveness," observes Saxvik. "We have to learn from the mistakes of others and what's happening around us - in other oil companies and other industries."

He believes that the exchange of experience between the companies on the NCS functions well today.

Awareness "The companies don't compete with each other over HSE," Saxvik says. "On the contrary, I think there's an awareness that we stand together on this.

"If a major accident occurs, we'll be condemned as an industry and not just as an individual company. So it's important that we constantly learn from each other.

"As a licensee, too, this company's very active in safety work. We've found that our safety mindset is one of our biggest 'exports' to other companies."

Kvendseth notes that ConocoPhillips has achieved good safety results over many years: "At the same time, we're very respectful about this. We know that safety's a perishable commodity."

He believes that long-standing collaboration and trust between unions and management in his company has been an important factor in achieving good results.

"We have the room to talk together about the things we disagree on. Safety has a lot to do with the culture which prevails in the workplace."

Available When Ekofisk was developed, the companies drew on the knowledge and experience then available. Much of this came from the Gulf of Mexico, where the waters were both calmer and shallower.

"Conditions in the North Sea were tough," says Kvendseth. "The Americans encountered a quite different reality there, and had to go through a demanding learning process.

"But that resulted in a technological and safety progress which has been very important for activity both on the NCS and internationally."

Since trial production from Ekofisk began in 1971 and up to 2019, the field has yielded 4.2 billion barrels of oil equivalent – and six billion in all from the greater Ekofisk area.

Some 180 000 barrels a day are still being produced, and the field is set to remain on stream at least until 2050.

"Tailoring safety work to technological advances will be an important job for the future," Kvendseth notes. "We must always try to understand the interaction between technology and people.

"Good collaboration with our employees and our suppliers occupies a key place. And, not least, we must constantly learn from others."

Ekofisk is still in full production, 50 years after its discovery. Activity will remain high for many years to come, affirm Stig S Kvendseth (left) and Bjørn Saxvik. (Photo: Jonas Haarr Friestad)

Worst that can happen

40

It will be 40 years in 2020 since *Alexander L Kielland* capsized on the Edda field in the North Sea with the loss of 123 lives. This disaster has been highly significant for safety work ever since. (Photo: NTB Scanpix)

BY INGER ANDA

A major accident is the most-feared scenario. The biggest in Norway's oil history happened on 27 March 1980, when *Alexander L Kielland* capsized in the North Sea with the loss of 123 lives.

The Mayday call from the flotel came at 18.33 on that dark evening. A leg had been torn off, it quickly listed, took in water and overturned completely in just 20 minutes.

Weather conditions were poor, and fog descended. A high south-easterly wind produced waves six-eight metres high in strong currents.

The official inquiry report in April 1981 attributed the disaster to fatigue cracking in a weld, which led to one of the five support columns being lost. Disaster was then unavoidable.

Retracted *Kielland* was moored alongside the Edda installation in the greater Ekofisk area when the accident occurred. The gangway linking rig and platform had been retracted because of the bad weather.

Events developed so quickly that few of the 212 people on board managed to get to their cabin to fetch a survival suit. Only eight succeeded in putting one on – and four of those survived.

Three of the seven lifeboats, with space for 50 people, were crushed by waves hitting the rig columns during lowering. Just two of the boats therefore remained usable.

And nobody on board managed to operate the release mechanism for the liferafts, which were capable of accommodating 400 people.

Temperatures of 7°C in the air and 4°C in the sea meant that those who fell into the water had little chance. A few managed to swim to the Edda platform and were hoisted on board.

But 123 people died in the North Sea that evening. Eighty-nine survived.

A major accident can be defined as an incident, such as a fire or explosion, which causes the death of or serious injury to a number of people.

Such an incident may also be an oil spill which does serious harm to the environment, or leads to the loss of substantial material assets.


Dagbladet

Løssalgspris 2,75 Nr. 76 - 112. årg. Lørdag 29. mars 1980

139 døde – største ulykke i vår tid

Alt håp er ute

HER ER ÅRSAKEN:

— Alt håp er ute. Vi har sopt havet rent.

Dette var den nedslående, men klare konklusjonen på det stabsmøtet som ble avsluttet på hovedredningssentralen på Sola litt før kl. 21.00 i går kveld.

Samtidig avviklet sjukehusene i Rogaland katastrofeberedskapen i forbindelse med Nordsjø-ulykken.

Dermed synes det også klart at 139 mennesker mistet livet da boligplattformen «Alexander Kielland» gikk rundt, og at dette er den største ulykke i Norge i vårt århundre.

Ulykken er også den største som noen gang har forekommet med oljeplattformer.

Sidene 2, 3, 6, 7, 8, 9, 10 og siste

Misjonær Agnar Espegren

Brugt 6

HYTTEMØBLER

"All hope gone" reads this headline in Oslo daily *Dagbladet* from 29 March 1980. No accident in the Norwegian petroleum industry caused more fatalities than the *Alexander L Kielland* disaster.

Positive inheritance

Allocating responsibility is another of today's key concepts. The operator companies have a clearly defined overall duty to take care of safety in their operations. (Archive photo: Marie von Krogh))

BY INGER ANDA

The *Alexander L Kielland* disaster proved extremely important for safety progress on the NCS in terms of regulation, supervision and allocation of responsibility between government agencies.

Norway's oil adventure began long before dedicated safety regulations were put in place for the industry, with the first exploration well being drilled on the NCS in 1966.

It was not until 1970 that a committee was appointed to draw up offshore safety rules, and the Norwegian Petroleum Directorate (NPD) began work only in 1973.

The loss of the *Kielland* proved a turning point in organising the regulatory regime for the petroleum sector, with the Petroleum Act coming into force five years later in 1985.

One of its innovations was to give the NPD the job of coordinating supervisory activities by government agencies in this field to achieve a better overview of their work.

The PSA was established as a separate regulator in 2004 on the basis of the NPD's former safety division.

Central Efforts aimed at preventing a major accident are extensive and demanding, and play a central role in safety work on the NCS today.

Accident prevention begins as early as the drawing board, with the way a facility is designed and built. The precautionary principle applies from here on in.

Combined with risk understanding and understanding of barrier principles, this is crucial for the industry's work in preventing major accidents and personal injury.

The interaction between humans, technology and organisation is complex – and understanding it is basic to these protective efforts.

Allocating responsibility represents another of today's key concepts. The operator companies have a clearly defined overall duty to take care of safety in their operations.

That means prevention, the right priorities and systematic daily work to block accidents. Constant learning and applying the lessons properly are also very important for reducing risk.

Prepared Good emergency preparedness is crucial in avoiding the worst imaginable incidents. Being prepared includes ensuring that people can be rescued quickly and efficiently from danger.

The *Kielland* disaster clearly showed what can otherwise happen. Any operator of oil-related platforms, rigs and land plants today must comply with strict demands for emergency plans.

Evacuation offshore can be conducted with helicopters, lifeboats and nearby vessels, in close cooperation with the rescue centres and health services on land.

Research A number of research projects were initiated after the *Kielland* incident, including work to improve lifeboats. These differ fundamentally today from the ones used in 1980, and the regulations require 200 per cent lifeboat coverage on all facilities.

During the 1970s, it was up to each company to decide whether employees should be kitted out with survival suits offshore. Only a few people on *Kielland* had them.

Soon after the incident, the government made it mandatory for everyone on an offshore facility to have such a garment. Two per person have to be available today.

Over the years, high-tech and specially tailored suits have been developed. These can store heat, for example. And dedicated versions are available for use in Arctic waters.

Accidents before and after *Kielland*

A number of major accidents and serious incidents have occurred both on the NCS and elsewhere, before and after the *Alexander L Kielland* disaster.

This timeline is not a complete overview, but all have been particularly significant for safety developments in Norway. The number of fatalities involved in each case is shown in brackets.

In addition to lives lost in major offshore accidents, many people have died as a result of occupational incidents.

1973 **Ekofisk** Helicopter crash **(4)**

1975 **Ekofisk** Rescue capsule **(3)**

1976 ***Deep Sea Driller*** Wreck **(6)**

1977 **Ekofisk Bravo** Oil blowout **(0)**

1977 **Ekofisk** Helicopter crash **(12)**

1978 **Statfjord A** Fire **(5)**

1978 **Statfjord A** Helicopter crash **(18)**

1980 ***Alexander L Kielland*** Wreck **(123)**

1983 ***Byford Dolphin*** Diver accident **(5)**

1988 **Piper Alpha** (UK) Gas blowout and fire **(167)**

1991 **Ekofisk** Helicopter crash **(3)**

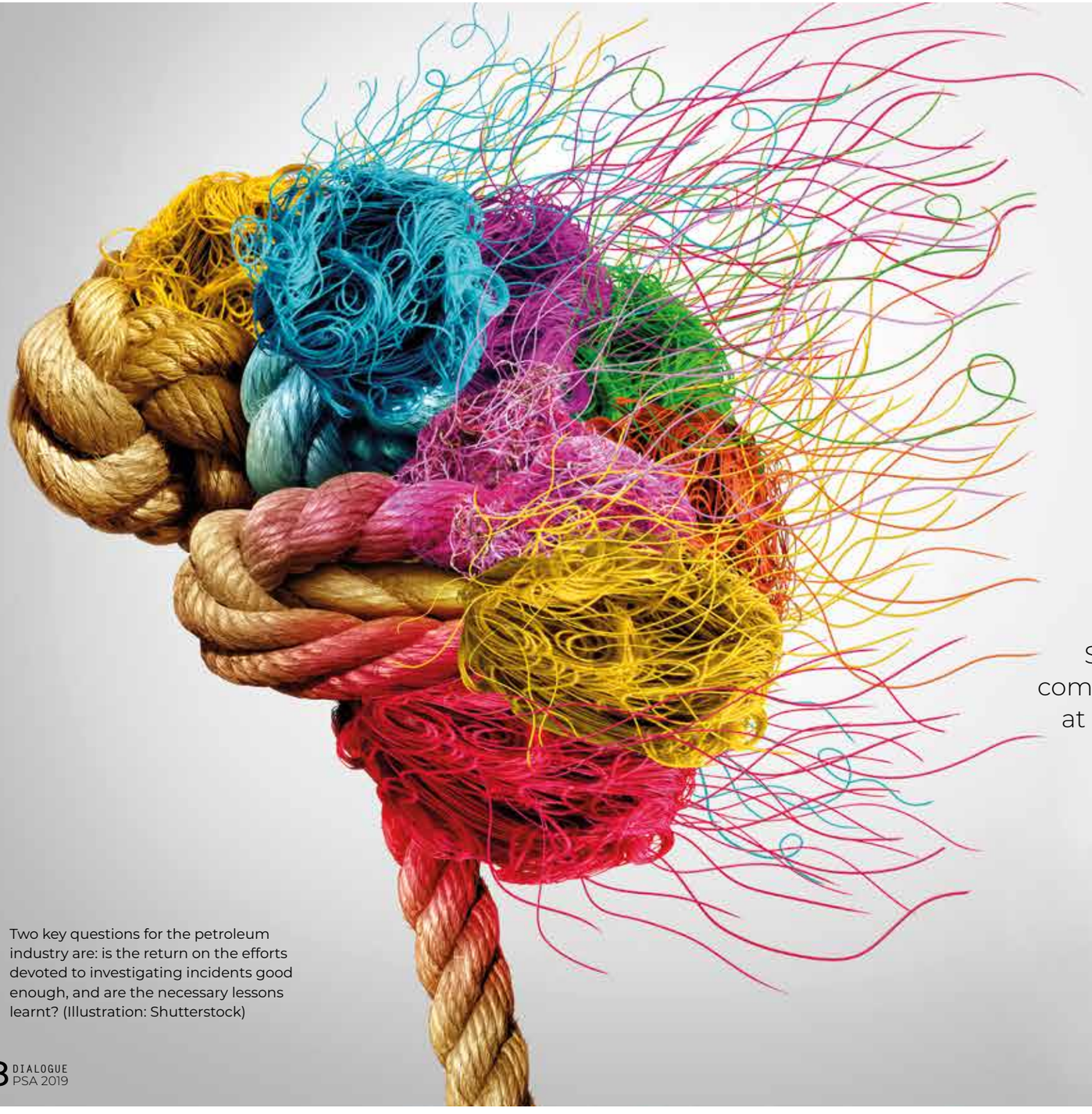
1997 **Norne** Helicopter crash **(12)**

2004 **Snorre A** Gas blowout (0)

2005 **Texas City** (USA) Explosion **(15)**

2010 ***Deepwater Horizon*** (USA) Blowout and fire **(11)**

2016 **Turøy** Helicopter crash **(13)**



Two key questions for the petroleum industry are: is the return on the efforts devoted to investigating incidents good enough, and are the necessary lessons learnt? (Illustration: Shutterstock)

BY **EILEEN BRUNDTLAND**

Learning difficulties

Safety specialist Ranveig Kviseth Tinmannsvik thinks the oil companies learn too little from serious incidents. “We’re fairly good at investigating, but fall short in applying the lessons,” she says.

Both the companies and the government devote substantial efforts to investigating serious incidents in the petroleum sector. But failure to learn from the findings is a recurring theme.

The question is then whether sufficient benefit is being gained from the commitment to conduct such investigations. Is the industry drawing the necessary lessons?

A senior researcher at the Sintef foundation, Tinmannsvik has studied learning from incidents for many years. She emphasises that much good and systematic investigatory work is done by the companies.

In her view, however, the weak point lies in the follow-up, with the systematic approach and attention seen in the inquiry missing once it has been completed.

"An investigation can obviously identify important direct and underlying causes of an incident, but drawing lessons from this calls for much more," she emphasises.

Changes "The ideal learning process yields specific changes in technology, equipment, procedures and behaviour. The organisation also becomes more conscious of its ability to learn from incidents."

Tinmannsvik points out that disseminating information in the wake of an accident or the like is not enough to ensure that the lessons are learnt.

"Sharing information is easy. The question is whether the recipient has the capability to convert it into specific measures tailored to local conditions in their own organisation.

"It's important to decide who should be involved in adopting measures, what requirements should be set for them, and how we're going to measure their effect."

Raised She wants to see more ambitious targets set for learning. Noting the frequent claim that an incident must be investigated to prevent repetition, she says that this goal is far too modest.

"If we conduct a thorough investigation by seeking out the underlying causes, we'll prevent not only similar events recurring but also other types of incidents and accidents happening at all.

"So the aim must be learn more than simply stopping the same type of accident happening again."

Demanding Investigation is a precondition for learning. But the most demanding work comes afterwards, when the findings are to be converted into measures and follow-up.

"Good decision processes for selecting and implementing measures are crucial in learning lessons," Tinmannsvik observes. "Our starting point here is often a little too narrow."

She urges the industry to concentrate less on individual incidents when deciding on measures, and to look instead at the overall risk picture.

"It should draw on several information sources, including results from other investigations, risk analyses, and internal and external audits.

"Finding out what concerns the employees have in their day-to-day work is not least important. What subjects are raised at HSE meetings in the companies, for example?"

Prioritise Tinmannsvik emphasises the significance of daring to prioritise: "Choose a few long-term improvements rather than a lot of short-term correctives.

"Pursuing too many measures at once will undermine concentration and the motivation for making changes. If everything's important, nothing is."

She believes that the measures given priority must be followed up in detail, and stresses that failing to assess their effect means an amputated learning process.

"We see that companies often sign off measures with a starting point in an *intention* or a plan to adopt them, rather than waiting until they are actually implemented and assessing their effect.

"If we let go of the measures too early, before they're put into effect and their outcome is evaluated, learning opportunities will be lost. So it's important to see this work through and follow it up over time."

Sintef researcher Ranveig Kviseth Tinmannsvik has devoted a lot of time to identifying what constrains and promotes learning.

BY EILEEN BRUNDTLAND

What *Kielland* means today

The 40th anniversary of the *Alexander L Kielland* disaster will be marked in 2020. Three key players in Norway's oil sector have been asked how this incident continues to affect NCS safety work.

Photo: Aker BP

Karl Johnny Hersvik
CEO, Aker BP

I remember the news reports about the disaster which had occurred in the North Sea on 27 March 1980 as a completely unreal experience.

People who lay in the sea and fought for life. The rig overturned with only its pontoons showing. The rescue operation with ships and helicopters. The chaos and the uncertainty.

I'll never forget it. Nobody will ever forget it. It became a national trauma – and an incident which has left deep and lasting traces in the way we operate.

The accident demonstrated in all its gruesomeness the risks faced in recovering petroleum resources from the NCS. It also brought government and industry closer together in developing a new and better safety regime.

Advances include improved regulations and company management systems, enhanced design criteria and technological solutions, and more robust emergency preparedness.

It's easy to highlight and refer to these changes. However, the most important alteration relates to something entirely different – our safety culture.

That covers such aspects as the way we think about safety, a precautionary approach, and a "safety first" mindset throughout the value chain.

And, not least, openness, trust and collaboration across organisations, companies, industries and government agencies, worker participation and open dialogue.

The Norwegian model, involving close collaboration with union officials, information sharing and early involvement, marks a fundamental change in the safety regime since the 1980s.

It also represents a safety barrier we must preserve and develop. In addition, we need to assess safety at all times in the work being planned and executed.

We expect operations to be halted when conditions or assumptions change. That's how things have become – and it's how we want our industry to behave.

We must be conscious of our responsibility and satisfy ourselves that everything has been done to keep all the barriers intact, to protect people and society from new major accidents.

That's our responsibility as an operator.

Photo: Morten Berentsen

Erik Haugane
CEO, Okea

This question is very difficult to answer. A long time has passed since the accident, and much has changed fundamentally.

Only oil company employees took safety courses then, and contractors hadn't even tried on a survival suit. Deaths among contractor personnel were therefore disproportionately high.

I personally know a lot about *Kielland*, because one of my best friends was on board and was only saved by the skin of his teeth. His story is surreal.

But to say that the incident affects today's safety work, except in the sense of understanding that things can go really wrong, would be an exaggeration.

In that context, Britain's Piper Alpha disaster undoubtedly has a greater influence on our current HSE processes.

Photo: Morten Berentsen

Lill-Heidi Bakkerud
Vice president, Norwegian Union of Industry and Energy Workers

The *Kielland* tragedy was a parting of the ways, which led to big changes in regulations and how we think about safety and emergency response in the industry.

This is something we're strongly involved with, and we work daily with union officers and safety delegates in the industry to prevent major accidents and minimise the impact if one happens.

A key part of this work is being proactive in the established collaboration arenas, to help ensure that emergency preparedness and safety are taken good care of as early as the concept phase.

Collaboration between companies, unions and government is challenged at times, which we saw in particular when oil prices slumped.

It's important to emphasise that the regulatory regime built up since *Kielland* is wholly dependent on a functioning tripartite collaboration.

Robust solutions are established through general involvement and participation by workers, union officials and safety delegates. Such cooperation must be maintained so that we never again suffer a major accident.

Disaster with a long-term impact

10

The 10th anniversary of the *Deepwater Horizon* blow-out, explosion and fire in the Gulf of Mexico is due on 20 April next year.

Eleven people were killed in this disaster, and a number of others suffered serious injuries.

The drilling rig sank after two days, but more than four million barrels of oil continued flowing out of control from the well for 87 days until it could finally be capped.

In the wake of the incident, the PSA devoted substantial resources to reviewing investigation reports and learning lessons with an eye to applying them to Norway's petroleum operations.

Follow-up of *Deepwater Horizon* has included:

- updating drilling and well standards
- developing well-capping equipment for use with blowouts
- advances in barrier and risk management.

Deepwater Horizon was drilling for BP on the Macondo field off Louisiana when disaster struck. The rig was owned by Transocean. (Photo: AP)

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HSE: Health, safety and the environment
NCS: Norwegian continental shelf
NPD: Norwegian Petroleum Directorate
PSA: Petroleum Safety Authority Norway