G+ Global Offshore Wind Health & Safety Organisation

2017 incident data report

G+ Global Offshore Wind
Health & Safety
Organisation

www.gplusoffshorewind.com

About the G+ Global offshore wind health and safety organisation

Offshore wind power is a primary technology helping to meet the global low carbon challenge. With costs falling, deployment of offshore wind and employment in the sector are rising dramatically. This places an obligation on operators to observe the very highest standards of health and safety.

G+ Global offshore wind health and safety organisation (G+) is the global health and safety organisation for the offshore wind industry.

We bring together business leaders, health and safety experts and organisations operating in the offshore wind industry to drive good practice and promote world-class safety performance across the sector.

Through an evidence-based approach, we ensure key emerging risks are mitigated through co-operation and shared learnings, resulting in the highest levels of health and safety standards being achieved.

We engage on important industry matters by facilitating discussion and bringing together industry stakeholders to speak with one voice for the offshore wind industry.

For more information, please visit **www.gplusoffshorewind.com**

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Introduction from the Chair

I am delighted to introduce the first annual incident data report produced during my time as G+ Chairman. Health and safety performance remains top priority with all our member companies, and the insights gained from this report will help immensely in defining the G+ workstream and interventions going forward. In 2017, the G+ introduced Associate Membership of the organisation to involve contractors, offshore transmission owners (OFTOs), non-operating owners and non-lead operators/developers, which has already seen a number of new members who have brought their own expertise to the table.

On the content of our 2017 incident data report: it provides an overview of the health and safety performance of the G+ members' offshore wind activities across the globe and continues to provide the benchmarking metrics lost time injury frequency (LTIF) and total recordable injury rate (TRIR) seen in previous reports. We have made available anonymised incident data as an Annex to this report for further independent analysis. Every year the G+ Focal Group review and streamline the information we collect from member companies through regular deep dive data exercises.

The 2016 report highlighted high potential incidents for the first time. This was well received by member companies and stakeholders as a positive step for safety culture, as well as a more proactive method of reducing the risk of serious injuries occurring. The 2017 report has a similar theme, and compared to 2016 there were 46 fewer high potential incidents despite five million more hours worked. The report provides an analysis of work processes where the majority of the high potential incidents occurred. The latest Safe by Design workshop on access and egress was in response to an emerging trend on operational sites of high potential incidents.

The 2017 report shows a positive improvement in lagging indicators with a reduction in the absolute number of high potential incidents, a reduction of 8 % in the lost time injury frequency and a reduction of 14 % in the number of restricted work day incidents. Although this is a step in the right direction, further improvement and vigilance is still required. Dropped objects have been highlighted as a higher risk area in this and previous reports, and a big step forward has been made in response to this. The G+ is now a member of the cross-industry organisation set up to prevent incidents caused by dropped objects, Dropped Objects Prevention Scheme (DROPS), and a working group has been set up to tailor some of their materials to make them more relevant to the offshore wind industry.

In conclusion, I would like to say that 2018 will be a challenging year for the G+ and the wider offshore wind industry as we aim to expand the influence of our work internationally and see a continued reduction in injury frequencies. Through our own work programme, those of other organisations, collaboration with key stakeholders and our partnership with the Energy Institute (EI), our focus continues to be on improving the health and safety performance of our own companies and the industry as a whole.

Paul Cowling
Chairman – G+ Global Offshore Wind Health and Safety Organisation
Managing Director Innogy Renewables UK Limited
Director of Offshore Wind

Overview of 2017 incident data report: sites and method of work

Overview of G+ member sites

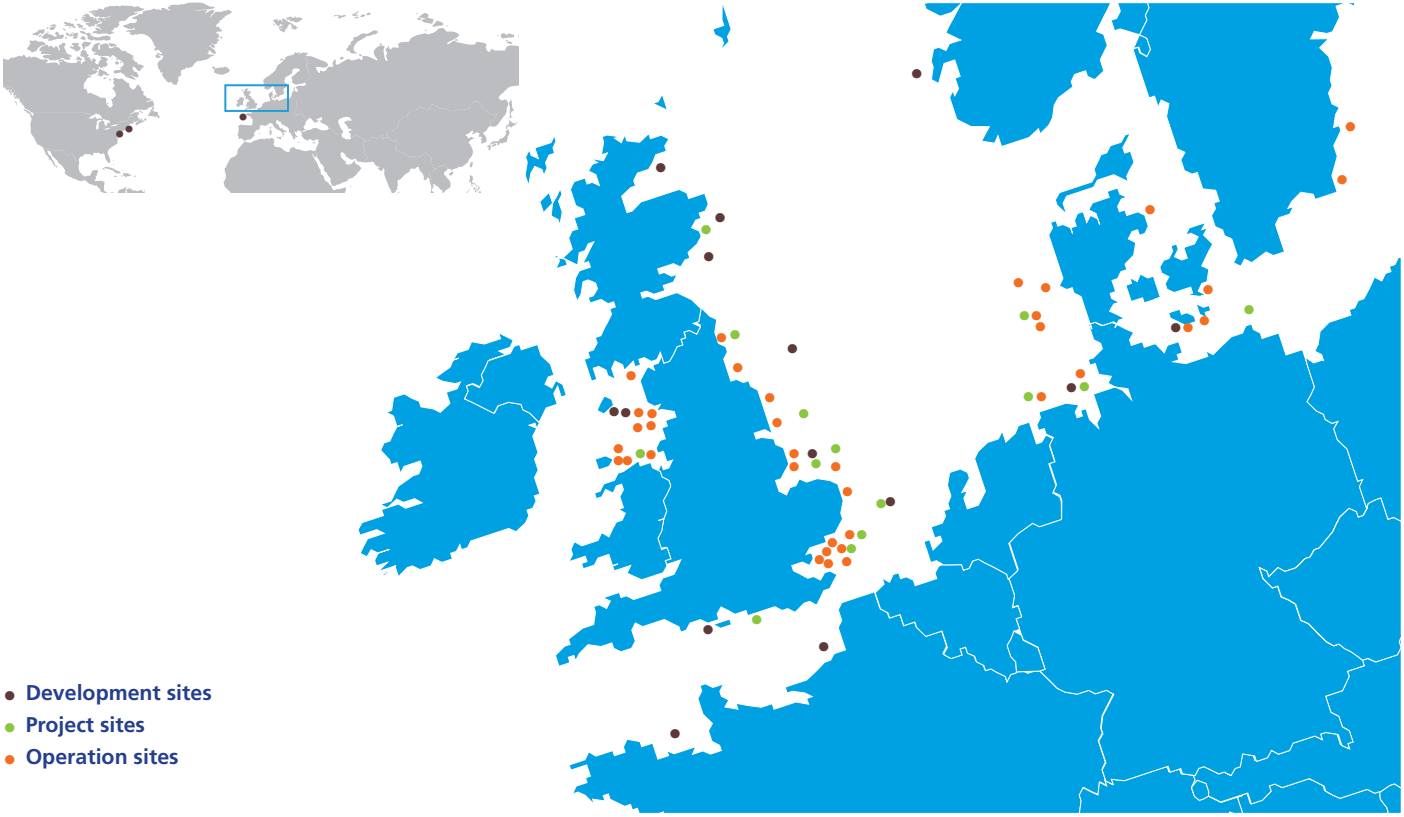


Figure 1: G+ member sites included in the incident data reporting

Method of work

G+ member companies submit incident data on a quarterly basis, which is then analysed by the Energy Institute secretariat. Quarterly reports are issued for G+ Board and Focal Group review. The G+ identify focus areas within the data and decide on a work programme to mitigate these risks. Each year, the data collection template is reviewed, streamlined and enhanced to reflect industry feedback. A full list of the incidents included in the G+ report is available as a separate Annex on the G+ website.

2017 highlights

2017: key facts and figures

Key facts

2200	reported incidents
0	**fatalities**
49	total **lost work day** incidents
32	incidents resulting in an **emergency response** or **medical evacuation**
1168	incidents occurred on **operational** sites
1020	incidents occurred on **project** sites
12	incidents occurred during **development** work

Work process

483	incidents during **marine operations***[1]
320	incidents during **lifting operations***[2]
293	incidents when **gaining access/egress** or **climbing**

Incident area

521	incidents occurred in the **turbine***[3]
616	incidents occurred on **vessels***[4]
959	incidents occurred **onshore***[5]

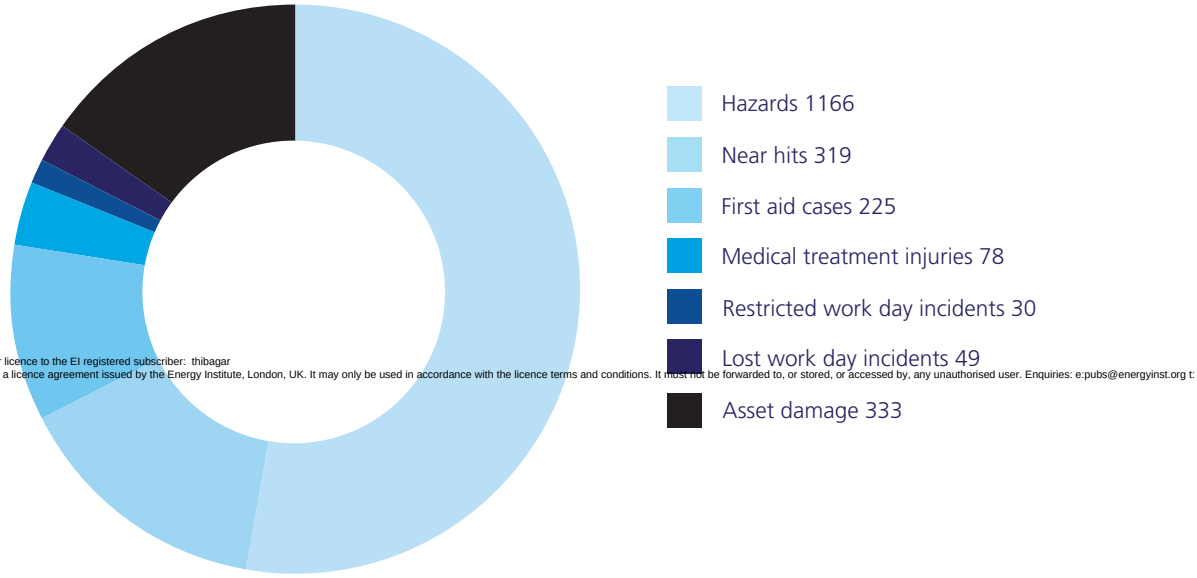


Figure 2: 2017 incident consequence summary

*1, 2, 3, 4, 5, 6 See Annex A for the definitions of these terms.

Safety statistics for 2017

Hours worked

	2017 (2016)	Relative to 2016
Hours worked*	**26 815 000** (21 726 000)	+ 23%

Industry benchmarking metrics

	2017 (2016)	Relative to 2016
Fatalities	**0** (0)	No change
Lost work day incidents	**49** (43)	+ 14%
Restricted work day incidents	**30** (35)	- 14%
Medical treatment injuries	**78** (42)	+ 86%
Total	**157** (120)	+ 31%
Total recordable injury rate	**5,85** (5,52)	**+ 6%**
Lost time injury frequency	**1,83** (1,98)	**- 8%**

Items of note

- The lost time injury frequency rate has reduced by 8 %
- The restricted work day incidents reduced by 14 %
- The medical treatment injuries has increased at a greater rate than the increase in hours worked. A deep dive review highlighted that this statistic has a historic wide variation and there may be evidence of some misalignment in definitions used in different members' HSE data reporting systems. Further work will be undertaken in 2018 to confirm and align reporting definition in this area.

Total recordable injury rate (TRIR)

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

Lost time injury frequency (LTIF)

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

* Hours worked rounded up to nearest 10 000.

High potential incidents

Summary – breakdown by incident area, consequence and work process

In 2017, 294 incidents were reported as high potential. While G+ member descriptions of what constitutes a high potential incident may vary slightly, a generally applicable definition is that an incident took place that could have resulted in a fatality or life changing injury. 35 % occurred on the turbine*[3], 28 % on vessels*[4] and 30 % during onshore*[5] activity. In terms of work processes, 24 % of incidents occurred whilst lifting/winching/rigging*[2], 19 % during marine operations*[1], 12 % while gaining access/climbing and 11 % while working on energized systems.

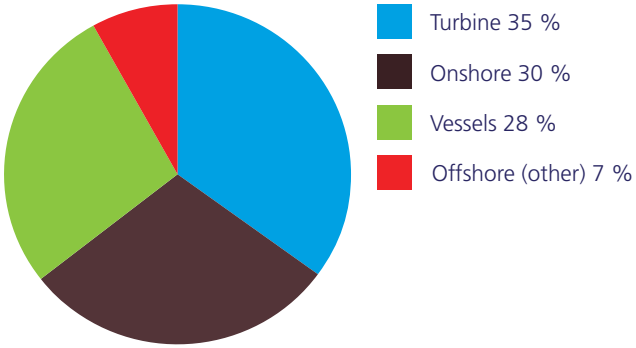


Figure 3: High potential – incident area summary

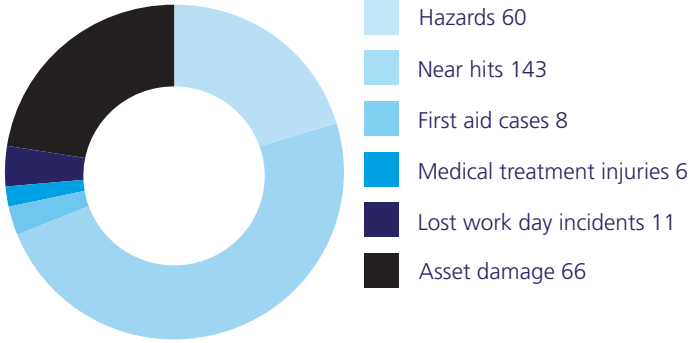
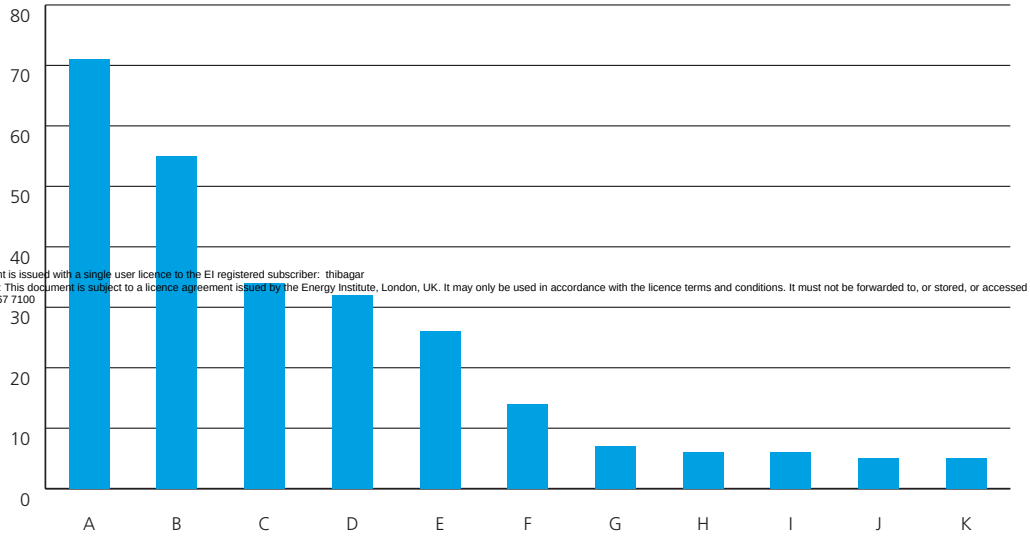


Figure 4: High potential – actual incident consequence



Key

- A Lifting/winching/rigging
- B Marine operations
- C Access/climbing
- D Working on energized systems
- E Working at height
- F Civil works
- G Working with hand tools/power tools
- H Cable termination/jointing
- I Commissioning (hot/cold)
- J Office work
- K Manual handling

Figure 5: High potential – work process breakdown

Emergency response or medical evacuation incidents

Summary – breakdown by incident area and work process

In 2017, there were 32 emergency response or medical evacuation (ERME) incidents reported, 14 of which resulted in lost work days. 56 % of all ERMEs were from a vessel*[4] and 25 % from a turbine*[3]. 47 % of ERME incidents were classified as high potential. Most ERME incidents in 2017 took place during marine operations*[1].

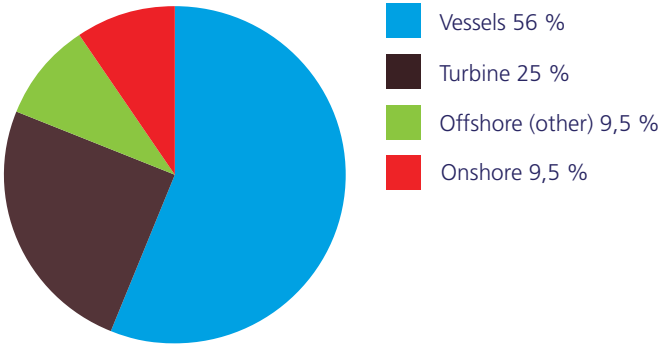


Figure 6: Incident area from which the ERME took place

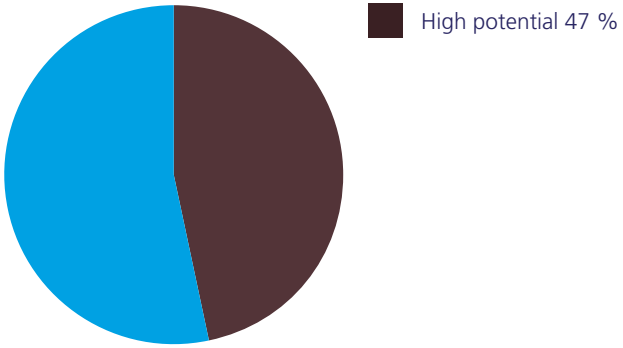


Figure 7: Percentage of ERME incidents that were classified as high potential

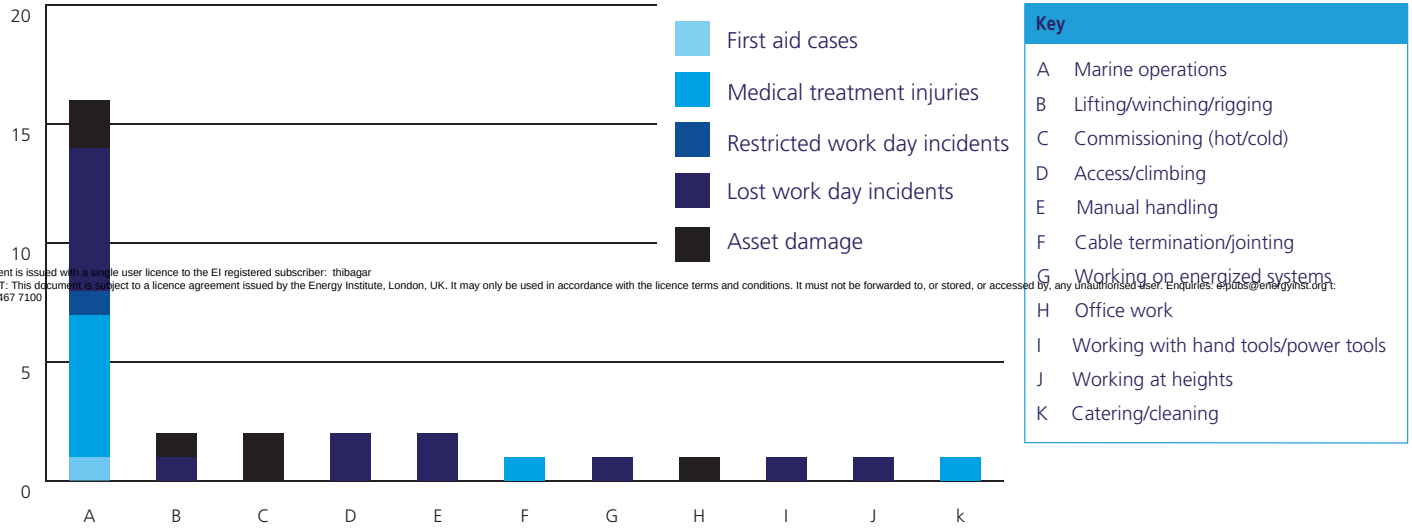


Figure 8: Work process breakdown of ERME incidents by the actual consequence of the incident

Lost work day incidents

Summary – breakdown by incident area and work process

There were 49 lost work day incidents reported in 2017. 16 of these incidents occurred on vessels*[4], 16 occurred on a turbine*[3], 15 onshore*[5] and 2 from other offshore structures*[6].

The highest number of lost work day incidents occurred while gaining access/climbing (12), marine operations*[1] (11), manual handling (8) and lifting/winching/rigging*[2] (6). It is also important to recognise that 11 of the 49 lost work day incidents were classified as high potential by G+ members.

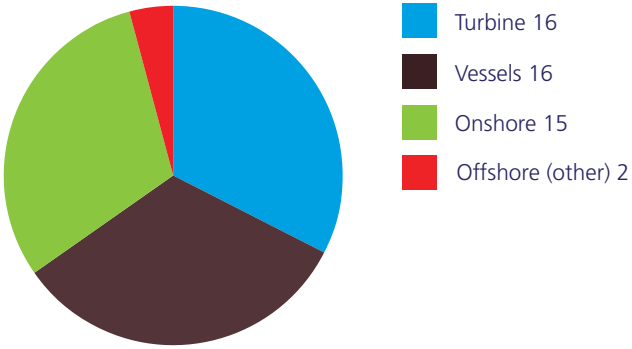


Figure 9: Lost work day – incident area breakdown

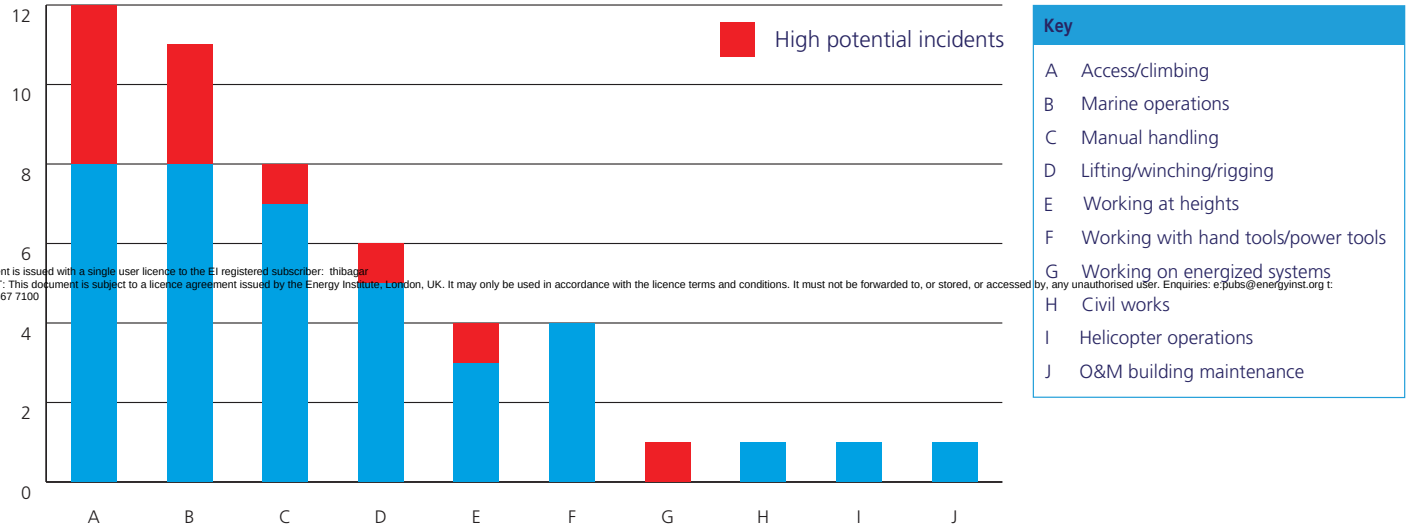
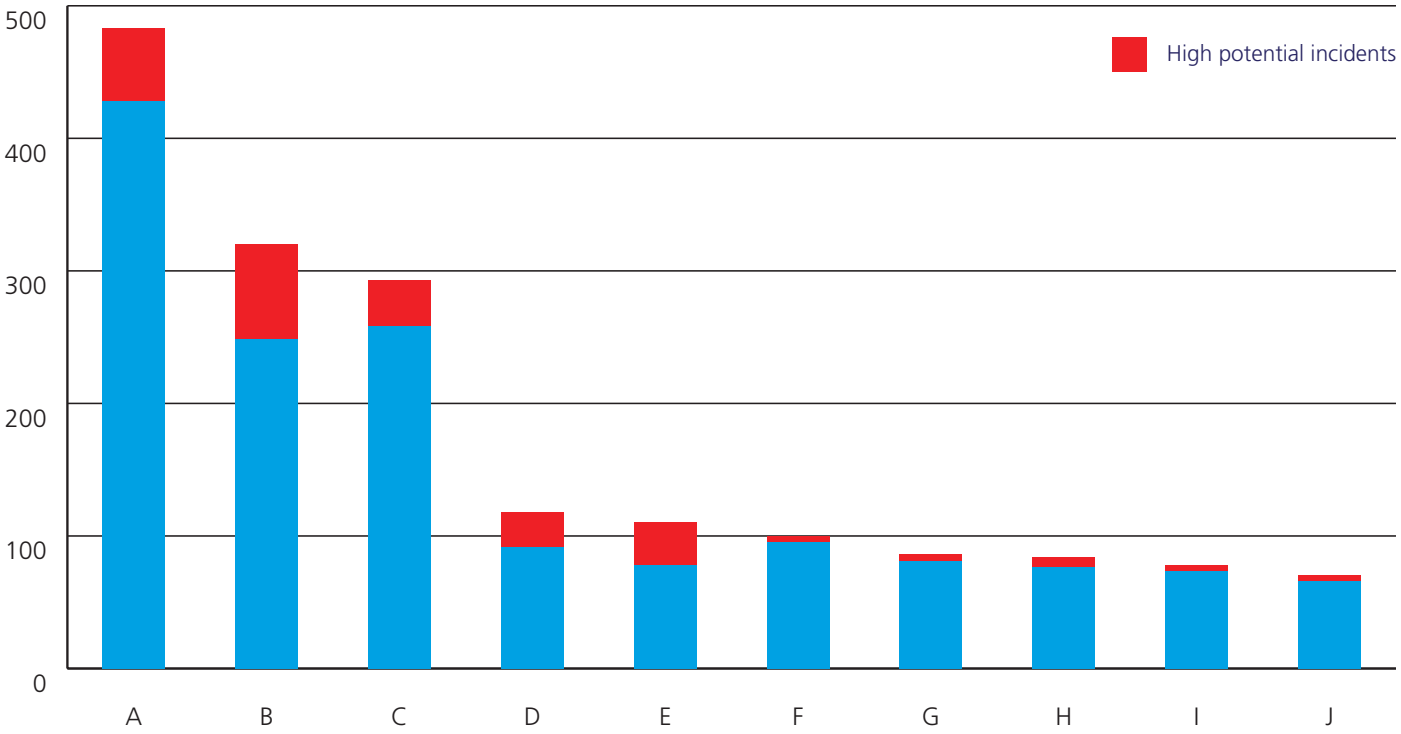


Figure 10: Lost work day – work process breakdown with high potential incidents identified

Incident data summary: work process

42 work process categories could be selected by G+ members when inputting data. Some of these processes have been grouped during analysis, an explanation of which is included in Annex A. The top 10 work processes resulting in incident reports are shown in Figure 11, with the proportion of high potential incidents identified. A considerable number of high potential incidents occurred during lifting/winching/rigging*[2] (71) and during marine operations*[1] (55).



Key

A Marine operations	E Working on energized systems	I Other
B Lifting/winching/rigging	F O&M building maintenance	J Catering/cleaning
C Access/climbing	G Manual handling	
D Working at heights	H Working with hand tools/power tools	

Figure 11: Work process – top 10 work processes with the highest number of incidents reported, with high potential incidents identified

Work process analysis: Lifting operations

Summary – breakdown by incident area and consequence

In 2017, there were 320 incidents related to cable pull/winching, lifting operations, davit crane operations and rigging/slinging/banking. Of these, 94 occurred on vessels*[4]; on heavy installations vessels (27), on crew transfer vessels (26) and service operation vessels (17). In the turbine*[3], most incidents occurred on the transition piece area (36) and nacelle (17), which relate to davit cranes and WTG internal hoists. In total, 71 high potential incidents occurred during these work processes, and 6 incidents resulted in lost work days.

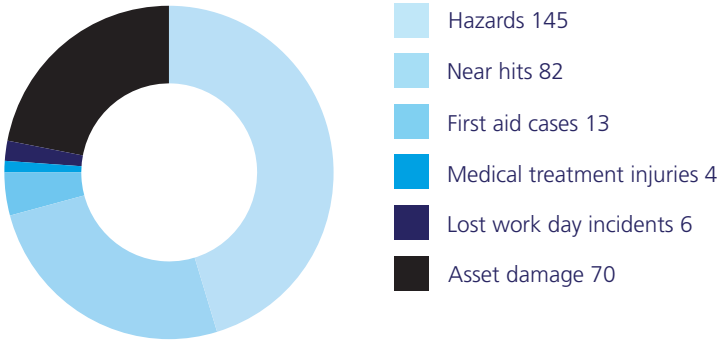


Figure 12: Lifting/winching/rigging – incident consequence

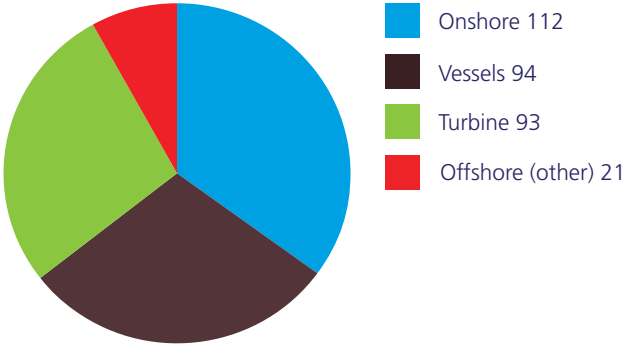
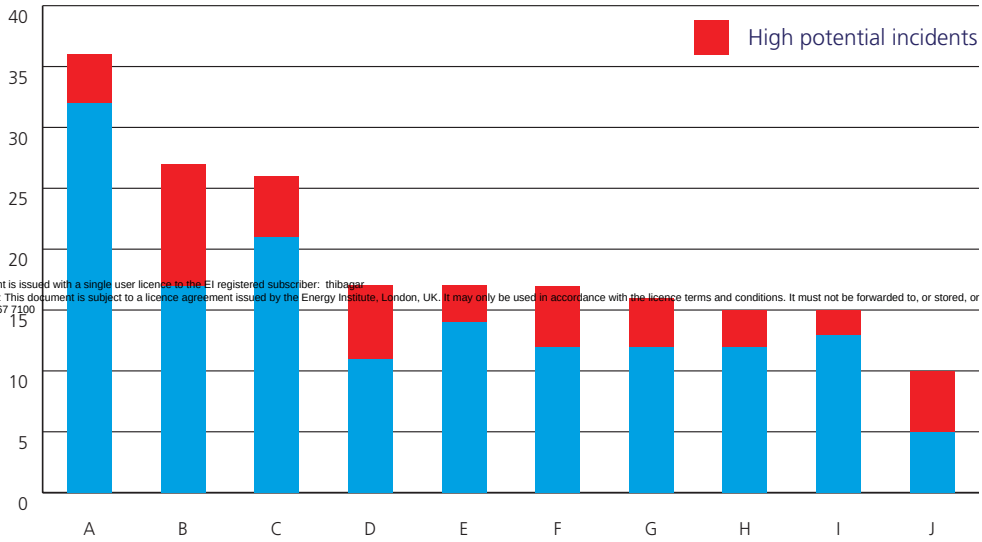


Figure 13: Lifting/winching/rigging – incident area summary



Key

- A Transition piece area
- B Heavy installation vessels
- C CTV (crew transfer vessel)
- D Harbour, quay and pontoons
- E SOV (service operation vessel)
- F Nacelle
- G Storage
- H Turbine tower
- I Vessel (other)
- J Turbine assembly area

Figure 14: Lifting/winching/rigging – incident area breakdown with high potential incidents identified

Gaining access/egress and climbing

Summary – breakdown by incident area and consequence

In 2017, there were 293 incidents relating to gaining access and climbing, 12 of which resulted in lost work days. Most of these occurred in the turbine*[3]; turbine tower (37), nacelle (32), transition piece (19) and hub and blades (17). 34 high potential incidents occurred during these work processes, with the greatest number in the nacelle (6), hub and blades (5) and WTG service lift (4).

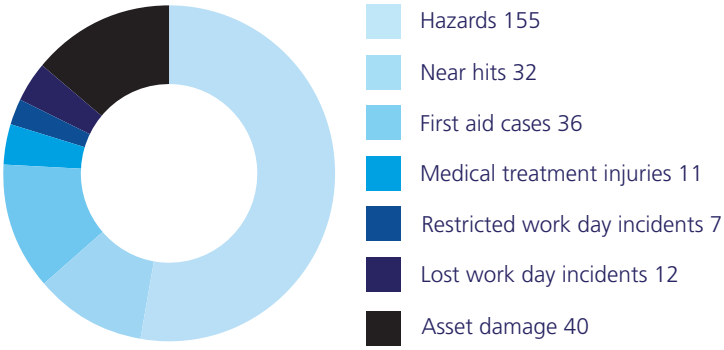


Figure 15: Gaining access/climbing – incident consequence

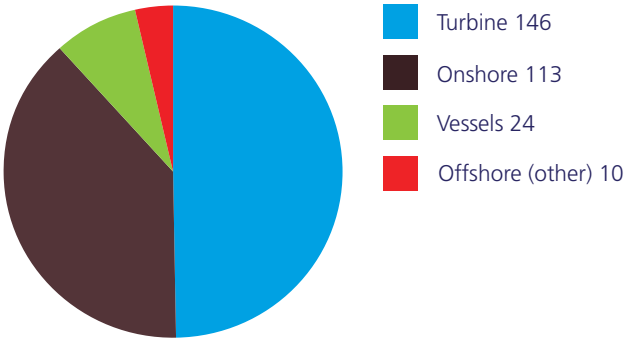


Figure 16: Gaining access/climbing – incident area summary

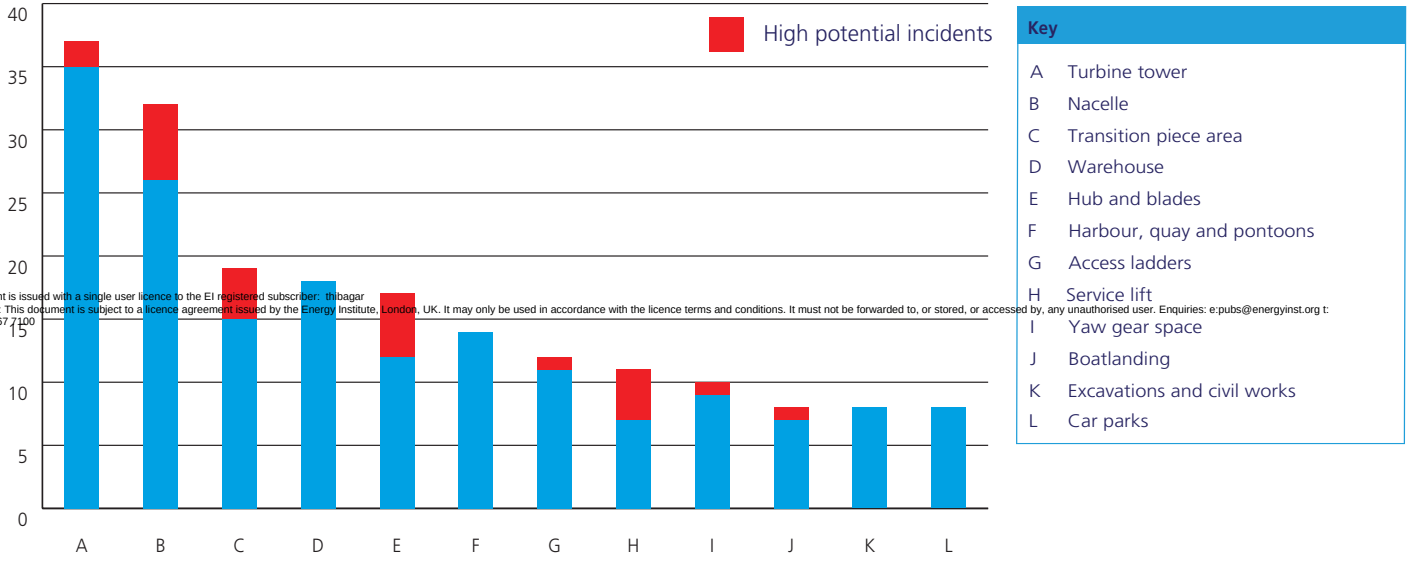


Figure 17: Gaining access/climbing – incident area breakdown with high potential incidents identified

Marine operations

Summary – breakdown by consequence and incident area

In 2017, there were 483 incidents that occurred during marine operations*[1]. 11 of these were lost work day incidents, and 55 were classified as high potential. Transferring from a vessel to another vessel or fixed structure was one of the work processes with the highest number of incidents (176) and correspondingly most high potential incidents took place on crew transfer vessels (32).

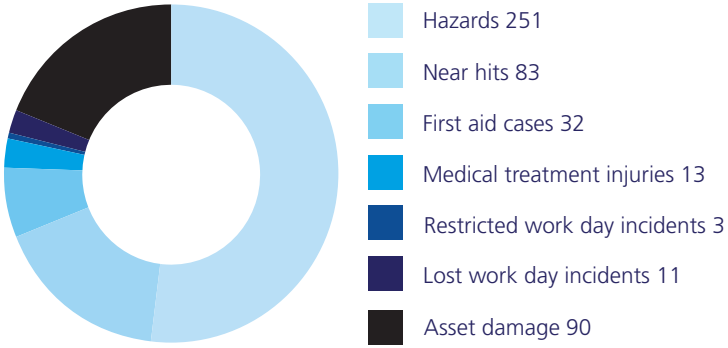


Figure 18: Marine operations*[1] – incident consequence

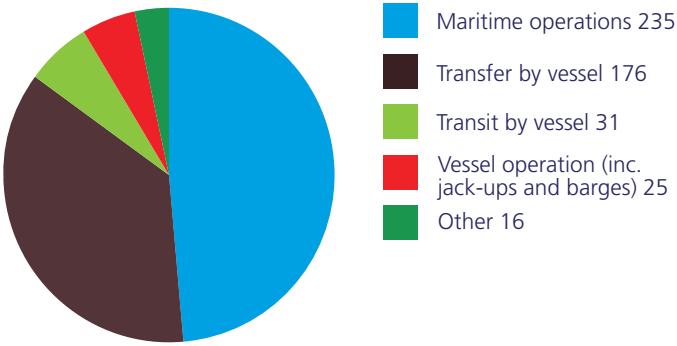


Figure 19: Marine operations*[1] – incident area summary

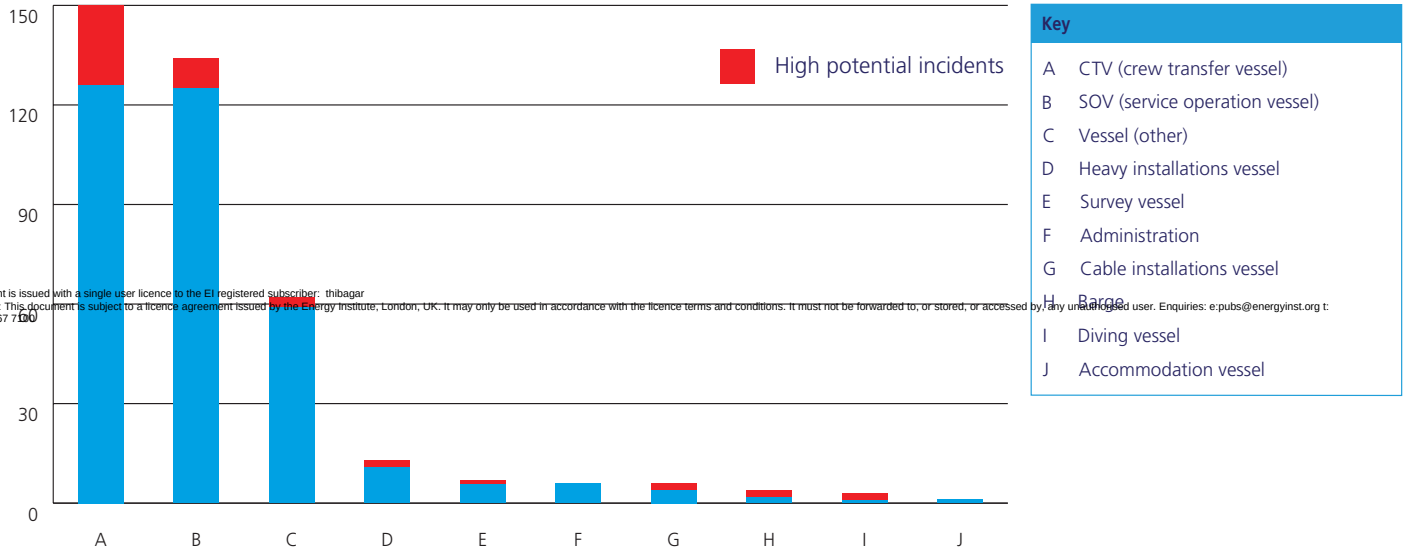


Figure 20: Vessel incidents*[4] – incident area breakdown with high potential incidents identified

Working on energized systems

Summary – breakdown by consequence and incident area

This is the first analysis of incidents occurring while working on energized systems presented in the annual G+ report. This includes incidents relating to electrical, hydraulic and pneumatic systems, although most incidents relate to electrical systems. Although only 1 incident resulted in lost work days, 32 of the 110 incidents were classified as high potential. The most incidents were reported in the turbine tower (16), substation low voltage areas (11), nacelle (10) and substation high voltage areas (9).

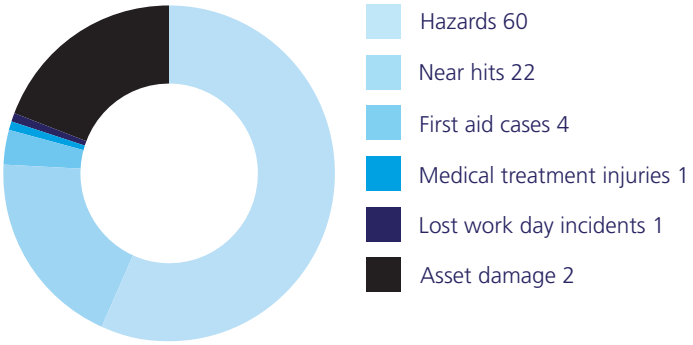


Figure 21: Working on energized systems – incident consequence

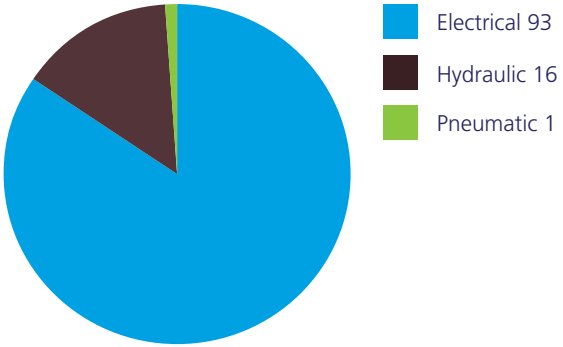
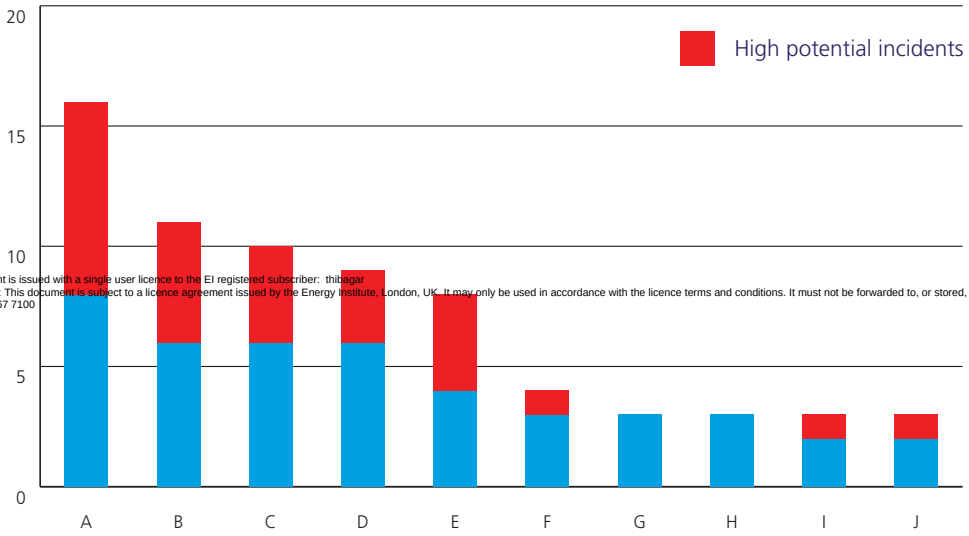


Figure 22: Working on energized systems – incident area summary



Key

A	Turbine tower
B	Substation work and cable areas
C	Nacelle
D	Substation HV areas (>1000 V)
E	Transition piece area
F	Harbour, quay and pontoons
G	Warehouse
H	Vessel (other)
I	Turbine assembly area
J	Other

Figure 23: Working on energized systems – incident area breakdown with high potential incidents identified

Dropped object incidents

Summary – breakdown by incident area and consequence

In 2017, there were 169 dropped object incidents. 47 % of all dropped object incidents occurred on the turbine*[3], 22 % on vessels*[4] and 25 % during onshore*[5] activity. There were 8 lost work day incidents resulting from a dropped object, and significantly 38 % of dropped object incidents were classified as being high potential. During lifting operations*[2], 57 % of dropped objects were classified as high potential incidents.

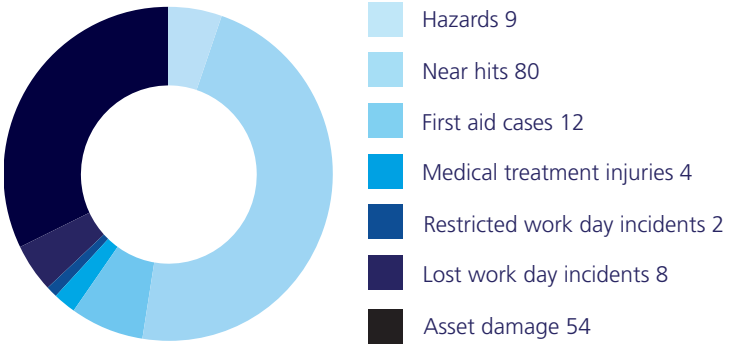


Figure 24: Dropped objects – incident consequence

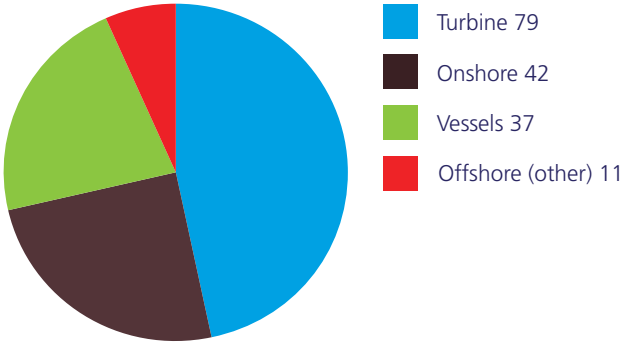


Figure 25: Dropped objects – incident area summary

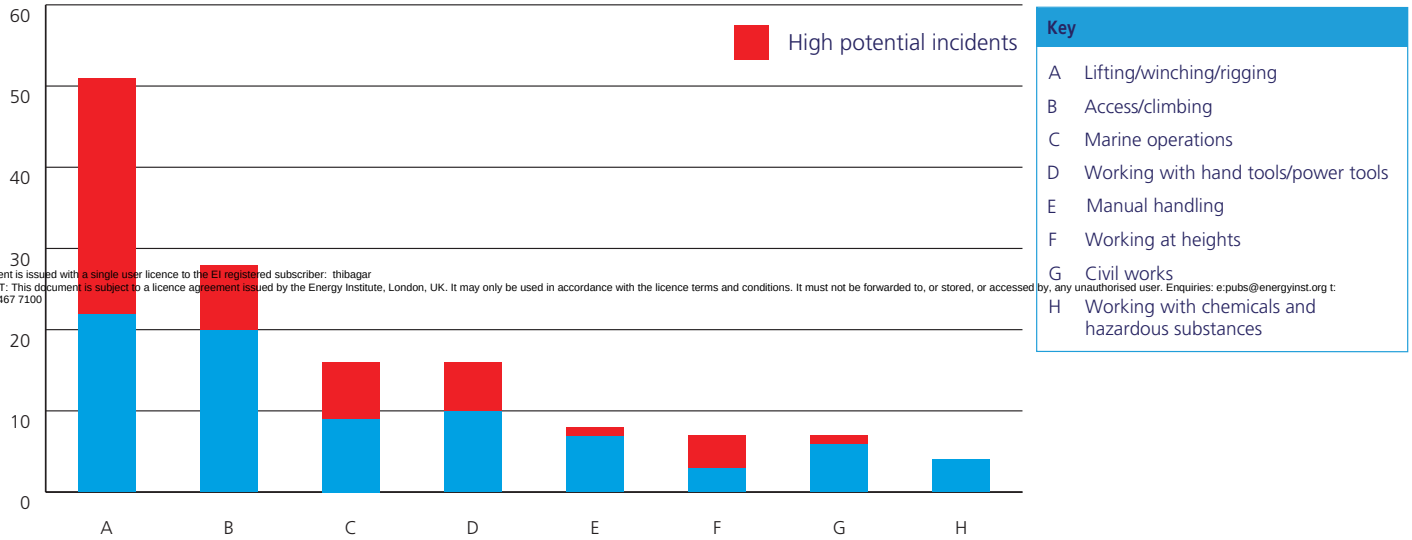


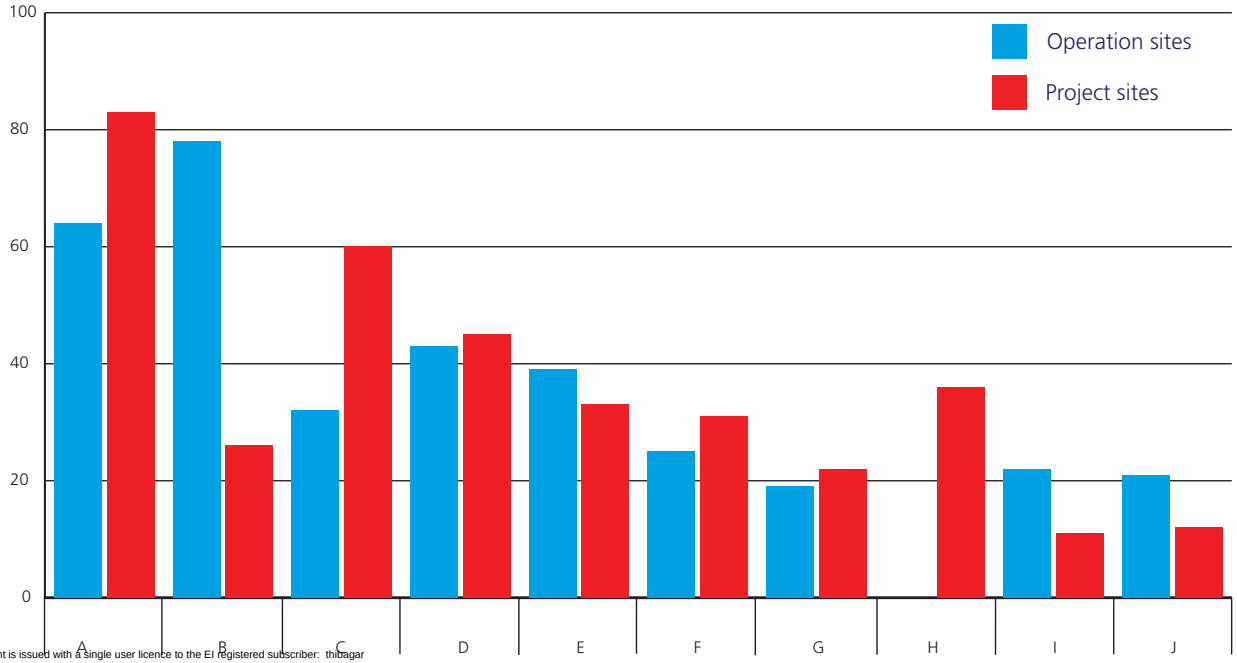
Figure 26: Dropped objects – work process breakdown with high potential incidents identified

Project and operation sites

G+ member offshore wind farms comprise projects that are in either the development, projects (construction) or operational phases. These are defined as:

Project site: Commissioning and construction
Operation site: Site in operation producing power
Development phase: Development and consenting

A breakdown of the incident data by work process (with hazard observations excluded) in either the project or operational phases of a wind farm site is shown in Figure 27. Some work processes have broadly similar profiles across site type (lifting operations*[2], vessel*[4] transfers), while others have differences (gaining access/egress, maritime operations). For clarity, work processes are not grouped here as they have been throughout the report [see Annex A].



Key					
A	Lifting operations	E	Manual handling	I	Climbing/rope access
B	Gaining access/egress	F	Working with hand tools/power tools	J	Office work
C	Maritime operations	G	Working on energized systems (electrical)		
D	Transfer by vessel	H	Civil works		

Figure 27: Work process – project/operation site breakdown

Conclusions and next steps

Publication of the G+ incident data is a crucial step in ensuring information is provided in a transparent and open way. It is only with this approach that genuine improvements can be made to the offshore wind industry's health and safety performance. Whilst the key headlines from this data are presented in this report, the G+ encourages further analysis of the data and welcomes queries from interested stakeholders.

Learnings from the report are shared within member companies and data champions contribute to the evolution of the G+ work programme. There is a significant task to ensure that the high-level information produced by the G+ gets back to the people involved in the incidents behind the statistics, and that real change is implemented on an organisational level. With the internationalisation of the offshore wind industry, differences in safety culture will play an increasing role in safety performance and the G+ are uniquely placed to monitor and respond to this. In 2018, for the first time, we are recording which country an incident took place in and we hope to provide country-specific feedback this time next year.

The focus in 2016 and 2017 on high potential incidents was well received by industry, as this is a step towards a more proactive safety culture. There is an ongoing need to recognise that those injuries that result in lost work days do not predict where the most serious incidents will happen. This is an overarching reminder for organisations to be aware of complacency as the offshore wind industry matures.

Annex A – Glossary

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

Marine operations*[1]	Marine operations comprise the following work processes: anchoring, diving operations, maritime operations, transfer by vessel, transit by vessel, vessel operation, vessel mobilisation.
Lifting operations*[2]	Lifting operations comprise the following work processes: cable pull/winching, davit crane operations, lifting operations and rigging/slinging/banking.
Turbine*[3]	The turbine includes: access ladders, boatlanding, transition piece area, external and internal foundations, service lift, turbine tower, helicopter area, hub and blades, nacelle, yaw gear space.
Vessels*[4]	Vessels include: accommodation vessels, barges, crew transfer vessels (CTVs), service operation vessels (SOVs), diving vessels, fast rescue craft (FRC), guard vessels, installation vessels, survey vessels and tugs.
Onshore*[5]	Onshore areas include: access roads, public roads/areas, car parks, company vehicles, harbour/quay/pontoons, excavations and civil works, administration, offices, warehouses and workshops.
Energized systems*[6]	Energized systems include: electrical systems, hydraulic systems and pneumatic systems.

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

Fatality	Incidents that involve one or more people who died as a result of a work-related incident or occupational illness. 'Delayed' deaths that occur after the incident are to be included if the deaths were a direct result of the incident.
Lost work day	Non-fatal incidents that involve 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.
Restricted work day	Incidents that do not result in a fatality or a lost work day but do result in a person being unfit for the full performance of the regular job on any work on any day after the occurrence of the occupational injury.
Medical treatment injury	Those incidents not severe enough to be reported as fatalities, lost work day incidents or restricted work day incidents but are more severe than requiring simple first aid treatment.
First aid	An injury that requires simple medical 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.
Near hit	A near hit is any incident that could have resulted in a work-related accident but did not either by chance or timely intervention.
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'.
Asset damage	An event where there is damage to plant, equipment or facilities (no injury to persons).

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 other medical treatment injuries requiring treatment by a medical professional per million hours worked.
Lost time injury frequency (LTIF)	The number of fatalities and lost work day incidents per million hours worked.

The following abbreviations have been used throughout the report:

CTV	crew transfer vessel
DROPS	Dropped Objects Prevention Scheme
ERME	emergency response or medical evacuation
FRC	fast rescue craft
G+	G+ Global offshore wind health and safety organisation
HV	high voltage
LTIF	lost time injury frequency
OFTO	offshore transmission owner
SOV	service operation vessel
TRIR	total recordable injury rate

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