RNNP

SUMMARY REPORT 2024

THE NORWEGIAN CONTINENTAL SHELF

Trends in risk level in the petroleum activity

Havtil Norwegian Ocean Industry Authority

Preface

Trends in the risk level in the petroleum activities concern all parties involved in the industry, as well as the general public. RNNP is an important tool for helping to establish a common picture of the trends in selected conditions that affect risk. RNNP is consequently of particular significance for interaction between the social partners within the petroleum activities, and their ownership of the process and the results are important both in terms of the implementation of the activity and the follow-up of results.

The petroleum industry has considerable HSE expertise, and this expertise is a critical success factor for an activity such as RNNP. We are therefore pleased to acknowledge the active contribution to this work of the industry participants, as well as key personnel from operating companies, vessel owners, helicopter operators, consultancies, research and teaching.

Stavanger, 20 March 2025

Finn Carlsen,
Technical Director, Havtil

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1. Objective and limitations

1.1 Purpose

The "Trends in risk level on the Norwegian Continental Shelf" project started in the year 1999. The background to the project was the participants' need to clarify uncertainties concerning the safety consequences of the major structural changes that the petroleum industry underwent in the late 1990s.

The industry has traditionally used a selection of indicators to illustrate safety trends in the petroleum activities. Indicators based on the frequency of lost-time incidents have been particularly widespread. It is generally accepted that this only covers a small part of the overall safety picture. Recent developments have moved towards using several indicators to measure trends. For the parties in the industry, it is important to establish methods for measuring the impact of the industry's overall safety work.

In this report, the Norwegian Ocean Industry Authority (Havtil) wishes to set out a description of core factors that affect risk based on sets of information and data from the activities, in order to allow key aspects of the impact of the overall safety work in the activities to be measured.

1.2 Objective

The objective of the work is to:

- Measure the impact of the industry's HSE work.
- Contribute to identifying areas that are critical for HSE and where the effort to identify causes must be prioritised in order to prevent undesirable incidents and accidents.
- Increase insight into potential causes of accidents and their relative significance for the risk profile, to provide better decision support for the industry and authorities concerning preventive safety and emergency preparedness planning.

The work may also contribute to identifying focus areas for amending regulations, as well as research and development.

1.3 Key limitations

In this report, the spotlight is on personal risk, which here includes major accidents and work accidents. Reactive and proactive indicators, both qualitative and quantitative in nature, are used.

The work is restricted to matters that are included in Havtil's area of authority as regards safety and the working environment. All passenger transport by helicopter is also included, in cooperation with the Civil Aviation Authority Norway and the helicopter operators on the Norwegian Continental Shelf (NCS). The following areas are covered:

- All production and mobile facilities on the NCS, including subsea facilities.
- Passenger transport by helicopter between the helicopter terminals and the facilities.
- Use of vessels within the safety zone around the facilities.

Onshore installations in Havtil's administrative area are included as of 1 January 2006. Data collection started from this date, since when separate reports have been published. Outcomes and analyses for onshore installations and the results from these installations are not included in this summary report. Since 2010, an annual report has been published, with the spotlight on acute spills to sea from offshore petroleum activities. The next report on acute spills will be published in autumn 2025.

2. Conclusions

Through RNNP, we seek to measure trends in safety, the working environment and the external environment using a series of indicators. The basis for the evaluations is the triangulation principle, i.e. assessing developments by using several instruments to measure changes in factors that affect risk.

In an indicator-based model, it is to be expected that some indicators, particularly within areas with relatively few near-misses, will sometimes display large annual variations. The main focus of this report is therefore trends and developments. A positive trend in the number of near-misses may indicate that the industry's risk-management efforts are having an effect, but it provides no guarantee that future incidents will be avoided. Consequently, the petroleum industry, especially in the light of the Norwegian Parliament's ambition for the Norwegian petroleum activities to be world-leading in HSE, should maintain a constant focus on the effective management of conditions that affect risk.

Ideally, it should be possible to reach a summary conclusion on the basis of information from all the measurement instruments used. In practice, this is difficult, partly because the information used reflects HSE conditions at different levels.

Major accidents

In 2024, there were no accidents that resulted in fatalities in Havtil's administrative area, hence no major accidents according to the definition of major accident used in this report. As in 2023, nor were there any exceptionally serious major-accident near-misses assessed as having the potential for a large number of fatalities.

The number of near-misses with major accident potential has remained at a stable level since 2013. The level in recent years is lower than in the period preceding 2013. In 2024, there were 32 such incidents (helicopters not included). This is at the same level as in recent years. When the number of incidents is normalised against working hours, the frequency in 2024 is within the expected range.

Five non-ignited hydrocarbon leaks at a rate in excess of 0.1 kg/s were recorded in 2024 (four in 2022). All the leaks were in the 0.1-1 kg/s category. In 2024, there were 14 well control incidents, all of them in the lowest risk category. In 2024, nine instances of damage to structures and maritime systems that meet the damage criteria used in RNNP were recorded. This is an increase from 2023 (three incidents).

If the near-misses with major accident potential are weighted by factors identifying their inherent potential for causing fatalities were they to develop into an accident, it can be seen that the indicator (the total indicator) is higher in 2024 than in 2023. The total indicator has long shown an underlying positive trend. Since particularly serious incidents are assigned a relatively high risk weighting, the annual variation in the total indicator is large, but the positive trend is nevertheless clear. As described in chapter 6.3, the total indicator is a composite indicator that reflects the industry's ability to influence and manage a variety of risk-related factors. The underlying positive trend in the indicator indicates that over time the industry has improved at managing factors that affect risk. The stable levels of recent years may indicate that achieving systematic improvements at the current level may be more challenging. Although an indicator based on historical figures provides relevant information on factors that affect future risk, it in no way provides sufficient information about future risk itself.

Helicopter risk constitutes a large share of the overall risk exposure to which employees on the NCS are subjected. The purpose of the risk indicators used in this work is to capture risks associated with incidents and to identify opportunities for improvement.

In the expert group's assessment of incidents for 2024, there were no incidents included in incident indicator 1. The helicopter accident off the coast of the island of Sotra in

February 2024, in which one person died, occurred during a training exercise and is not included in these statistics, as they are limited to ordinary transport by helicopter.

Barriers

Leading indicators are used to describe robustness in withstanding incidents. Barrier indicators are an example of these. Notably, this type of indicator describes the barriers' ability to function when called on. The barrier indicators continue to show that there are major differences in levels between the facilities. Over time, for many barriers, there is a positive trend that has been outside the industry's self-defined requirements. This may be because the participants have become more aware of the importance of the quality of the barriers, and thus also the associated testing.

The maintenance data for 2024 for the fixed facilities show that there are few hours of backlog in preventive maintenance, but a number of facilities have not performed the HSE-critical preventive maintenance in accordance with their own deadlines. The total backlog of preventive maintenance is at the same level as it was in 2023. The backlog of HSE-critical preventive maintenance is lower in 2024 than that reported in recent years. For some operators, there is an increase in the number of hours of corrective maintenance identified, but unperformed. Overall, a significant number of hours of corrective maintenance that have been identified remained unperformed as of 31.12.2024, and the scope in 2024 is approximately 8.5% more than in 2023. The trend over the past four years is negative. The number of hours of maintenance performed increased in 2024 compared to the last few years.

The data for mobile facilities show large variations in the backlog in preventive maintenance and in outstanding corrective maintenance. This corresponds to what we have seen in recent years. A number of facilities have not carried out HSE-critical preventive maintenance and corrective maintenance in accordance with their own deadlines.

Personal injuries and accidents

In 2024, 223 reportable personal injuries were recorded on the NCS. In 2023, 185 such injuries were reported, with 21 of the injuries being classified as serious in 2024 against 25 in 2023. The rate of serious personal injuries per million working hours fell to 0.52 in 2024. In 2024, the injury rate is within the expected level based on the ten preceding years.

The diving personnel questionnaire-based survey

In 2024, the diving personnel questionnaire-based survey was conducted for the fourth time among diving personnel working on the NCS and received 106 responses. The survey still bears the hallmarks of being under development, and it underwent a major revision ahead of its implementation in 2024. The aim of the revision was to increase the understanding and relevance for the target group, as well as the usefulness and quality of the results. However, the revision does limit the comparability of the survey with respect to previous surveys as regards the diver-specific questions.

In 2024, the diving personnel survey was also distributed to respondents working on the UK shelf for the first time. This provides a basis for comparison with the survey on the NCS, in addition to opportunities for further studies.

The results from 2024 show that divers (both saturation and surface-oriented) find they are not necessarily able to freely indicate that they need to take a break during a dive, if they want exemption from a diving period because they feel unwell, or if they believe they are in need of a medical assessment. In addition, 28.6% stated that they fully or partially

agree with the statement: "I find it uncomfortable to point out breaches of safety rules and procedures".

When asked about safety-related behaviour, one of the statements related to whether they had worked with any divers they would not trust in an emergency. This was one of the statements with the most negative results for both divers and dive leaders.

The results show that the HSE climate is moving in a positive direction, and the results for statements to the effect that both colleagues and leaders are concerned about HSE were more positive in 2024. However, working environment conditions remain relatively stable compared to previous measurements. Overall, the results are more positive than both the offshore results from 2023 and the results from the UK sector in 2024.

As regards health, the vast majority of respondents (regardless of job category) consider themselves to be in good or very good health. In addition, there is a slight decrease in the prevalence of health problems. However, there was an increase in sickness absence compared to 2022.

When the respondents were asked whether they had been involved in an accident involving personal injury, there was a significant increase in the proportion that responded that they had, from 2.2% in 2022 to 8.6% in 2024.

In-depth study - The scope of identified, but unperformed corrective maintenance

An in-depth study was conducted which looked at whether there is any correlation between the scope of the total corrective maintenance identified but unperformed and other RNNP indicators, such as reported incidents and results from the questionnaire survey on HSE climate and working environment. The study is limited to the RNNP data for permanently located offshore facilities and onshore facilities during the period 2015 to 2023.

The study indicates that there is a correlation between quantity and trend in total corrective maintenance and frequency of incidents, as well as the opinion among employees that poor maintenance compromises safety. The correlation for both areas suggests that more incidents occur on facilities with a lot of unperformed corrective maintenance, and that employees on facilities with more performed maintenance believe more strongly that poor maintenance adversely impacts on safety than employees on facilities with less performed maintenance.

3. Implementation

The results from RNNP are presented in annual reports. This report covers the year 2024. Work on the report was carried out mainly during the period December 2024 – March 2025.

The detailed objectives for 2025 were to:

- Continue the work carried out in previous years
- Maintain and develop the total indicator method
- Evaluate correlations in the datasets.

3.1 Performance of the work

The following participants contributed to the work on this year's report:

- The Norwegian Ocean Industry Authority (Havtil): Responsible for execution and further development of the work
- Operating companies and vessel owners: Contribute data and information about activities on the facilities
- The helicopter operators: Contribute data and information about helicopter transport activities
- HSE specialist group: (selected specialists) Evaluate the procedure, input data, viewpoints on developments, evaluate trends, propose conclusions
- Safety Forum: (multipartite) Comment on the procedure and results, and recommend further work
- Advisory group: (multipartite) Multipartite RNNP advisory group that advises Havtil regarding further development of the work

Havtil's working group consists of: Tor Inge Handeland, Vebjørn Nygaard, Tore Endresen, Marita Halsne, Morten Langøy, Trond Sundby, Roar Høydal, Astrid Schuchert, Jan Ketil Moberg, Semsudin Leto, Eivind Jåsund, Kenneth Skogen, Bente Hallan, Torbjørn Gjerde, Øyvind Loennechen, Ulrik Junge, Roar Sognnes and Torleif Husebø.

The following external parties have assisted Havtil with specific assignments:

- Irene Buan, Jorunn Seljelid, Torleif Veen, Marius Gårdsmann Fosse, Espen Stemland, Askild Underbakke, Martin Dugstad, Kaia Stødle, Ragnar Aarø, Torbjørn Mjåtveit, Inger Karin Dirdal, Lars Mogstad, Siri Mo, Benjamin Sigbjørnsen and Marita Pytte, all from Safetec
- The questionnaire-based survey: Leif Inge Sørskår, Marita Pytte, Malin Almedal, Jens Christen Rolfsen, Rolf Johan Bye and Trond Stillaug Johansen from Safetec

The following people have contributed to the work on indicators for helicopter risk:

- Øyvind Solberg, Maj Brit Fjermestad, Offshore Norge represented by LFE
- Nils-Rune Kolnes, Atle Brokjøb, CHC Helikopter Service
- Kristoffer Erga-Johansen, Simen Solvik, Sven A Sæbøe, Svein Fitjar, Bristow Norway AS
- Sverre Hanssen, Lufttransport AS

Numerous other people have also contributed to the work.

3.2 Use of risk indicators

Data have been collected for hazard and accident situations associated with major accidents, work accidents and working environment factors, specifically:

- Defined situations of hazard and accident, with the following main categories:
  - Uncontrolled discharges of hydrocarbons, fires (i.e. process leaks, well incidents/shallow gas, riser leaks and other fires)
  - Structure-related incidents (i.e. structural damage, collisions and risk of collision)
- Test data associated with the performance of barriers against major accidents on the facilities, including data concerning well status and maintenance management
- Accidents and incidents in helicopter transport
- Work accidents
- Other hazard and accident situations with consequences of a lesser extent or significance for emergency preparedness.

The term 'major accident' is used in many places in the reports. There are no unambiguous definitions of the term, but the following are often used, and coincide with the base definition employed in this report:

- A major accident is an accident (i.e. entails a loss) where at least three to five people may be exposed.
- A major accident is an accident caused by failure of one or more of the system's built-in safety and emergency preparedness barriers.

In light of the definition of major accident in the Seveso II Directive and in Havtil's regulations, the definition used here is closer to a 'large accident'.

Data collection for the DSHAs (Defined situations of hazard and accident) related to major accidents is founded in part on Havtil's existing databases (the Incident database (formerly CODAM), DDRS, etc.), but also to a significant degree on data collection carried out in cooperation with the operating companies and vessel owners. All incident data have been quality-assured by, for example, checking them against the incident register and other Havtil databases.

Table 3-1 lists the 21 DSHAs and the data sources used. The industry has used the same categories for registering data through databases such as Synergi.

Table 3-1 List showing the primary source of data for incidents

DSHA	*Description*	*Database*
1	Unignited hydrocarbon leak	Industry
2	Ignited hydrocarbon leak	Industry
3	Well incidents/loss of well control	Havtil
4	Fire/explosion in other areas, not hydrocarbon	Havtil/Industry
5	Ship on collision course	Industry
6	Drifting object	Industry
7	Collision with field-related vessel/facility/shuttle tanker	Havtil
8	Damage to a facility's structure, stability/anchoring/positioning failure	Havtil/Industry
9	Leak from riser, pipeline and subsea production facility*	Havtil
10	Damage to riser, pipeline and subsea production facility*	Havtil
11	Evacuation	Industry
12	Helicopter incidents	Industry
13	Man over board	Industry
14	Work accidents	Havtil
15	Work-related illness	Industry
16	Full loss of power	Industry
18	Diving accident	Havtil
19	H_2S emission	Industry
20	Crane and lifting operations	Havtil/Industry
21	Dropped objects	Havtil/Industry

* Also includes wellstream pipeline, loading buoy and loading hose where relevant.

3.3 Developments in the activity level

Figure 3-1 and Figure 3-2 show the trends over the period 2005-2024 for production and exploration activities of the parameters used for normalisation against the activity level (all figures are relative to the year 2005, which has been defined as 1.0). Appendix A to the main report (Havtil, 2025a) presents the underlying data in detail.

From 2023 to 2024, we see that the total number of working hours decreased by around 4%. The number of working hours for mobile facilities fell by around 0.4% and for production facilities by around 5%.

Production volume increased by 4% in 2024 compared to 2023.

A presentation of DSHAs or contributors to risk can sometimes vary according to whether absolute or normalised values are stated, depending on the normalisation parameter. In the main, normalised values are presented.

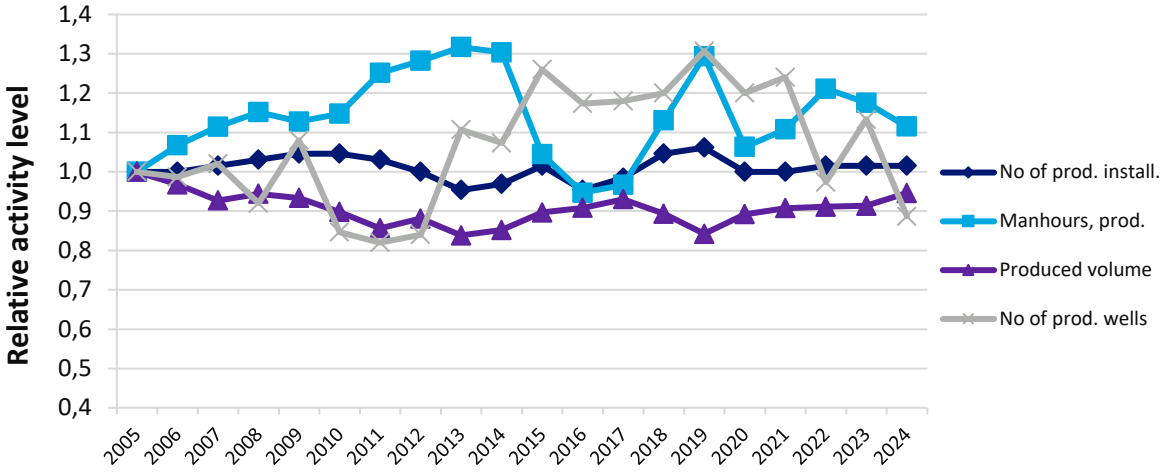

Figure 3-1 Relative trend in activity level for production facilities. Normalised against the year 2005.

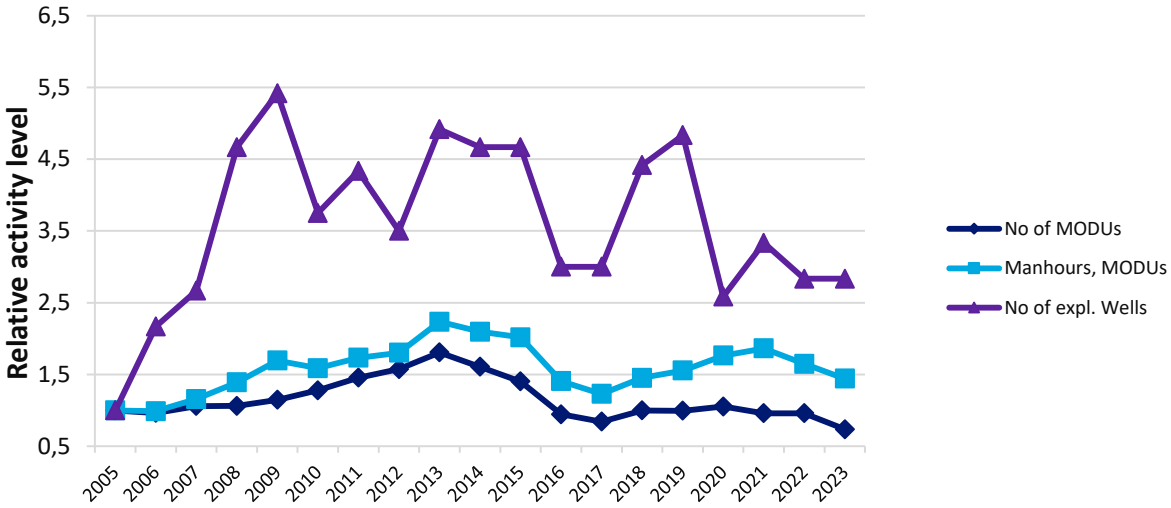

Figure 3-2 Relative trend in activity level for MODUs. Normalised against the year 2005

A corresponding activity overview for helicopter transport is shown in sub-chapter 5.1.

3.4 Documentation

Analyses, assessments and results are documented as follows:

- Summary report – the Norwegian Continental Shelf for the year 2024 (Norwegian and English versions)
- Main report – the Norwegian Continental Shelf for the year 2024
- Report for onshore facilities for the year 2024
- Report for acute spills to sea for the Norwegian Continental Shelf 2024, to be published in the autumn of 2025
- Methodological report, 2024

The reports can be downloaded from the Norwegian Ocean Industry Authority's website (www.havtil.no/rnnp).

4. The diving personnel questionnaire-based survey

In 2024, a questionnaire-based survey was conducted among diving personnel for the fourth time. Everyone who participated in diving operations on the NCS during 2024 calendar year was invited to participate. The questionnaire is essentially the same as the one used in the regular survey for employees on offshore and onshore facilities, but with some adaptations and additional questions specifically aimed at diving-related topics.

The questionnaire-based survey received 106 responses, fewer than in 2022. This may be due to somewhat lower activity and the fact that many of the employees on the UK shelf may have opted to respond to the UK survey instead of the Norwegian one. The sample consisted of 56.6% divers, of whom 66.7% were saturation divers and 33.3% surface-oriented divers. Collectively, dive leaders accounted for 13.1% of the total sample, while other diving personnel accounted for 30.1%. There was an increase in the proportion of respondents in the age categories 40 years and above, which accounted for 60% of participants. In addition, there was an increase in the proportion of Norwegian respondents and a reduction in British respondents. However, the proportion of British respondents accounted for the highest share, 56.9%. More than half of the sample worked on the same vessel in the last 12 months. There was also an increase in the proportion in permanent employment, with 26.6% stating that they had this type of contract, compared to 13% in 2022. Day rate is the most common form of employment. The most common working hours arrangement is both day and night shifts (52.3%). There was an increase in the proportion with fixed night shifts (from 7% in 2022 to 15.6% in 2024).

4.1 Diving-related topics

Divers and their dive leaders were asked to consider general working environment factors related to diving. The divers rated these more positively than the leaders, and there was a marked difference in the assessment of "Length of offshore diving period (saturation/surface)" and "Length of stay onboard", with the divers being more positive. The diver-specific hazard situations that divers were most concerned about were "Hazardous situations resulting from environmental factors (wave height, current conditions, visibility)", while dive leaders were most concerned about "Human error during diving operations".

When asked about safety-related behaviour during diving operations on the NCS, 15.4% of managers stated that the operational diving procedures were "very rarely or never" sufficient to do the job safely, while 15.4% stated that they quite often worked with divers they would not trust in an emergency.

Divers were also asked about safety-related behavior, but with different questions. A total of 47.4% of divers stated that they fully or partially agreed with the statement: "I am reluctant to request exemption from diving if I feel unwell". Regarding exposure at work, we found that the two questions with the most negative assessments were linked to whether adequate precautions were being taken to avoid harmful exposure to welding gases, as well as whether cleaning of the suit/umbilical cord/equipment was carried out as and when necessary.

4.2 Assessment of the HSE climate

Some results are measured using indices, which are a compilation of questions that naturally belong together. There are six indices for HSE climate (the management's commitment, colleagues' commitment, the organisation's commitment, conflicting objectives, freedom to speak up, and cooperation and communication), all of which are assessed more positively in 2024 than in 2022. Only the index *The management's commitment* has changed to a statistically significant extent, in the positive direction. If we compare the results with those of the ordinary offshore survey (RNNP 2023), the results among diving personnel are more positive. Compared to the UK sector, the results on the NCS are more positive, with the greatest difference relating to the results for the indices *Freedom to speak up* and *Conflicting objectives.*

If we look at individual statements, there are some "regulars" among those which are assessed most negatively in the RNNP forms. We also find challenging results for diving personnel as regards statements such as "I find it uncomfortable to point out breaches of safety rules and procedures" and "Reports on accidents are often 'sanitised'". There was an increase in the proportion of respondents who stated that they find it uncomfortable to point out breaches of safety rules and procedures, with 28.6% now claiming this. At the same time, there has also been an increase in the proportion stating that they do *not* find it uncomfortable, and an overall assessment of the distribution of responses generally indicates more positive results in 2024. There has been a statistically significant change in the positive direction as regards the statement concerning reports being 'sanitised'.

4.3 Working environment

In terms of physical, chemical and ergonomic working environment, there is a change as regards two of the statements compared to 2022. In 2024, a higher proportion stated that they perform heavy lifting relatively rarely, very rarely or never. However, a higher proportion stated that they quite often, very often/always perform sedentary work, with little scope for variation. With regard to the psychosocial and ergonomic working environment, the most negative answers concerned the ability to determine one's own work pace. This question also came out worst in 2020 and 2022, and shows a (statistically insignificant) negative development in 2024. The results for the statement "Do you get feedback on how you did the job from your immediate superior?" are statistically significantly more negative in 2024 than in 2022.

At index level, Job control is assessed most negatively and is the only working environment index with more negative results among diving personnel than among offshore personnel (RNNP 2023). Compared to results from the UK shelf, more positive assessments were found among respondents on the NCS for the indices *Job demands, Job control* and *Workload*.

4.4 Sleep quality

The sleep quality index contains questions about the respondent's sleep before, during and after an offshore trip. 29.2% rate the *Sleep quality* index negatively. This is relatively high. However, as regards the individual questions in the index, we see a positive development compared to 2022, for example concerning the individual questions "I sleep well on the first few nights after an offshore trip" and "Noise is a problem for me when I try to sleep offshore".

4.5 Health complaints and sickness absence

When asked about their own health, most respondents stated they considered it to be either good or very good. A higher proportion on the NCS also considered their own health to be good, compared to the British shelf. Sickness absence increased slightly compared to 2022, and is also slightly higher on the NCS than on the British shelf. However, a lower proportion on the NCS stated that sickness absence is work-related.

5. Status and trends – helicopter incidents

Cooperation with the Civil Aviation Authority Norway and the helicopter operators on the work on risk indicators was continued in 2024. Aviation data obtained from the helicopter operators involved includes incident type, risk class, severity, type of flight, phase, helicopter type and information about departure and arrival.

5.1 Activity indicators

Figure 5-1 shows activity indicator 1 which includes volumes in the number of flight hours and the number of passenger flight hours per year in the period 2005-2024. The sharp reduction in the number of flight hours and passenger flight hours from 2014-2016 is due to the reduction in the number of hours worked on the NCS.

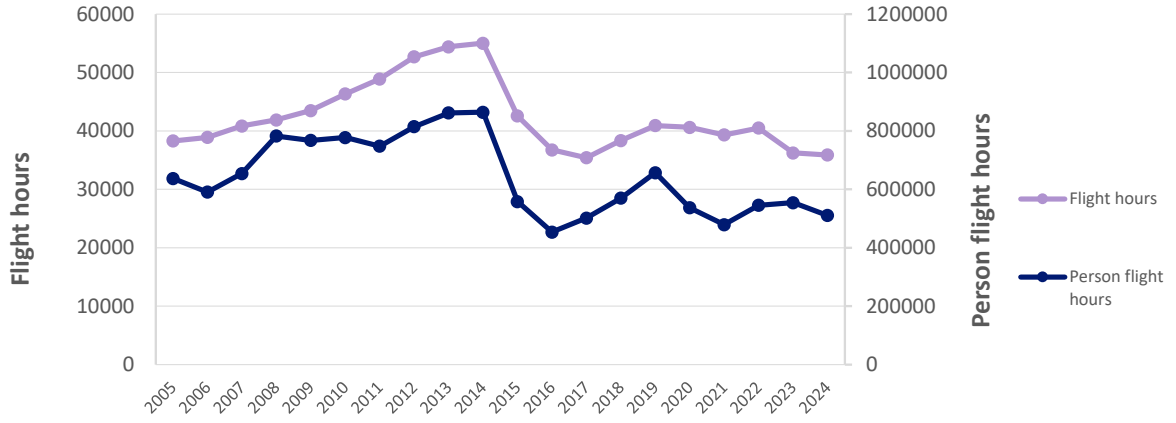

Figure 5-1 Flight hours and passenger flight hours per year, 2005-2024

5.2 Incident indicators

5.2.1 Incident indicator 1 – serious incidents and near-misses

Figure 5-2 shows the number of incidents included in incident indicator 1. From 2009 (and subsequently for 2006, 2007 and 2008), the most serious near-misses which the companies reported were reviewed by an expert group consisting of operational and technical personnel from the helicopter operators, from the oil companies and from Havtil's project group in order to classify the incidents based on the following categories:

Little remaining safety margin against fatal accident: *No remaining barriers*
Medium remaining safety margin against fatal accident: *One remaining barrier*
Large remaining safety margin against fatal accident: *Two (or more) remaining barriers.*

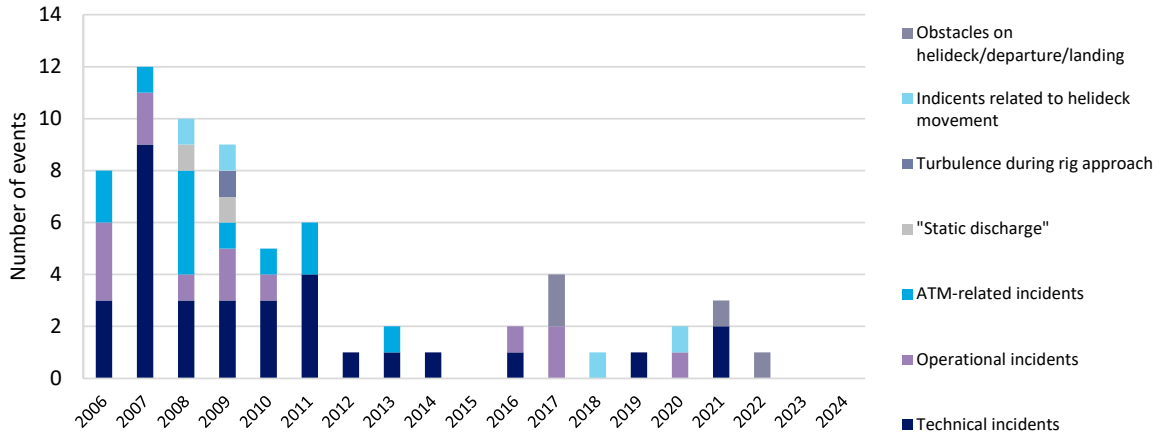

Figure 5-2 Incident indicator 1 per year by causal categories, not normalised, 2006–2024

In the expert group's assessment of incidents for 2024, there were no incidents included in incident indicator 1.

A helicopter accident occurred off the coast of the island of Sotra on 28 February 2024, in which one person died. The incident took place during a training exercise involving the rescue helicopter. Practice flying is not one of the indicators used in RNNP, as the risk profile for such activities is different than for ordinary flying, including SAR.

6. Status and trends – indicators for major accidents on facilities

The indicators for major accident risk from previous years have been continued, with a primary emphasis on indicators for incidents and near-misses with the potential for causing a major accident (DSHA 1-10). The indicators for DSHA 12, helicopter incidents, are presented separately in chapter 5. Barriers against major accidents are presented in chapter 7.

There have been no major accidents, per the definition used in the report, on facilities on the NCS since 1990. The serious incident on COSL Innovator in 2015 where a wave stove in windows in an accommodation section, injuring four and killing one person, is categorised as a structural incident and is the first major accident DSHA to have caused a fatality in the period 2005-2024. The last time there were any fatalities in connection with one of these major accident DSHAs was in 1985, with a shallow gas blowout on the "West Vanguard" mobile facility. Added to this are the helicopter accidents which occurred at Norne and Turøy in 1997 and 2016.

6.1 DSHAs associated with major accident risk

Figure 6-1 shows the trend in the number of reported DSHAs during the period 2005-2024. It is important to emphasise that this figure does not take account of the potential of near-misses in respect of loss of life. There was a rising trend in the number of incidents during the period 1996-2000, which has been discussed in previous years' reports. From the level in 2005, there has been a gradual reduction in the number of incidents with major accident potential. The level has been stable since 2013. In 2024, there are more incidents than during the previous year, primarily due to an increase in well control incidents and structural damage.

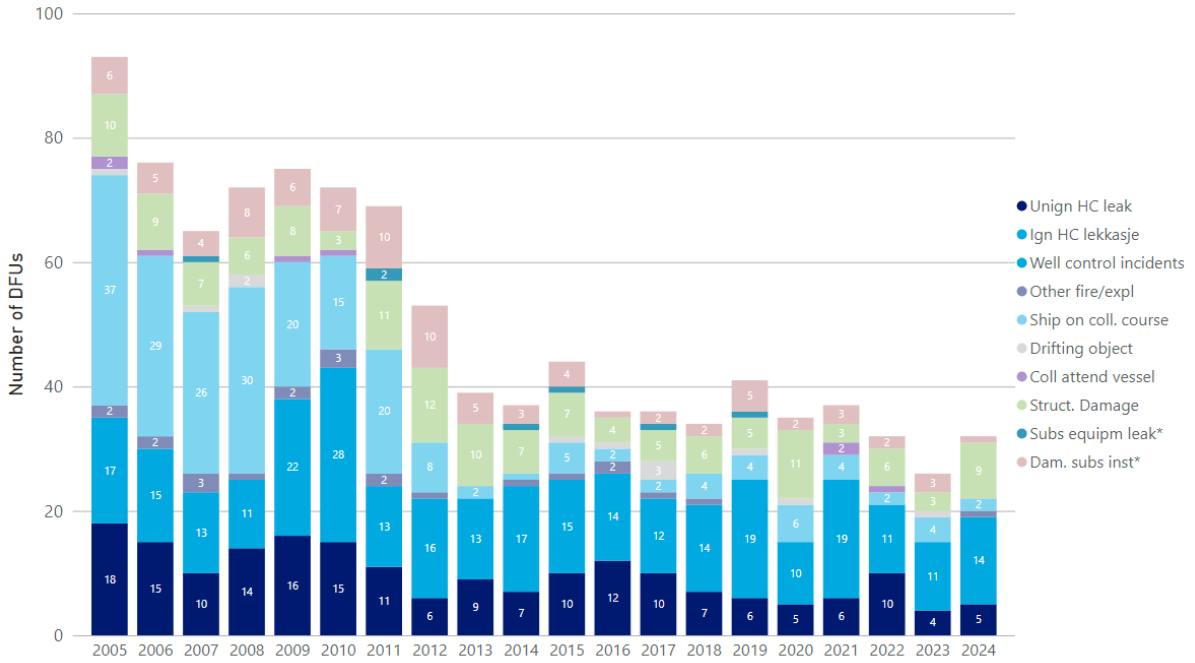

Figure 6-1 Reported DSHAs (1-10) by categories. (*Within the safety zone)

Figure 6-1 shows the numbers, while Figure 6-2 is same overview normalised against the number of working hours. The level for 2024 is in the hatched area, indicating a stable level compared to the average in the previous ten-year period.

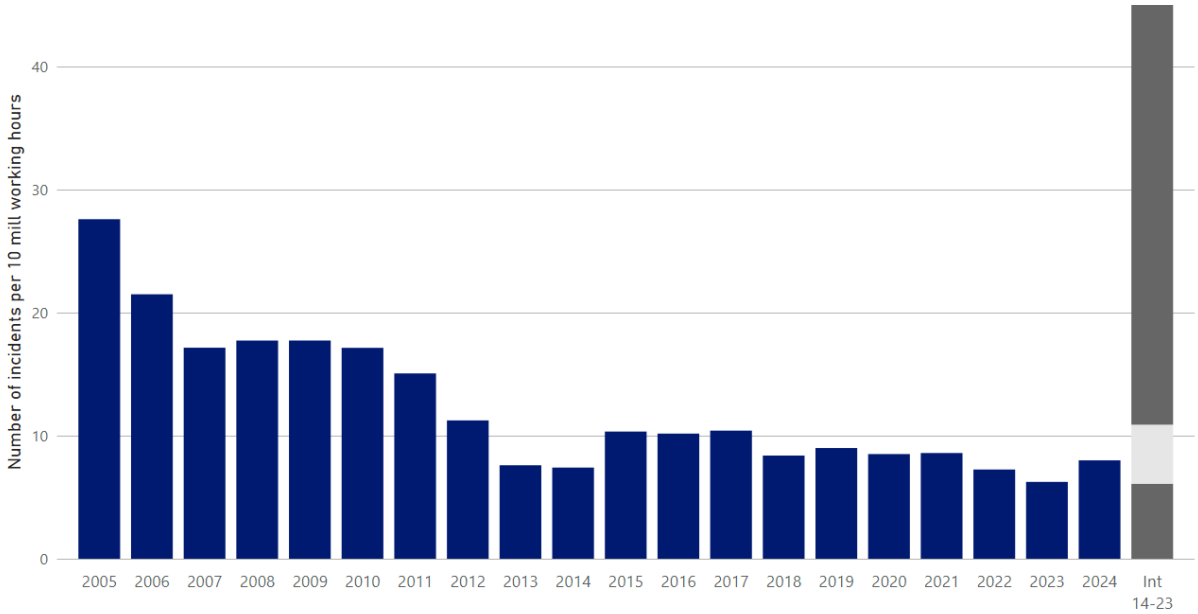

Figure 6-2 Total number of DSHA 1-10 incidents normalised against working hours.

6.2 Risk indicators for major accidents

6.2.1 DSHA 1 - Hydrocarbon leaks in the process area

Figure 6-3 shows an overview of hydrocarbon leaks above 0.1 kg/s for the period 2005-2024, broken down by category of leak rate. Five hydrocarbon leaks with a rate above 0.1 kg/s were recorded in 2024, all of which were in the 0.1-1 kg/s category.

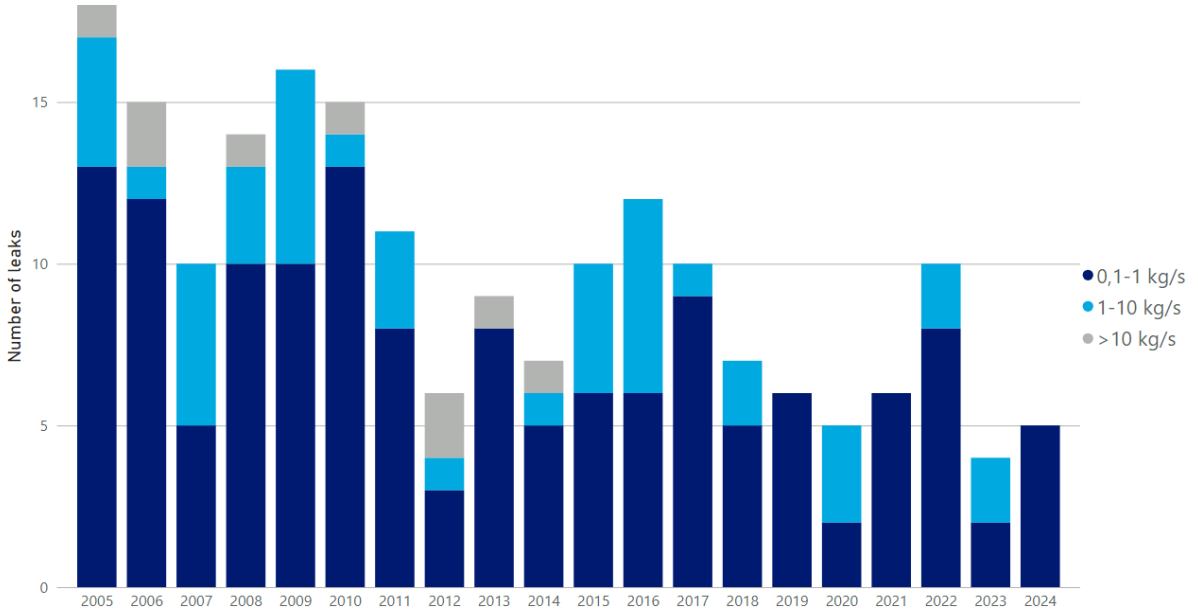

Figure 6-3 Number of hydrocarbon leaks exceeding 0.1 kg/s, 2005-2024.

Figure 6-4 shows the number of leaks when these are weighted according to the risk potential they are considered to have. In simple terms, one can say that the risk contribution of each leak is roughly proportional to the leak rate expressed in kg/s. The risk contribution in 2024 is somewhat lower than in 2023, when all events in 2024 were in the lowest category.

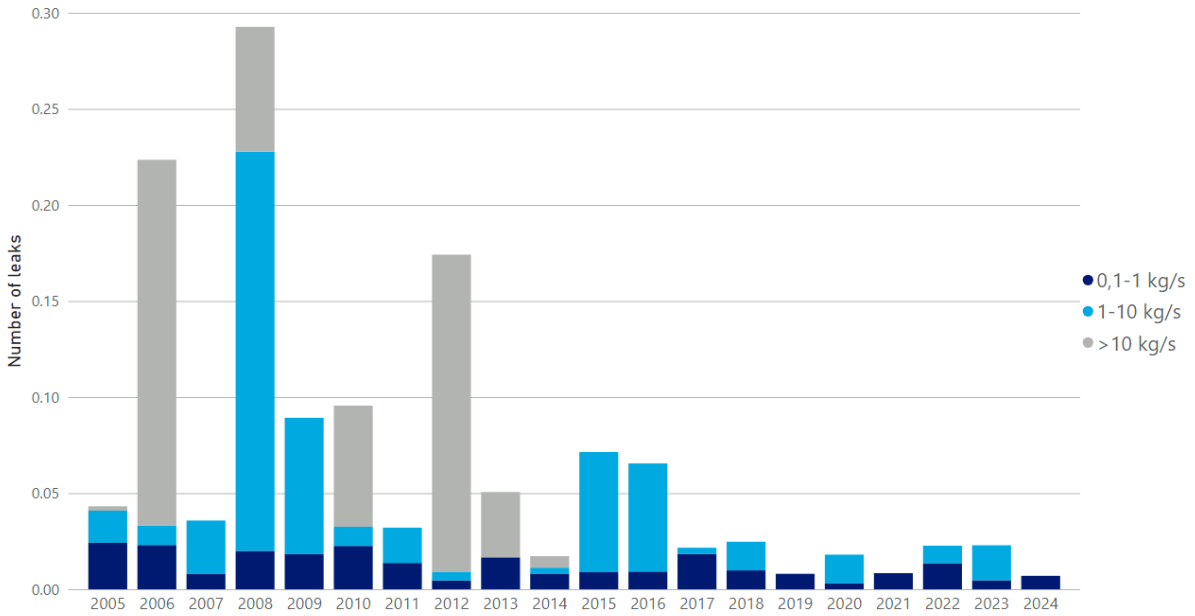

Figure 6-4 Number of hydrocarbon leaks exceeding 0.1 kg/s, 2005-2023, weighted according to risk potential

Figure 6-5 shows the trend in leaks exceeding 0.1 kg/s, normalised against working hours for production facilities. The figure shows that the number of leaks per million working hours in 2024 lies within the prediction range. The change is therefore not statistically significant relative to the mean for the period 2014-2023. The number of leaks has been normalised both against working hours and the number of facility years in the main report.

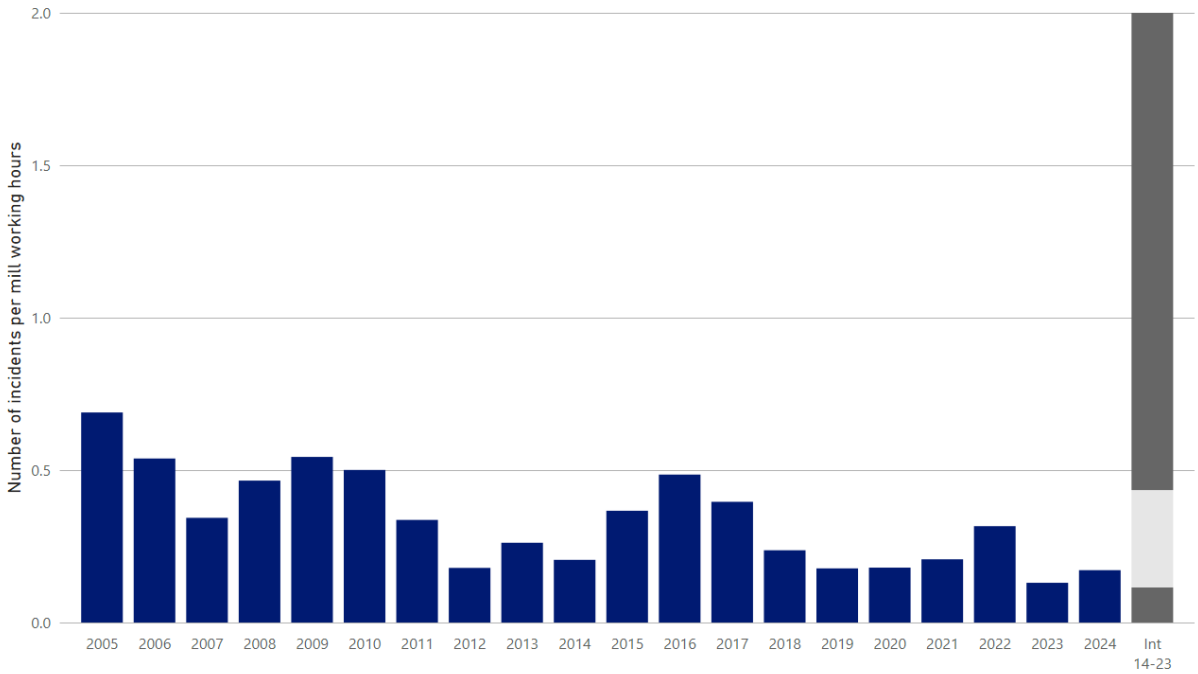

Figure 6-5 Trend, leaks, normalised against working hours

6.2.2 DSHA 3 - Loss of well control, blowout potential, well integrity

Figure 6-6 shows well control incidents broken down by exploration drilling and production drilling, normalised per 100 drilled wells.

There were 14 well control incidents in 2024, nine in production drilling and five in exploration drilling. They were all in the lowest risk category. Figure 6-6 shows the proportion of well control incidents per 100 wells drilled. In general, the number of well

control incidents per drilled well has been higher for exploration drilling, and with greater annual variation, than for production drilling. This is also the case in 2024. As regards production drilling, it is apparent that the incident frequency in 2024 is higher than it has been during the past two years.

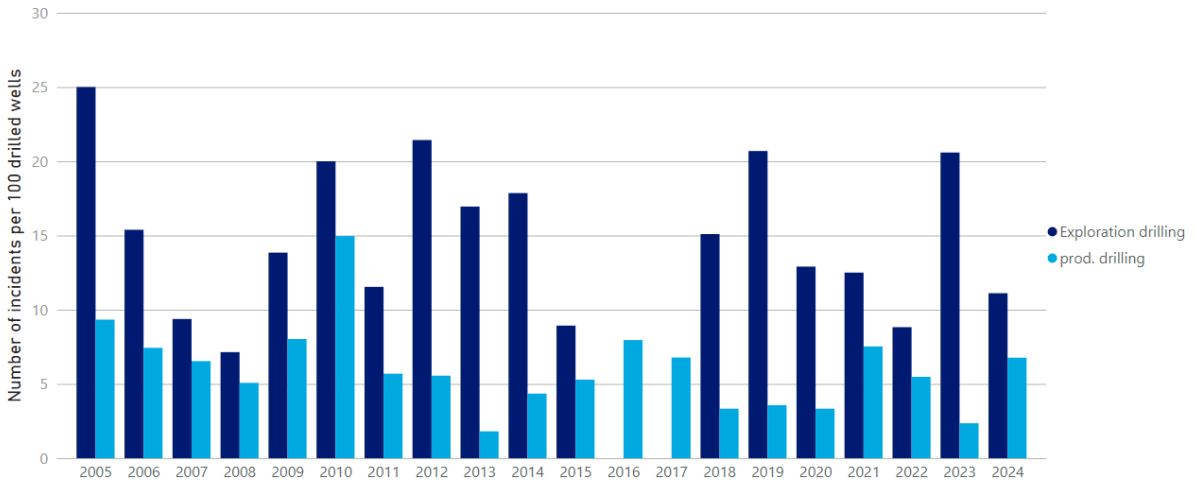

Figure 6-6 Well incidents per 100 wells drilled, for exploration and production drilling

Figure 7-3 shows the total number of hours for *performed maintenance, modifications and planned shutdowns* for the fixed facilities in the period 2013 to 2024. The figure shows that in 2017-2024 there was a relatively low risk associated with well control incidents on the NCS. The peaks we see in the figure are often associated with serious individual incidents that are weighted very highly compared to other incidents.

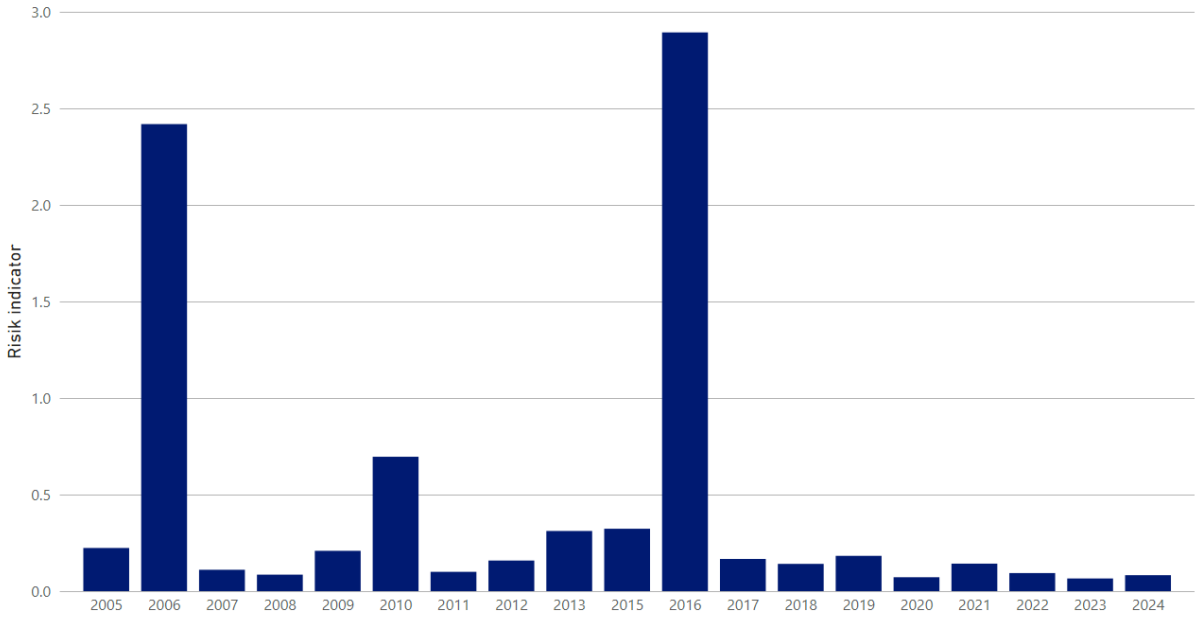

Figure 6-7 Risk indicators for well-control incidents in exploration and production drilling, 2005-2024

6.2.3 DSHA 9 and DSHA 10 - Leak/damage to risers, pipelines and subsea facilities

In 2024, no serious leaks from risers were reported. Nor were any serious leaks from pipelines within the safety zones in 2024. Two incidents of hydrocarbon leaks from pipelines and subsea facilities outside the safety zones of manned facilities were reported.

As in previous years, there are still some leaks of chemicals such as hydraulic/barrier/control fluid and the like. Nine such leaks have been reported.

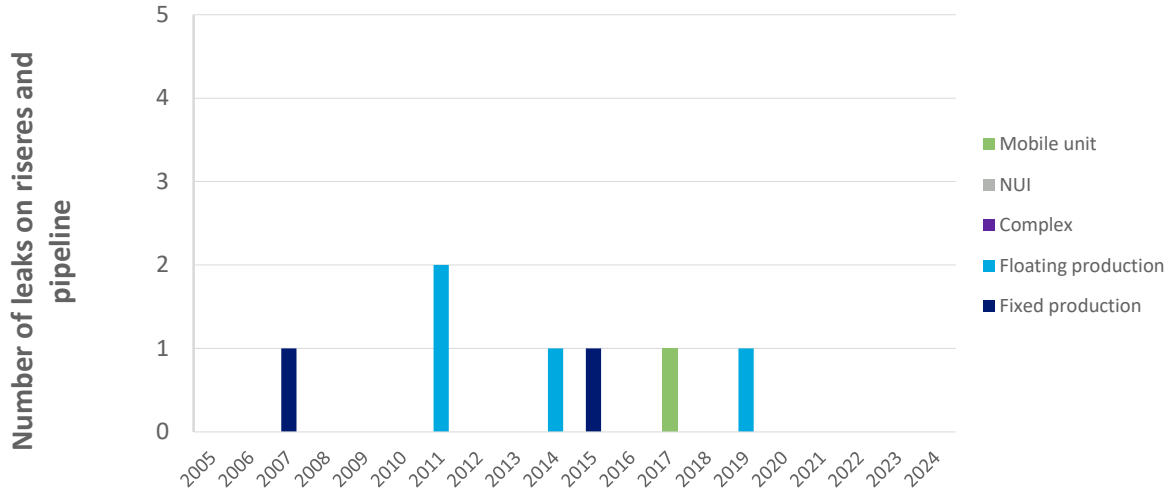

Figure 6-8 Number of leaks from risers & pipelines within the safety zone, 2005-2024

In 2024, one serious incident involving a flexible riser was reported. Flexible risers have been and remain an important contributor to risk. We have followed up on this topic for several years, and in 2024 continued our previous work on auditing and general monitoring of flexible risers. Figure 6-9 shows the number of incidents of major damage to risers and pipelines during the period 2005-2024. Updated information has emerged from a number of previous years, which means that the figure is not comparable with figures in previous reports.

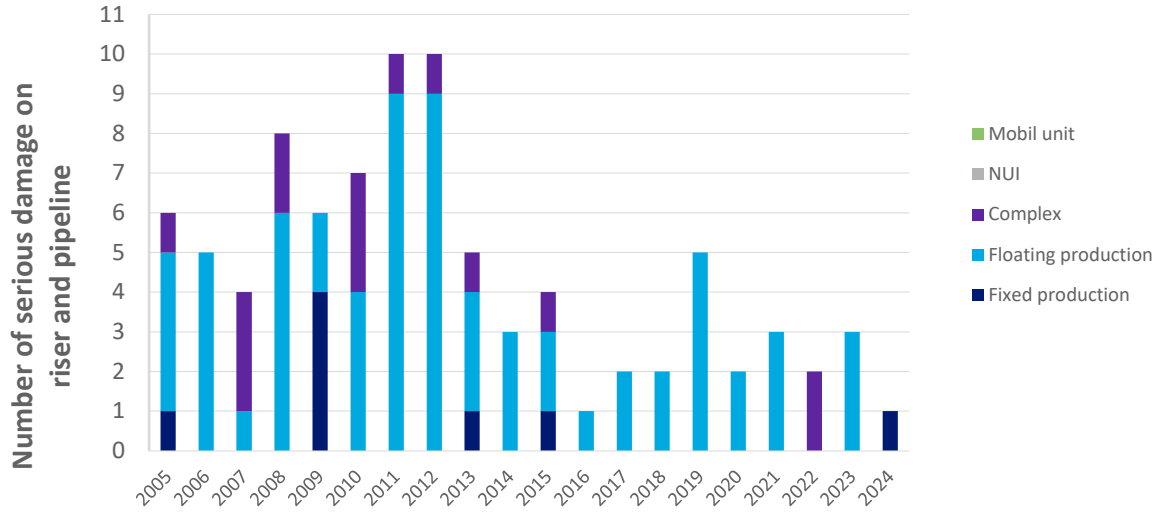

Figure 6-9 Number of major damage incidents to risers & pipelines within the safety zone, 2005-2024

6.2.4 DSHA 5, 6, 7 and 8 - Ship on collision course, structural damage

The number of instances of ships on collision courses has declined substantially in recent years. The number of incidents in 2024 shows no statistically significant change against the average in the period 2014 – 2023.

Major accidents associated with structures and maritime systems are rare. Even though there have been several very serious incidents in Norway, there are too few to gauge trends. Accordingly, incidents and damage of lesser severity have been selected as measures of changes in risk. It is assumed that there is a connection between the number of minor incidents and the most serious; see the methodology report.

The current regulations set requirements for flotels and production facilities in terms of withstanding the loss of two anchor lines without serious consequences. Loss of more than one anchor line happens from time to time. Mobile drilling facilities are required to withstand the loss of one anchor line without undesirable consequences.

Structural damage and incidents that have been included in RNNP are primarily classified as fatigue damage, while some are storm damage. As regards cracks, only continuous structural cracks are included. No clear connection has been demonstrated between the age of the facility and the number of cracks. Figure 6-10 shows the number of reported incidents and damage events to structures and maritime systems which conform to the criteria for DSHA 8 in the period 2005-2024. In total, nine incidents are included for 2024. This is six more than in 2023.

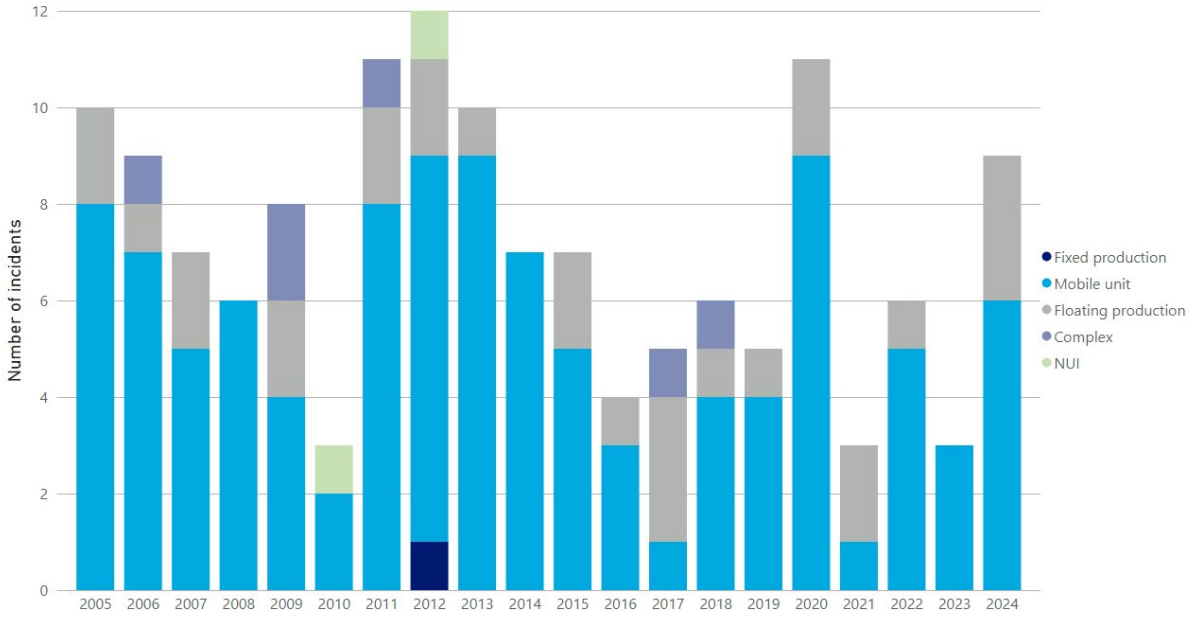

Figure 6-10 Number of reported incidents and damage events to structures and maritime systems which conform to the criteria for DSHA 8

6.3 Total indicator for major accidents

The total indicator is a calculated indicator based on incident frequency and the potential of the incidents/near-misses to cause loss of life if they develop into an actual accident. It is emphasised that this indicator is only a supplement to the individual indicators, and expresses the development in risk factors related to major accidents. In other words, the indicator expresses the effects of risk management.

The total indicator weights the contributions from the observations of the individual near-misses according to the potential for loss of life, and will therefore vary considerably, based on the potential of the individual incidents. The weightings were last amended in 2020 to better reflect current knowledge. More details about these can be found in the methodology report (Havtil, 2025c). The weightings are still fixed for different types of incidents and facility types. Especially serious incidents are assessed individually, in order to determine a realistic weighting based on the relevant conditions at the facility and the incident. In 2024, there were no especially serious incidents.

There are large annual variations in this indicator, mainly caused by especially serious incidents. The large variations are reduced when viewing the three-year rolling average. This clarifies the underlying trend. Normalisation is performed against working hours. The level of the normalised value is set at 100 for the year 2005, which also applies to the value for the three-year rolling average.

Over time, the number of near-misses has been reduced from a peak of 120 incidents in 2002, to between 30 and 40 incidents in recent years. Such a positive development in itself means that an overall, and weighted, indicator such as the total indicator will become more sensitive to annual fluctuations in the number of incidents. Thus, one should now focus less on annual values and switch to a greater emphasis on trends over time instead.

Figure 6-11 shows the total indicator for production and mobile facilities. Although there is an increase in 2024, the underlying trend, illustrated using a three-year rolling average, shows a positive trend over time, with a levelling off in recent years.

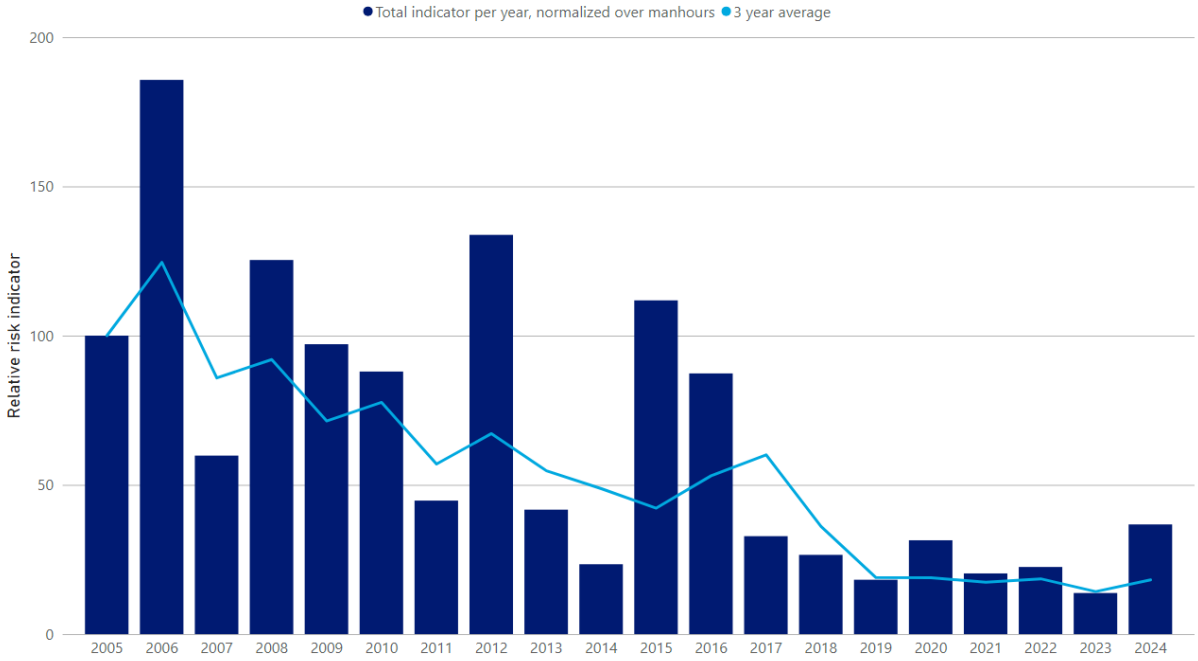

Figure 6-11 Total indicator for major accidents per year, normalised against working hours (Reference value is 100 in the year 2005, both for total indicator and three-year rolling)

The trend can be interpreted to mean that, in the period, the participants have achieved better management of factors that affect major accident risk. This can also be taken as an indication that factors that affect future risk must be kept in sharp focus and under active and continuous management.

Figure 6-12 and Figure 6-13 show the total indicator for production facilities and mobile facilities respectively.

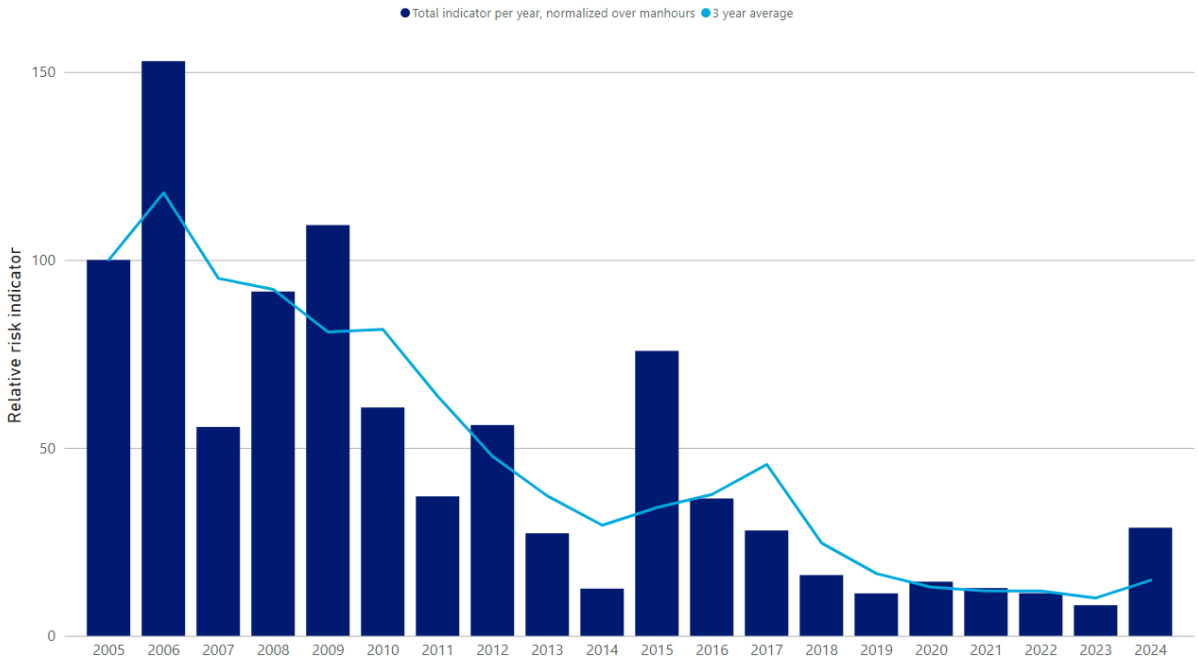

Figure 6-12 Total indicator, major accidents, production facilities, normalised against working hours, compared to three-year rolling average (Reference value is 100 in the year 2005, both for total indicator and three-year rolling)

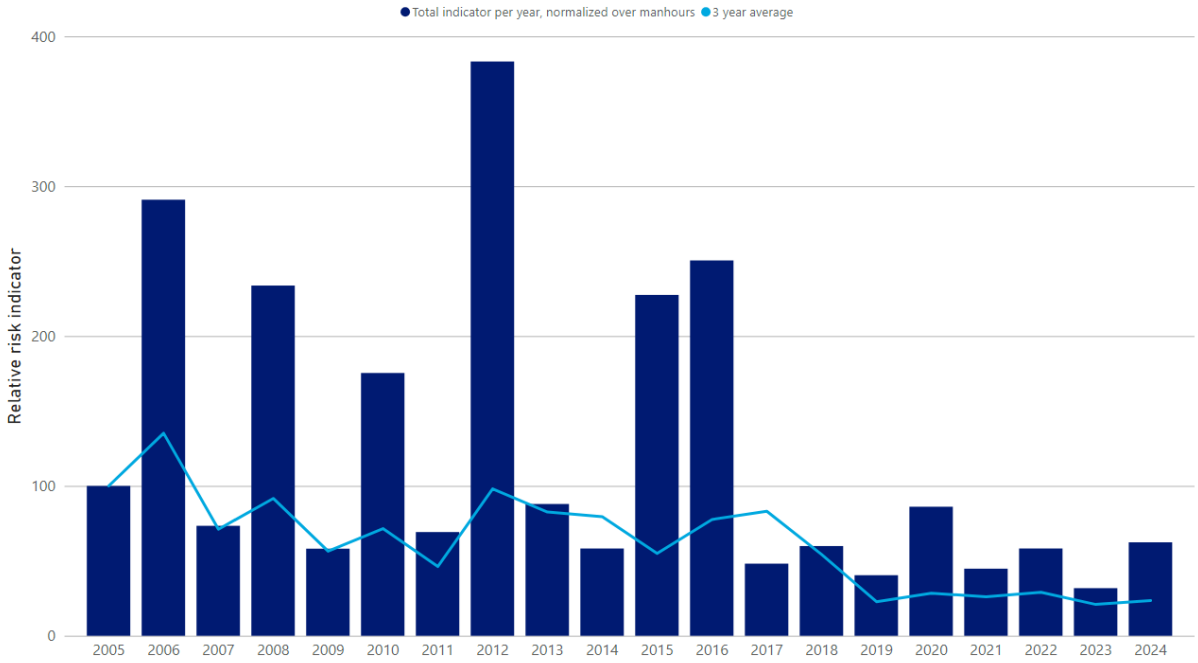

Figure 6-13 Total indicator, major accidents, mobile facilities, normalised against working hours, compared to three-year rolling average (Reference value is 100 in the year 2005, both for total indicator and three-year rolling)

7. Status and trends – barriers against major accidents

Reporting and analysis of data concerning barriers has been continued from preceding years without significant adjustments. As previously, the companies report test data from routine periodic testing of selected barrier elements.

7.1 Barriers in the production and process facilities

Primary emphasis is placed on barriers relating to leaks from the production and process facilities, including the following barrier functions:

- Integrity of hydrocarbon production and process facilities (covered to a considerable degree by the DSHAs)
- Prevent ignition
- Reduce clouds/emissions
- Prevent escalation
- Prevent any fatalities

The different barriers consist of several interacting barrier elements. For example, a leak must be detected before isolation of ignition sources and emergency shutdown (ESD) is implemented.

Figure 7-1 shows the proportions of failures for selected barrier elements associated with production and processing. The test data are based on reports from all production operators on the NCS. In addition, the associated industry norm for each barrier element is shown. The mean proportion of failures for 2024 lies outside the industry norm for DHSV, blowdown valves (BDV) and deluge valves.

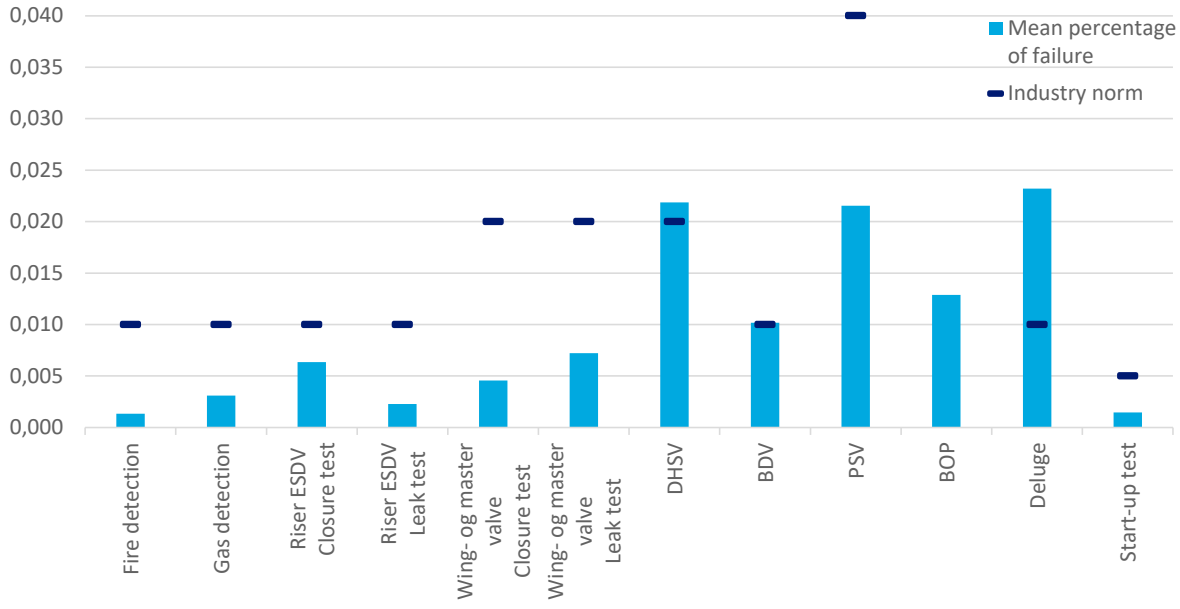

Figure 7-1 Mean percentage of failure for selected barrier elements in 2024

The main report shows both the "mean proportion of failures", i.e. the proportion of failures for each facility individually, averaged for all facilities, and the "overall proportion of failures", i.e. the sum of all failures on all reporting facilities, divided by the sum of all tests for all reporting facilities. All facilities make the same contribution to the mean proportion of failures, regardless of how many tests they have.

The data show considerable variations in average levels for each of the operating companies, and for several of the barrier elements. The variations are even greater when one looks at each individual facility, as has been done for all barrier elements in the main report. Figure 7-2 shows an example of such a comparison for gas detection (all types of

gas detectors). Each individual facility is assigned a letter code, and the figure shows the proportion of failures in 2024, the mean proportion of failures during the period 2005-2024, as well as the total number of tests carried out in 2024 (as text on the X axis, along with the facility code).

The industry norm for gas detection is 0.01. Figure 7-2 shows that six facilities lay outside the norm for the proportion of failures in 2024, while eight lay outside the norm when considering the mean over the period 2005-2024.

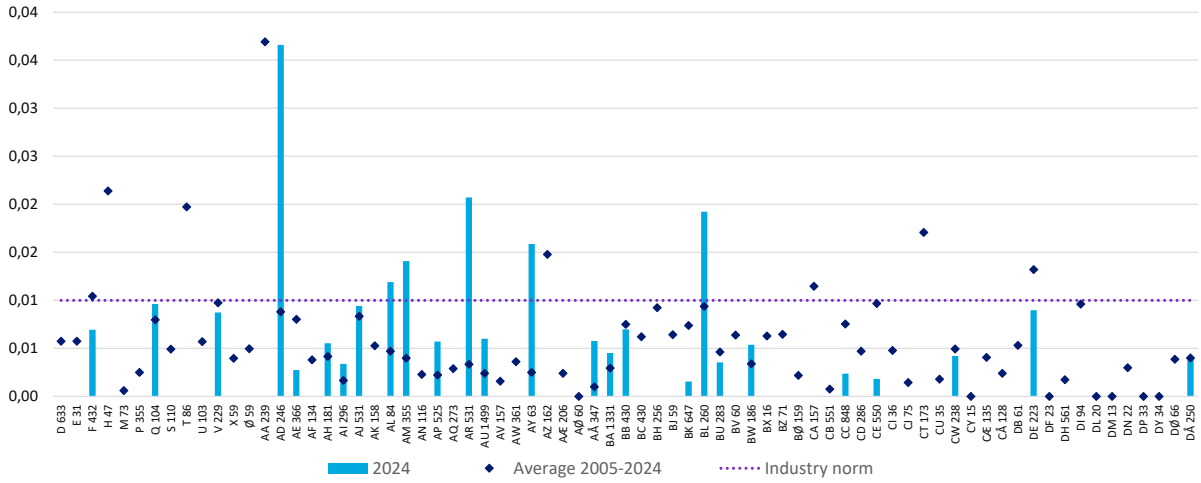

Figure 7-2 Percentage of gas detection failures

For production facilities, barrier data have now been collected for 20 years for most of the barriers, and the results show that there are large differences in level between the facilities. In Figure 7-3 and Figure 7-4 the mean proportion of failures as three-year rolling averages are compared from 2011 to 2024.

Figure 7-3 shows that fire detection, gas detection and start tests of fire pumps are consistently low and within the respective industry norms for mean proportions of failures expressed as three-year rolling averages. Riser ESDV closure tests show a fall from the start of the period up to 2015, but a rising trend from 2015-2021. Since 2021, closure tests have shown a declining trend, with the value for 2024 being the lowest during the period. All years lie well outside the industry norm of 0.01 for both riser ESDV closure tests. Riser ESDV leak tests show the same trend, with a decline up until 2018, followed by a sharp increase each year until 2021, before declining again during the period 2022-2023, along with a sharp decline in 2024 which caused riser ESDV leak tests to end up within the industry worm, after being outside the industry norm since 2020. BDV shows a downward trend from 2012 to 2015, with a subsequent slight upward trend in the period 2015-2022. In 2023-2024, we see a decline, with the mean proportion of failures in 2024 being the lowest measured during the period 2011-2024. For the past ten years, BDV has been between 0.015 and 0.025, which is well outside the industry norm of 0.01. Deluge valve fluctuates around the industry norm at 0.01, with some years above and other years within the industry norm. In 2024, deluge valves saw an increase and now fall outside the industry norm.

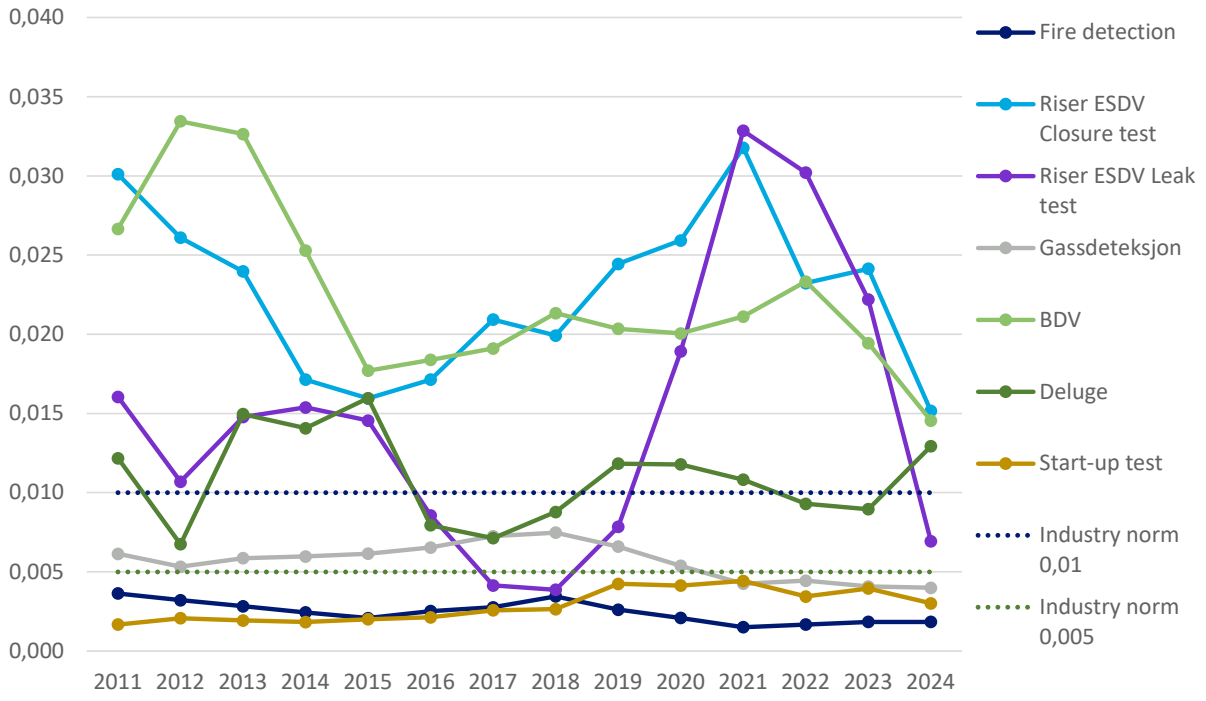

Figure 7-3 Mean percentage of failures as a three-year rolling average (part 1 of 2)

Figure 7-4 shows that, for DHSV, the mean proportion of failures expressed as a three-year rolling average has a rising trend from 2012 to 2017, before flattening out and showing a steady slight decline during the period 2021-2024. DHSV has been outside the industry norm of 0.02 since 2013. Other barriers in Figure 7-4 remain within the applicable industry norm. The wing and master valve closure and leakage tests have shown a weak downward trend in recent years. In 2024, they are both at approximately the same level as in 2023. PSV is relatively stable in the period 2011-2019, with a rising trend in subsequent years. PSV is still well within the industry norm of 0.04 throughout the period 2011-2024.

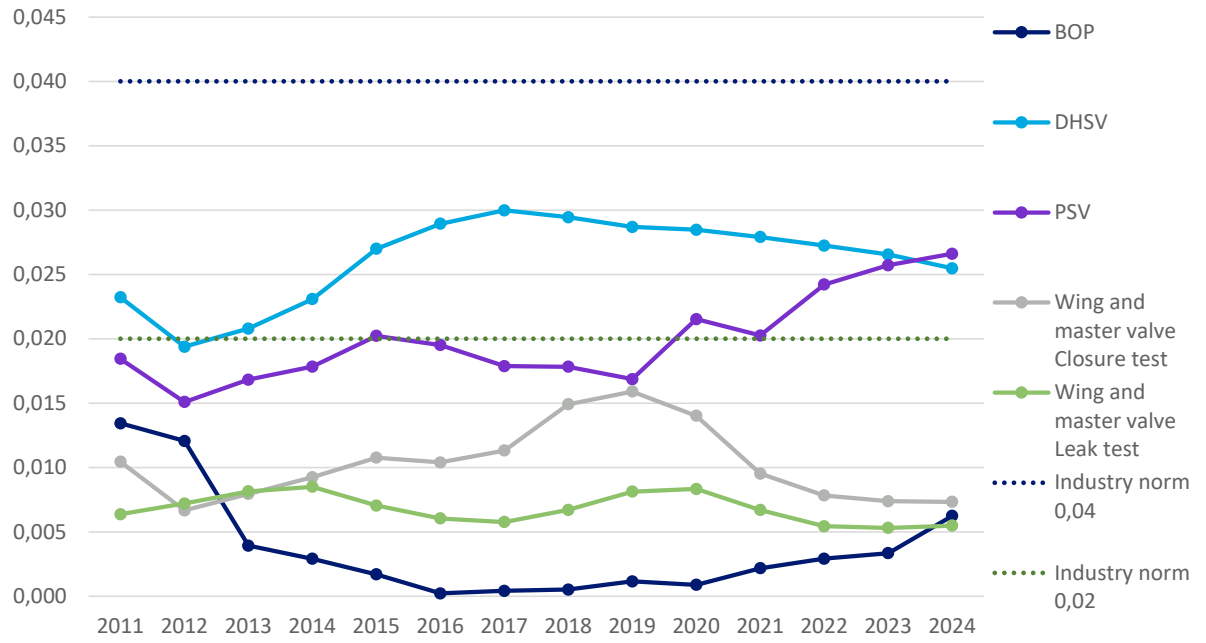

Figure 7-4 Mean percentage failures as a three-year rolling average (part 2 of 2)

Table 7-1 shows the number of facilities that have carried out tests for each barrier element, the average number of tests for those facilities that have carried out tests, the number of facilities with a proportion of failures above the industry norm in 2024, and the average for the period 2005-2024 outside the industry norm. The mean proportion of failures for 2024 and for the period 2005-2024 have also been included. These can then be compared with the industry's availability requirements for safety-critical systems. Figures in bold indicate that the proportion of failures lies outside the industry norm.

Table 7-1 General calculations and comparison with the industry norms for barrier elements

Barrier elements	*Facilities conducting tests in 2024*	*Average no of tests for facilities testing in 2024*	*Facilities with failures above industry norm in 2024 (average 2005-2024 in brackets)*[1,2]	*Mean percentage failures in 2024*	*Mean percentage failures 2005-2024*	*Industry norm for availability*
Fire detection	73	417	2 (5)	0.001	0.003	0.010
Gas detection	73	247	6 (12)	0.003	0.006	0.010
Shut down:						
· Riser-ESDV	66	22	9 (11)	0.005	**0.019**	0.010
Closure test	66	14	7 (9)	0.006	**0.021**	0.010
Leak test	66	8	2 (5)	0.002	**0.015**	0.010
· Wing and master valve	82	222	4 (7)	0.006	0.010	0.020
Closure test	80	105	4 (6)	0.005	0.007	0.020
Leak test	82	120	7 (10)	0.007	0.010	0.020
· DHSV	82	90	28 (26)	**0.022**	**0.026**	0.020
BDV	64	51	17 (20)	**0.010**	**0.020**	0.010
PSV	70	82	12 (14)	0.022	0.023	0.040
Isolation with BOP	22	174	3 (6)	0.013	0.010	-
Active fire protection:						
· Deluge valve	73	26	13 (10)	0.023	**0.011**	0.010
· Start up test	60	84	9 (9)	0.001	0.003	0.005

7.2 Barriers associated with maritime systems

In 2024, data were collected for the following maritime barriers on mobile facilities:

- Watertight doors
- Valves in the ballast system

For 2024, no failures were recorded for the closure of watertight doors. The proportion of failures for valves in the ballast system is similar to that for 2023, and thus falls directly outside the availability requirement of 0.02 used in the industry.

[1] For *closure tests* and *leak tests* for riser ESDVs and wing and master valves, the average is from 2007, for PSVs and BDVs, the average is from 2005.
[2] For BOP, which does not have a defined industry norm, the table shows the number of facilities with number of failures above 0.

7.3 Maintenance management

Defective or deficient maintenance has often proved to be a contributory cause of major accidents. The major accident potential means that safety work in general and the maintenance of safety-critical equipment in particular have been given a strong emphasis in the petroleum industry.

One aim of such maintenance management is to identify critical functions, and ensure that safety-critical barriers work when required.

The individual participant is responsible for regulatory compliance and ensuring systematic HSE efforts, so as to reduce the risk of unwanted incidents and major accidents.

7.3.1 The management of maintenance of fixed facilities

The main report shows more figures for maintenance management by participants than are reproduced here.

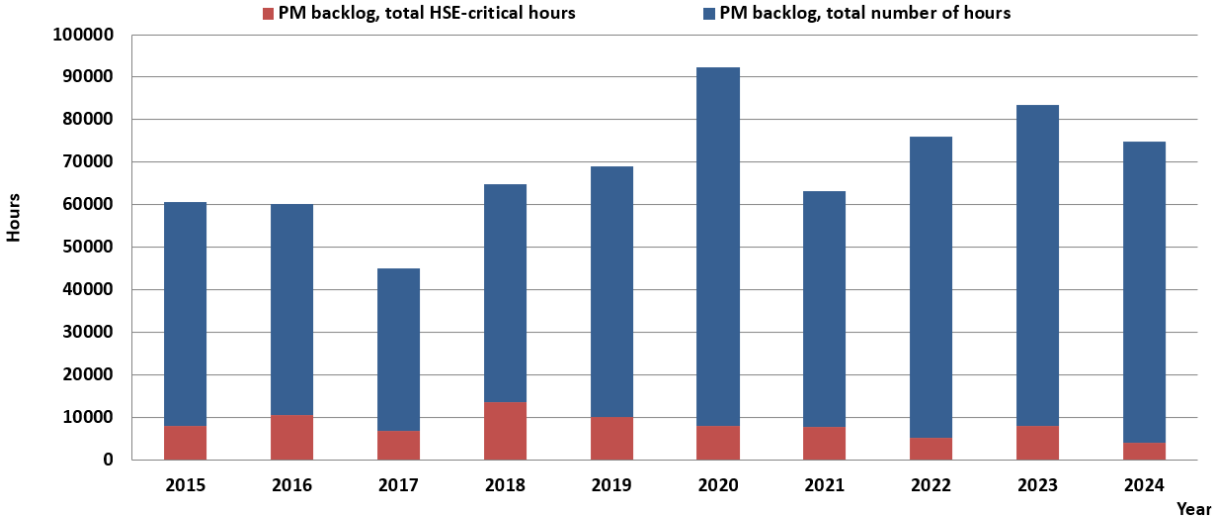

Figure 7-1 The total backlog of the PM per year in the period 2013-2023 for the fixed facilities on the NCS

Figure 7-1 shows the *total backlog in preventive maintenance* in the period 2013 to 2024 (sum of monthly averages). In 2024, the backlog of preventive maintenance was at the same level as in 2022 and 2023. The backlog of HSE-critical preventive maintenance is somewhat lower in 2024 than has been reported in recent years.

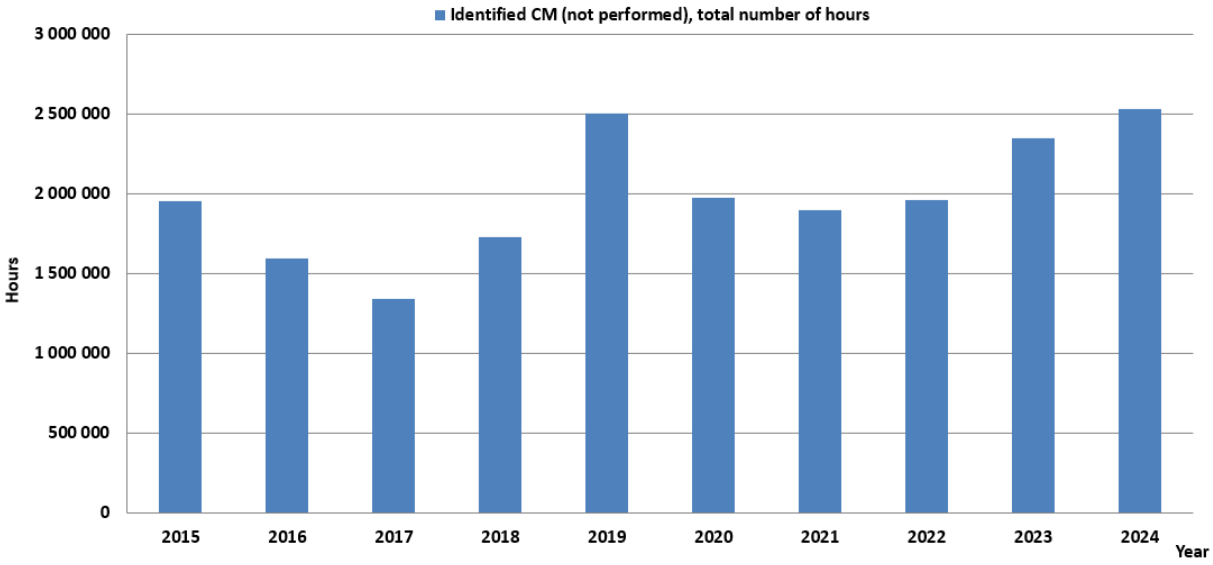

Figure 7-2 The total CM as of 31.12 for the fixed facilities on the NCS in the years 2015 to 2024

Figure 7-2 shows that the overall number of hours of corrective maintenance unperformed was significant as of 31.12.2024, being the highest reported figure during the period 2015 to 2024. At facility level, we see that many facilities have a high total number of hours of corrective maintenance not performed as of 31.12.2024.

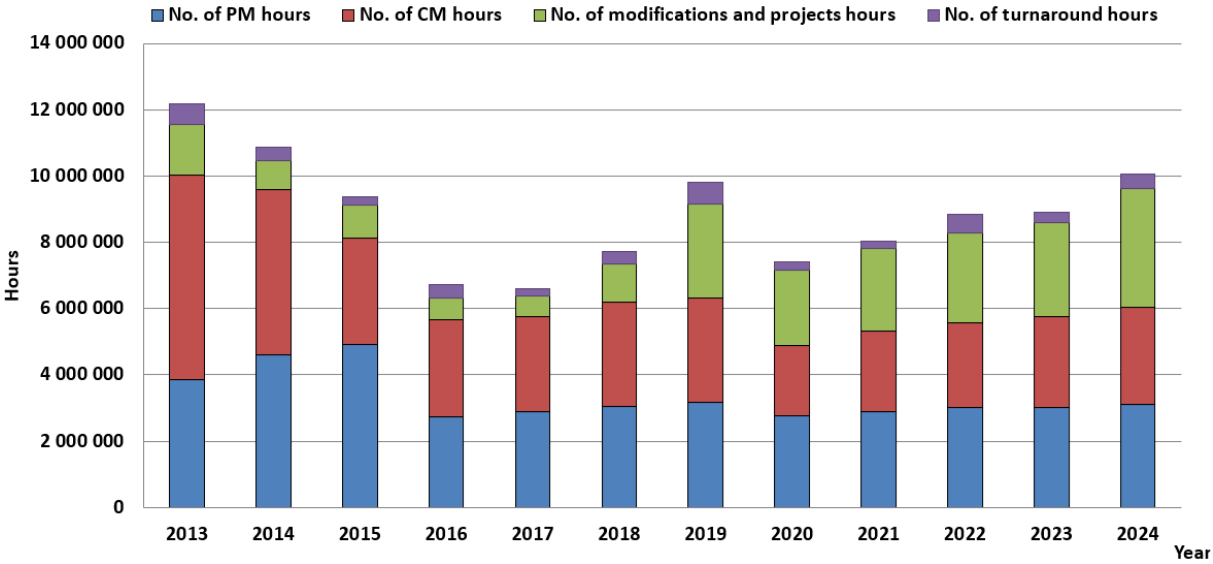

Figure 7-3 Total number of hours for the performed maintenance, modifications, and turnarounds for the fixed facilities in the period from 2013 to 2024

Figure 7-3 shows the total number of hours for *performed maintenance, modifications and planned shutdowns* for the fixed facilities in the period 2013 to 2024. Figure 7-3 is especially intended to show the *distribution* of the activities. We see that the hours performed for the activities overall are higher in 2024 than in recent years, with the number of hours for modifications and projects seeing a significant increase. A slight increase in corrective maintenance performed is also apparent, although Figure 7-2 shows that there is still a considerable amount of corrective maintenance identified but unperformed, with the figure reported for 2024 being the highest figure reported during the period 2015 to 2024.

We note that:

- some of the facilities have not classified some of the tagged equipment
- there is considerable variation in the proportion of HSE-critical equipment among the permanently located facilities, with some facilities having a low proportion of HSE-critical equipment. The operators use virtually identical methods for classification purposes
- there are few hours of backlog in preventive maintenance, but a number of facilities have not performed HSE-critical preventive maintenance in accordance with their own deadlines
- the total backlog of preventive maintenance in 2024 is at the same level as in 2022 and 2023. the total backlog of preventive maintenance is somewhat lower in 2024 than that reported in recent years.
- some facilities saw a significant and increasing number of hours of corrective maintenance unperformed as of 31.12.2024, and some facilities also saw a significant increase compared to the previous years. Most facilities have stable figures.
- there is an increase in the number of hours of corrective maintenance identified but unperformed for some operators. There is a slight reduction in the figures for 2024 for one operator for which there had been a significant increase in recent years
- overall, there is a significant number of hours of corrective maintenance unperformed as of 31.12.2024, with the figure being the highest reported during the period 2015 to 2024. There has also been a negative trend over the past four years
- the number of hours of total outstanding corrective maintenance in 2024 is at approximately the same level as in recent years, but the total outstanding HSE-critical corrective maintenance showed an increase.
- the hours performed for the activities overall are higher in 2024 than in recent years, with the number of hours for modifications and projects seeing a significant increase. Although a slight increase in corrective maintenance performed is apparent, a considerable amount of corrective maintenance identified but unperformed remains, with 2024 seeing the highest figure reported during the period 2015 to 2024
- there is a consideration variation in the percentage distribution by operator of performed preventive and corrective maintenance. A number of operators have a low proportion of preventive maintenance relative to the proportion of corrective maintenance
- one operator has identified a significant amount of corrective maintenance that has not been performed, and one operator has identified more corrective maintenance than is being performed, including over a period of years

These observations must be seen in the context of the regulatory requirements, This means that

- plant, systems and equipment must be tagged and classified so as to facilitate safe operation and prudent maintenance, including maintaining the performance of the barriers
- the activity level on the facility must take account of the status of maintenance performance. Status in this context includes the backlog of preventive maintenance and the outstanding corrective maintenance
- the significance of unperformed maintenance must be assessed both individually and in combination. The assessment is crucial for determining the extent to which unperformed maintenance entails increased risk
- backlogs in the HSE-critical preventive maintenance may contribute to increased uncertainty with regard to technical condition, and hence increased risk
- corrective maintenance of HSE-critical equipment should not exceed the defined deadlines, since the HSE-critical equipment is intended to inhibit or restrict the defined hazard and accident situations.

7.3.2 The management of maintenance of mobile facilities

Figure 7-4 provides an overview of tagged and classified equipment as of 31.12.2024. The figure shows that there is large variation in the degree of tagging and classification of the facilities' systems and equipment

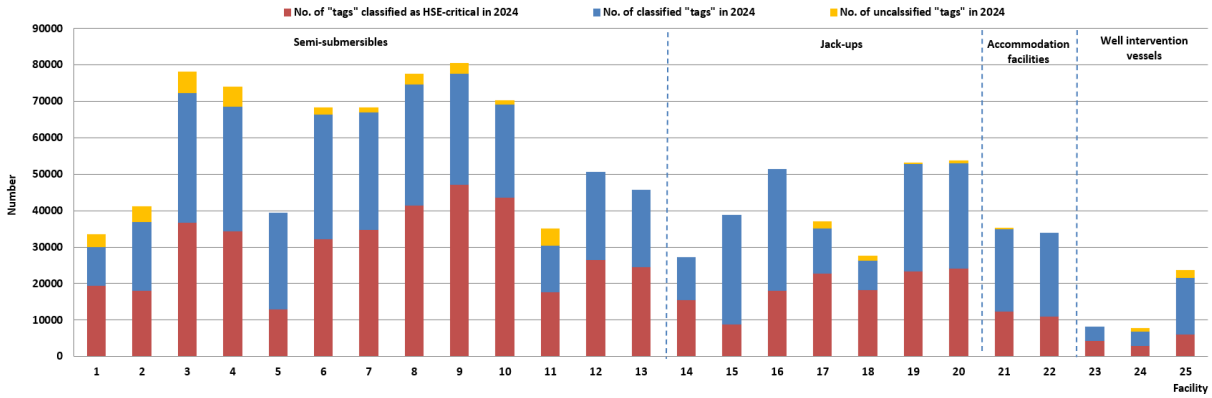

Figure 7-4 Tagged and classified equipment for the mobile facilities as of 31.12.24

Figure 7-5 shows the *backlog of preventive maintenance* in 2024.

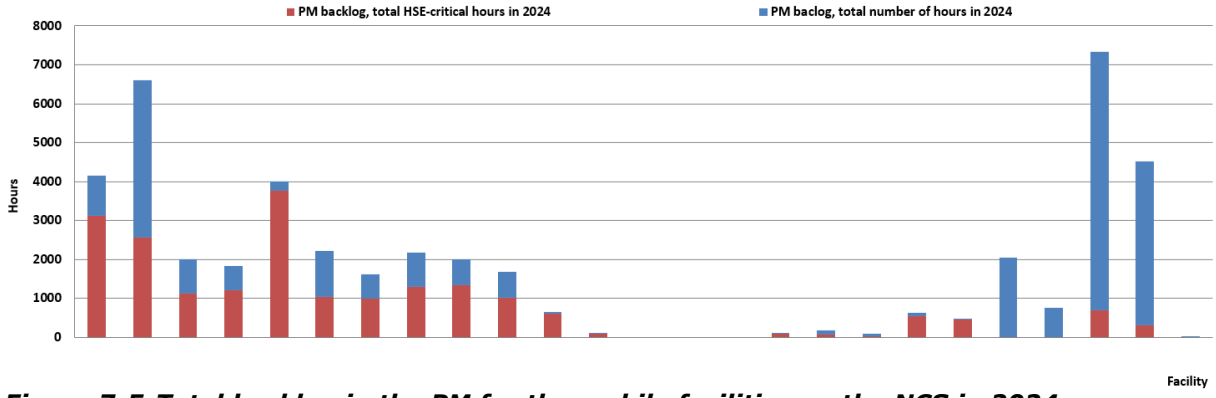

Figure 7-5 Total backlog in the PM for the mobile facilities on the NCS in 2024

Figure 7-5 shows variations in the backlog of preventive maintenance for mobile facilities. Several facilities have not performed HSE-critical preventive maintenance in accordance with defined deadlines. This may contribute to increased uncertainty with regard to technical condition, and hence increased risk.

Maintenance is of great importance for maintaining critical functions and ensuring that HSE-critical equipment functions when required.

Figure 7-6 shows the *outstanding corrective maintenance* in 2024.

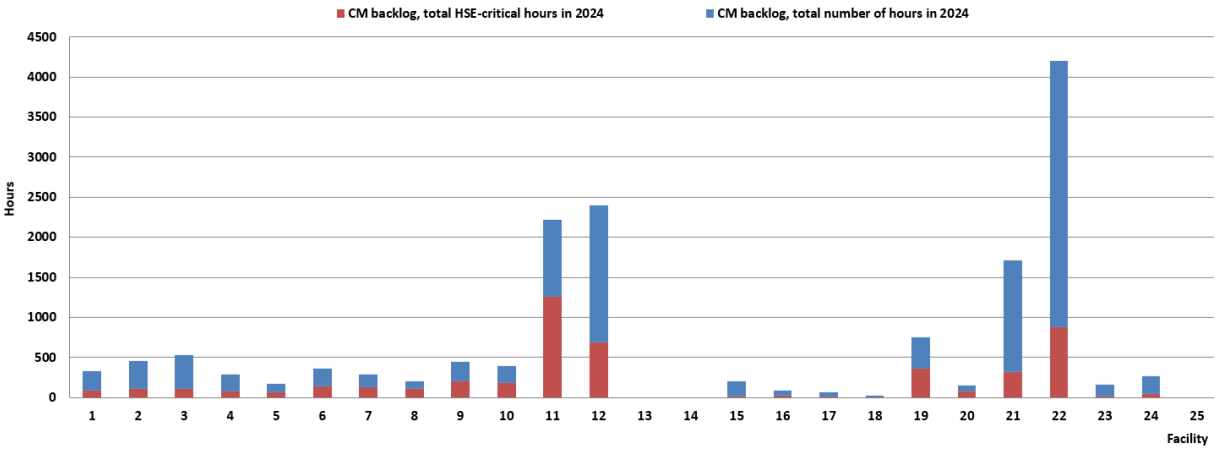

Figure 7-6 Total backlog in the CM for the mobile facilities on the NCS in 2024

Figure 7-6 shows variations in the outstanding corrective maintenance for mobile facilities. However, the hour count is relatively low for most facilities. Some facilities have not performed HSE-critical corrective maintenance in accordance with their defined deadlines.

Maintenance of this type of equipment should not exceed the defined deadlines since HSE-critical equipment is intended to inhibit or restrict the defined situations of hazard and accident.

On several occasions, we have emphasised the importance of participants assessing the significance of outstanding corrective maintenance, both as individual items and collectively. The assessment is crucial for determining the extent to which outstanding maintenance entails increased risk.

We note that:

- there is a substantial variation in the degree of tagging and classification of the facilities' systems and equipment
- there is a wide variation in the proportion of HSE-critical equipment among the mobile facilities. Not all equipment is classified. The participants use virtually the same classification method.
- there are variations in the backlog of preventive maintenance among mobile facilities. Several facilities have not performed HSE-critical preventive maintenance in accordance with defined deadlines.
- there are variations in outstanding corrective maintenance among mobile facilities. However, the hour count is relatively low for most facilities. Some facilities have not performed HSE-critical corrective maintenance in accordance with their defined deadlines.
- several facilities have large variations in the tagging of equipment from year to year. Most show stable numbers.
- there is a large variation in the percentage distribution by participant of performed preventive and corrective maintenance.

These observations must be seen in the context of the regulatory requirements, This means that

- plant, systems and equipment must be tagged and classified so as to facilitate safe operation and prudent maintenance, including maintaining the performance of the barriers
- the activity level on the facility must take account of the status of maintenance performance. Status in this context includes the backlog of preventive maintenance and the outstanding corrective maintenance

- the significance of unperformed maintenance must be assessed both individually and in combination. The assessment is crucial for determining the extent to which unperformed maintenance entails increased risk
- backlogs in the HSE-critical preventive maintenance may contribute to increased uncertainty with regard to technical condition, and hence increased risk
- corrective maintenance of HSE-critical equipment should not exceed the defined deadlines, since the HSE-critical equipment is intended to inhibit or restrict the defined hazard and accident situations.

8. Occupational accidents involving fatalities and serious personal injuries

There were no fatalities within Havtil's area of authority on the NCS in 2024. For 2024, Havtil recorded 223 personal injuries on facilities in the petroleum activities on the NCS that fulfil the criteria of absence into the next shift or medical treatment. In 2023, a total of 185 personal injuries were reported. First-aid injuries and off-work injuries are not included in the statistics.

In recent years, we have seen a reduction in the number of injuries reported on the NAV (Norwegian Labour and Welfare Administration) forms, and this trend continued in 2024. 49% of the injuries were not reported to Havtil on NAV forms in 2024. These injuries are therefore recorded on the basis of information received in connection with the quality assurance of the data. The injuries not reported on NAV forms include six classified as serious. The injuries concern both contractors' and operators' employees.

There were 178 personal injuries on production facilities in 2024, against 155 in 2023. In the long term, there has been a positive trend in the injury rate since 2014, when the overall rate was 7.1 injuries per million working hours. In 2024, there were 6.1 injuries per million working hours. However, there was an increase from 2023 to 2024 of 1.1 injuries per million working hours.

In 2024, there were 45 personal injuries on mobile facilities, compared to 30 in 2023. In 2024, the total injury rate rose from 2.7 in 2023 to 4.1 injuries per million working hours in 2024. In 2021, we recorded the lowest level of injury in the entire period. In the long term, mobile facilities, like production facilities, have seen a positive trend. The injury rate has fallen from 6.7 in 2013 to 4.1 in 2024.

8.1 Serious personal injuries

Serious personal injuries are defined in the guidelines to the Management Regulations Section 31, which definition is used as the basis for classifying serious personal injuries.

Figure 8-1 shows the frequency of serious personal injuries on production facilities and mobile facilities combined. In 2024, a total of 21 serious personal injuries were reported, against 25 in 2023.

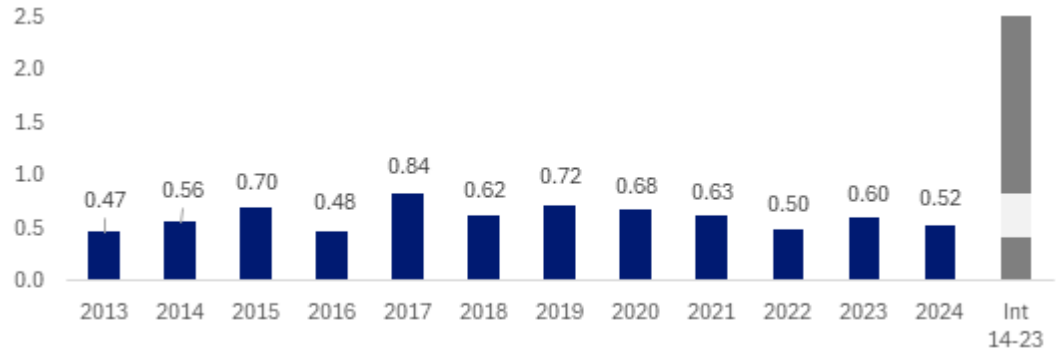

Figure 8-1 Serious personal injuries per million working hours – NCS

In the first part of the 12-year period, there was an upward trend in the personal injury rate on the NCS. After 2015, the trend was more varied, with the rate of serious injuries per million working hours varying from 0.5 in 2016 to 0.8 in 2017. In the latter part of the period, from 2019 to 2024, we see a downward trend. In 2024, the rate of serious injuries per million working hours worked fell to 0.5, meaning it has now returned to the 2022 level. In 2024, the injury rate is within the expected level based on the ten preceding years.

The activity level on the NCS last year fell by 1.6 million working hours from 41.6 to 40.0 million working hours.

8.2 Serious personal injuries on production facilities

There were 16 serious personal injuries on production facilities in 2024. This is the same number as in 2023. The number of working hours fell by 1.6 million hours in 2024, from 30.7 million in 2023 to 29.1 million in 2024.

Figure 8-2 shows the frequency of serious personal injuries on production facilities per million working hours.

The figure shows that the injury rate was fairly stable during the period 2013-2016, before then rising slightly during the period 2017-2021. Over the past three years, the injury rate has again remained stable at a lower level.

The rate of serious personal injuries per million working hours rose marginally from 0.52 in 2023 to 0.55 in 2024. The rate in 2024 lies within the expected range based on the ten preceding years.

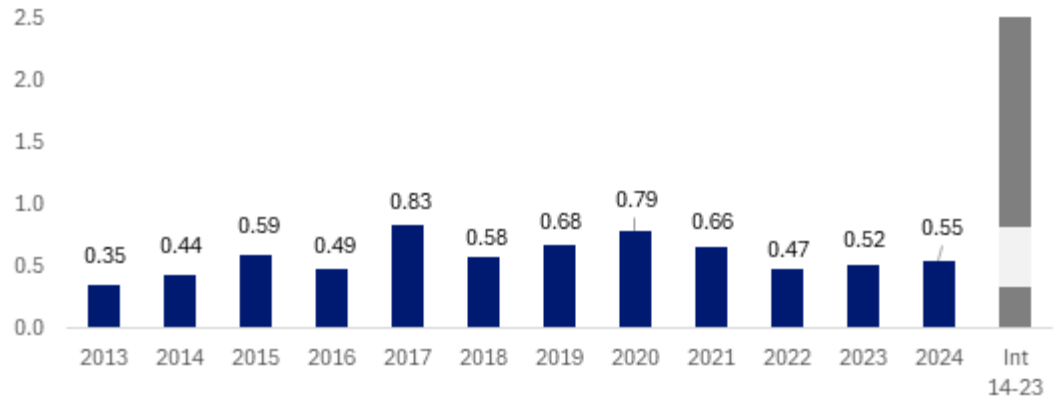

Figure 8-2 Serious personal injuries on production facilities per million working hours

8.3 Serious personal injuries on mobile facilities

Figure 8-3 shows the frequency of serious personal injuries per million working hours on mobile facilities.

In 2023, we saw a marked increase to 0.8 serious injuries per million working hours compared to the previous year, but in 2024 we are back at the same level as was seen during the period 2020 to 2022. In 2024, the injury rate was 0.46. There were five serious injuries in 2024, compared to nine in 2023.

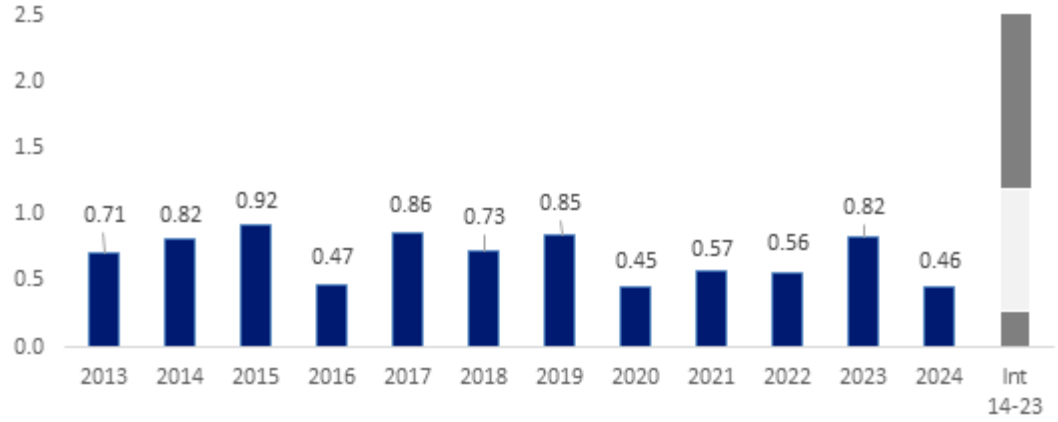

Figure** 8-3 **Serious personal injuries per million working hours, mobile facilities

9. Other indicators

9.1 DSHA 20 Crane and lifting operations

DSHA 20 crane and lifting operations includes incidents involving lifting equipment and its use which led to, or could have led to, personal injury or harm to equipment or the environment. It includes incidents both involving and not involving dropped objects. DSHA 20 was created and presented for the first time in the 2015 report. The time series now consists of data covering the period 2015-2024. The analysis looks at both the ten years combined and a comparison between the years, as appropriate.

The most important findings, which are also shown in the figures below, are:

Fixed facilities

- Figure 9-1 shows that there was a marginal increase in the number of reported incidents for fixed facilities in 2024 compared to 2023 (from 99 to 102). This also had an impact on the number of incidents normalised against the number of working hours, as there were fewer working hours in 2024 than in 2023.
- For **incidents involving personal injury in** Figure 9-2, there is also a marginal increase from 2023 to 2024. Given the relatively low number of personal injuries overall, the annual fluctuations in the normalised graph will inevitably be relatively substantial.
- For incidents linked to **Lifting using offshore cranes**, there was an increase in 2022 compared to the previous year. This is shown in Figure 9-3. In 2023 and 2024, there was a fall, and the number of incidents in 2024 is at the same level as in 2018. In 2024, measured in terms of both absolute figures and normalised against the number of working hours, the number of incidents involving offshore cranes was the lowest since 2016.
- Figure 9-4 shows that the number of absolute incidents involving **Lifting in the drilling module** increased in 2023 to the maximum level seen during the entire analysis period (33, the same number of incidents as in 2017). In 2024, there was one incident more than in 2023, with the consequence that 2024 saw the highest number of incidents of all the years during the period. The number of incidents normalised against working hours linked to drilling and well operations also increased from 2023 to 2024 – to the highest level since 2017.
- If one considers the incidents which did not involve personal injury in Figure 9-5, but which had **the potential for injury**, there were more incidents in 2024 than in 2023, but at the same level as in previous years.

Mobile facilities

- Among mobile facilities, there has been a downward trend since 2021 in terms of both the absolute number of incidents and normalised against the number of working hours. This trend has continued in 2024, as shown in Figure 9-1.
- As regards **incidents involving personal injury**, there was an increase from 2023 to 2024 according to Figure 9-2, and the number of injuries (five) is the highest seen since 2015. Normalised against the number of working hours, 2024 saw the highest figure observed during the period 2015-2024. Given the relatively low number of incidents involving personal injuries, the annual fluctuations will however inevitably be relatively high. Five injuries in 2024 are two more than the average over the period 2015-2023.
- In 2024, as regards **Lifting in the drilling module**, there was a marginal reduction in the number of incidents in terms of both absolute and normalised numbers, compared to 2023 (see Figure 9-4).

- Figure 9-6 shows that, if one looks at incidents which did not involve personal injury, but which had the **potential for injury**, a total of five incidents with one or more persons exposed occurred in 2024, which is approximately the average for recent years.

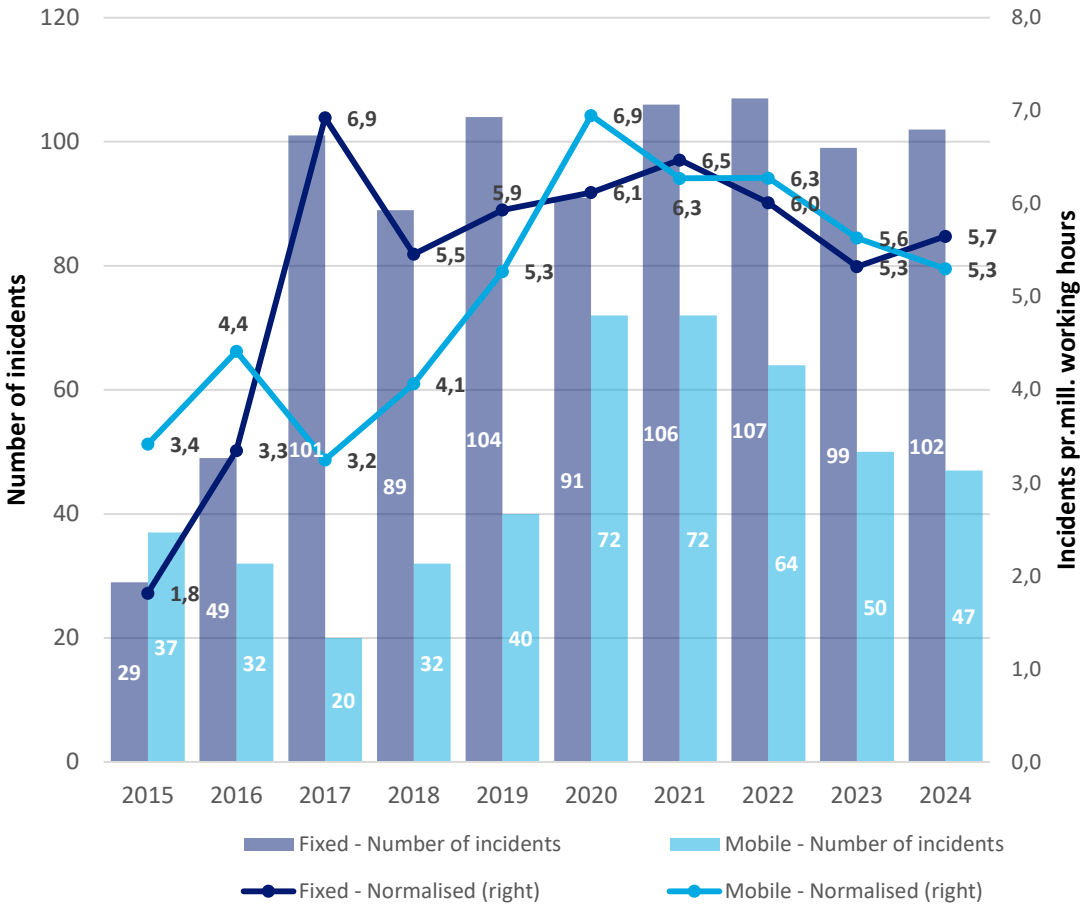

Figure 9-1 Number of reported incidents for crane and lifting operations in the period 2015-2024 for fixed and mobile facilities – absolute numbers and numbers normalised against millions of working hours relating to drilling and well operations and to construction and maintenance, per type of facility

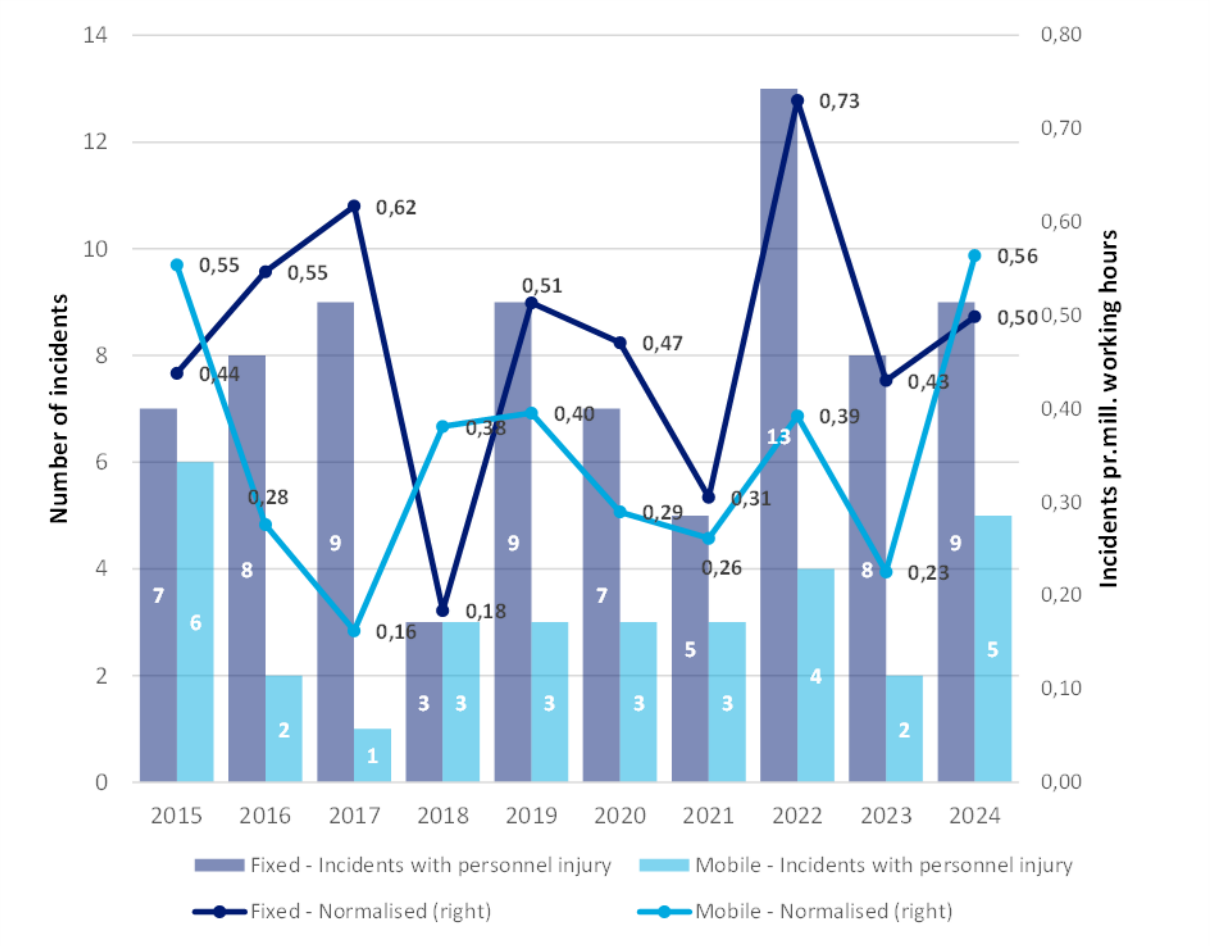

Figure 9-2 Number of incidents with personnel injury for crane and lifting operations in the period 2015-2024 for fixed and mobile facilities - absolute numbers and numbers normalised against millions of working hours relating to drilling and well operations and to construction and maintenance, per type of facility

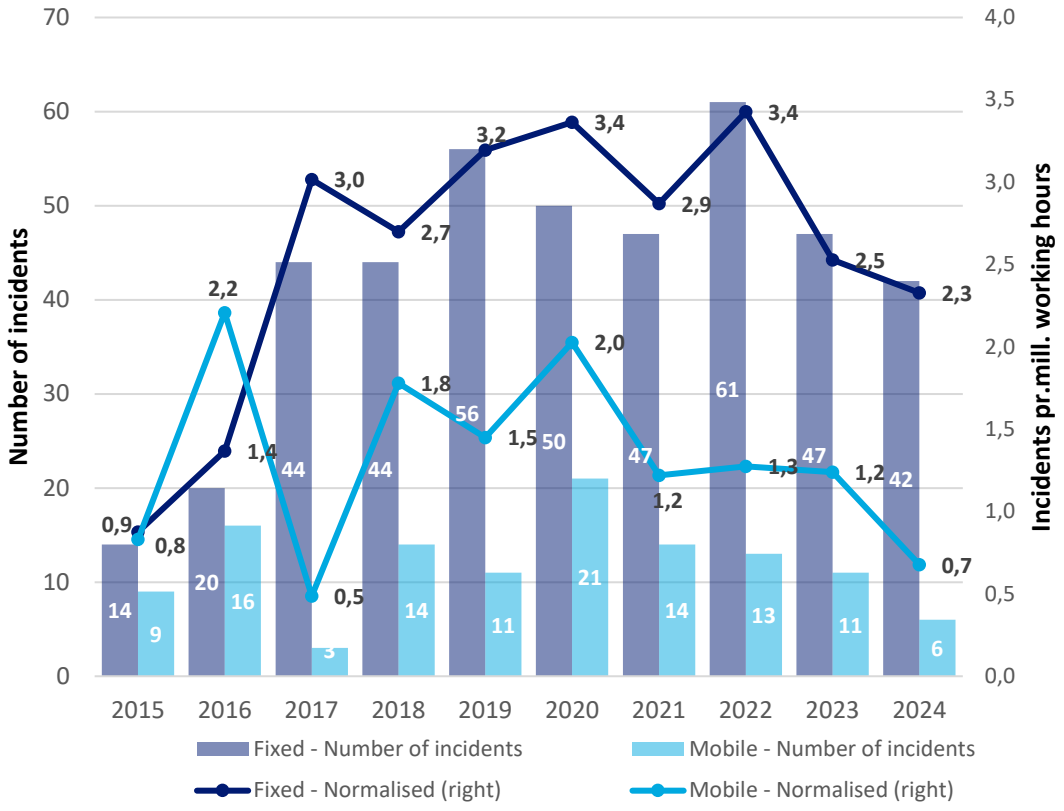

Figure 9-3 Number of reported incidents related to offshore crane lifting operations in the period 2015-2024 for fixed and mobile facilities – absolute numbers and numbers normalised against millions of working hours relating to drilling and well operations and to construction and maintenance, per type of facility

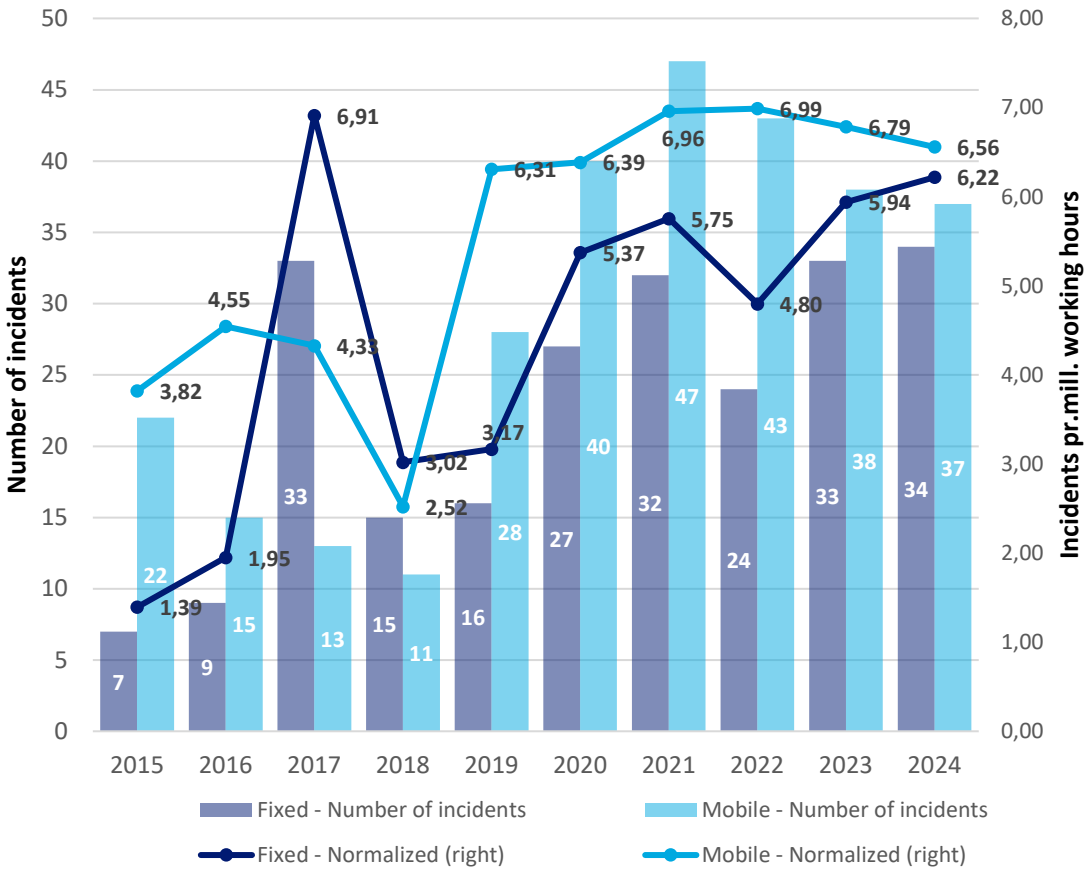

Figure 9-4 Number of incidents related to lifting in drilling module in the period 2015-2024 for fixed and mobile facilities – absolute numbers and numbers normalised against millions of working hours relating to (only) drilling and well operations, per type of facility

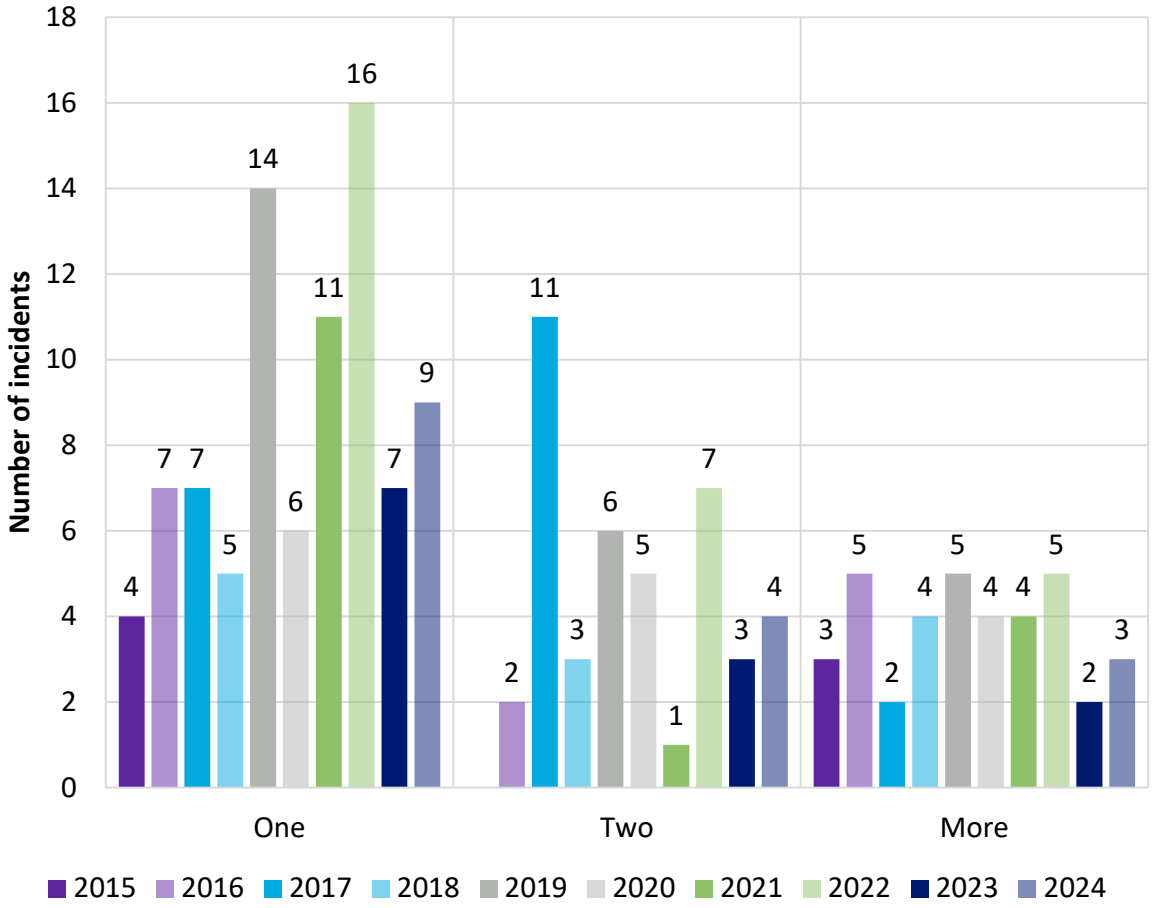

Figure 9-5 Number of incidents (without personnel injury) with person/people exposed to the incident, for fixed facilities, for the period 2015 to 2024.

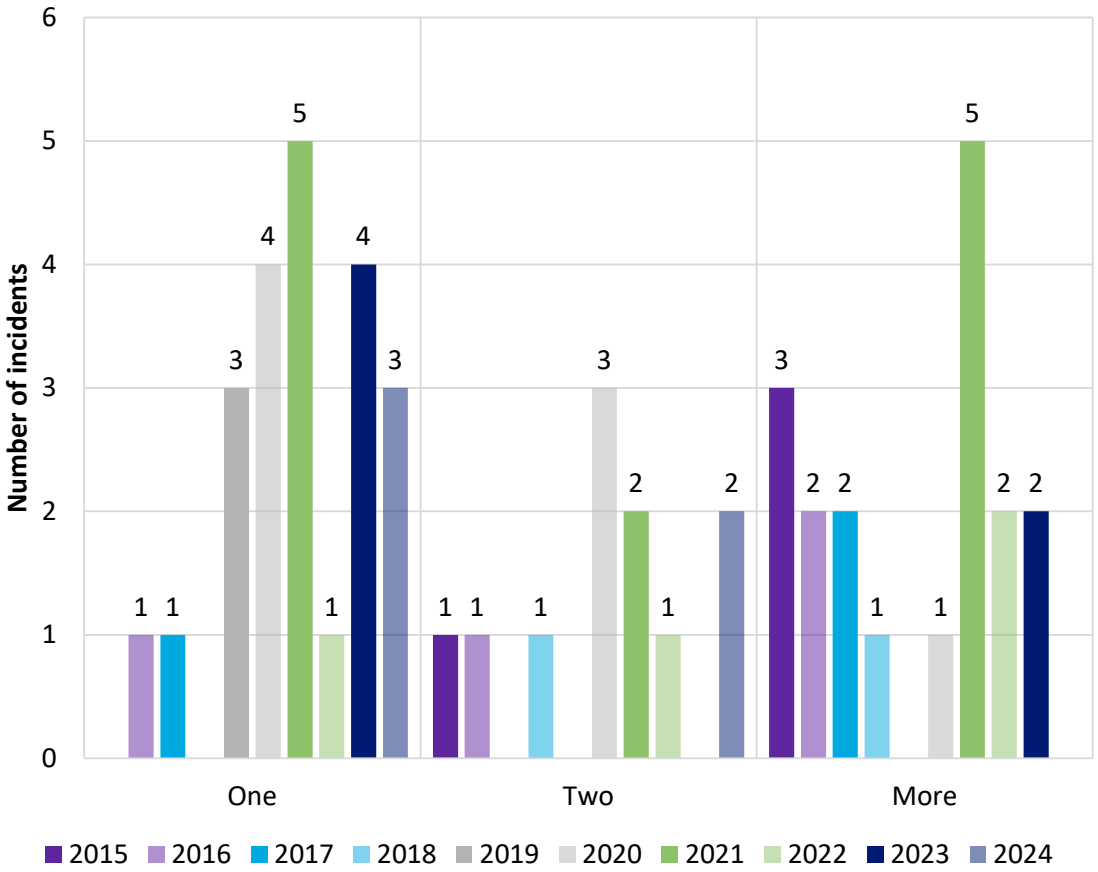

Figure 9-6 Number of incidents (without personnel injury) with person/people exposed to the incident, for mobile facilities, for the period 2015 to 2024.

9.2 DSHA 21 Dropped objects

DSHA 21 Dropped objects comprises all incidents where an object falls within a facility's safety zone, either on deck or into the sea, with the potential for becoming an accident, and which does not involve crane and lifting equipment and the use thereof. Incidents linked to crane and lifting equipment and the use thereof are presented in DSHA 20.

With effect from the 2015 report, a new DSHA 20, Crane and lifting operations, was introduced for offshore facilities, which entailed changes to DSHA 21 Dropped objects. Up until the 2022 report, the entire period back to 2015 was presented. New in 2023 was a switch to presenting data for the past ten years. This year's report presents data covering the period 2015-2024. The analysis looks at both the ten years combined and a comparison between the years, as appropriate.

The most important findings, which are also shown in the figures below, are:

Fixed facilities

- The number of reported incidents for *fixed facilities* shows a decrease in 2024 compared to 2023, as shown in Figure 9-7. This applies in terms of both absolute figures and the number of incidents normalised against the number of working hours. The normalised number of incidents in 2024 is the lowest since 2016. The absolute number of incidents in 2024 is also low compared to previous years, and is the lowest since 2017.
- Following the sharp rise in, and high number of, incidents involving personal injury seen in 2023 for *fixed facilities*, this figure has now been greatly reduced and is

down at the level seen before 2023. This is apparent from Figure 9-8, which shows the total number of incidents involving falling objects that have led to personal injury, for both fixed and mobile facilities.

- The number of falling objects >40 J in Other areas on *fixed facilities* shows an increase in 2024 and is approaching, but not as high as, the high figure seen in 2018. This is apparent from Figure 9-10, while Figure 9-9 shows the number of falling objects <40 J.
- Throughout the period from 2020 to 2023, there was an annual increase in the number of falling objects with energy of >40 J on fixed facilities. In 2024, the number has decreased, reaching the lowest number since 2020. This is presented in Figure 9-11.

Mobile facilities

- As regards mobile facilities, the same number of incidents occurred in 2024 as in 2023 in terms of both absolute number of incidents and number of incidents normalised against the number of working hours. Thus, as in 2023, the number of incidents in 2024 is now down to the lower level seen before 2018. See Figure 9-7.
- The number of falling objects in the Drilling area on mobile facilities, both <40 J (Figure 9-12) and >40 J (Figure 9-13) has seen had a downward trend in recent years. This trend continued in 2024.
- On mobile facilities, there was a reduction in the number of falling objects with energy >40 J during the period 2019-2023. In 2024, there was a slight increase in the number of such falling objects compared to 2023. See (Figure 9-11).

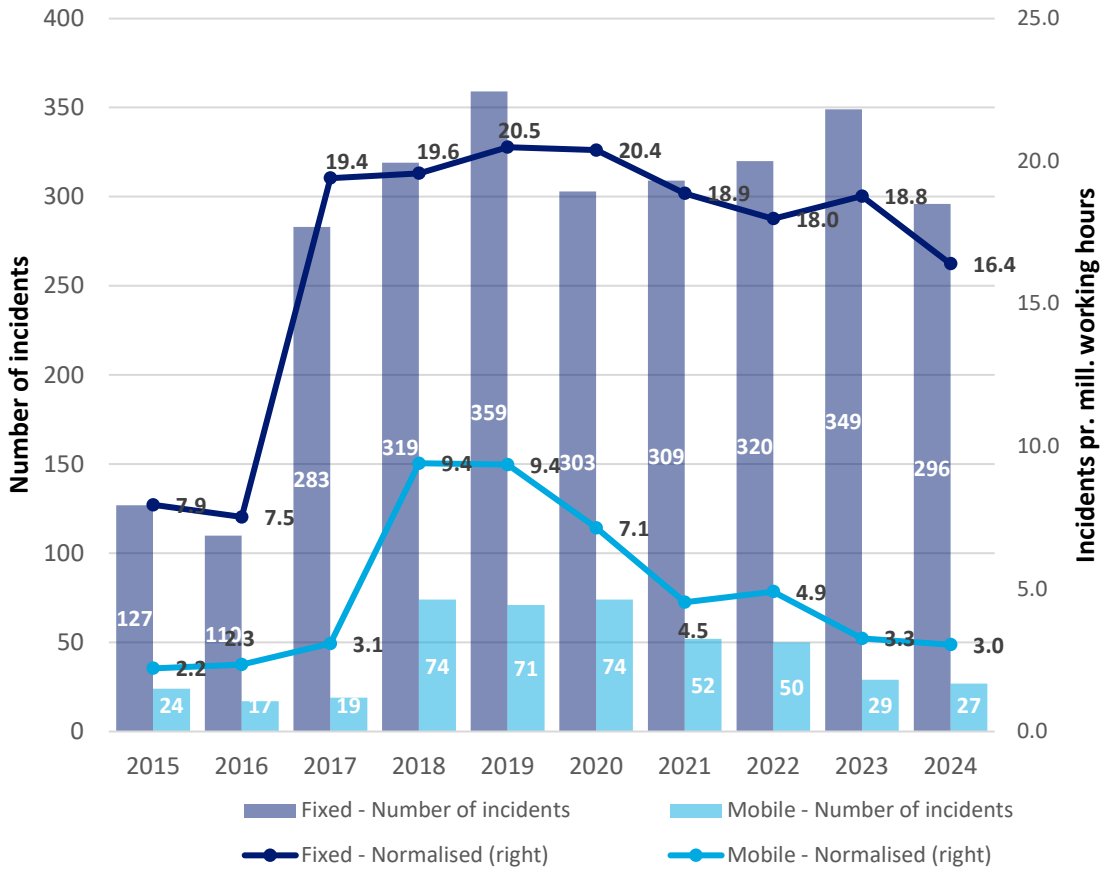

Figure 9-7 Number of reported incidents with dropped objects in the period 2015-2024 for fixed and mobile facilities – absolute numbers and numbers normalised against

millions of working hours relating to drilling and well operations and to construction and maintenance, per type of facility

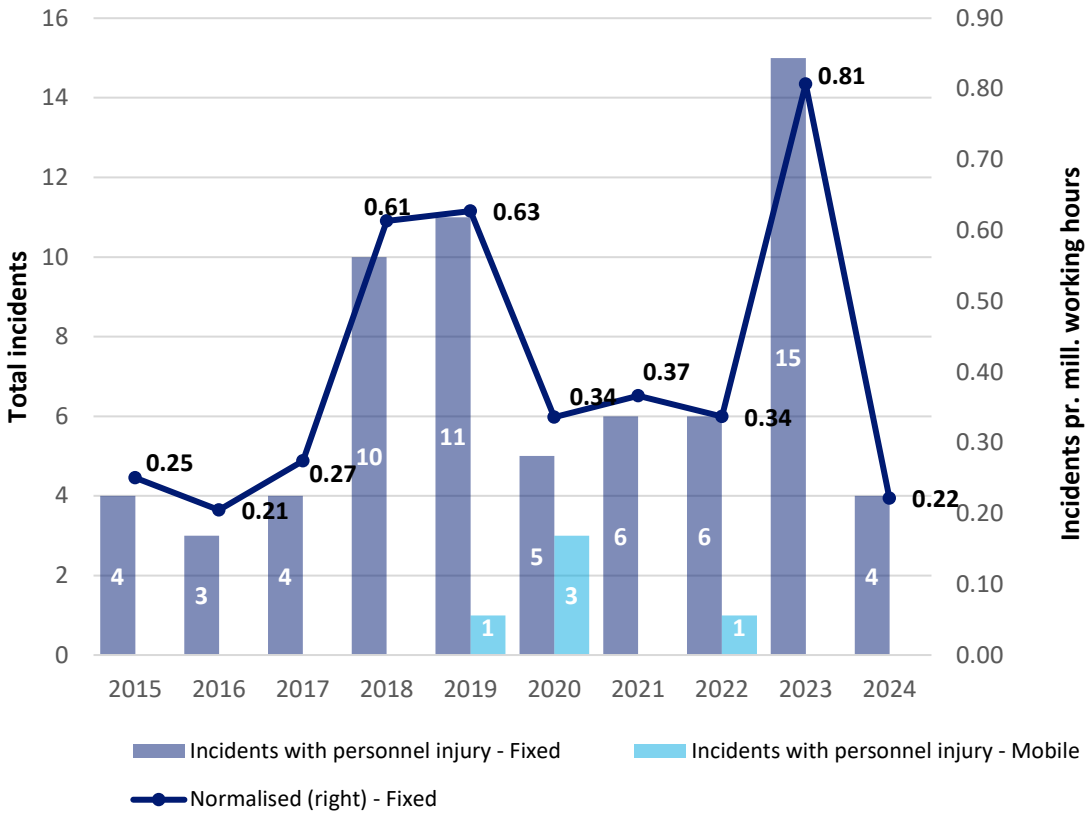

Figure 9-8 Number of incidents with personnel injury due to dropped objects in the period 2014-2024 for fixed and mobile facilities - absolute numbers and numbers normalised against millions of working hours relating to drilling and well operations and to construction and maintenance, per type of facility

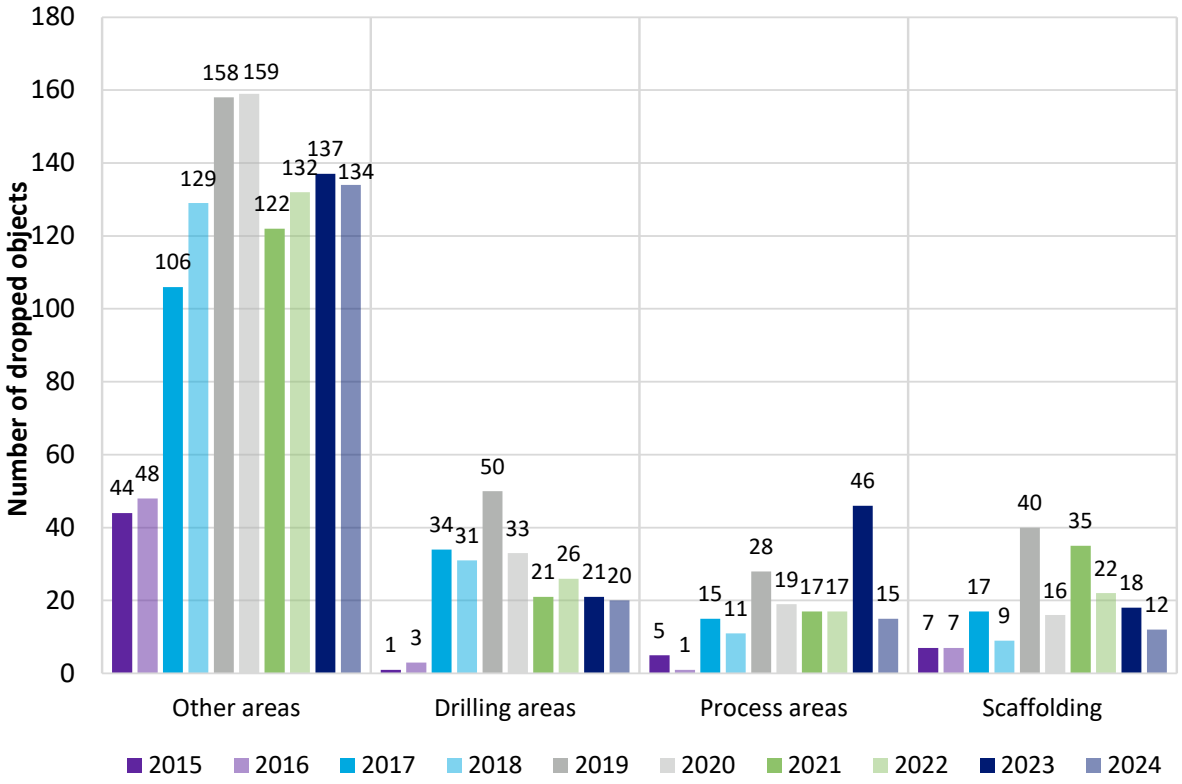

Figure 9-9 Total number of dropped objects on <u>fixed installations</u> with <u>energy < 40 J,</u> distributed among main areas

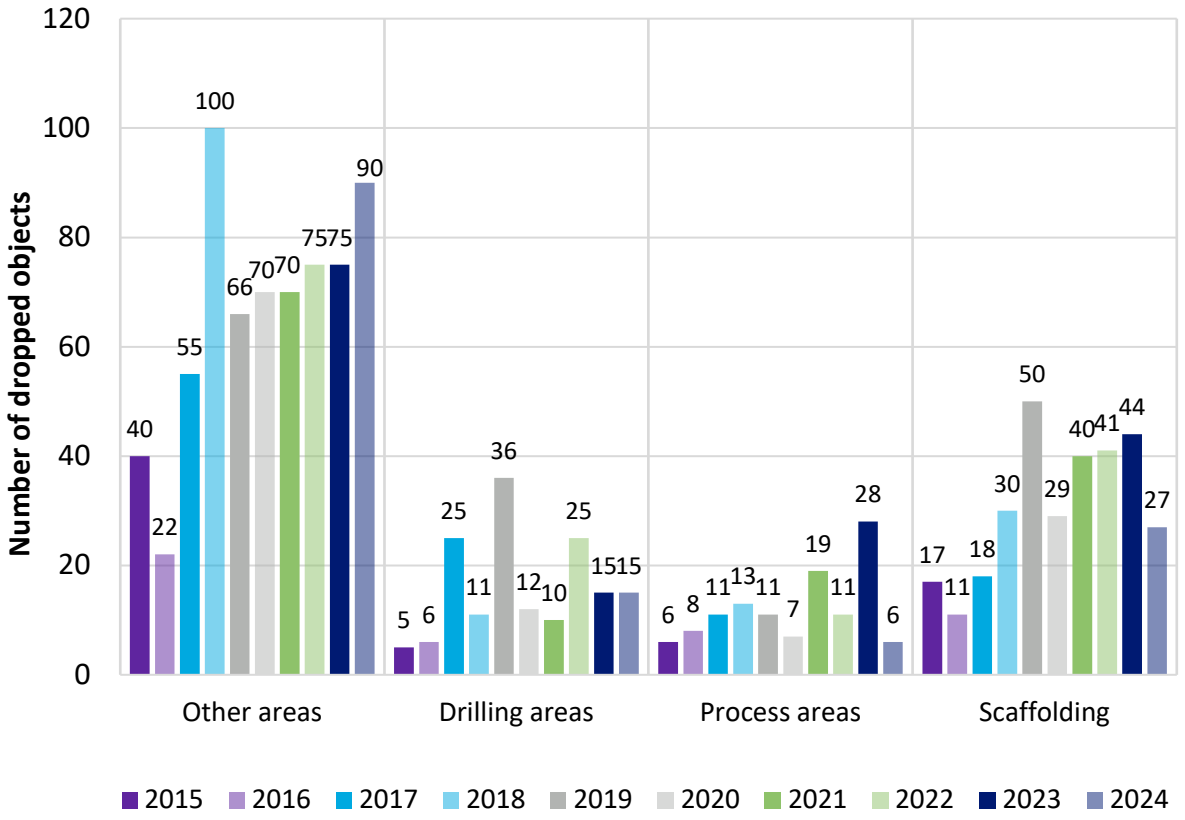

Figure 9-10 Total number of dropped objects on <u>fixed installations</u> with <u>energy > 40 J,</u> distributed among main areas

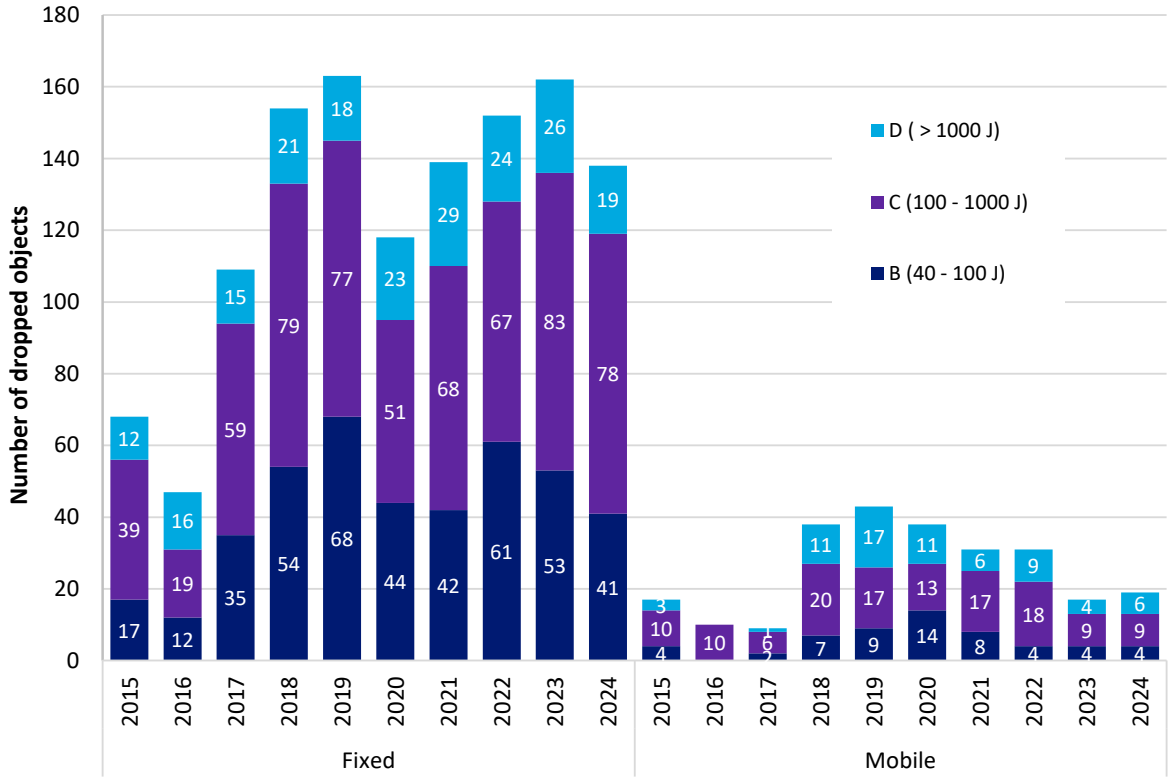

Figure 9-11 Number of dropped objects >40 J, for fixed and mobile installations in the period 2015-2024.

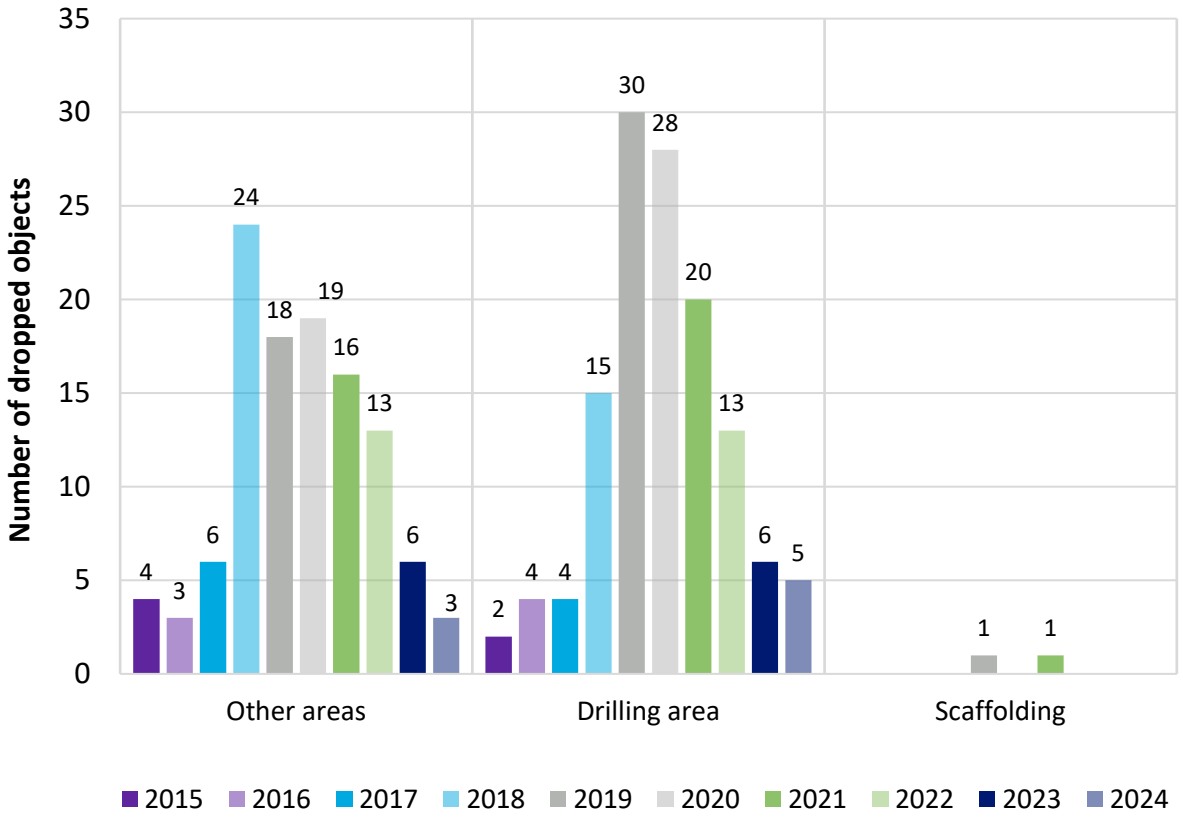

Figure 9-12 Total number of dropped objects on mobile installations with energy < 40 J, distributed among main areas in the period 2015-2024.

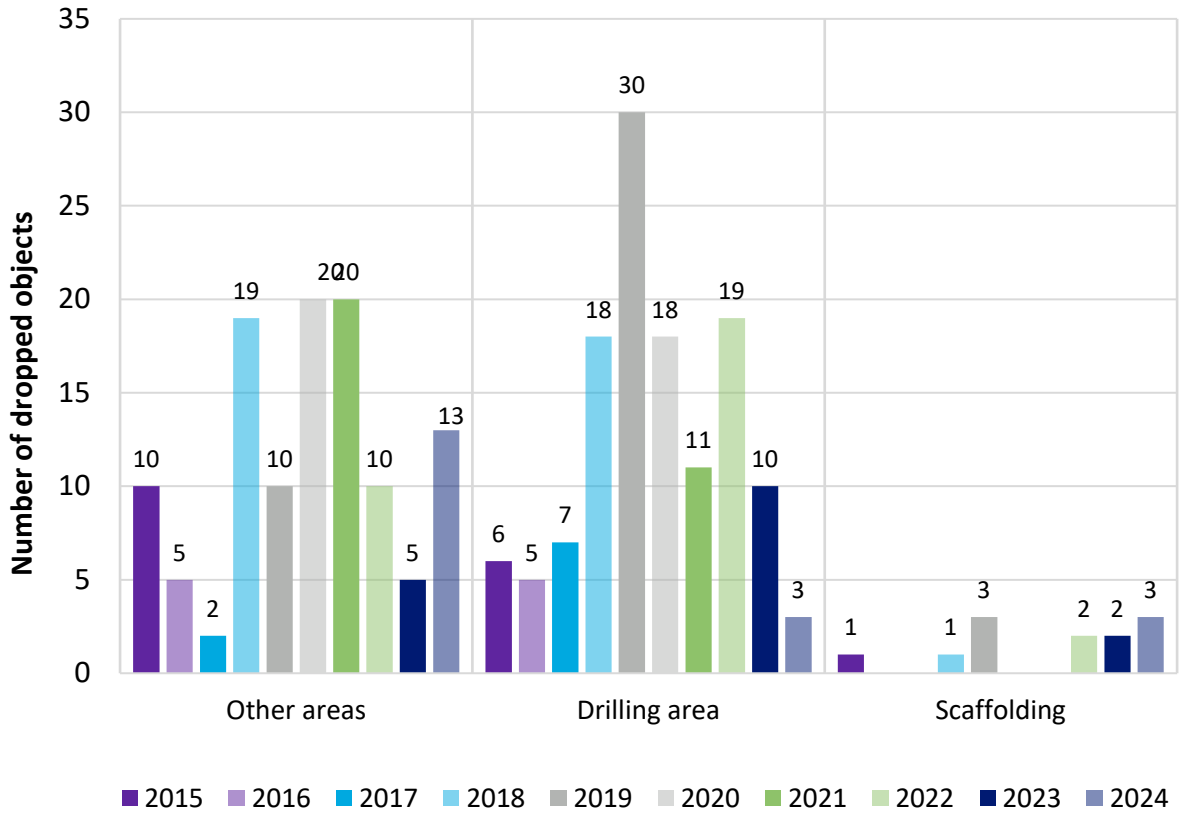

Figure 9-13 Total number of dropped objects on mobile installations with energy > 40 J, distributed among main areas in the period 2015-2024.

9.3 Other DSHAs

The main report presents data for incidents that have been reported to Havtil, as well as for other DSHAs without major accident potential, such as DSHA 11, 13, 16 and 19.

10. In-depth study of correlation of RNNP data for maintenance, incident data and questionnaire data

This study conducted by SINTEF and Safetec looks at whether it is possible to identify any correlations in the data for total corrective maintenance (CM) identified but unperformed ("Total CM") and incident data and questionnaire data from RNNP. The study is limited to the RNNP data for permanently located offshore facilities and onshore facilities during the period 2015-2023.

The study was commissioned because, in the RNNP results for 2023, Havtil saw a greater scope and a rising trend as regards total CM among the permanently located facilities and onshore facilities. The overall scope was the largest since records of total CM began in 2015, and had increased despite the increasing scope of corrective maintenance being performed.

The study was based on the hypothesis that an increase in the scope of total CM might leave less time for planning and organising the work, which in turn could lead to an increase in the risk of occupational accidents and major accidents.

Based on this hypothesis, data sources in RNNP were chosen based on their relevance to major accident risk, relevance to maintenance and the need to ensure that the data sources contain sufficient data points.

The study identifies a correlation between quantity and trend in total CM and the number of incidents in that facilities with an increasing trend and quantity of corrective maintenance have more incidents than expected. The same can be said about the correlation between the perception among employees that inadequate maintenance adversely impacts on safety, with a higher proportion of employees agreeing with this statement on facilities with a high level of total corrective maintenance.

The following conclusions are presented in the study:

- Access to substantial resources may be necessary in order to reverse the rising trend of total CM.
- Quality assurance of the numerical value for total CM is important to ensure that accurate analyses can be carried out.
- The time that elapses from a change in the scope of total CM until incidents occur must be taken into account in analyses.
- There is a correlation between the scope of, and trend in, total CM and the perception of maintenance among employees on permanently located facilities and onshore facilities.
- There is a correlation between the scope and trend in total CM and higher incident rates.
- Considering more indicators in RNNP in context provides a more comprehensive picture of risk factors.
- The follow-up of trends in total CM, regardless of overall scope, is important for safety.

Based on the conclusions, seven recommendations were defined for the industry and public authorities.

11. Definitions and abbreviations

11.1 Definitions

See sub-chapters 1.10.1 - 1.10.3, as well as 5.2, in the main report.

11.2 Abbreviations

For a detailed list of abbreviations, see Havtil, 2024a. The most important abbreviations in this report are:

CODAM	Database for damage to structures and subsea facilities (now the Incident database)
BDV	Blowdown valve
BOP	Blowout Preventer
BORA	Barrier and operational risk analysis
DDRS/CDRS	Database for drilling and well operations
DSHA	Defined situations of hazard and accident
DHSV	Downhole safety valve
DSYS	Havtil's database of personal injuries and hours of exposure during diving activities
ESDV	Emergency shutdown valve
PM	Preventive maintenance
GM	Metacentre height of floating facilities
HSE	Health, Safety and the Environment
KG	The distance from the keel to the centre of gravity on floating facilities
KPI	Key Performance Indicator
CM	Corrective maintenance
Havtil	The Norwegian Ocean Industry Authority (formerly the Petroleum Safety Authority Norway)
RNNP	Trends in risk level in the Norwegian petroleum activity
WIF	Well Integrity Forum

12. References

Detailed reference lists can be found in the main reports:

Havtil, 2025a. Risk level in the petroleum activity – Norwegian Continental Shelf, Main report, 20.03.2025
Havtil, 2025b. Risk level in the petroleum activity – onshore installations, 20.03.2025
Havtil, 2025c. Risk level in the petroleum activity – Methodology report, 20.03.2025