# 4. Questionnaire-based survey of divers

The results of a questionnaire-based survey conducted with diving personnel who have operated on the Norwegian continental shelf (NCS) between 1 January and 31 December 2022 are presented in this part of the report. Viewed overall, the goal of the survey is to measure how diving personnel experience HSE conditions in their working environment along the same lines followed over a number of years in the rest of the Norwegian petroleum industry. These questionnaire-based surveys have three main goals:

- provide a description of how employees experience HSE conditions in the petroleum sector, and identify aspects which are significant for variations in this experience
- help to throw light on underlying conditions which can help to explain results from other parts of the RNNP survey
- follow trends over time regarding employee experience of HSE conditions in their own workplace

This is the third time the questionnaire-based survey has been conducted among diving personnel since 2018. Such surveys have been carried out biennially with offshore employees since 2001, and for personnel at land-based facilities since 2007. Many of the questions are the same, so that developments for diving personnel can be compared with trends on offshore facilities and on land. The questionnaire for diving personnel has been customised by incorporating questions which are only relevant for this group – such as characteristics of diving operations, their frequency, and perceived risk and safety related particularly to this work. It is also customised for other conditions which differ, such as working time arrangements, work organisation and certain risks.

The report compares the results from 2022 with those for 2020. Its final summary will also draw comparisons with trends for the HSE climate and working environment on offshore facilities and on land with reference to RNNP results from 2021.

### 4.1 **Presentation of results and interpretations**

The data analysis conducted in this survey utilises familiar and much-used statistical methods. An express object of the RNNP survey is for its results and reports to be read and understood by people without a specialist background in statistics or social science methodology. We have therefore chosen to present the results without too much use of specialist terminology. In those cases where such terminology is difficult to avoid, we have sought to explain what the terms used mean.

The bulk of the questionnaire (the part which is identical to earlier surveys offshore and onshore) has been developed by the Petroleum Safety Authority Norway (PSA) in collaboration with several research institutes, and builds to a great extent on recognised and tested measurement instruments (including QPS-Nordic). In addition, the general questionnaire has been scientifically tested and validated earlier (Tharaldsen, Olsen and Rundmo, 2008; Høivik, Tharaldsen, Baste and Moen, 2009). In order for this questionnaire to be suitable for diving personnel as well, it has been supplemented with questions from a questionnaire developed by Norway's National Institute for Occupational Health (Stami) and specially targeted at divers. A group drawn from employers, unions and government was appointed to discuss and adopt the final version. This questionnaire is still under development, and adjustments are made with the aim of improving it.

The data are analysed with the aid of standard software used in social science methodology (SPSS 27.0). Results presented in this report arguably provide a good picture of employee perception of HSE conditions in their own workplace on the NCS. However, it must be observed that it nevertheless does not represent a complete or objective description of HSE conditions, but provides a description of how employees responding to the survey experienced the HSE climate and their workplace.

This is the third time diving personnel have had the opportunity to participate in the survey. We refer to results from all three years, and have carried out statistical tests of differences between the 2020 and 2022 results. These utilise the Chi-square test, which says something about the spread in the material. If a cell is marked with one, two or three asterisks (\*), it means that the result in 2022 differs statistically from that in 2020 – or that a *systematic bias* exists in the way the sample has responded from one year to another. (We use the asterisks in the tables as follows: \*p<0.05, \*\*p<0.01 and \*\*\*p<0.001, where the p value indicates the degree of coincidence. The lower the p value, the more confident we are in the strength of our assertion.) If no asterisks appear, no statistically significant difference has been found between the 2022 and 2020 results. The sample in the diving survey is small, which makes it harder to identify significant.

A survey taking the temperature of a whole sector in this way, and which presents all the results collectively, can only reflect very general conditions. An insight into the position on an individual vessel can only be acquired by breaking the data down to a lower level, which is difficult when the sample is so small. We therefore invite the reader to reflect on the results from their own background knowledge of diving operations in the Norwegian petroleum industry. The results can be advantageously understood in a frame of reference which takes account of local challenges and distinctive features.

# 4.2 The questionnaire

A description of the theoretical basis for the questionnaire and the development of its content appears in earlier reports (see <a href="http://www.ptil.no/risklevel">http://www.ptil.no/risklevel</a>) and will not be repeated here. A point to note is that the "measurement tool" (in other words, the questionnaire and the way the results are reported) should not be amended when seeking to measure changes over time. The diver questionnaire has been based on the regular version (for personnel offshore and at land-based facilities), but also contains some questions specially tailored for diving personnel. The regular questionnaire was revised in 2020 with the aim of reducing its length. Some questions were removed and others were placed in a rolling system for inclusion in every other survey only. These revisions were largely also applied to the diving survey, so this year's exercise contains rather fewer questions than in 2020.

The questionnaire has seven main sections.

- **Demographic data**. This section comprises questions on gender, age, nationality, education, job category, seniority, the employer company, vessel, affiliation to vessel and company, working time arrangements, emergency response functions and whether the respondent has supervisory responsibilities. It also covers experience of downsizing, reorganisation, changes and the adoption of new technology.
- **Questions only for divers.** Twenty-four questions dealing with safety-related behaviour in diving, work capacity and exposure when diving.
- **Questions only for supervisory personnel** (diving supervisor, life support supervisor, diving superintendent and offshore manager). Twenty-three questions covering safety-related behaviour, work conditions, digital technology and changes to the working day.
- **HSE climate in own workplace**. Forty-one statements related to various factors of significance for HSE: 1) personal qualifications for working safely, 2) characteristics of respondent's behaviour and that of others which are significant for HSE, 3) conditions in the work situation which affect the respondent's own behaviour.
- Assessment of accident risk. (rolling, not included in the 2022 survey). Comprises questions where respondents are asked to assess perceived risk related to 13 accident scenarios. These cover most of the defined situations of hazards and accidents (DSHA) included in the RNNP.

- **Working environment.** Twenty-nine questions covering physical working environment factors (exposure and strain) psychosocial working environment factors (requirements for concentration and attentiveness, control of the respondent's own work performance and social support) and job security. Two questions concern bullying.
- Sleep and working time. Eleven questions on working time and sleep quality.
- **Health complaints, sickness absence and injuries**. Six questions concerning sickness absence and involvement in any work accidents causing injuries, as well as well as a question covering 24 health complaints and how far these can be related to work.

In addition, the diver questionnaire includes questions on living conditions, bail-out, the communication system and training.

The questionnaire was distributed in English only and was available both on paper and online. Respondents were encouraged to answer online. The questionnaire is presented in appendix B.

# 4.3 Data collection and analyses

## 4.3.1 Population

The population is defined as all diving personnel who have worked offshore in the PSA's area of authority during 2022 (everyone who participated offshore in one or more diving operations on the NCS during this period). Data collection took place between 1 January and 31 December. Everyone involved in diving operations during this period should have had the opportunity to participate in the survey. People who were off sick, had leave of absence or were not offshore for other reasons in the relevant period are not included.

### 4.3.2 Distribution and collection of questionnaires

Paper questionnaires were sent to the diving companies or directly to vessels moored at the quayside. The companies or their representative were given responsibility for distributing the form to those who were due to be or had been involved in diving operations on the NCS in the survey period (1 January-31 December 2022). Information about the opportunity to respond on line was provided on the form. The provider of the internet solution had problems which meant that it was not possible to respond on line in the summer of 2022, but 28.4 per cent of responses were nevertheless submitted electronically. The total number of responses also suggests that most people opted to respond on the form, which was distributed together with a prepaid return envelope. Those who opted to respond on the form thereby mailed it back themselves.

# 4.3.3 Diving activity 2022

Observations on the response rate for the diver survey are difficult to estimate since it is unknown how many diving personnel were involved in the diving operations. A total of 89 960 work-hours in saturation during diving on the NCS and foreign continental shelves under Norwegian jurisdiction were reported in 2022. That corresponds to 295 days of manned underwater operations (MUO) from diving support vessel (DSVs), and is almost double the level of activity in the year before. In addition, 30 MUO vessel days were reported for surface-oriented diving offshore, with 266 work-hours in water. A comparison with activity in 2020 and 2018 is presented in figures 4-1 and 4-2.



Figure 4-1. Work-hours in saturation 2018-22.



Figure 4-2. Work-hours under water for surface-oriented diving 2018-22.

One feature which distinguishes the diver version from the other RNNP questionnairebased surveys (offshore and at land-based facilities) is that the same person is able to complete the form several times because they have worked on other vessels/operations during the collection period. Since the same divers are often involved in several operations, it is difficult and impractical to calculate a response rate.

# 4.4 Results

The presentation of results from the 2022 diver survey begins by describing the characteristics of the sample (respondents). Assessments are then presented of the various subjects in the questionnaire, as described in section 4.2.

# 4.4.1 Characteristics of the sample

The questionnaire was completed by 208 people in 2022, including 140 divers. Of the latter, 108 were saturation divers and 32 conducted surface-oriented dives.

Table 4-1 presents the characteristics of the sample – in other words, those who completed the questionnaire. The column on the right shows this year's sample

juxtaposed with the comparable figures for 2018 and 2020 in the other columns. Both sample size and level of activity varied between the different years. That must be borne in mind when comparing figures from year to year.

Year	2018	2020	2022
Number	n=115	n=70	n=208
20 years and below	-	-	0.5
21-24 years	0.9	-	0.5
25-30 years	9.6	8.6	8.7
31-40 years	35.1	24.3	36.5
41-50 years	27.2	35.7	30.3
51-60 years	19.3	31.4	18.8
61 years and above	7.9	-	4.8
Same vessel (past 12 months)	36.8	68.6	54.4
Various vessels (past 12 months)	63.2	31.4	45.6
Saturation diver	20.5	40.6	52.4
Surface-oriented diver	43.8	13	15.5
Diving technician	-	10.1	5.8
DP operator	-	-	1.9
Diving supervisor	17	14.5	6.3
Life support technician	8	7.2	1.9
Life support supervisor	7.1	4.3	1.0
ROV operator	-	7.2	12.1
Diving superintendent	1.8	1.4	1.5
Offshore manager	1.8	1.4	1.0
Gas	-	-	0.5
Permanent employment	5.2	22.9	13.0
Day rate	80.9	75.7	57.0
Other temporary contract	13.9	1.4	30.0
Norwegian	10.5	10.1	7.8
British	67.5	73.9	69.3
Other nationality	21.9	15.9	22.9

# Table 4-1. Characteristics of the sample (per cent)

Compared with 2020, more respondents are in the 31-40 age group and fewer in the 41-50 and 51-60 groups. At the same time, more respondents in this year's survey are over the age of 60. In section 4.4.3, we divide the sample into divers and supervisory personnel, depending on their job category, and also distinguish between saturation and surface-oriented divers when presenting a number of the results. Applying these divisions to the discussion on age, we see that supervisory personnel (n=20) are significantly older than divers (n=140). Fifty per cent of those defined as supervisory personnel are more than 50 years old, while the corresponding proportion for divers is 18.5 per cent. At the other extreme, we find that 11.4 per cent of the divers are below the age of 30, while none of the supervisory personnel are in this category. Those defined as "other" (n=48) lie in more the middle of the age range, with 85.4 per cent aged 31-50. Viewing the divers in isolation, we see that those involved in saturation diving are generally older than the surface-oriented ones. Of saturation divers, 28 per cent are older than 60, and only 3.7 per cent are younger than 30. The proportion of surface-oriented divers below the age of 30 is 37.5 per cent.

A little over half of respondents have been on the same vessel over the past 12 months, which is lower than in 2020. Divers (saturation/surface-oriented) account for 67.9 per cent of respondents. Comparing job categories with 2020, the proportion of saturation divers and ROV operators is substantially higher than in 2022, while there are fewer diving technicians/supervisors and life support technicians/supervisors. *Gas man* is a new job category in the 2022 survey. This was admittedly only available in the web version of the questionnaire, and just 0.5 per cent selected it. The proportion saying they are permanently employed is lower in 2022 (13 per cent) than in 2020 (22.9 per cent). Thirty per cent specified "other temporary contract", compared with only 1.4 per cent in the previous survey. Where nationality is concerned, the proportion of Norwegians and Britons is down from 2020 and the share from other countries has risen to 22.9 per cent.

Looking at offshore experience, we find that a relatively large share (17.4 per cent) have worked there for less than a year and a fairly similar proportion have served for two-four years. Roughly similar proportions (one in three) have six to 10 years and more than 10 years of experience. A total of 62.6 per cent have held the same job for two years or more.

Of those taking part, 6.6 per cent say they have an elected union office, 18.7 per cent are safety delegates and 5.9 per cent sit on the working environment committee. The mandatory 40-hour basic HSE course has been taken by 39.9 per cent, and more than half of these took it less than five years ago.

# 4.4.2 Working time and affiliation

The proportion of respondents who have worked for the same company over the past 12 months is 67.5 per cent, down from 74.3 per cent in 2020.

Diving personnel were asked how much of their working time had been devoted to operations on the NCS. Responses to this question could indicate that many were making their first tour there, since 27.5 per cent responded "none". Fifty-three per cent estimate that they have spent up to a quarter of their working time in this way.

Table 4-2 presents the breakdown between different types of working time arrangements. We see from this that more people are on permanent day shift in 2022 than in 2020, while the proportion working both day and night shift is still the largest.

	2018	2020	2022
Permanent day shift	12.4	12.9	23.3
Permanent night shift	19.5	8.6	8.7
Both day and night shift	55.8	65.7	59.2
Shift arrangements adapted to diving operations	12.4	12.9	9.7

 Table 4-2. Working time arrangements (per cent)

Table 4-3 presents the breakdown between different shift arrangements. The commonest is 12/12 hours, and the proportion with this scheme is rather higher in 2022 than in 2020.

# Table 4-3. Shift arrangements (per cent)

	2018	2020	2022
6/6 hours	15.9	14.3	8.3
12/12 hours	79.6	81.4	88.8
Other arrangements	4.4	4.3	2.9

The proportion of long-duration offshore tours has risen from 2020, with 70.6 per cent of respondents in 2022 specifying 21 days or more as the length of their latest tour (against 46.3 per cent in 2020). While 22.5 per cent say their latest tour lasted 15-20 days, only seven per cent were out for 14 days or less. The increase in the length of tours could be related to Covid-19 measures in the industry.

# 4.4.3 Results relating particularly to divers and their supervisors

Some of the questions in the survey are directed particularly at divers (saturation and surface-oriented) and supervisory personnel (diving and life support supervisors, diving superintendent and offshore manager). This sample totals 160 people, with divers accounting for 87.5 per cent and 12.5 per cent defined as supervisory personnel.

Table 4-4 shows how many dive periods the sample has had on the NCS and in other sectors respectively over the past 12 months. Respondents have spent more periods in other sectors than on the NCS. While 28.6 per cent of the divers have had three periods or more on the NCS, 44.3 per cent had the same number in other sectors. Compared with the other results, a relatively large proportion have chosen not to answer these two questions (see the bottom row). Supervisory personnel in particular have a high share of "no answer". It is also worth noting that 12.1 per cent specify "none" for dive periods on the NCS over the past 12 months, which could indicate that this period is their first.

Dive periods (saturation/surface-	NCS Divers Supervisors (n=140) (n=20)		Other sectors		
oriented)			Divers (n=140)	Supervisors (n=20)	
None	12.1	10	13.6	5	
1-2 periods	48.6	55	14.3	20	
3-9 periods	17.9	5	37.9	35	
10 periods or more	10.7	0	6.4	0	
No answer	10.7	30	27.9	40	

Table 4-4. Dive periods in the past 12 months by location (per cent)(divers and supervisory personnel, n=160)

The sample was asked for their opinion of various work factors on the NCS. These questions were headed: "General work factors. What is your opinion on the following issues related to working on the NCS?". The answers are presented in table 4-5, and differences shown between divers and supervisory personnel compared with the corresponding results in 2020 and 2018.

Responses are presented on the scale of 1 (very preferable) to 5 (not preferable at all). Table 4-5 presents the percentage of respondents who have given negative responses to the statements (4 or 5 on the scale). A share of 25.2, for example, therefore means that roughly a quarter of the sample have given a negative response to the question concerned.

The general working environment factors considered negative by most divers are length of stay on board (7.7 per cent), followed by long-term follow-up of diver health (4.6 per cent) and restriction of umbilical length (4.6 per cent). The last of these is viewed negatively by a far larger proportion (31.3 per cent) of supervisory personnel. In

addition, 25 per cent of supervisory personnel are less satisfied with the saturation period. Since relatively few supervisory personnel are included in table 4-5, caution must be exercised in interpreting differences between groups and years.

Table 4-5. Assessment of general working environment factors on the NCS, percentages
(two most negative categories) (divers and supervisors, n=160)

What is your opinion on the following issues related to working on the NCS?" Year (no divers/ no supervisors)		2018 (n=72/ n=31)	2020 (n=37/ n=15)	2022 (n=140/ n=20)
	Divers	0	0	0.8
Use of Norsok saturation/decompression tables	Supervisors	17.8	0	0
	Divers	9.9	18.2	3.3
Length of saturation periods	Supervisors	29.6	7.1	25.0
	Divers	1.6	3.1	2.5
Mandatory break in bell	Supervisors	7.6	7.1	0
	Divers	0	3	2.4
In-water time	Supervisors	7.6	14.3	6.3
	Divers	1.5	2.9	4.6
Long-term follow-up of diver's health	Supervisors	3.7	0	0
	Divers	14.9	14.3	7.7
Length of stay on board	Supervisors	39.3	42.8	25
	Divers	7.5	11.5	4.6
Restriction of umbilical length	Supervisors	18.5	35.7	31.3

The breakdown of responses in 2022 to the questions in table 4-5 is presented in figure 4-3 below. We see that a number of differences exist between divers (n=140) and supervisory personnel (n=20), particularly over the length of saturation periods and restriction of umbilical length. Too much weight should not be given to these differences because of the size of the groups.



Figure 4-3. What is your opinion of the following working environment factors? Percentage breakdown of responses (divers and supervisory personnel, n=160)

Table 4-6 shows the results for the perceived risk connected to diving operations. The questions are introduced as follows: "Please describe your perceived risk connected to the conditions and elements listed below". They were to be answered on a scale from 1 (very slight hazard) to 6 (very great hazard). As previously described, the figures presented in the table indicate the proportion of the sample which responded in the two most negative categories (values 5 and 6).

Where table 4-6 is concerned, a distinction is also made between diver types – saturation and surface-oriented. Since we have too few respondents with supervisory roles, we are unable to apply the same distinction to these personnel without compromising their anonymity.

	Year	2018	2020	2022	20	22
Type of risk	number (divers/ supervisors)	(n=72/ n=31)	(n=37/ n=15)	(n=140/ n=20)	Divers: saturation (n=108)	Divers: surface (n=32)
	Divers	52.9	38.9	28.1	30.7	19.4
Gas cut	Supervisors	30.7	38.5	23.1	-	-
	Divers	40.3	36.2	25.0	23.8	29.1
Human errors during diving operations	Supervisors	32.2	42.9	14.2	-	-
Mechanical breakdown during diving	Divers	34.9	38.6	20.6*	20.9	19.4
bell handling, hot water)	Supervisors	19.2	7.1	14.2	-	-
Personal diving equipment (including	Divers	36.9	20.6	19.2	19.0	19.4
bail-out)	Supervisors	14.3	21.4	8.3	-	-
	Divers	6.0	11.1	5.8	3.8	12.9
Cooperation with other team members	Supervisors	14.8	0.0	7.7	-	_
Operation of the installation/platform	Divers	27.3	19.5	18.4	18.1	19.6
on (e.g. water inlet/outlet, crane lifting)	Supervisors	36.0	21.4	7.7	-	_
	Divers	40.9	25.0	29.2	32.1	19.6*
Work inside structure	Supervisors	25.0	14.3	15.4	-	-
	Divers	34.4	30.3	19.4	19.8	17.8
Work on hydrocarbon systems	Supervisors	34.6	28.6	0.0	-	-
	Divers	27.3	11.1	21.5	21.7	20.7***
Extended umbilical	Supervisors	23.1	14.3	0.0	-	-
	Divers	25.5	18.2	15.3	18.1	3.8*
Bell located over structure	Supervisors	26.1	35.7	0.0	-	-
DSV lifting operations (crane or lift	Divers	22.7	20.0	13.4	14.3	10.0
bags)	Supervisors	24.0	21.4	23.1	-	-
Circultaneous energtions with DOV	Divers	1.5	8.4	4.5	2.9	10.0*
Simultaneous operations with ROV	Supervisors	8.0	7.1	7.7	-	-
Environmental factors (sea state,	Divers	17.9	14.3	17.5	12.3	35.5
currents, visibility)	Supervisors	11.5	7.1	0.0	-	-
Work within bobitot	Divers	24.1	6.2	21.6	22.3	18.2
	Supervisors	26.1	7.1	7.7	-	-
Fations	Divers	30.8	20.0	17.3	17.2	17.9
ratigue	Supervisors	25.9	21.4	7.7	-	-
Automated control systems failures	Divers	29.8	29.4	19.9	18.8	23.3
during diving operations	Supervisors	3.8	21.4	0.0	-	-
Manual control systems failures during	Divers	28.3	25.7	16.0	16.9	12.9
diving operations	Supervisors	0.0	7.1	0.0	-	-

# Table 4-6. Perceived risk related to diving operations, proportion with the most negative responses (two highest values on scale: 1=very slight hazard, 6=very great hazard)

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Figure 4-4 presents the breakdown of responses concerning perceived risk for divers alone. The questions in the figure represent the incidents considered to have the highest risk (overall for all respondents). In some cases, a number of differences exist in the way saturation and surface-oriented divers respond. That applies particularly for "work inside

# structure" and "extended umbilical", where saturation divers regard the risk as higher than surface-oriented divers do.



Figure 4-4. Breakdown of responses, perceived risk (divers and supervisors, n=140)

# 4.4.3.1 Questions for supervisory personnel only

One section of the questionnaire was directed at supervisory personnel alone, defined in the form as the job categories of *diving supervisor*, *life support supervisor*, *diving superintendent* and *offshore manager* (n=20). This section presents the results. Caution should be exercised in drawing conclusions from the supervisory personnel responses, since this group represents a small number of people (in 2020, too).

Supervisors were asked to answer questions on safety-related behaviour in diving operations on the NCS over the past 12 months, and the results are presented in table 4-7. The table always presents the proportion of negative responses, regardless of how the question was slanted.

Table 4-7. Safety-related behaviour among supervisors (n=20). Proportion responding negatively (two most negative values from 1=very rarely/never to 5=very often/always)

Statement	2018 (n=31)	2020 (n=15)	2022 (n=20)
Did you experience hazardous situations during diving operations?	8.3	7.1	12.6
Did you worry about safety during diving operations?	33.4	35.7	12.6
Did you work with divers that you are not relying on?	16.6	15.4	20.0

Statement	2018 (n=31)	2020 (n=15)	2022 (n=20)
Did you work with support personnel that you are not relying on	16.6	7.1	6.7
Did you find it hard to follow all operational procedures?	0.0	7.1	0.0
Did you have to follow procedures you feel should be done differently?	8.3	7.1	25.0
Did it happen that formal procedures were not followed?	16.6	0.0	6.3
Did you experience time pressure during diving operations?	33.3	28.6	12.6
Did you start dives even if you were not sure if diving equipment was checked?	8.3	0.0	0.0
Did you check if the divers were in good shape before dives?	16.6	23.1	6.3
Did you ask divers to break safety regulations/procedures in order to get things done?	0.0	7.1	0.0
Did you ask the divers whether they needed a break during the dive?	33.3	7.1	26.7

The questions on safety-related behaviour which yielded the most negative results are presented in figure 4-5. This shows that supervisory personnel were less worried about safety in diving operations in 2022 than in 2020, and that they experienced pressure of time less frequently. The breakdown in responses is otherwise fairly similar, once account is taken of the small number of people in the sample.





Very rarely or never

# Figure 4-5. Safety-related behaviour among supervisors in 2020 (n=15) and 2022 (n=20). Breakdown of responses, per cent

Supervisory personnel were also asked whether they receive support from digital solutions and access to IT systems. Figure 4-6 presents the breakdown of responses to these questions.



Figure 4-6. Questions about digital tools and access to IT systems (supervisory personnel, n=15). Breakdown of responses, per cent

One question deals with how often the respondent uses digital technology to do their work, and the results are shown in figure 4-7. The vast majority of supervisory personnel (94.1 per cent) use PCs for large parts of the day, and 37.5 per cent use smart phones and/or tablets. Of digital tools, the least used are wearable technology/registration equipment/scanners, information visors and digital personal protective equipment.



Figure 4-7. Questions on using digital tools (supervisory personnel, n=20). Breakdown of responses, per cent

Three questions deal with changes to the working day over the past year. The introduction is as follows: "Has your workday changed during the last year as a result of:", and the breakdown of responses to the three sub-questions is presented in figure 4-8. For all three questions, the proportion of supervisory personnel experiencing changes in 2022 has increased when compared with the responses in 2020.



*Figure 4-8. Questions on changes to the working day (supervisory personnel, n=20). Breakdown of responses, per cent* 

# 4.4.3.2 Questions for divers only

The questionnaire distinguishes between two categories of diving job: saturation and surface-oriented. Respondents who say they hold one of these jobs have also had a separate batch of questions on safety-related behaviour (table 4-8), fairly similar to those put to supervisory personnel (see table 4-7).

The scale for responses runs from 1 (very rarely/never) to 5 (very often/always), and table 4-8 shows the proportion who responded in the two most negative categories. This means values 1 and 2 for most questions, but 4 and 5 when the questions have been worded positively – and these are then the percentages presented in the table.

Grey rows contain questions which are difficult to interpret. They incorporate an inherent assumption and are in practice "two questions in one", which makes it difficult to know what the respondent is actually responding to. This is unfortunate in a questionnaire, and these questions will be revised before the next survey.

The column after the questions explains how we have interpreted the relevant question and what is therefore presented in the subsequent columns (most of them negative). Results for 2018, 2020 and 2022 are shown first, followed by 2022 results broken down between saturation and surface-oriented divers. The asterisks in the final column mark significant differences between the two diver types. Asterisks in the 2022 column headed "all" indicate significant differences between the results in 2020 and 2022.

	Year	2018	2020	2022		
Questions (for divers only)	Which proportions are shown in the column	n=72	n=37	All (n=140)	Saturation (n=108)	Surface (n=32)
Did you report deviations from planned procedures?	Seldom/never reported deviations	47.8	66.7	56.0	54.6	60.7
Did time pressure make it hard to follow operational procedures?	Often/always difficult to follow	7.0	2.8	2.3	0.0	10*
Were the operational procedures relevant for your specific task?	Seldom/never relevant	9.8	5.7	8.1	8.4	6.9
Did it happen that procedures were not followed?	Procedures often/ always not followed	4.3	0.0	3.1	1.0	10.0
Did you dive even if dive equipment was not checked according to procedures?	Dived often/always, even if	2.8	0.0	0.0	0.0	0.0
Did you dive even if not all parts of your diving equipment were in proper condition?	Dived often/always, even if	1.4	0.0	0.0	0.0	0.0
Have you experienced a need for a break during a dive?	Have often/always needed a break	2.9	2.9	6.3	7.1	3.4
Have you asked for a break?	Have often/always asked for a break	4.2	0.0	1.6	1.0	3.3
Were you worried about your own safety during diving?	Often/always concerned	2.8	0.0	0.8	1.0	0.0
Before diving: Did you consider task briefings to be adequate?	Seldom/never considered relevant	11.5	2.9	6.3	6.2	6.5
Did you work with divers or diving personnel that you regarded as incompetent?	Worked often/ always with diving personnel who	7.0	5.8	2.3	3.0	0.0
Did you work with supervisors or support personnel that you regarded as incompetent?	Worked often/ always with supervisors/ personnel who	4.2	5.7	2.3	3.0	0.0
During a dive period, did you ask for medical assessment if you were unwell?	Have often/always asked for	4.3	2.9	3.9	3.1	6.7
Did you ask to be excused from diving if not well?	Have often/always asked to be excused	5.7	8.8	2.4	0.0	10.3
Did you break safety procedures in order to get things done?	Have often/always breached safety procedures	0.0	0.0	0.0	0.0	0.0
Have you declined an offshore dive period if not feeling well?	Have often/always declined	1.4	0.0	3.2	2.1	6.9

# Table 4-8. Safety-related behaviour during diving (divers, n=140). Proportion responding most negatively, per cent

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Figure 4-9 presents the breakdown of responses to the questions with the most negative answers in table 4-8, or where the difference between saturation and surface-oriented divers is greatest.

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Figure 4-9. Safety-related behaviour during diving (divers, n=140). Breakdown of responses, per cent (2020 and 2022)

The divers were asked how physically demanding they found their most recent dive period on the NCS, with answers running from 1 (very little demanding) to 5 (very demanding). While 40.9 per cent responded that it had been averagely demanding (3 on the scale), 42.5 per cent had found it very little or little demanding (1 or 2) and 16.5 per cent considered it fairly or very demanding (4 or 5).

Asked about their capacity for work, 92.6 per cent of the divers considered that their capability to handle unforeseeable emergencies to be good or very good. An equal proportion considered that their condition (physical/psychological/health) to be good or very good during their most recent dive period.

The batch of questions directed at divers alone also covered exposure to and dealing with pollution (oil spills, drilling mud, chemicals or produced water) during diving. The results of these questions are presented in figure 4.10. We can see from the breakdown of responses that the two final questions attracted the most negative assessments. These concern to what extent respondents receive information about the harmful effects of chemicals/pollution and how far priority is given to cleaning suits/umbilicals.





Breakdown of responses, per cent

# 4.4.4 Assessment of HSE climate

Everyone who completed the questionnaire, regardless of job category, was asked about a number of HSE conditions. These are similar to those in the other questionnaires completed by offshore personnel and employees at land-based facilities.

The questions are formulated as statements which the respondents express their view on using a scale from 1 (fully agree) to 5 (fully disagree). While 24 of the statements are worded so that agreement is positive, 16 are worded so that disagreement is positive. To make it easier to gain an overview of the results, we present the positive statements first (table 4-9) and then the negative (table 4-10). Finally, a number of the statements are present as part of *indices* – in other words, grouped by topic. See section 4.4.5 for these.

Table 4-9 shows how diving personnel (all) responded to the positively worded statements in 2018, 2020 and 2022. The columns show the proportion who gave responses in the most negative categories (partially/fully disagree). Asterisks indicate statistically significant differences between 2020 and 2022 in the breakdown of responses as a whole for the statement concerned.

Table 4-9. HSE climate. Positively worded statements (proportion who fully/partiallydisagree)

Year (number)	2018 (n=115)	2020 (n=70)	2022 (n=208)
Risk-filled operations are always carefully planned before they are begun	1.8	4.5	1.0
There is enough manning to properly safeguard HSE	12.7	21.2	9.4*
The management takes input from the safety delegates seriously	5.6	1.5	5.2
The work permit (WP) system is always adhered to	2.7	0.0	2.6
I can influence HSE matters at my workplace	3.6	4.5	6.7
Information about undesirable incidents is used efficiently to prevent recurrences	9.1	6.2	5.6
My manager appreciates me pointing out matters of importance to HSE	5.4	10.5	4.2*
My colleagues will stop me if I work unsafely	0.0	6.0	1.0
The emergency preparedness is good	2.7	3.0	1.0
The company I work for takes HSE seriously	0.9	0.0	3.7
My supervisor is committed to the HSE work on the vessel	1.8	0.0	2.1
It is easy to tell the nurse/company health service about complaints and illnesses that might be work-related	5.6	9.0	12.0
My colleagues are very committed to HSE	0.9	0.0	1.0
The safety delegates do a good job	4.6	4.5	1.6
I think it is easy to find what I need in the governing documents (requirements and procedures)	9.1	13.4	3.1*
I have been given adequate training of working environment factors (e.g. chemicals, noise, ergonomics)	1.8	3.0	4.1
I am thoroughly familiar with the procedures and instructions regarding my work	-	1.5	0.5
My colleagues have the necessary competence to perform their job in a safe manner	-	4.6	3.6
I feel sufficiently rested when I am at work	12.0	28.3	14.4

Year (number)	2018 (n=115)	2020 (n=70)	2022 (n=208)
I have been informed of the risks of the chemicals I work with	7.4	7.5	4.6
I have been informed of the risks associated with noise	6.5	7.5	7.7
When I arrive at a new vessel, there is enough time for me to familiarise with everything I need to know to do a good job	-	24.2	17.2*
I have access to the information necessary to make decisions which ensure the HSE aspect	5.5	0.0	4.2
I have easy access to procedures and instructions concerning my work	1.8	3.0	2.6

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Comparing responses between different years, we see some improvement for statements where many respondents checked "partially/fully disagree" in 2020. Despite this positive trend in the results, attention still needs to be paid to these statements. An example is "When I arrive at a new vessel, there is enough time for me to familiarise with everything I need to know to do a good job". In 2020, 24.2 per cent disagreed fully or partially, compared with 17.2 per cent in 2022 (a significant change for the question as a whole). The proportion disagreeing fully or partially with the statement "I feel sufficiently rested when I am at work" came to 28.3 per cent in 2020, compared with 14.4 per cent two years later. An improvement was also noted for the statement "There is enough manning to properly safeguard HSE", but more respondents disagreed that "It is easy to tell the nurse/company health service about complaints and illnesses that might be work-related".

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% There is enough manning to properly safeguard HSE 2020 24.2 2022 8.9 7.81.6 It is easy to tell the nurse/company health service about complaints and illnesses that might be work-... 2020 26.9 9.0 6.0**B.0** 2022 I feel sufficiently rested when I am at work 2020 10.4 2022 36.1 11.9 9.8 4.6 When I arrive at a new vessel, there is enough time for me to familiarize with everything I need to know ... 2020 13.6 2022 28.8 15.2 12.0 5.2 ■ Fully agree ■ Partially agree ■ Netiher agree nor disagree ■ Partially disagree ■ Fully disagree

Figure 4-11 presents the statements which had particularly negative scores in 2022 and their breakdown compared with 2020.

*Figure 4-11. Breakdown of responses to a selection of positively worded HSE statements, 2020 (n=70) and 2022 (n=208), per cent* 

Results for the negatively worded statements are presented in table 4-10. Asterisks indicate statistically significant differences between 2020 and 2022 (from the response breakdown as a whole for the statement concerned).

*Table 4-10. HSE climate. Negatively worded statements (proportion fully/partially agreed)* 

Year (number)	2018 (n=115)	2020 (n=70)	2022 (n=208)
At times, I am pressured to work in ways that threaten safety	12.6	7.6	11.8
I feel uncomfortable pointing out breaches of safety rules and procedures	26.1	17.9	26.4
I sometimes breach safety rules in order to get a job quickly done	8.1	10.6	10.8
In practice, production takes priority over HSE	22.5	19.4	23.8
Being too preoccupied with HSE can be a disadvantage to your career	29.6	33.3	18.8
Communication between me and my colleagues often fails in a way that may lead to dangerous situations	9.1	9.0	7.7
I would rather not discuss HSE with my immediate supervisor	4.5	6.0	6.3
Deficient maintenance has caused poorer safety	33.3	24.6	18.3
I doubt that I will be able to perform my emergency preparedness tasks in case of an emergency	6.4	4.5	5.7
There are often simultaneous work operations which lead to dangerous situations	15.0	19.4	14.0
Reports about accidents or dangerous situations are often moderated	30.2	38.8	25.8*
Lack of cooperation between operators and contractors often leads to dangerous situations	36.2	31.3	20.5
There are different procedures and routines for the same matters on different vessels and this poses a threat to safety	36.3	35.8	24.7
I feel peer pressure which affects HSE assessments	13.2	7.6	13.2
Dangerous situations arise because everyone does not speak the same language	31.8	31.3	21.7
I experience a pressure not to report personal injuries or other incidents which may "mess up the statistics"	9.3	19.4	20.3

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Statements receiving the most negative results are broken down in figure 4-12. The statement "I feel uncomfortable pointing out breaches of safety rules and procedures" receives particularly negative evaluations, with 26.4 per cent fully or partially in agreement. That is a higher proportion than in 2020 and accordingly represents a negative trend. Furthermore, 25.8 per cent agree fully or partially with the statement that "Reports about accidents or dangerous situations are often moderated", which is a significant improvement from 2020. Another statement revealing improvement is "There are different procedures and routines for the same matters on different vessels and this poses a threat to safety". Although the proportion who fully or partially agree with this statement is lower than in 2020, 24.7 per cent is a high figure. Viewing the results in table 4-10 in relation to those shown in table 4-8 and figure 4-9 in the previous chapter is recommended, since these deal with some of the same subjects (procedures and routines).



*Figure 4-12. Breakdown of response to a selection of negatively worded HSE statements, 2020 (n=70) and 2022 (n=208), per cent.* 

# 4.4.5 Indices for the HSE climate

To provide a simpler overview of the HSE climate results, six indices have been created from grouping statements by subject.<sup>1</sup> Not all the statements are included in an index. These indices are also used in the other RNNP reports (for offshore and land-based facilities).

Table 4-11 shows the results for the indices in 2018, 2020 and 2022. The figures in the table represent the proportion of respondents with a negative view of the statements, based on responses to the questions included in that index. For example, 14.4 per cent of the sample experience conflicting goals to a greater extent.

<sup>&</sup>lt;sup>1</sup> The indices have been tested for Cronbach's Alpha values, which indicate whether the statements are well-suited collectively to express a common view. Ideally, the indices should have a Cronbach's Alpha value of >0.7, but it can be challenging to obtain a high value since the index comprises few questions. Where diving personnel are concerned, the Alpha values vary from 0.440 to 0.760 (2020) and from 0.568 to 0.811 (2022).

### Table 4-11. HSE indices. Proportion responding most negatively

Scale 1 (positive score) – 5 (negative score)	2018 (n=115)	2020 (n=70)	2022 (n=208)
Management engagement 1) The management takes input from the safety delegates seriously, 2) My manager appreciates me pointing out matters of importance to HSE, 3) My supervisor is committed to the HSE work on the vessel	4.9	1.5	0.5
<b>Engagement by colleagues</b> 1) My colleagues will stop me if I work unsafely, 2) My colleagues are very committed to HSE, 3) The safety delegates do a good job	0.0	1.5	0.5
<b>Engagement by the organisation</b> 1) Risk-filled operations are always carefully planned before they are begun, 2) The work permit (WP) system is always adhered to, 3) Information about undesirable incidents is used efficiently to prevent recurrences, 4) The emergency preparedness is good, 5) The company I work for takes HSE seriously	0.9	0.0	0.5
<b>Conflicting goals</b> 1) At times, I am pressured to work in ways that threaten safety, 2) I sometimes breach safety rules in order to get a job quickly done, 3) In practice, production takes priority over HSE, 4) I feel peer pressure which affects HSE assessments	13.3	6.3	14.4
<b>Collaboration and communication</b> 1) Communication between me and my colleagues often fails in a way that may lead to dangerous situations, 2) There are often simultaneous work operations which lead to dangerous situations, 3) Lack of cooperation between operators and contractors often leads to dangerous situations, 4) There are different procedures and routines for the same matters on different vessels and this poses a threat to the safety, 5) Dangerous situations arise because everyone does not speak the same language	21.9	22.4	13.1
Climate for speaking out 1) I feel uncomfortable pointing out breaches of safety rules and procedures, 2) Being too preoccupied with HSE can be a disadvantage to your career, 3) I would rather not discuss HSE with my immediate supervisor, 4) Reports about accidents or dangerous situations are often moderated, 5) I experience a pressure not to report personal injuries or other incidents which may "mess up the statistics"	16.7	19.7	16.7

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Figure 4-13 presents the differences between the 2020 and 2022 results for the HSE climate indices. The bars indicate the proportion of respondents who have responded negatively in the index as a whole. The way the statements are worded (positive or negative slant) has some effect on how "easy" it is to agree or disagree with them. Indices comprising statements with positive wording therefore have a smaller proportion giving a negative response than ones with negative wording. The scale accordingly differs very considerably for the first three indices compared with the final three.



*Figure 4-13. HSE indices. Comparison between 2020 and 2022. All diving personnel. Proportions responding negatively to the index as a whole.* 

Figure 4-13 shows that five of six HSE indices are considered more positive in 2022 than in 2020, but that the difference between indices 2-4 is in reality small (from 1.5 per cent negative to 0.5 per cent negative). More respondents take a more negative view of the *conflicting goals* index in 2022 (14.4 per cent) than in 2020 (6.3 per cent). The trend for the *climate for speaking out* index is positive, but 16.7 per cent still take a negative view of this in 2022.

# 4.4.6 Physical, chemical and ergonomic working environment

The questionnaire asked about working environment exposures and how often respondents are affected by these. Figure 4-14 presents the breakdown in responses concerning these exposures. Looking at those who have checked "rather often/very often or always", we see that "cold areas exposed to the weather" and "heavy manual lifting" are the categories most of them are exposed to. These two conditions also have a large proportion who respond "sometimes". Many experience vibration and skin exposure to hazardous substances sometimes, and both categories have a higher proportion experiencing exposure to them in 2022 than in 2020.



Figure 4-14. Breakdown of responses on the physical, chemical and ergonomic working environment. Per cent

# 4.4.7 Psychosocial and organisational working environment

Respondents were also asked about psychosocial and organisational aspects of the working environment. Questions are worded both positively and negatively, and the results are accordingly presented in two figures. Figure 4-14 shows the breakdown of response to questions with a negative wording, and where frequent experience of these conditions is negative. Although small proportions find the shift arrangement a strain "rather often/very often or always", many (31.4 per cent) do so sometimes. The same applies to experiencing that their work requires so much attention that it is a strain (32.1 per cent).



*Figure 4-15. Breakdown of responses to questions on the psychosocial and organisational working environment (negative wording). Per cent* 

Results for the questions with positive wording are presented in figure 4-15. The wording means that frequently experiencing what the question describes is positive. We find the most negative results for the final three questions in figure 4-15. All these questions concern a form of employee participation or autonomy at work. While 15.5 per cent say that they can "very seldom or never" influence the way they do their work, 34.6 per cent say "sometimes". Seldom or never is the response of 11.3 per cent to the question of whether they can influence decisions important for their work, while 38 per cent respond that they "sometimes" have this opportunity.



Figure 4-16. Breakdown of responses to questions on the psychosocial and organisational working environment (positive wording). Per cent

Other questions about the working environment deal with support, collaboration and feedback from the respondent's superior. Responses to these questions are broken down in figure 4-16. For 2022, this breakdown shows that more respondents get support "rather often/very often or always" from colleagues (77 per cent) than from their immediate superior (64 per cent). The most positive assessment is given for the climate of cooperation in the work unit, which 81.7 per cent say they perceive as encouraging and supportive "rather often/very often or always".



■Very rarely or never ■Quite rarely □Sometimes □Quite often ■Very often or always

Figure 4-17. Breakdown of responses to questions on support, collaboration and feedback in the working environment

Like the HSE questions, those on the psychosocial and organisational working environment are divided into topics – *indices*. These provide an overview of various conditions in the working environment. The five indices are presented in table 4-12, which also shows the questions grouped in each index.

### Table 4-12. Overview of working environment indices

Scale 1 (positive score) – 5 (negative score)

#### Job demand

1) Does your work require so much attention that you find it a strain? 2) Do you have so many tasks that it becomes hard to concentrate on each one?

#### Job control

1) Can you set your own work speed? 2) Can you influence decisions which are important to your work? 3) Can you influence the way you perform your work?

#### Support from management

1) Does your immediate supervisor help and support you in your work if you need it? 2) Does your immediate supervisor give you feedback on your work performance?

#### Support from colleagues

1) Do your colleagues help and support you in your work, if you need it? 2) Do you feel that the cooperation climate in your work unit is encouraging and supportive?

#### Worktime strain

1) Do you work so much overtime that it is a strain? 2) Do you get sufficient rest/recreation between work days?

Figure 4-17 presents the proportion of employees who responded negatively to the working environment indices in 2020 compared with 2022. The trend is negative for the *control over the job* index, which more respondents assess negatively in 2022 (18.9 per cent). Group differences in the indices will be presented in section 4.4.10.



*Figure 4-18. Working environment indices, proportion of negative responses in 2020 and 2022.* 

In earlier years, the questionnaire has requested assessments of food/drink quality, cabin and chamber conditions, and exercise and other recreational opportunities. These questions have now been replaced with a new one question: "How satisfied are you with the accommodation conditions on the vessel?" A total of 80.7 per cent are satisfied or very satisfied, while only 4.7 per cent are dissatisfied.

## 4.4.8 Sleep and rest

Five questions deal with sleep and opportunities for rest. The results for these are presented in table 4-13, which shows an improvement from 2020 in sleep quality at sea and after a tour offshore. However, more respondents fail to sleep well before an offshore tour and the proportion who must very often or always share a cabin has risen from 2020 to 2022.

Table 4-13. Sleep and rest. Most negative assessments (1=very often/always, 5=very seldom/never)

Year (number)	2018 (n=115)	2020 (n=70)	2022 (n=208)
I sleep well when offshore	5.3	13.4	6.8
I sleep well the last few nights before going offshore	23.8	28.8	31.6
I sleep well the first few nights after an offshore tour	20.0	40.3	34.2
I have a problem with noise when sleeping offshore	9.0	14.9	13.2
I must share cabins with others when I sleep	19.3	25.4	30.7

Sleep quality can be related to the type of shift arrangement a person is on. Figure 4-18 presents a breakdown of responses by the extent of sleeping well offshore in relation to the type of shift arrangement specified earlier in the questionnaire. Those on a permanent day shift have the best sleep quality, while those on permanent night shift are least able to sleep well offshore.

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# *Figure 4-19.* "I sleep well when offshore" responses broken down by type of shift arrangement. Per cent

The survey contains a question about overtime, and fewer respondents in 2022 say that they have had to work more than 16 hours a day (15.1 per cent) than in 2020 (25.4 per cent). Fewer also say they have been woken up in their free time to do a work task (nine per cent as against 17.9 per cent). The proportion saying they have an additional job on land is more or less unchanged, at 29.9 per cent in 2020 and 27.6 per cent in 2022.

### 4.4.9 Health and sickness absence

No less than 91.2 per cent of respondents consider their own health to be good (48.2 per cent) or very good (43 per cent). Only 0.5 per cent consider it to be poor.

# 4.4.9.1 Health complaints

The survey contains a question covering a number of health complaints which respondents might experience, both in general and related to their occupation. The wording is: "Over the last three months, have you been troubled by any of the following:", followed by a list of 24 complaints. Each of these was to be assessed on a scale of 1 (not troubled) to 4 (very troubled). The table shows how many per cent have responded that they are quite (3 on the scale) or very (4) troubled by each complaint.

In addition to specifying how troubled they are, respondents were also asked to indicate whether they felt their symptoms were fully or partially job-related. The final column in table 4-14 shows how many of *everyone with a complaint* (ie, categories 1-4) regarded the complaint as job-related. It is worth noting that a few responses can have big percentage effect in the final column (if eight people have a complaint, for example, and two feel it is job-related, the proportion becomes 25 per cent).

			2022			
Health complaint	2018 (n=115)	2020 (n=70)	All (n=208)	Divers (saturation) (n=108)	Divers (surface) (n=32)	Job-related (per cent) (n=208)
Reduced hearing	1.8	7.4	2.1	4.1	0.0	42.4
Ringing in the ears/ tinnitus	4.5	10.3	5.2	3.0	10.0	51.3
Other ear problems	0.0	6.1	1.0	1.0	0.0	52.9
Feeling exhausted	4.5	7.5	6.8	6.2	6.7	33.9
Vertigo	0.0	0.0	0.5	0.0	3.4	33.3
Nausea	0.9	3.0	0.5	0.0	0.0	16.7
Feeling unwell	0.9	0.0	0.5	0.0	0.0	5.7
Anxiety	2.7	4.5	5.3	6.2	0.0	60.0
Itching	2.7	9.0	2.7	1.0	0.0	54.2
Tingling or numbness	0.0	1.5	1.1	0.0	0.0	37.5
Teeth problems	0.0	0.0	2.6	0.0	0.0	18.8
Joint discomfort	4.5	9.0	5.9	5.3	0.0	49.0
Headache	2.7	6.0	2.6	3.1	0.0	43.6
Neck/shoulder/arm pain	7.3	10.4	8.0	8.3	0.0	54.8
Back pain	4.5	12.1	5.3	1.0	6.7	48.2
Knee/hip pain	1.8	7.5	3.6	2.0	0.0	51.2
Eye problems	1.8	6.0	3.1	1.0	0.0	33.3
Skin complaints	3.6	1.5	3.7	2.1	0.0	53.6
White fingers	0.0	0.0	1.6	1.0	0.0	33.3
Allergic reactions/ hypersensitivity	0.0	0.0	0.5	0.0	0.0	28.6
Stomach/bowel problems	1.8	3.0	1.6	0.0	0.0	23.8
Respiratory problems	0.0	0.0	0.5	0.0	0.0	14.3
Cardiovascular problems	0.0	1.5	1.0	0.0	0.0	25.0
Psychological problems	2.7	4.5	5.8	6.2	0.0	72.7

Table 4-14. Health complaints. Percentages responding "quite troubled" and "verytroubled", and who feel their complaints are job-related

Figure 4-19 presents a detailed breakdown for seven health complaints. These are chosen because they have the highest proportion of respondents who are "quite" or "very troubled" (viewed overall). This figure also distinguishes between the two diver types in order to show the breakdown of response between them. No surface-oriented divers, for example, are affected by ringing in the ears/ tinnitus, anxiety or psychological problems, but have a higher incidence of exhaustion and back pain. Varying work tasks could help to explain the differences between these groups. In section 4.4.1, on characteristics of the sample, we noted that age composition varies greatly between saturation and

surface-oriented divers. That could also contribute to the different results we see for health complaints when the two groups are viewed separately.



# *Figure 4-20. Complaints reported by the largest proportion of respondents. Breakdown by responses, per cent.*

### 4.4.9.2 Sickness absence and injuries

When asked about absence from work, 89.6 per cent say they have not been away from work because of illness over the past year, down from 94 per cent in 2020. The remainder have been absent 1-14 days (7.8 per cent) and more than 14 days (2.6 per cent). By nationality, short-term absence (1-14 days) is lowest for British personnel.

The 2.2 per cent reporting that they have been injured in a work accident has declined from 4.6 per cent in 2018 and 3.2 per cent in 2020.

# 4.4.10 Differences between groups

This chapter will compare results between groups, using indices not only for HSE climate but also for questions related to the working environment and health. In other words, these indices are based on results already presented earlier in this chapter. Indices for HSE are presented in table 4-11 (section 4.4.5) and for the working environment in table 4-12. An overview of the sleep and health indices is provided in table 4-15.

### Table 4-15. Overview of health indices

Scale 1 (positive score) – 5 (negative score)
<b>Quality of sleep</b> 1) I sleep well when offshore, 2) I sleep well the last few nights before going offshore, 3) I sleep well the first few nights after an offshore tour
Hearing complaints 1) Reduced hearing, 2) Ringing in the ears/ tinnitus, 3) Other ear problems
Muscular complaints

1) Neck/shoulder/arm pain, 2) Back pain, 3) Knee/hip pain

It is often desirable to divide a sample into various sub-groups (based, for example, on age, education and so forth) in order to learn more about correlations in the data. Not all such breakdowns are possible for diving personnel, because the sample size is so small. As in section 4.4.3 above, we make comparisons in this section not only between the type of diving personnel (divers and supervisory personnel), but also between all diving personnel in the various years, as in the preceding tables.

Figure 4-20 presents the results for the HSE indices for divers (n=140) and supervisory personnel (n=20). Because the latter group is so small, caution must be shown in over-comparing the differences. As we see in figure 4-20, none of the supervisory personnel and very few of the divers assess indices 2-4 negatively. The differences are greater with indices where the statements are negatively worded (and it is easier to respond positively). A larger proportion of the divers than the supervisory personnel assess indices 2-4 negatively, and the largest proportion of negative assessments is for the index on *climate for speaking out* at 16.7 per cent.





*Figure 4-21. HSE indices, 2022. Comparison of divers and supervisory personnel. Proportions responding negatively in the overall index* 

Figure 4-22 presents results for the working environment indices and those for sleep and health, broken down by divers (n=140) and supervisory personnel (n=20). It shows that more supervisors than divers take a negative view of the index for *demands of the job*, while the opposite applies to the *control over the job* and *quality of sleep* indices.



*Figure 4-22. Working environment indices. Comparing divers and supervisory personnel. Proportions responding negatively in the overall index* 

Figure 4-23 presents results for two indices on health complaints – hearing problems and musculo-skeletal complaints respectively. Both are based on three questions (see table 4-15), and the proportions are those where the mean lies at "quite" or "very troubled".

As shown in figure 4-23, the proportion with health complaints is smaller for divers than for supervisors. Bear in mind that the latter group is small and has a higher average age than the divers.



*Figure 4-23. Health indices, 2022. Comparison of divers and supervisory personnel. Proportions responding negatively in the overall index* 

# 4.5 Summary

The 2022 diving survey has a larger number of respondents than in earlier years, and this is positive. It could be because the exercise has become better known and follow-up from the diving companies along the way has therefore improved. The rise in responses could also reflect a generally high level of diving activity in 2022, which increased the population (number of personnel). More respondents provide better information and make it easier to establish sub-categories such as saturation and surface-oriented divers.

This survey can still be regarded as fairly new, and we see that some of the diver-specific questions do not function so well or fail to pick up what was sought. The questionnaire for diving personnel is therefore likely to undergo a revision before the next survey is circulated. This process has also been the one used with the RNNP questionnaire-based surveys for personnel offshore and at land-based facilities, and is a natural one. However, it makes year-by-year comparisons a little challenging initially. A methodological balance must always be struck between retaining questions or their wording in order to be able to measure trends over time and retaining/amending them to improve the quality of the information collected. These assessments are made through a collaboration between technical specialists and statisticians.

Where the composition of the sample (respondents) is concerned, 2022 differs somewhat from earlier years. The average age of participants has declined from 2020, but the age range is wide. Supervisory personnel are older than divers, and saturation divers are older on average than surface-oriented ones. Many have relatively little experience of diving on the NCS, and a number have low seniority. Fewer than a 10th of respondents are Norwegians, and British citizens continue to provide the bulk of the sample. Few are permanently employed and day rate is the commonest form of contract. Divers (saturation and surface-oriented) represent two-thirds of all respondents, and it has been possible to compare results between the two groups. Those categorised as supervisory personnel comprise a very small group (20 people), and caution should therefore be exercised when making comparisons between them and divers.

# 4.5.1 Results from diver-specific questions

Results from the diver-specific questions show that working environment factors on the NCS are generally regarded as positive, but that differences exist between assessments by divers and supervisory personnel. The former are more positive than the latter, which could reflect the stricter Norwegian diving regulations. They create less demanding working conditions than on other continental shelves which permit longer dive periods.

Perceived risk for most diver-specific hazards is lower in 2022 than in 2020. Viewing the divers as two groups, however, we find a number of differences in assessments between saturation and surface-oriented divers. A high perceived risk (in general) relates to work inside structures, external factors (wave heights, currents and visibility), human errors during diving operations, and failures in automated control systems during dives.

Results for questions put to supervisory personnel only and related to diving operations on the NCS over the past 12 months reveal that the most challenging questions are:

- did you ask the divers whether they needed a break during the dive?
- did you have to follow procedures you feel should be done differently?
- did you experience time pressure during diving operations?
- did you work with divers that you are not relying on?

Where safety-related behaviour is concerned (divers only), we find the biggest challenges relate to the following questions:

- were the operational procedures relevant for your specific task?
- did you report deviations from planned procedures?

Furthermore, two questions related to exposure in the work situation received fairly negative assessments overall. Where the second is concerned, assessments by surface-oriented divers were more negative than for saturation divers:

- do you receive information of potential harmful effects of chemicals?
- is cleaning of the suit/umbilical/equipment given priority?

## 4.5.2 Results from comparable RNNP questions

Results from questions which are comparable with those asked in the other RNNP questionnaires deal with the HSE climate, the working environment, health and rest.

The HSE climate has been measured with the aid of a number of statements worded either negatively or positively. We have opted to highlight the three statements in each group which indicate the biggest challenges (negative assessments). The change from 2020 to 2022 is shown in brackets, but we would note that only 70 people responded in 2020 and this should not be emphasised overmuch.

- There are different procedures and routines for the same matters on different vessels and this poses a threat to the safety (virtually the same/negative trend)
- Reports about accidents or dangerous situations are often moderated (positive trend)
- I feel uncomfortable pointing out breaches of safety rules and procedures (negative trend)
- When I arrive at a new vessel, there is enough time for me to familiarise with everything I need to know to do a good job (positive trend)
- It is easy to tell the nurse/company health service about complaints and illnesses that might be work-related (negative trend)
- I feel sufficiently rested when I am at work (positive trend)

The diver sample has been asked how troubled they have been by 24 different health complaints over the past three months. A general improvement has occurred since 2020 for seven of the most widespread complaints (fewer who are a little, quite or very troubled). However, the proportion who relate their complaint(s) to their work situation has risen for five of these, as indicated in brackets. The most widespread complaints in 2022 are:

- ringing in the ears/tinnitus
- feeling exhausted
- anxiety (increase in work-related)
- joint discomfort (increase in work-related)
- neck/shoulder/arm pain (increase in work-related)
- back pain (increase in work-related)
- psychological problems (increase in work-related).

Where the physical, chemical and ergonomic working environment is concerned, both noise and vibration and skin exposure to chemicals and the like are on the list of challenging issues. The most negative assessments (things often experienced) relate to:

- do you work in cold areas exposed to the weather?
- do you do heavy manual lifting?

As with the HSE climate, questions concerning the psychosocial and organisational working environment are worded either positively or negatively. We have selected the two most negatively-worded statements (often experienced by most respondents) and four positively-worded (fewest who experience it often). The common denominator for the chosen statements is that each is the most negatively assessed in their category. Questions with the most negative results are:

- does your work require so much attention that you find it a strain?
- do you find the shift arrangement a strain?
- can you influence the way you perform your work?
- can you influence decisions which are important to your work?
- do you get sufficient rest/recreation between work periods?
- does your immediate supervisor help and support you in your work if you need it?

Other results show that the vast majority of respondents to the diving survey regard their health as good or very good. Sickness absence was somewhat higher than in 2020, but the proportion injured in a work accident declined. The quality of sleep offshore is considered to be better than in 2020, but more respondents say they must share a cabin with others when sleeping.

We will now draw some parallels between the diving survey and the 2021 survey of offshore personnel in order to give an impression of how results from the two compare. Since the sample sizes, group compositions and general working conditions are different, caution must be exercised when comparing the diver sample with the rest of the offshore workforce and drawing conclusions. Generally, we can say that the 2021 RNNP questionnaire-based survey (offshore personnel) showed a negative trend in a number of HSE climate and working environment areas. We do not see this clearly negative development in the 2022 diving survey.

Diving personnel generally give more positive responses than offshore workers in indices for the HSE climate (in other words, a smaller proportion responded negatively to these). Offshore and diving personnel are more or less the same on the *climate for speaking out*. In the case of offshore personnel, *conflicting goals* stood out as the index with the biggest negative trend. This was also the only index assessed negatively by a larger proportion of diving personnel than in the 2020 survey.

Where working environment indices are concerned, results from divers for *demands* of *the job* and *management support* appear to have improved. However, these indices are not directly comparable with those used offshore because one question is missing in each. Divers experience a lower degree of control at work but report a poorer quality of sleep than offshore personnel.

Looking at health complaints, we find that divers experience fewer of those related to hearing and musculo-skeletal conditions than offshore workers. However, the diving index for hearing complaints contains one more question for diving personnel than for the other workers, and is therefore not directly comparable.