G+ Global Offshore Wind Health and Safety Organisation

2022 incident data report

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Health & Safety
Organisation

www.gplusoffshorewind.com

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Contents

Introduction from the chair:

In my final year as G+ Chairperson I am more convinced than ever of the value of the G+ global incident data report. Unlocking and sharing data is the key to creating a safer and healthier offshore wind energy sector. The 2022 annual incident data report provides a comprehensive global overview of the health and safety incidents that occurred across member construction, operation, and development sites.

In 2022, we saw a significant increase in the number of hours worked. A record-breaking 44.6 million hours worked represented a 38% increase on the previous year. Despite this increase, we are delighted to report that both the Total Recordable Injury Rate (TRIR) and Lost Time Injury Frequency (LTIF) have continued on a downward trajectory. The TRIR, which measures the number of injuries per million hours worked, has fallen from 5.52 in 2016 to 2.82 in 2022. Similarly, the LTIF, which measures the frequency of injuries resulting in lost work time, has also decreased over the years, falling from 1.98 in 2016 to 1.03 in 2022. Overall, we are pleased with the progress we have made in improving safety practices over the years. The decreasing TRIR and LTIF rates are a testament to the effectiveness of the safety measures being put in place by our industry. Of particular note is that, compared with the 2021 data, there was a 69% decrease in the number of Emergency Response and Medical Evacuation (ERME) incidents, from 62 in 2021 to 19 in 2022, which, given the increase in hours reported, is a significant decrease.

However, there is still more to be done. The data shows that there was a total of 225 high potential incidents recorded in 2022, which is a 10% increase on the previous year. Most of these incidents occurred during the operation phase, with turbines and vessels being the two areas with the highest number of high potentials. Once again, lifting operations accounted for the highest number of incidents throughout the year. The work process incidents witnessed a significant increase of 21%, with 119 incidents reported compared to 94 incidents in 2021. It is, however, noteworthy that there was a 30% decrease in the number of incidents occurring during lifting operations occurring in the nacelle when compared with 2021 figures. Also, one of the key areas of focus in this report is manual handling, where incidents were again the second-highest work process in 2022. Although this is a 9% decrease from the previous year, it is still higher than the incidents reported in 2020. The work programme of the G+ will continue to address these areas as we strive to improve safety performance across the whole industry.

The data presented in this report is based on our commitment to transparency and accountability, and we hope that it will serve as a valuable resource for the offshore wind industry and that it will help us to continue to improve our health and safety practices in the years to come.

Jakob Nielsen
Chair - G+ Global Offshore Wind Health and Safety Organisation

Overview of G+ member sites

The G+ requires its member companies to provide incident data on a quarterly basis, which is then subject to anonymisation for analysis by the Energy Institute and widely reviewed and scrutinised by industry experts. The resulting report is then published each year for public use. In addition, throughout the year, quarterly reports are issued to the G+ Board and Focal Groups for in-depth examination and analysis. These reports are used to identify key risk areas, which are then incorporated into the G+ work programme.

To further enhance the analysis process, Deep Dive data meetings are held quarterly, bringing together the collective expertise of G+ member companies to scrutinise industry performance and determine specific areas of focus and attention. An annual data reporting review meeting is also held to assess the overall process and identify opportunities for improvement.

To continually improve the process, the template used for data collection is reviewed, streamlined, and enhanced each year in line with industry feedback. A full list of the incidents included in the G+ report, which includes information submitted by G+ members and associates, is published on the G+ website, through PowerBI. In 2022, the G+ received data from Europe, Asia (South Korea and Taiwan) and the United States of America.

Figure 1: G+ Member sites

2022 highlights

2022 Key facts and figures

Key facts

868 Reported incidents and injuries[1]

Distributed in the following areas as follows:

325 Incidents occurred on **vessel**[4]

298 Incidents occurred in a **turbine**[6]

185 Incidents occurred **onshore**[8]

The incidents include:

0 Fatalities

46 Total **lost work day** injuries

19 Incidents resulting in **Emergency Response and Medical Evacuation**

36 Restricted Workday Injuries

44 Medical treatment injuries

Top three work process are:

119 Incidents during **Lifting operations**[2]

67 Incidents during **Manual handling**

58 Incidents during **Access/egress**

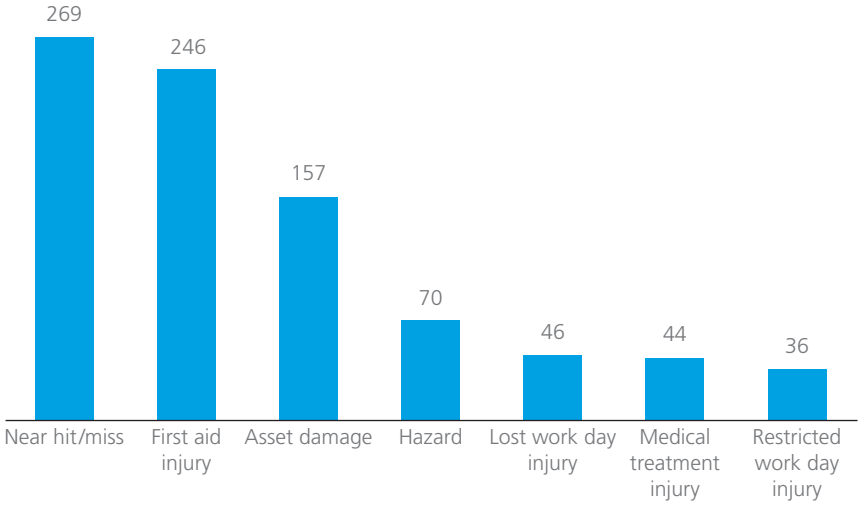


Figure 2: 2022 Incidence Consequence Summary

[1] Throughout this report, injuries will denote the number of injured people, and incidents will denote the number of occurrences that led to, or potentially led to, an injury. Injuries are defined as a person requiring first aid, medical treatment, restricted workday, or lost workday.

[2, 3, 4, 5, 6, 7, 8] See Annex A for the definitions of these terms.

Safety statistics for 2022[9]

	2016	2017	2018	2019	2020	2021	2022
*Hours Worked	21 726 000	26 815 000	25 359 000	22 374 000	25 318 000	32 342 000	44 640 000
Fatalities	0	0	0	0	0	0	0
Lost work day injuries	43	49	39	62	43	50	46
Restricted work day injuries	35	30	34	23	30	22	36
Medical treatment injuries	42	78	45	38	22	34	44
Total	120	157	118	123	95	106	126
Total recordable injury rate (TRIR)	5.52	5.85	4.65	5.50	3.75	3.28	2.82
Lost time injury frequency (LTIF)	1.98	1.83	1.54	2.77	1.70	1.55	1.03

In 2022, the number of hours worked saw a significant increase, with a record-breaking 44.6 million hours worked. This is a 38 % increase from the previous year. The TRIR and LTIF have both continued on a downward trajectory in 2022.

The TRIR, which represents the number of injuries per million hours worked, has fallen from 5.52 in 2016 to 2.82 in 2022. Similarly, the LTIF, which measures the frequency of injuries resulting in lost work time, has also decreased over the years, falling from 1.98 in 2016 to 1.03 in 2022.

While there was an increase in the number of restricted work day injuries in 2022, with 36 reported cases, the number of injuries resulting in lost work days decreased from 50 to 46. The number of medical treatment injuries also increased in 2022 to 44 cases, up from 34 in the previous year.

Overall, the numbers indicate that significant progress has been made in improving safety practices over the years, with decreasing TRIR and LTIF rates indicating that the safety measures implemented are effective; however, there is still room for improvement.

TRIR

The number of recordable injuries (fatalities + lost workday injuries + restricted workday injuries + medical treatment injuries) per 1 000 000 hours worked.

LTIF

The number of recordable injuries (fatalities + lost workday injuries) per 1 000 000 hours worked.

*Hours worked rounded up to the nearest 10 000

[9] Safety statistics before 2019 reflect the number of incidents, not injuries.

High potential incidents and injuries

Across all offshore wind farm sites globally, there was a total of 225 high potential incidents recorded. Compared to the 2021 data, the total number of high potential incidents increased by 10 % from 204. Most of the incidents occurred during the operation phase (125 incidents). The construction phase had 85 incidents recorded, and the development phase had 15 incidents recorded.

Turbines and vessels were the two areas with the highest number of high potential incidents, with 91 and 78 incidents, respectively. Specifically, the turbine area in operation sites had 73 high potential incidents as compared to 18 in construction sites.

While there was a slight decrease in the number of total high potential incidents occurring in turbine area from 97 in 2021 to 91 in 2022, there was a significant increase in the number of incidents reported in vessel areas. The number of high potential incidents in the vessel areas increased by 59 % year-on-year, from 49 in 2021 to 78 in 2022 across all site types.

These incidents resulted in several consequences. The number of near hit/miss incidents increased from 82 in 2021 to 98 in 2022, whereas the number of incidents of reported hazard decreased from 80 in 2021 to 70 in 2022. Of concern is the increase in restricted work day injuries and asset damage. Asset damage high potential incidents increased from 14 in 2021 to 27 in 2022 which represents a 97 % increase, whereas restricted work day injuries increased from 0 in 2021 to 4 in 2022.

Overall, while the number of high potential incidents has increased slightly in 2022, the efforts undertaken by G+ members to improve work processes have shown some success. However, there are still areas for improvement, such as working with electrical systems and hand/power tools; the G+ continues to work on these topics with active workstreams in both, through the management of the Wind Turbine Safety Rules and a hand injuries working group. It should be noted that high potential incidents do not necessarily result in actual injuries.

G+ has been sharing learnings from high potential incidents with the global energy industry via Toolbox to facilitate learning from incidents and help improve safety. The G+ has also established Focal Groups in different regions to share knowledge and experience and to enable new markets to avoid incidents which occurred during the early stages of the offshore wind industry in Europe.

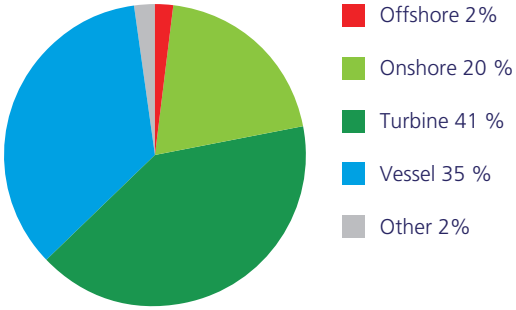
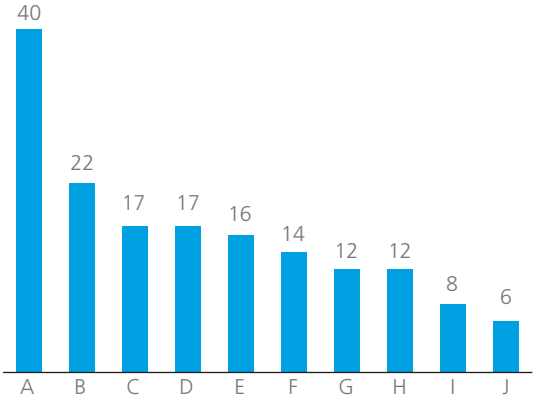


Figure 3: High potential incidents and injuries – area summary

Figure 4: High potential incidents and injuries

High potential incidents and injuries (continued)



Key	
A	Lifting operations
B	Electrical systems (working with)
C	Access/egress
D	Vessel operation (including jack-ups and barges)
E	Working at heights
F	Routine maintenance
G	Surveys (geophysical, environmental, meteorological)
H	Transfer from/to vessel
I	Civil works onshore including excavations
J	Hand tools/power tools (working with)*

Figure 5: High potential – Top 10 work process breakdown

* Other work processes which also had six (6) incidents are Mechanical systems (working with) and Walking from A to B.

Incident area analysis: Nacelle

Historically, the nacelle accounts for the area with the highest number of incidents. In 2022, the top incident area, like in 2021, is once again the nacelle. While there was a decrease in the number of incidents occurring in the nacelle in 2022, with a total of 88 incidents against 91 recorded in 2021, which is positive given the increase in hours worked, the number of recordables in 2022 was 15, an increase of 67 % over the previous year. Most of the incidents that occurred in the nacelle area (76) happened on operation sites. Routine maintenance, lifting operations and hand tools/power tools (working with) were the work processes with the highest number of incidents, with 12 incidents each. There was a decrease of 30 % in the number of incidents occurring during lifting operations in 2022 compared to 2021. A total of 21 high potential incidents occurred within the nacelle in 2022. Electrical systems (working with) work process had the highest number of high potential incidents in the nacelle (5), while routine maintenance was the second highest with three high potential incidents reported.

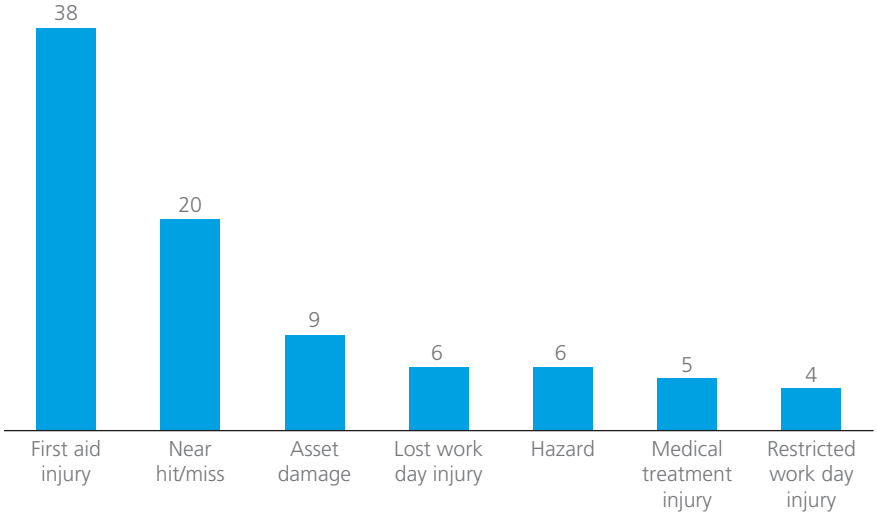
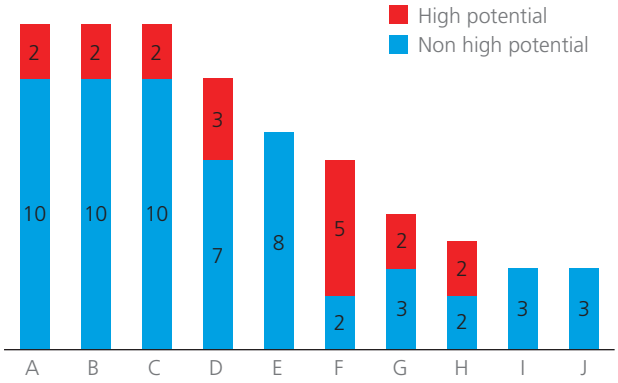


Figure 6: Nacelle – actual consequence



Key

A	Routine maintenance
B	Lifting operations
C	Hand tools/power tools (working with)
D	Access/egress
E	Manual handling
F	Electrical systems (working with)
G	Mechanical systems (working with)
H	Working at heights
I	Climbing/rope access
J	Chemicals and hazardous substances (working with)

Figure 7: Nacelle – work process breakdown

Incident area analysis: Vessel: Jack-up vessel/Barge

Vessel operations are critical in the offshore wind industry. Jack-up vessel/barge was the second highest overall incident area in 2022 with 84 incidents reported, which is a slight increase from the 2021 figure (79). Of the 84 incidents reported, 18 were high potential incidents representing 21 % of the total number of incidents occurring in the area, and 10 of those high potential incidents occurred during lifting operations.

The top three work processes were lifting operations (30), vessel operation (including jack-ups and barges) (8) and mechanical systems (working with) (6). There was 43 % increase in lifting operations incidents within the area between 2021(21) and 2022 (30).

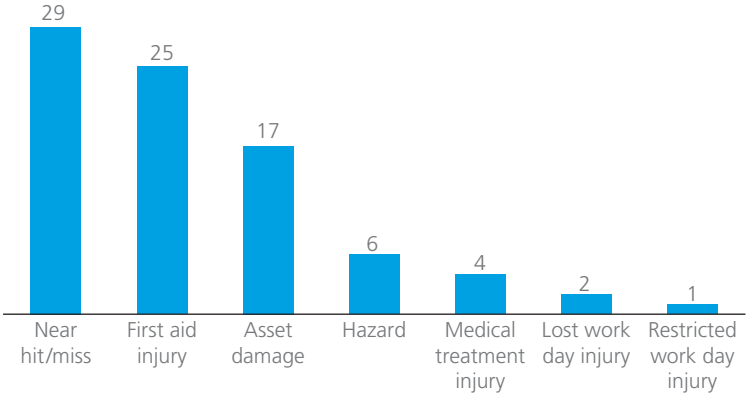
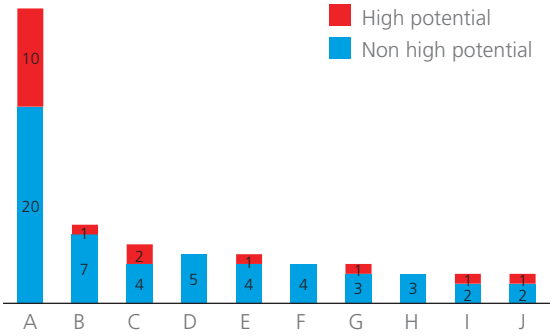


Figure 8: Vessel: Jack-up vessel/Barge actual consequence



Key	
A	Lifting operations
B	Vessel operation (including jack-ups and barges)
C	Mechanical systems (working with)
D	Walking from A to B
E	Manual handling
F	Hand tools/power tools (working with)
G	Access/egress
H	Catering/cleaning
I	Chemicals and hazardous substances (working with)
J	Electrical systems (working with)

Figure 9: Jack-up vessel/Barge – work process breakdown

Emergency Response and Medical Evacuation (ERME)

Based on the ERME data for 2022, there were 19 incidents that required emergency rescue and medical evacuation. Compared to the 2021 data, there was a decrease in the number of incidents by 69 % (62 in 2021 versus 19 in 2022), which, given the increase in hours, is a significant decrease.

In terms of the actual consequences, nine incidents required medical treatment, while six resulted in lost work days. One incident resulted in restricted work days. One incident required first aid treatment, and two incidents resulted in asset damage. Of the asset damage, one was because of collision between two vessels outside a wind farm, with one of the vessels then colliding with a jacket, and the second was a vessel reported to be taking on water.

Analysing the ERME incidents by work process revealed that vessel operation (including jack-ups and barges), surveys (geophysical, environmental, meteorological), working at heights, and walking from A to B were the most common work processes associated with ERME incidents (each with two incidents). Incidents reported include two that led to eye injury, three incidents of injured leg, three hand injuries, four injuries to the head or face and four due to personnel collapsing or falling ill.

The most common areas where incidents led to ERME were onshore: turbine assembly, onshore: warehouse/workshop, and vessel: jack-up vessel/barge (each with two incidents).

Overall, the ERME incidents for 2022 suggest a significant reduction in the incidence rate compared to the previous year.

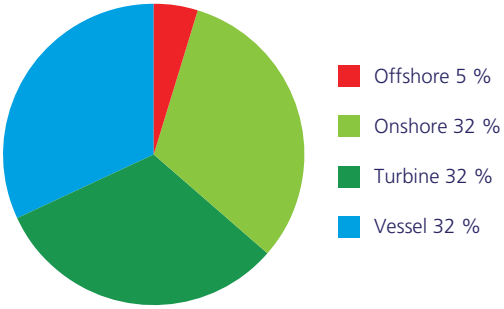


Figure 10: Incident area from which ERME took place

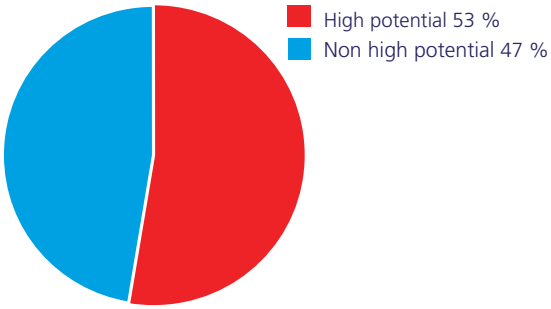


Figure 11: Percentage of ERME incidents that were classified as high potential

Lost work day injuries

A total of 46 lost work day injuries were reported in 2022 compared to 50 reported in 2021. This represents an 8 % decrease year-on-year.

52 % (24) of the lost work injuries occurred in the turbine area, with six of the injuries occurring in the nacelle and five occurring in the hub and blades. 10 of the lost work day injuries were reported as high potential. Operational sites accounted for 57 % (26) of lost work injuries reported, while construction sites had 37 % (17) of the injuries.

In terms of the work process, lifting operations had the highest number of reported lost work day injuries with 20 % (9) of the total, while hand tools/power tools (working with) and walking from A to B had 11 % (5) of reported injuries each.

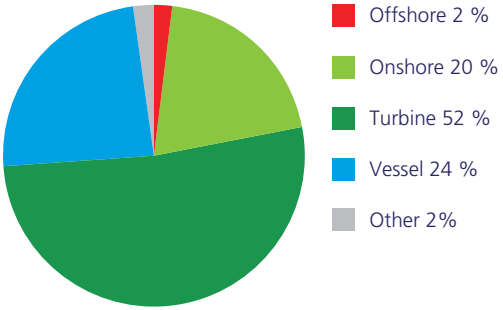
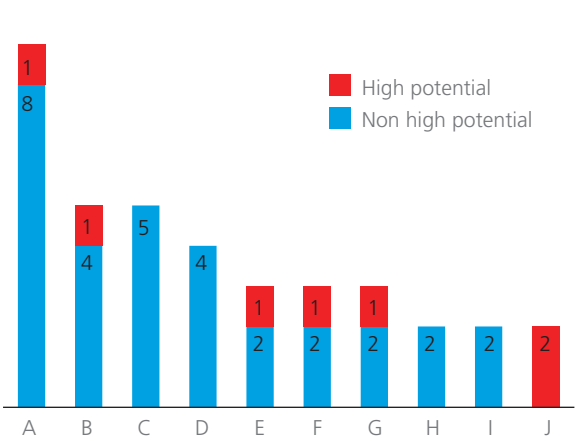


Figure 12: Lost work day injuries – incident area breakdown



Key	
A	Lifting operations
B	Walking from A to B
C	Hand tools/power tools (working with)
D	Manual handling
E	Access/egress
F	Working at heights
G	Climbing/rope access
H	Vessel operation (including jack-ups and barges)
I	Cable termination/jointing
J	Surveys (geophysical, environmental, meteorological)

Figure 13: Lost work day injuries – work process breakdown with high potential injuries identified

First aid injuries

There were 246 first aid injuries recorded in 2022, which represents a 13 % decrease in the number of first aid injuries recorded in 2021 (283) despite the increase in reported hours worked in 2022.

Analysing the areas in which first aid injuries happened showed that 40 % of the incidents (99) occurred in the turbine area while 39 % of the incidents happened on vessels. Of the first aid injuries that occurred in the turbine, 38 % happened in the nacelle (38), 14 % each in the tower and foundation external, and 13 % each at the transition piece/boat landing and tower. The area with the second highest first aid injuries was Vessel, with 39 % of first aid injuries (96). Of those, 27 % were in the service operation vessel (SOV) (26), 26 % in the jack-up vessel/barge (25), and 21 % in Crew Transfer Vessels (20).

Construction sites had 48 % of first aid injuries (117) compared to 46 % which occurred on operation sites (114).

The top three work processes where first aid injuries occurred were manual handling, access/egress and hand tools/power tools (working with). Manual handling was responsible for 19 % (47) of the injuries which occurred while access/egress was 12 % (29). 10 % (25) occurred with hand tools/power tools (working with). Nine of those incidents were considered high potential. Consequently, the G+ is running a hand injuries campaign in 2023 and has a workstream on manual handling.

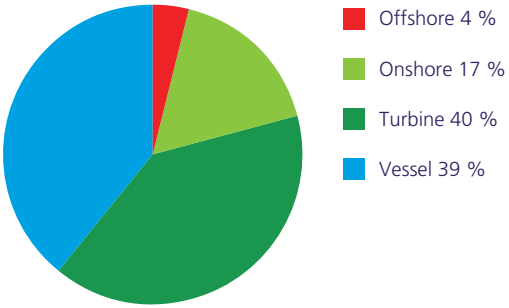
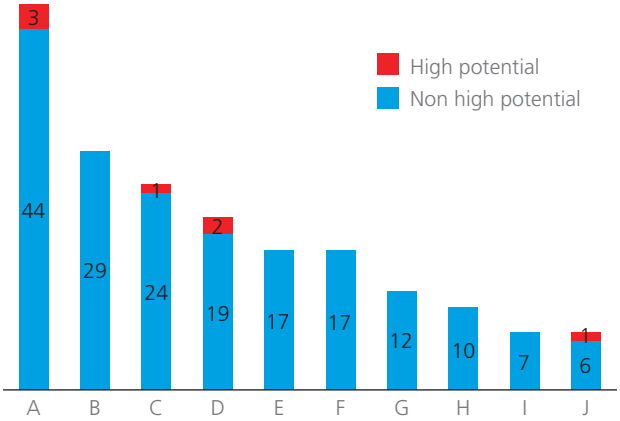


Figure 14: First aid injuries – incident area breakdown



Key	
A	Manual handling
B	Access/egress
C	Hand tools/power tools (working with)
D	Lifting operations
E	Walking from A to B
F	Catering/cleaning
G	Electrical systems (working with)
H	Routine maintenance
I	Vessel operation (including jack-ups and barges)
J	Chemicals and hazardous substances (working with)

Figure 15: First aid injuries – work process breakdown with high potential injuries identified

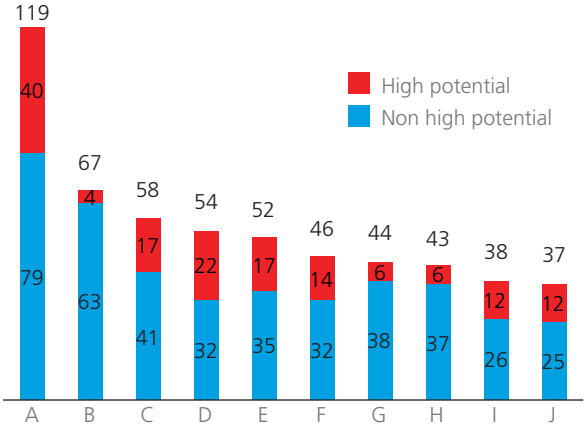
Incident data summary: Work process

The G+ data reporting mechanism has 38 work process categories. Figure 16 shows the top 10 work processes, with the proportion of high potential incidents identified. Lifting Operations, Access/Egress and Manual Handling. were the top three work processes where incidents occurred.

As with 2021, Lifting Operations was the top work process in 2022, with 119 incidents reported. This is a 21 % increase year-on-year. On the other hand, the second highest work process in 2022 was Manual Handling (67), which made up 8 % of total recorded incidents for the year and a decrease of 10 % from 2021 (74). Access/Egress incidents (58) was the third highest work process for 2022.

The work process with the highest number of incidents in construction sites was lifting operations (68) and the top work process for operation sites was also lifting operations (47). Surveys (geophysical, environmental, meteorological) (25) had the highest number of incidents recorded from development sites.

This is the first time surveys (geophysical, environmental, meteorological) have featured in the top 10 work processes and this indicates the increasing developmental activities in the industry. There was a 26 % year-on-year increase in development site hours reported.



Key	Work process
A	Lifting operations
B	Manual handling
C	Access/egress
D	Electrical systems (working with)
E	Vessel operation (including jack-ups and barges)
F	Routine maintenance
G	Walking from A to B
H	Hand tools/power tools (working with)
I	Transfer from/to vessel
J	Surveys (geophysical, environmental, meteorological)

Figure 16: Work process – top 10 work processes with high potential incidents identified

Work process analysis: Lifting operations

The highest number of incidents in 2022 occurred during lifting operations. Incidents during the work process increased by 21 % (119) compared to 2021(94). Most of the incidents reported under lifting operations were near misses (52), asset damage (24) and first aid injury (21) incidents. Furthermore, 12 cases of recordable injuries were reported during lifting operations this year compared to eight in 2021. There was a 62 % increase in the number of first aid cases in 2022 (21) compared to 2021 (13). This is concerning. It is also important to note that there was a 41 % decrease in the number of hazards recorded this year (10) in comparison to 2021 (17).

Since 2017, Lifting Operations has been the work process with the highest number of high potential incidents every year. The number of high potentials was very similar in 2022 (40) compared to 2021 (39). Half of the high potential incidents (20) during this work process happened on construction sites, 45 % (18) happened on operation sites and 5 % (2) on development sites.

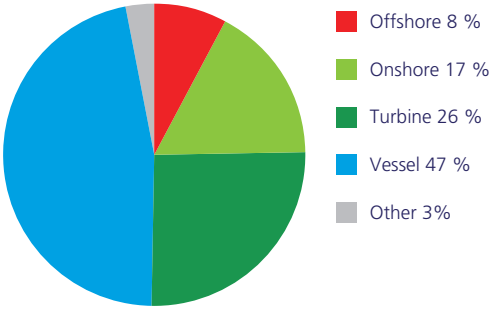


Figure 17: Lifting operations – incident and injury area summary

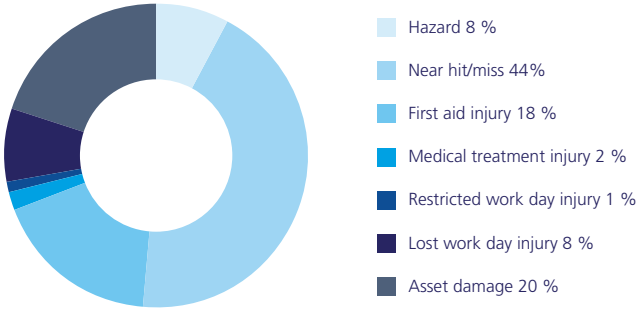
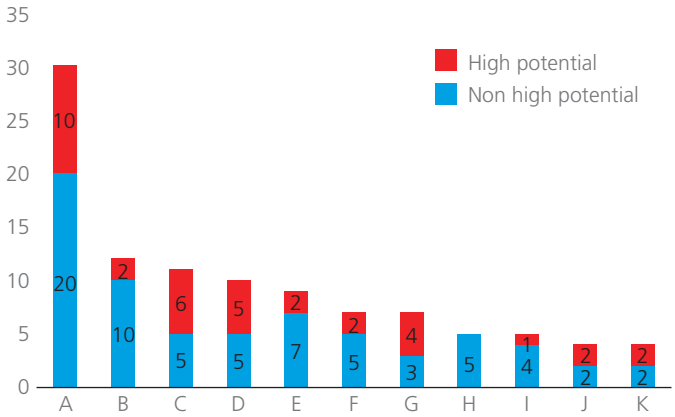


Figure 18: Lifting operations – incident consequence

Work process analysis: Lifting operations (continued)



Key	
A	Vessel: Jack-up vessel/Barge
B	Turbine: Nacelle
C	Turbine: Transition piece/boat landing
D	Onshore: Harbour, Quay, Pontoons
E	Vessel: SOV
F	Vessel: Crew transfer vessel (CTV)
G	Turbine: Foundation external
H	Onshore: Warehouse/workshop
I	Offshore: Civils works
J	Offshore: Substation other
K	Vessel: Survey

Figure 19: Lifting operations – incident area breakdown with high potential incidents identified

Work process analysis: Manual handling

Manual Handling Incidents was again the second-highest work process in 2022 with 67 incidents reported across all site types. This is a 9 % decrease from 2021 (74), but still higher than the previous year of 2020 (60). Most incidents that occurred during manual handling were first aid injuries (47), which decreased by 13 % compared to 2021 (54), but this is higher than those reported in 2020 (35). This shows that there is still room for improvement in ensuring the safety of manual handling processes. Lost work day injury and medical treatment injury were less common, with four and six incidents, respectively. Near hit/miss incidents were the least common, with only three incidents.

The total recordable injuries during the manual handling process remained unchanged at 17 when compared to 2021 (17) which is a positive development, given that the number of reported hours worked for the year increased by over 38 %. Moreover, there were only three near hit/miss incidents during manual handling. One; however being high potential. Three of the first aid injuries were also categorised as high potential incidents.

A further breakdown of the data of top incident areas by site type shows that on development sites, the most common incident area was vessel: survey, with two incidents out of the total of four incidents. In construction sites, the most common incident area was vessel: SOV, with six incidents, followed by onshore: turbine assembly and vessel: Jack-up vessel/barge, with five incidents each. In Operation sites, the most common incident area was turbine: Nacelle, with six incidents, followed by turbine: foundation external and turbine: hub and blades, with four and three incidents, respectively. Overall, there was a total of four high potential manual incidents across all site types and they occurred in vessels (2), offshore (1) and onshore (1).

A breakdown of the injured body parts during manual handling incidents and the associated outcomes, including the number of cases requiring first aid, restricted duties, lost work days, and medical treatment, shows that the most frequently injured body parts during manual handling incidents were the hand (29 incidents) and the back (14 incidents). Four of the hand injuries required medical treatment and two resulted in lost work days. The shoulder/arm and leg were also commonly injured, with eight and seven cases respectively. The head/face, neck, and torso were less frequently injured, with a total of five injuries reported. These findings highlight the importance of proper manual handling techniques and training to prevent injuries to the most affected body parts, particularly the hand and back.

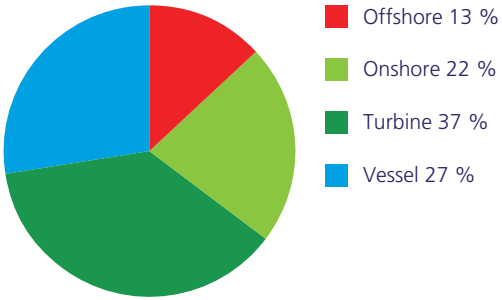


Figure 20: Manual handling – incident and injury area summary

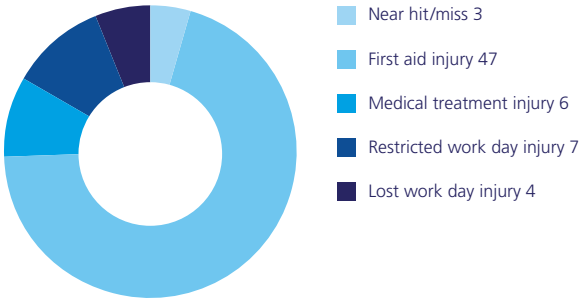
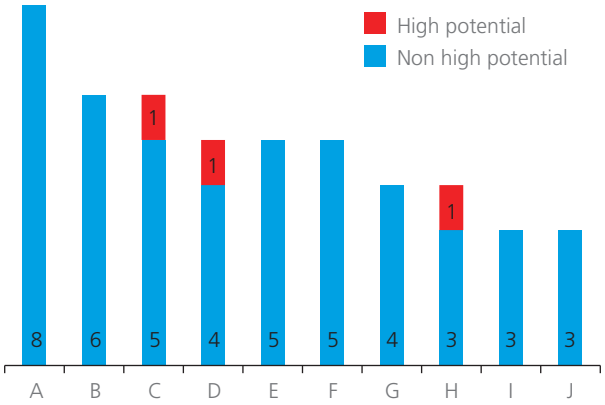


Figure 21: Manual handling – incident consequence

Work process analysis: Manual handling (continued)



Key	
A	Turbine: Nacelle
B	Vessel: SOV
C	Offshore: Substation other
D	Vessel: Jack-up vessel/Barge
E	Onshore: Turbine assembly
F	Turbine: Foundation external
G	Turbine: Transition piece/boat landing
H	Onshore: Warehouse/workshop
I	Turbine: Tower
J	Turbine: Hub and blades

Figure 22: Manual handling – incident area breakdown with high potential incidents identified

Dropped object incidents

There were 77 incidents of dropped objects in 2022. This is a 36 % decrease in the number of incidents since 2021 (113). Most (73 %) of the dropped object incidents (56) were near misses, while 13 % (10) resulted in asset damage. There were three lost work day injuries and one restricted work day injury as a result of dropped objects. The number of high potential dropped object incidents in 2022 (42) decreased by 11 % compared to 2021 (47). About 55 % of dropped object incidents recorded were classed as high potential. Due to the high proportion of high potential incidents, it is important to pay more attention to this issue and put measures in place to minimise its occurrence.

When segmented by site type, 49 % of dropped object incidents occurred on construction sites (38) and 43 % occurred on operation sites (33). Six incidents occurred on development sites.

The area with the highest reported incidents of dropped objects is Turbine: Tower (13) and the second highest is Vessel: Jack-up vessel/Barge (10).

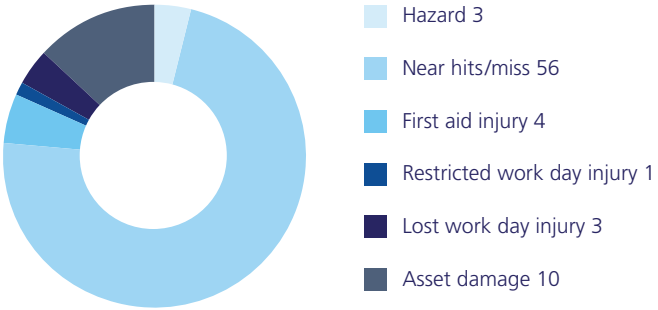


Figure 23: Dropped objects – incident consequence

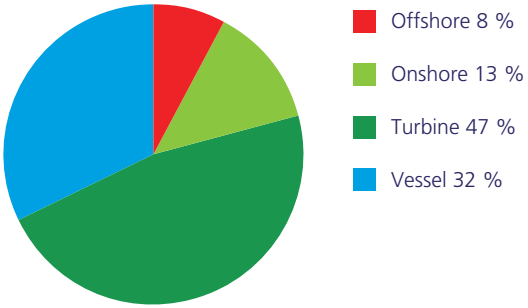
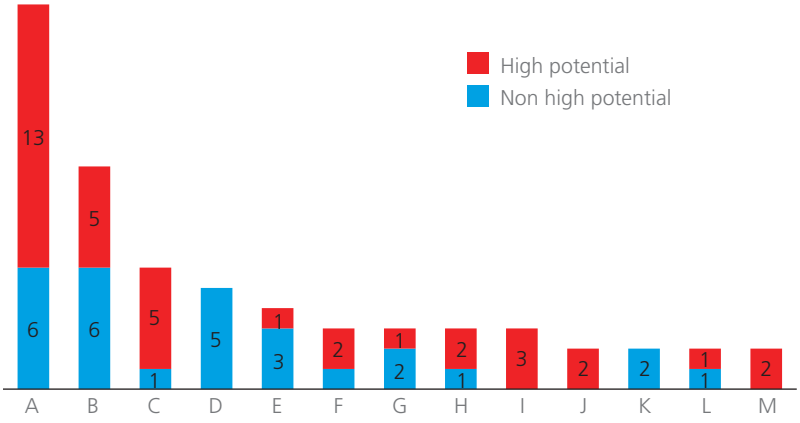


Figure 24: Dropped objects – incident and injury area summary

Dropped object incidents (continued)



Key	
A	Lifting operations
B	Working at heights
C	Routine maintenance
D	Civil works offshore including trenching
E	Hand tools/power tools (working with)
F	Climbing/rope access
G	Transit by vessel
H	Walking from A to B
I	Mechanical systems (working with)
J	Access/egress
K	Surveys (geophysical, environmental, meteorological)
L	Manual handling
M	Operating plant and machinery

Figure 25: Dropped objects – work process breakdown with high potential incidents identified. Work processes with 2 or more

Site type analysis

Offshore wind farms projects are either in the development, construction, operational or decommissioning phases. These are defined as:

Development site: Development and consenting phase of the project. Site area has been awarded by the landowner and surveys are being undertaken for consenting and pre-construction.

Construction/project site: Construction and commissioning are being undertaken.

Operation site: The site is in operation and producing power. (Note: Turbines will often be commissioned and handed over to operations as soon as they are built. In the case where a site has both project and operational activities, the incident should be evaluated to determine what activity was performed and classified accordingly.)

Decommissioning: The offshore wind farm has stopped operation and work is under way to remove the wind farm.

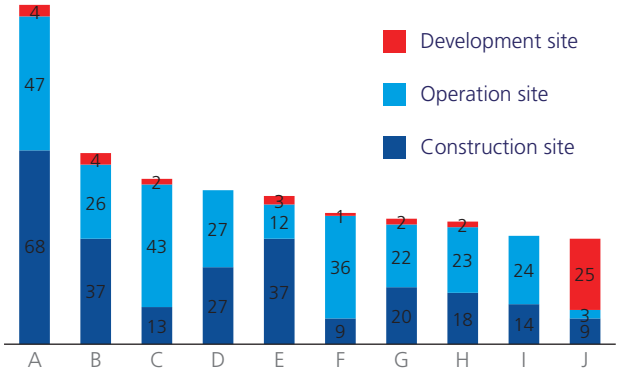
No hours or incidents were reported as decommissioning in 2022.

In 2022, a total of 44.6 million hours worked was reported. The construction site hours increased by 51 % from 19.1 million hours to 28.8 million hours. This increase in hours translated to a 41 % increase in the number of reported construction incidents (425) in 2022 compared to 2021 (301). On the other hand, operation sites' hours increased by 17 % from 9.09 million hours to 10.65 million hours in 2022, while the number of incidents (388) decreased by 11 % from the previous year (434). Development site hours increased by 26 % in 2022.

The chart in Fig. 26 shows top 10 work processes by site types. The construction sites' incidents accounted for 49 % of reported incidents compared to 45 % reported for operation sites (388), with the rest (55) occurring in development sites.

20 % of all construction site incidents were classified as high potential incidents, which is slightly below the 2021 rate (22 %). The operation site incidents reported reduced by 11 % in 2022. However, the proportion of high potential incidents that occurred on operation sites increased slightly from 31 % the previous year to 32 % in 2022.

There were 55 development site incidents reported in 2022 of which 27 % were classed as high potential (15).



Key	
A	Lifting operations
B	Manual handling
C	Access/egress
D	Electrical systems (working with)
E	Vessel operation (including jack-ups and barges)
F	Routine maintenance
G	Walking from A to B
H	Hand tools/power tools (working with)
I	Transfer from/to vessel
J	Surveys (geophysical, environmental, meteorological)

Figure 26: Work process – construction/operation site breakdown

Site type analysis (continued)

From the table in Fig. 27, construction sites had the lowest TRIR and LTIF of the other site types; this is a similar trend to 2021. Overall, the TRIR and LTIF improved in 2022 except for a 1 % (0.01) increase in construction TRIR.

	Development	Construction	Operations
Hours worked	5,199,105	28,776,791	10,654,212
TRIR	2.1	1.95	5.54
LTIF	0.6	0.59	2.44

Figure 27: Worked hours – site type breakdown

Country profiles

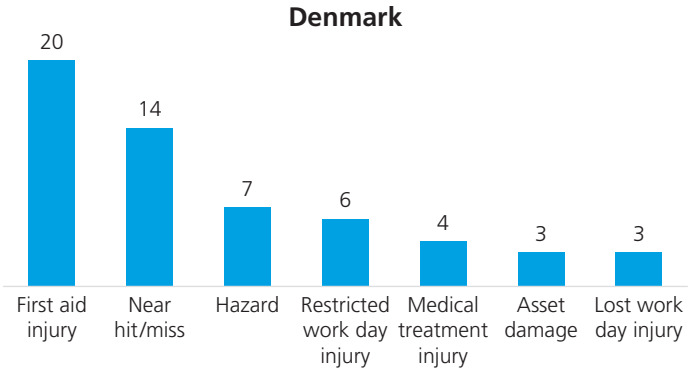
G+ collects data from several countries including Denmark, United Kingdom, France, Germany, The Netherlands, Taiwan and the United States of America. The incident rates and frequencies vary for different countries according to the activities in each country. The top three work processes are shown in Figures 29 to 35.

Further analysis of the country data can be carried out using the interactive dashboard on the G+ website.

	Asset damage	First aid injury	Hazard	Lost work day injury	Medical treatment injury	Near hit/ miss	Restricted work day injury	Total	Hours in millions	TRIR/LTIF
UK	54	102	36	16	11	113	16	348	16.20	2.7/1.0
Taiwan*	43	54	9	6	19	47	7	185	11.58	2.8/0.5
France	26	30	0	7	3	52	2	120	4.53	2.6/1.5
Denmark	3	20	7	3	4	14	6	57	0.87	14.9/3.4
Germany	3	20	3	10	1	18	1	56	3.89	3.1/2.6
The Netherlands	19	8	11	1	3	6	2	50	2.38	2.5/0.4
United States	0	5	2	1	0	7	0	15	2.39	0.4/0.4

Figure 28: Country profiles – the actual consequences, worked hours, LTIF and TRIR

* There's a significant increase in reporting of incidents and hours for Taiwan in 2022.

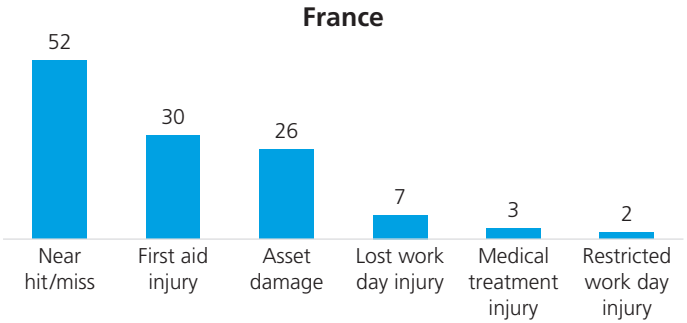


Denmark 57 incidents	
Lifting operations	18 %
Manual handling	12 %
Electrical systems (working with)	11 %
Walking from A to B	11 %

Figure 29: Denmark's incident consequence profile and top three work processes

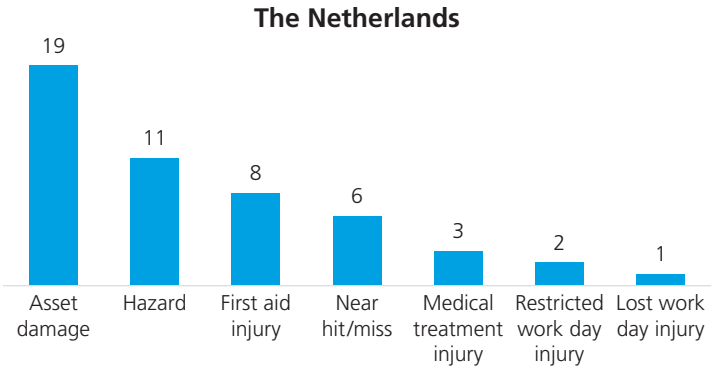
Germany 56 incident	
Electrical systems (working with)	14 %
Lifting operations	13 %
Walking from A to B	11 %

Figure 30: Germany's incident consequences profile and top three work processes



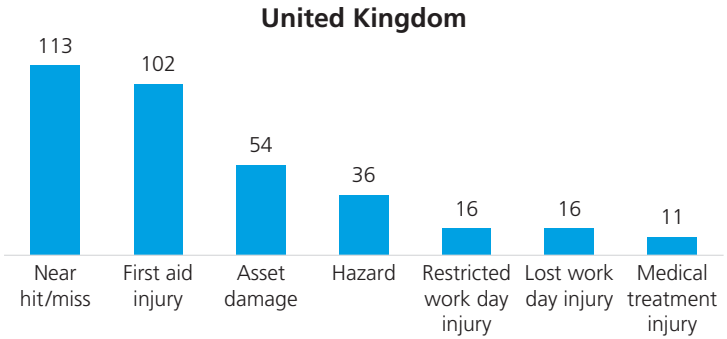
France 120 incidents	
Lifting operations	18 %
Vessel operation (including jackups and barges)	16 %

Figure 31: France's incident consequences profile and top three work processes



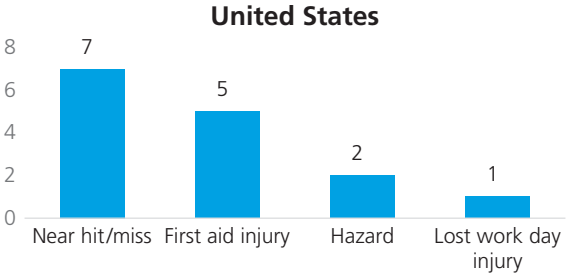
The Netherlands 50 incidents	
Lifting operations	20 %
Transfer from/to vessel	12 %
Working at heights	10 %
Mechanical systems (working with)	10 %

Figure 32: The Netherlands' incident consequences profile and top three work processes



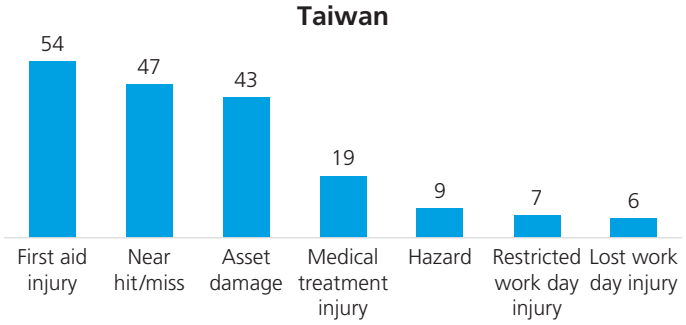
United Kingdom 348 incidents	
Access/egress	13 %
Lifting operations	13 %

Figure 33: United Kingdom's incident consequences profile and top three work processes



United States 15 incidents	
Surveys (geophysical, environmental, meteorological)	47 %
Walking from A to B	13 %
Lifting operations	13 %

Figure 34: United States' incident consequences profile and top three work processes



Taiwan 185 incidents	
Lifting operations	11 %
Vessel operation (including jackups and barges)	9 %

Figure 35: Taiwan's incident consequences profile and top three work processes

Conclusions and next steps

The annual G+ incident data report gives a snapshot of health and safety incidents and injuries in the year. The backbone of offshore wind health and safety is the incident data collected from industry stakeholders. This allows stakeholders to learn from past incidents and accidents and enables the industry to develop effective measures to prevent or mitigate future occurrences.

The 2022 data shows that there is increasing activity in the offshore wind industry with the reported highest number of hours worked on record (44.6m). Construction site hours had the most significant increase in the period under review with a 51 % increase in construction hours reported year-on-year. In terms of number of incidents recorded, construction has overtaken operations but with the increased construction hours reported, the TRIR/LTIF of operations is higher.

The year 2022 saw improved reporting from the Asia Pacific (APAC) region, particularly from Taiwan. A total of 185 incidents was reported from Taiwan compared to 31 in 2021. The total hours reported from the country was over 11.5 million compared to the 6.5 million reported in 2021. This shows increasing developmental activities in the region and the increasing engagement and expansion of G+ in the region.

The G+ will continue to provide global leadership in offshore wind health and safety through its work programmes and activities.

Annex A – Glossary

Throughout the report, some terms are used to mean a group of work processes or incident areas. The definitions of these terms are as follows:

[2]**Lifting operations**	Lifting operations comprise the following work processes: lifting operations and rigging/slinging/banking. They do not include davit crane lifting operations or cable pull/winching operations.
[3]**Operational site**	Site in operation producing power.
[4]**Vessels**	Vessels include: accommodation vessels; cable installation vessels; crew transfer vessels (CTVs); diving vessels; fast rescue crafts (FRCs); guard vessels; jack-up vessel/barge; service operation vessels (SOVs); survey vessels, and tugs.
[5]**Construction site**	Site under construction and commissioning.
[6]**Turbine**	The turbine includes: internal and external foundations; hub and blades; nacelle; service lift; tower; transition piece/boat landing area;, external and internal foundations; helicopter area, and yaw gear space.
[7]**Development site**	Development and consenting phase of the project.
[8]**Onshore**	Onshore areas include: public roads/areas; car parks; harbour/quay/pontoons; excavations and civil works; administration; offices; warehouses and workshops; substations, and WTG assembly.
Offshore	Offshore areas include: offshore accommodation platform; offshore meteorological mast, and offshore substation areas.

The following incident consequence definitions have been used in the G+ dataset:

Fatality	An incident that involves death as a result of a work-related incident or occupational illness. Deaths that occur after an incident. but are a direct consequence of an incident, are to be included.
Hazard	A hazard is a condition or a situation where there is a potential to cause an incident. It is important to remember that nothing has happened, and no impact/harm has occurred. Only hazards which are considered to be high potential are included.
Near hit/near miss	A near hit or miss is any incident which could have resulted in a work-related accident but did not, either by chance or timely intervention.
First aid	An incident which requires simple treatment that is self-administered or by a first aider, doctor or nurse, but does not result in lost time or long-term medical care.
Medical treatment	An incident not severe enough to be reported as a fatality, lost work day incident or restricted work day incident, but which is more severe than one requiring simple first aid treatment.
Restricted work day	An incident that does not result in a fatality or a lost work day but does result in a person being unfit for the full performance of the regular job or any work on any day after the occurrence of the occupational injury.

Lost work day	Non-fatal incident that involves a person being unfit to perform any work on any day after the occurrence of the occupational injury. 'Any day' includes rest days, weekend days, leave days, public holidays or days after ceasing employment.
Asset damage	An event where there is damage to plant, equipment or facilities (no injury to persons).
High potential incident	High potential incidents are incidents or near misses that have the potential to cause a fatality/life-changing injury.

The following statistical definitions have been used in the G+ incident data analysis:

Total recordable injury rate (TRIR)	The number of fatalities, lost work day incidents, restricted work day incidents and medical treatment injuries per million hours worked.
Lost time injury frequency (LTIF)	The number of fatalities and lost work day incidents per million hours worked.

The following acronyms have been used in the G+ incident data analysis:

APAC	Asia Pacific
ERME	Emergency response and medical evacuation
SOV	Service operational vessell

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