

WORK & SAFETY ANALYSIS 2021



ABSTRACT

The report presents data of employment, incidents and accidents submitted by IRATA members over the period January – December 2020. During the period submissions were received from 530 members (516 in 2019) by Q4, an increase of 14 members operating worldwide, a reduced increase compared to previous years. Total employed fell from 19,257 to 16,389; associated work hours fell from 22.6 to 19.4 million hours; effective 'full time equivalent' workforce fell from ~11,300 to ~9,700.

The COVID-19 pandemic appeared to have had a significant impact on the figures supplied but the effects were inconsistent between regions, some hardly affected, some continued to increase whilst some suffered significant reductions in employment and/or work hours.

There were 260 reported incidents and accidents; 188 were 'near misses', injuries and illnesses accounted for 72, of which 10 were 'reportable' to authorities (3 major injuries and 7 serious injuries). The 'reportable' injury rate was 103 per 100,000 full time workers. The injury rate for 'On Rope' working in isolation was only 61 per full time 100,000 workers. Thankfully, there were no fatalities in 2020. The excellent safety record for reportable injuries was maintained by members of the Association.

The summary and conclusions highlight specific issues raised by the data supplied. Notable areas of concern included frequency of site intrusions by third parties, 'dropped objects' (including potential objects left by other worker)s, site 'housekeeping' issues for site controllers and personnel factors leading to medical conditions and strain injuries, particularly during training.

It remains to be seen whether the resilience of the Association to the pandemic, shown in 2020, is maintained in 2021.

Dr C H Robbins
15 August 2021

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1. INTRODUCTION

Members of the Industrial Rope Access Trade Association (IRATA) International are required to submit annual employment data and details of accident and incident events. Data supplied for analysis includes regional identification but excludes identification of individual members. Calculation of accident rates requires details of employment numbers and associated work hours. Gratitude is due to those who presented data for analysis, both within individual member companies as well as IRATA Head Office staff who assemble all the data. The effects of the COVID-19 pandemic must have hindered the process for all concerned. All data supplied, both employment and accident/incident events, was subjected to quality checks prior to analysis.

This report presents summaries of the data provided for the period January - December 2020 by all member companies. It is important to note that the employment data relates to member company employees only. Thus, IRATA qualified individuals who were not employees of member companies are not covered by this report.

The COVID-19 pandemic, commencing around January 2020, must have had an influence on the figures to be examined. The effect may be 'direct' (e.g. employment reductions) but also may be 'indirect' such as administrative problems in assembly and submission of data.

In 2012, it was decided that zones or regions around the world would be established, overseen by Regional Advisory Committees (RACs). Members' data are reported under their RAC, the only information provided to the assessor.

There are currently 15 RACs, increased by the split of Asia into Far East and South East Asia:

- Australasia
- Benelux
- Brazil
- D-A-CH (Germany, Austria and Switzerland)
- Eastern Europe
- Far East Asia
- Mediterranean
- MECASA (Middle East, Central Asia & South Asia)
- North America
- North Sea Operators
- Other (diverse, includes W Africa and Ireland)
- Scandinavia
- South Africa
- South East Asia
- UK

The report is arranged with figures, graphs and tables incorporated within the text to which they apply. The report presents conclusions and makes recommendations, based on the data supplied, identifying specific work issues of relatively high frequency and/or seriousness.

(See Appendix II for description or explanation of various terms used in this report).

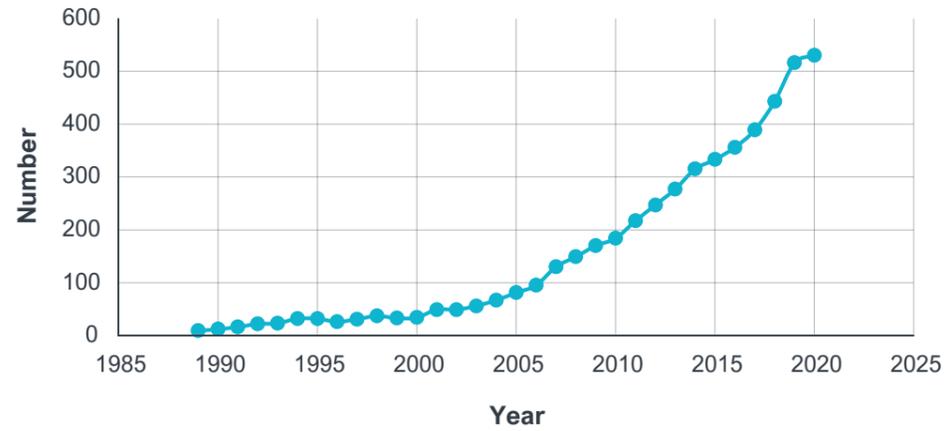


2. IRATA MEMBERSHIP

Figure 1, the number of members submitting data by Q4, shows the continuing increase in membership of the Association from 516 to **530 in 2020**. Thus, despite COVID-19, membership continued to increase albeit at a significantly reduced rate. It is possible that some members may have been unable to submit data during 2020 due to COVID-19, in which case the number of members identified here will be less than actual membership. The increase was probably the net result of losses and gains.

(Note that the 'membership' referred to in this report is limited to the number of companies submitting data in the last quarter of the year and may not equate to membership figures for the Association).

Figure 1 | IRATA Membership



3. EMPLOYMENT STATISTICS

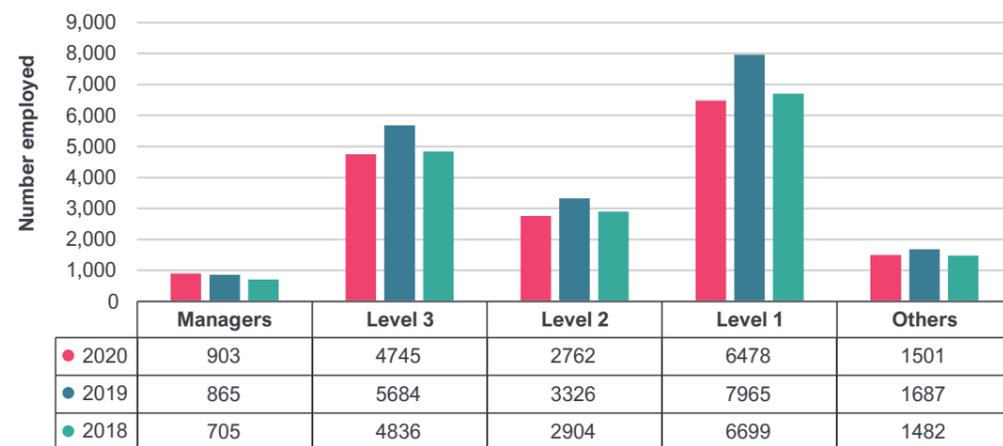
3.1 EMPLOYMENT LEVELS

Employment fell by 16% to an average quarterly figure of **16,389** from 19,527 in 2019, in contrast to the rise in membership. Distribution of employment between the grades is shown in **Figure 2**. Reductions were in all grades except, notably, managers. Return to 2018 figures is apparent, almost certainly due to COVID-19, but individual regions varied greatly.

Increases in employment were recorded by Benelux, Mediterranean and South Africa. Reductions, some significant, occurred in Australasia, D-A-CH (Germany, Austria and Switzerland), MECASA (Middle East, Central and Southern Asia), with largest decreases reported by North America, North Sea Operators, collectively South and Far East Asia and, particularly, UK. Brazil and Eastern Europe remained fairly static.

(Note that the employment figures are taken as the average of the four quarterly figures submitted for the year.)

Figure 2 | Employment by Grade



(Note that these figures are the summed averages of all four quarters)

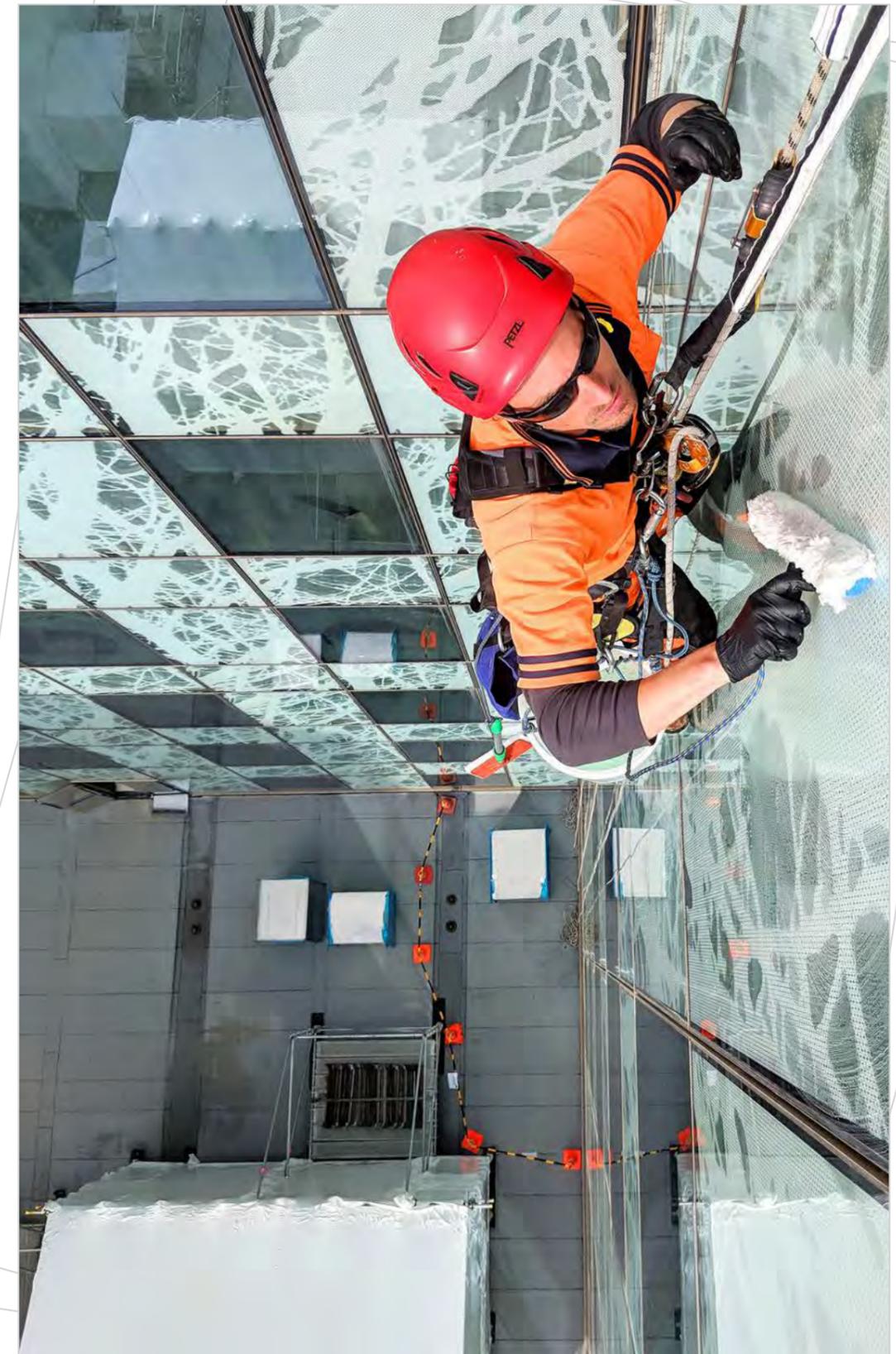


Image courtesy of Heads Up Training © 2021

3.2 HOURS WORKED

The total hours worked in 2020 were **19,412,219**, a 14% reduction from the 2019 figure of 22,573,961 and slightly less than in 2018. As with employment numbers, there were variation figures for the individual regions but these were not necessarily related to employment changes. For example, North Sea Operators reported a reduction in employment but recorded an increase in worked hours.

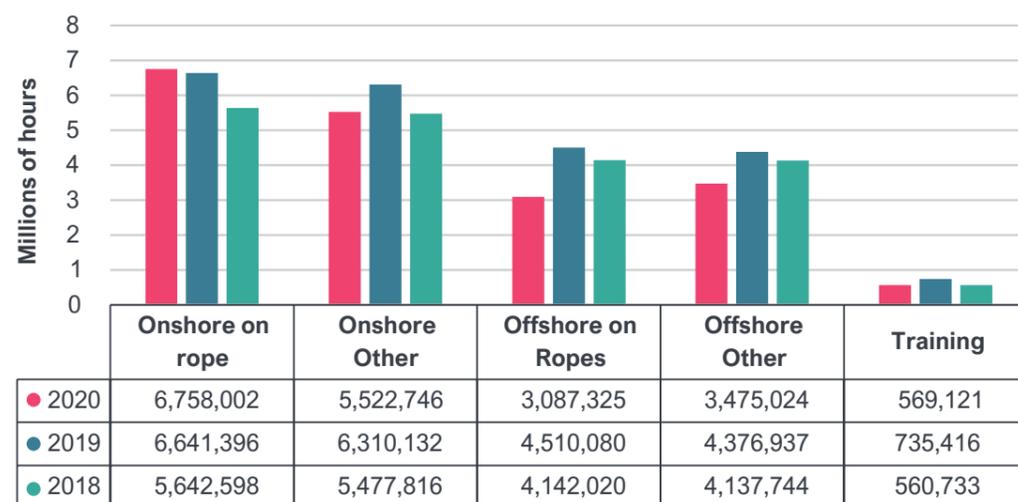
Major reductions were also reported by Brazil, South and Far East Asia combined, MECASA, North America and, again particularly, UK. Mediterranean and Scandinavia had little change in total work hours. Utilisation figures (hours worked divided by number of employees) for the last three years are shown on the small table in the right column.

They show little change, remaining well

Year	Utilisation (Hours/ Worker per annum)
2018	1,201
2019	1,156
2020	1,184

below a maximum utilisation of about 2,000 hours per worker per annum. It may be surmised that, since the utilisation was similar in 2019 compared to 2020, the possible effects of COVID-19, in terms of illness/isolation amongst the workforce as a whole, was minimal (in terms of work time lost). Thus, the reductions were more probably due to loss of work inducing lay off, i.e. fewer technicians working the same hours as normal? The reported workforce of 16,389 reduces to a full time workforce of only 19,412,219 hours/2,000 hours per employee = **9,706** for later purposes. (The 2,000 hours is used internationally as the annual work hours per employee for full time employment).

Figure 3 | Location of Reported Hours



Work hours can also be shown distributed between onshore and offshore working and training, shown in **Figure 3**. During the early years of the Association, most rope access work of founder members was carried out on North Sea offshore platforms, hence the division. Only onshore 'On Rope' working managed to remain almost unaffected by COVID-19, apparently, although onshore 'Other' working hours fell by about 0.8 million, returning to 2018 figures.

Most affected was offshore 'On Rope' working with a reduction of nearly 1.5 million hours and also nearly 1 million hours lost in offshore 'Other' working. Thus, the major cause of the reduced total work hours occurred in offshore working. Training hours also returned to 2018 figures. However, as with employment and work hours, there were large variations between regions in the changes to training, as shown in **Table 1**. Some appeared to have taken advantage of circumstances and increased training; others reduced the amount of training or were forced to due to unavailability of training courses. In some cases, such as in the UK, availability restrictions of training may have contributed to the large reductions.

Table 1 | Training Hours

RAC	2020	2019
Australasia	46,133	40,095
Benelux	8,530	7,800
Brazil	103,169	119,711
D-A-CH	2,266	5,423
Eastern Europe	40,065	58,536
Far East Asia	*	Included in SE Asia
Mediterranean	25,598	19,984
MECASA	41,104	88,570
North America	48,156	78,107
North Sea Operators	9,437	10,456
Other	70,323	42,807
Scandinavia	3,976	4,315
South Africa	16,732	12,671
South East Asia	77,706	94,404
United Kingdom	75,927	152,537
Total	569,122	735,416

* 14,006 added to South East Asia for comparative purposes

3.3 REGIONAL ADVISORY COMMITTEES (RACs)

The more detailed data supplied by RACs are shown in the following tables. **Table 2** presents the employment data by grade used in the summary chart **Figure 2**. Totals for the previous year are shown alongside for comparison, with falls highlighted in red.

Table 2 | Employment Submissions by Grade for RACs

RAC	Managers	Level 3	Level 2	Level 1	Others	Total 2020	Total 2019
Australasia	101	622	339	704	62	1,828	2,034
Benelux	37	182	87	143	28	477	535
Brazil	32	172	108	252	48	612	628
D-A-CH	13	33	19	53	16	132	54
Eastern Europe	46	210	97	211	48	611	608
Far East Asia	38	127	105	125	18	412**	*
Mediterranean	38	98	52	129	31	347	254
MECASA	123	511	509	1,054	361	2,557	2,685
North America	90	374	207	795	106	1,571	1,905
North Sea Ops	38	546	213	669	255	1,720	2,128
Other	27	148	116	180	111	581	861
Scandinavia	22	99	54	42	16	232	268
South Africa	32	154	87	238	66	577	398
South East Asia	52	347	208	544	102	1,253	2,160
UK	217	1,125	564	1,341	234	3,480	5,010
Total	903	4,745	2,762	6,478	1,501	16,388	19,526

* Included within SE Asia

** Taken into account with SE Asia figure

Table 3 summarises the work hours submitted by the individual RACs. As with employed numbers, some RACs showed clear reductions from 2019 figures whilst others showed little or no impact of COVID-19 on work hours submitted.

Perhaps the easiest way of demonstrating the difference between RACs, in terms of the possible impact of COVID-19 on the number employed and work hours, can be seen on the bottom of the next page. The arrows represent increases or decreases from 2019 to 2020. The arrows give an indication of the relative rise or fall in figures for each RAC; the more arrows, the bigger the relative change.

The inconsistencies are now clearly apparent. The large falls, in UK data particularly, would be difficult to explain without recognition of the probable negative impact of COVID-19 induced restrictions on work.

The distribution of work hours between onshore and offshore working submitted by RACs, together with training (previously discussed), are tabulated in **Table 4**. It is clear that the bulk of the negative impact overall lies in offshore working, now accounting for only 6.5 million hours of the 19.4 million hours total.

Table 3 | Distribution of Work Hours Reported by RACs

RAC	Managers	Level 3	Level 2	Level 1	Others	Total 2020	Total 2019
Australasia	132,022	605,742	343,830	615,101	55,596	1,752,291	2,296,749
Benelux	33,782	181,842	89,889	114,989	27,655	448,157	425,691
Brazil	32,735	106,963	60,289	94,401	50,277	344,665	483,809
D-A-CH	13,626	30,890	10,551	9,683	12,285	77,035	65,970
Eastern Europe	44,994	211,004	101,781	172,940	56,216	586,934	506,810
Far East Asia	31,004	108,610	79,587	98,978	21,769	339,948**	*
Mediterranean	46,270	90,861	49,092	79,914	19,791	285,928	275,387
MECASA	233,879	892,957	788,432	1,729,473	773,383	4,418,123	4,597,818
North America	90,361	317,098	174,980	624,243	92,361	1,299,043	1,767,668
North Sea Ops	55,821	527,456	195,646	662,074	1,071,748	2,512,745	2,163,532
Other	32,217	234,337	183,676	624,301	148,787	1,223,319	1,428,146
Scandinavia	19,940	102,563	57,571	35,643	21,039	236,756	231,179
South Africa	50,506	185,885	102,115	250,091	106,459	695,056	521,847
South East Asia	68,755	351,529	233,653	512,094	149,782	1,315,813	1,965,319
UK	232,430	1,295,568	632,743	1,429,162	286,504	3,876,408	5,844,037
Total	1,118,342	5,243,305	3,103,833	7,053,087	2,893,652	19,412,219	22,573,961

* Included within SE Asia

** Taken into account with SE Asia figure

RAC	Total Employees	Total Hours
Australasia	▼	▼▼
Benelux	▼	▲
Brazil	●	▼▼
D-A-CH	▲	▲
Eastern Europe	●	▲▲
Far East Asia	*	*
Mediterranean	▲	▲
MECASA	●	▼
North America	▼	▼▼
North Sea Ops	▼	▲▲
Other	▼	▼
Scandinavia	●	●
South Africa	▲	▲▲
South East Asia	▼	▼▼
UK	▼▼▼	▼▼▼

* Included within SE Asia

SUMMARY OF EMPLOYMENT DATA

Total number employed	16,389 (average quarterly figure)
Total work hours	19,412,219 million
Equivalent workforce	9,706 (2,000hrs per employee)
Total training hours	569,122 (included within total work hours)

Table 4 | Location of Work Hours reported by RACs

RAC	Onshore on rope	Onshore other	Offshore on rope	Offshore other	Training	Total 2020	Total 2019
Australasia	964,051	498,644	115,827	127,636	46,133	1,752,290	2,296,749
Benelux	215,288	113,092	86,083	25,165	8,530	448,157	425,691
Brazil	40,599	63,365	79,214	58,318	103,169	344,665	483,809
D-A-CH	16,973	43,584	11,855	2,357	2,266	77,035	65,970
Eastern Europe	112,022	211,908	67,991	154,949	40,065	586,935	506,810
Far East Asia	122,612	104,343	43,222	55,765	14,006	339,948	*incl SE Asia
Mediterranean	118,768	118,733	7,058	15,771	25,598	285,928	275,387
MECASA	1,849,044	1,707,852	395,167	424,956	41,104	4,418,123	4,597,818
North America	734,816	413,170	71,316	31,585	48,156	1,299,043	1,767,668
North Sea Ops	208,462	554,408	487,982	1,252,456	9,437	2,512,745	2,163,532
Other	512,748	172,253	249,584	218,411	70,323	1,223,319	1,428,146
Scandinavia	75,038	102,528	19,310	35,904	3,976	236,756	231,179
South Africa	112,474	204,234	154,448	207,168	16,732	695,056	521,847
South East Asia	259,447	360,198	289,561	342,908	63,700	1,315,813	1,965,319
UK	1,415,661	854,437	1,008,708	521,676	75,927	3,876,408	5,844,037
Total	6,758,002	5,522,747	3,087,325	3,475,025	569,122	19,412,219	22,573,961

* Included within SE Asia

** Taken into account with SE Asia figure

4. ACCIDENT AND INCIDENT STATISTICS

4.1 INTRODUCTION

(See APPENDIX II for explanations and descriptions of terms used for 'Fatality', 'Major Injury', 'Serious' or 'Over 7 Day Injury', 'Minor' or 'Less than 7 Day Injury', 'Incident' or 'Near Miss', 'Ill Health', 'Sprains/ Strains' and 'Reportable Accident').

Factors that cause many low severity incidents are frequently different to those that cause high severity accidents. For example, apparently minor errors in rope device handling, such as failing to attach descenders properly, could lead to major accidents whereas high frequency errors, such as temporary single point attachment, rarely result in a serious outcome. Therefore, it seems more appropriate to concentrate on the minor incidents that share similar root causes, than to those that lead to serious accidents. There seems limited value to examine more closely near miss incidents that had low probability of leading to serious accidents. Nevertheless, all reports were included in the analysis that follows.

Before addressing the accident and incident data, it should be noted that three injury reports were classified 'Serious' or 'Minor'. Two involved shoulder dislocations and a third a broken arm. The correct classification should have been 'Major' for all three

injuries despite understandable reasons for the lesser classification. These have been corrected. There would be no impact, either way, on the later calculation of accident rates as both 'Serious' and 'Major' injuries are collectively treated as 'Reportable Accidents'.

Disappointingly, there were many errors and/or omissions in the data used to prepare **Figures 8, 9 and 11** particularly. Where obvious or possible, corrections and amendments were made in an effort to present more accurate analysis.

4.2 CONSEQUENCES OF ACCIDENTS AND INCIDENTS

A total of **260** acceptable reports were received. Within this total were **3** reports of 'Major' injuries, **7** 'Over 7 Day' or 'Serious Injuries' (including 2 'Ill Health' and 'Strains'), **62** 'Less than 7 Day' or minor injuries (including 20 'Ill Health' and 'Strains') and **188** 'Near Miss' reports. **There were no reports of fatalities.** The 'Reportable Accidents' are shown in the following table alongside those for 2017/8/9:

Reportable	2020	2019	2018	2017
Fatal	0	1	0	3
Major	3	2	1	1
Serious (over 7 days)	7	7	4	9

The table below summarises the data for the remaining 250 'Less than 7 Day' injuries and 'Near Misses' or non injurious incidents, but note these numbers take no account of differences in population year by year:

Not reportable	2020	2019	2018	2017
Minor < 7 day injuries	62	63	60	74
Near miss	188	173	101	86

4.3 LOCATION OF ACCIDENTS AND INCIDENTS

All events reported are tabulated according to work place.

	Major	Serious	Minor	Near Miss	Ill Health/Strain*
On Rope	0	3	37	101	9
Other	1	3	10	37	0
Training	2	1	15	50	13

Numbers per million work hours
*Included within Minor and Serious Injuries

Taking into account 'time at risk', dividing the figures by reported hours totalling 9.8 million for 'On Rope', 9.0 million for 'Other' and 0.57 million for training gives:

	Major	Serious	Minor	Near Miss	Ill Health/Strain*
On Rope	0	0.3	3.6	11.2	1.0
Other	0.1	0.3	1.1	4.1	0
Training	3.5	1.8	26	88	23

Numbers per million work hours
*Included within Serious or Minor Injuries

The significantly higher injury risk, on an hourly basis, when training reinforces the need for training establishments to maintain close supervision at all times. The higher figure for 'Near Miss' in training reflects a high incidence of training related 'student errors'. A similar relationship exists when comparing onshore and offshore working and training:

	Major	Serious	Minor	Near Miss	Ill Health/Strain*
Onshore	1	4	38	126	7
Offshore	0	2	13	12	2
Training	2	1	15	50	13

Numbers per million hours worked
*Included within Serious or Minor Injuries

Taking reported hours into account with onshore of 12.3 million hours, offshore of 6.6 million and training of 0.57 million, the figures transform to:

	Major	Serious	Minor	Near Miss	Ill Health/Strain*
Onshore	0.08	0.33	3.1	10.2	0.57
Offshore	0	0.30	2.0	1.8	0.30
Training	3.5	1.8	26	88	23

Numbers per million hours worked
*Included within Serious or Minor Injuries

There was no significant difference between risk of serious injury working offshore or onshore, and only a small increase in risk of minor injury working onshore over offshore. The majority of 'Near miss' reports originated from onshore members. The smaller proportion of 'Near miss' reports from offshore possibly reflect commercial concerns whilst working under platform management and a reluctance to disclose errors if possible. As before, training exceeds in all cases by significant margins on an hourly basis (which may be considered an unfair basis for comparison!).

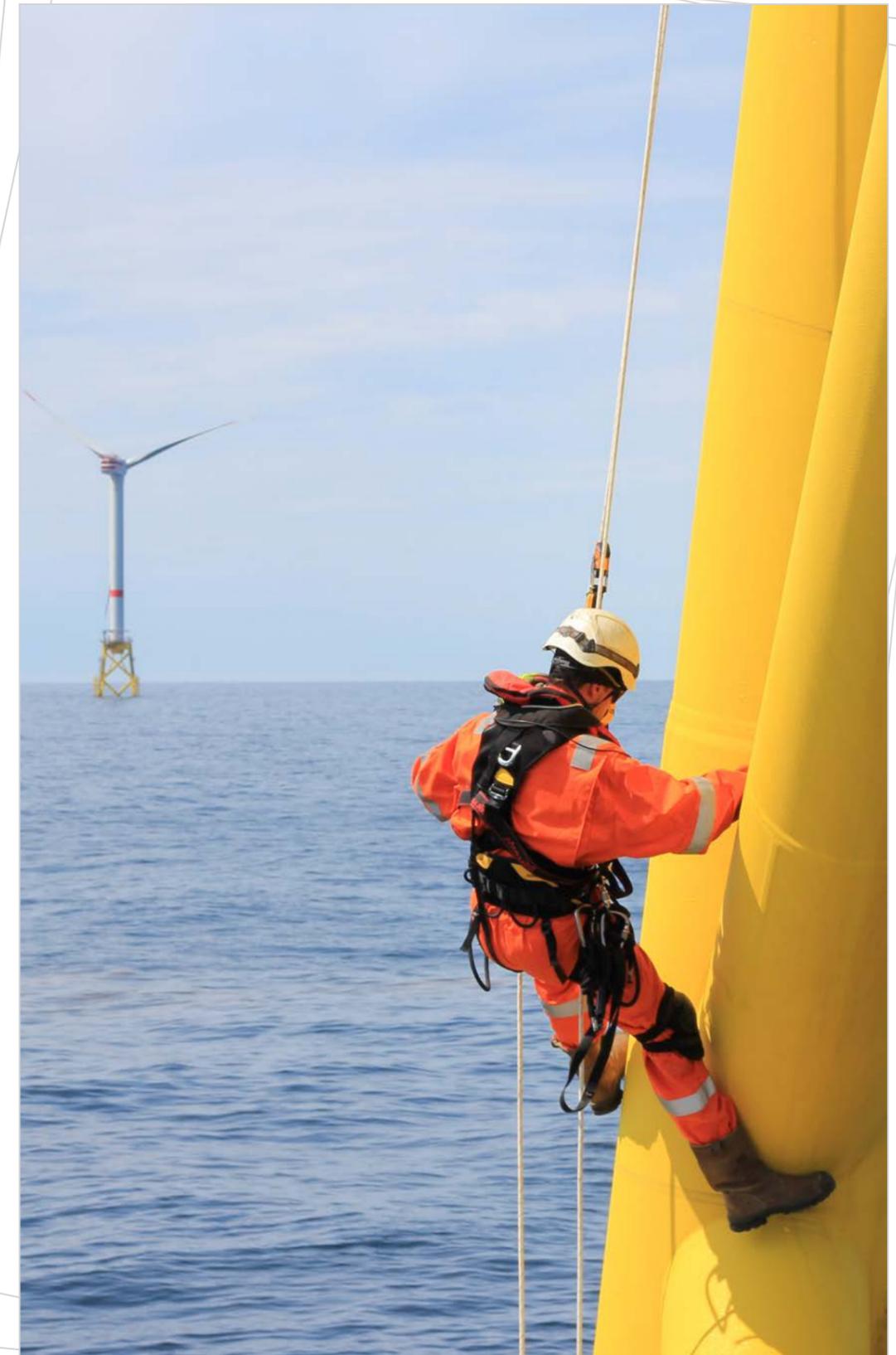
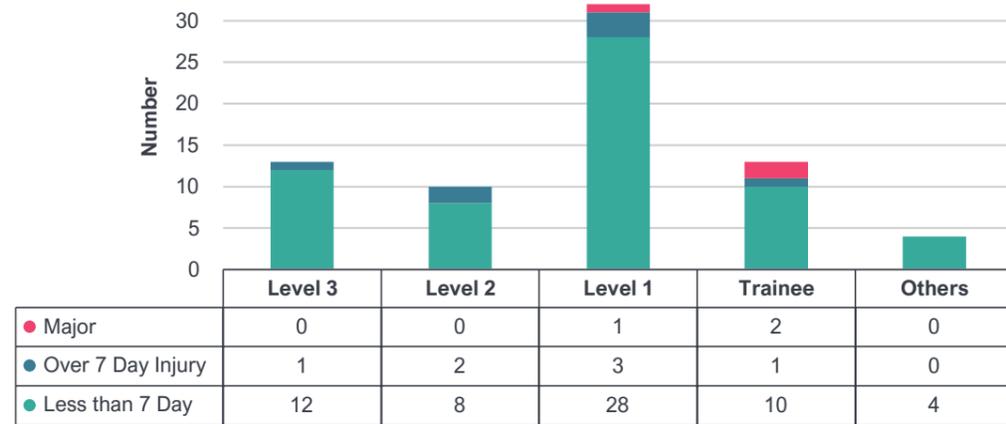


Image courtesy of C2 (Crane Inspection Services B.V. 2 Go Access) © 2021

4.4 ACCIDENT EVENTS BY GRADE

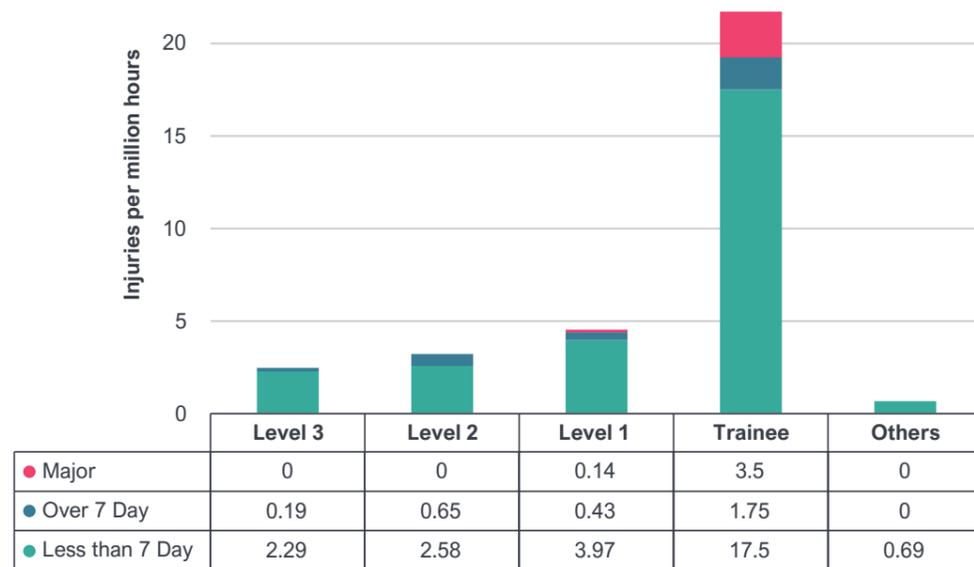
The 3 major and 7 serious injuries, together with the 62 minor (less than 7 days) injuries, sustained by individuals are shown in **Figure 4**; according to grade.

Figure 4 | Injuries by Grade



It is necessary to take into account the populations of the different grades. Using the employment hours from **Tables 3** and **4** and dividing gives the following result in **Figure 5**.

Figure 5 | Injuries by Grade (per million hours)



It is important to recognise that the figures involved are small; therefore, care is necessary in interpretation. Taking populations into account shows that the risk of injury of all qualified grades lie roughly in the range 2-5 per million, as in previous years. However, the figure for trainees is four or five times higher and risk of serious injury is also significantly higher (although only actually 3 in number 'injuries'). There will be several reasons for this and training members will be aware of hazards dealing with trainees. However, the injury numbers involved remain statistically small.

4.5 BODY PART INJURIES

Figure 6 shows the distribution of reported injuries, sustained in 2020. It should be noted that the chart is of actual numbers of injuries and takes no account of populations. The chart also shows the 7 'Serious' and 3 'Minor' injuries. There is a similarity with previous data in respect of arm and hand injuries. The one significant difference to 2019 figures is the reduction of face and eye injuries, returning back to 2017/18 figures of about 10. There were some instances of 'double' injuries sustained in single events; hence the total of injuries in the chart exceeds reported accidents involving injury.

Of the 14 arm injuries, 5 were sustained by students during training, one of which was major, a 're-broken' arm during training. Miscellaneous causes of arm injuries included wasp stings, hot condensate burns and being struck by a falling ice block.

The 11 hand/finger injuries included 4 hand cuts from a knife, a karabiner and 2 gratings or deck plates, one of which was serious. Also included were 2 instances of hands being pinched, a burn from contact with a hot pipe and 2 injuries caused using

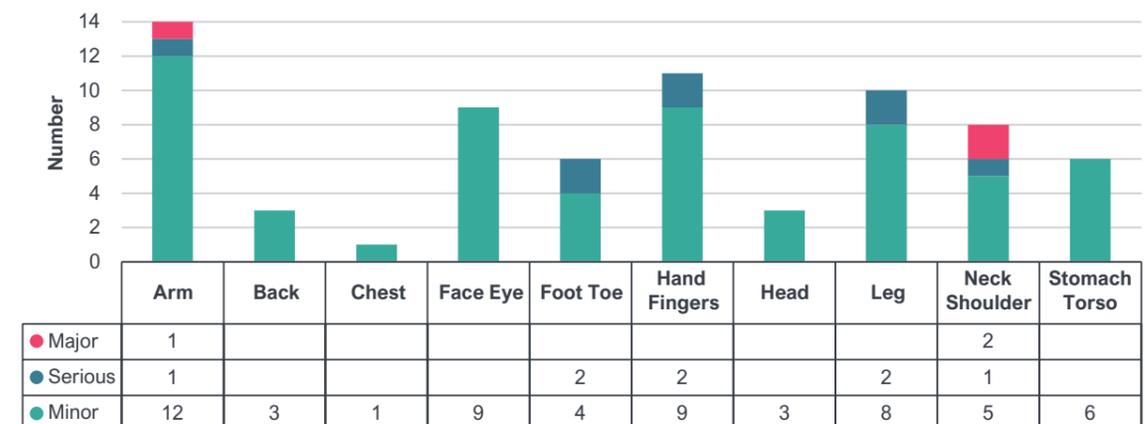
tools, one of which was serious from a blow from a hammer.

Of the 10 leg injuries, 2 were serious injuries; 1 during Level 3 re-certification whilst aid climbing. Of 4 injuries caused by slips or trips, 1 resulted in a dislocation serious injury. Two injuries involved contact with fixed structures related to 2 injuries. Both were strains and 1 occurred whilst training.

Neck/shoulder injuries were primarily due to shoulder problems including a major dislocation injury slipping on a staircase whilst on a training course. The other major was simply caused whilst putting on a harness! Another 2 minor injuries followed working 'On Rope' and 1 opening a door. Lime powder deposited on the neck was the only event not involving strain or injury.

The 2 serious foot injuries were caused by a burn from standing on hot ash and, the second, being struck by a moving trolley. A second burn was caused by weld spatter entering the boot. An uncontrolled rope descent resulted in heel damage.

Figure 6 | Body Part Injuries





COVID-19

The COVID-19 pandemic appeared to have had a significant impact on the figures supplied but the effects were inconsistent between regions; some hardly affected, some continued to increase whilst some suffered significant reductions in employment and/or work hours.



MEMBERSHIP

It is possible that some members may have been unable to submit data during 2020 due to COVID-19; in which case the number of members identified here will be less than actual membership.



EMPLOYMENT

The large falls in employment rates, in UK data particularly, would be difficult to explain without recognition of the probable negative impact of COVID-19 induced restrictions on work.



INJURIES

Frequency of site intrusions by third parties, dropped objects (including potential objects left by other workers), site 'housekeeping' issues for site controllers and personnel factors leading to medical conditions and strain injuries, particularly during training.



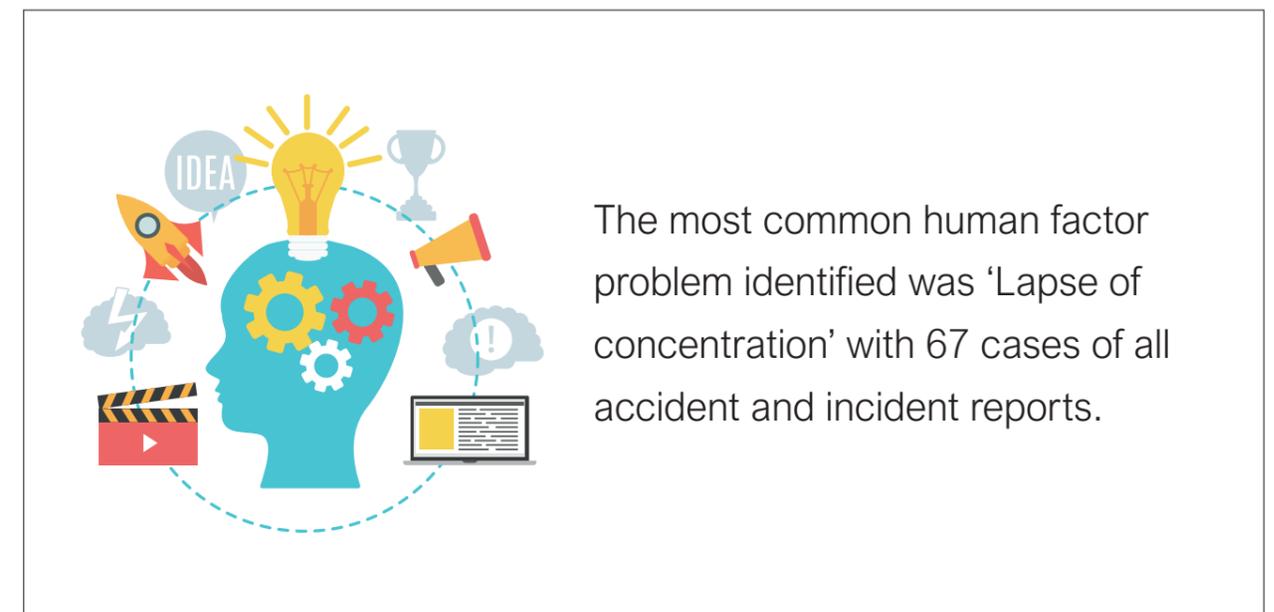
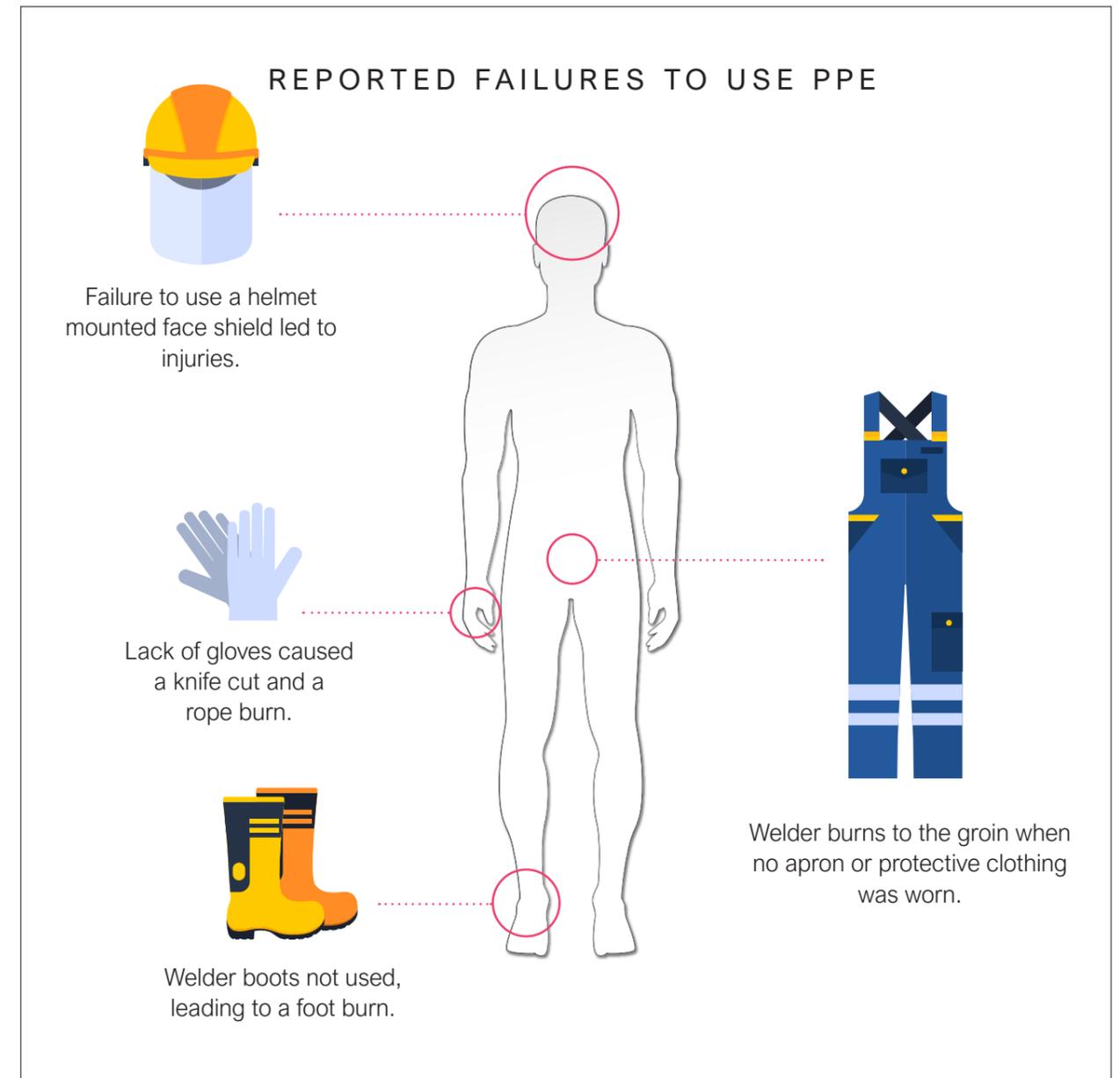
WORK HOURS

Most affected was offshore 'On Rope' working with a reduction of nearly 11.5 million hours and also nearly 1 million hours lost in offshore 'Other' working. Thus, the major cause of the reduced total work hours occurred in offshore working.



INCIDENTS

Falling or dropped objects by Rope Access Technicians (RATs) (40) was the greatest single cause of reported incidents. Half were rope access devices. There was one reported serious injury as a result. Technicians reported 22 potential falling objects left by third parties. 'On Rope' and rigging errors did not result in any serious injuries.



4.6 CAUSES OF ACCIDENTS AND INCIDENTS

'Manual handling' data is omitted because it was frequently interpreted as 'manual error'. Also omitted was 'Operator error or omission' because it is covered in more detail later. 'Rope access equipment failure' and 'Rope access equipment malfunction' categories are combined into 'Rope access equipment problems'. 'Rope damage' continued to be identified as a separate category. 'Illness and medical condition' are also combined with 'Sprains'.

Two additional categories were created to include 'Rope errors' (errors using rope access). 'Dropped objects' is sub-divided into 'Potential dropped objects' and 'Objects dropped by RATs and trainees'. Also added were instances of 'Third party acts or omissions'. Conventionally, 'falls' include slips and trips. 'Falls' are separated in this analysis, being more appropriate to this industry.

Figure 7 presents the data supplied, amended and corrected for report purposes.

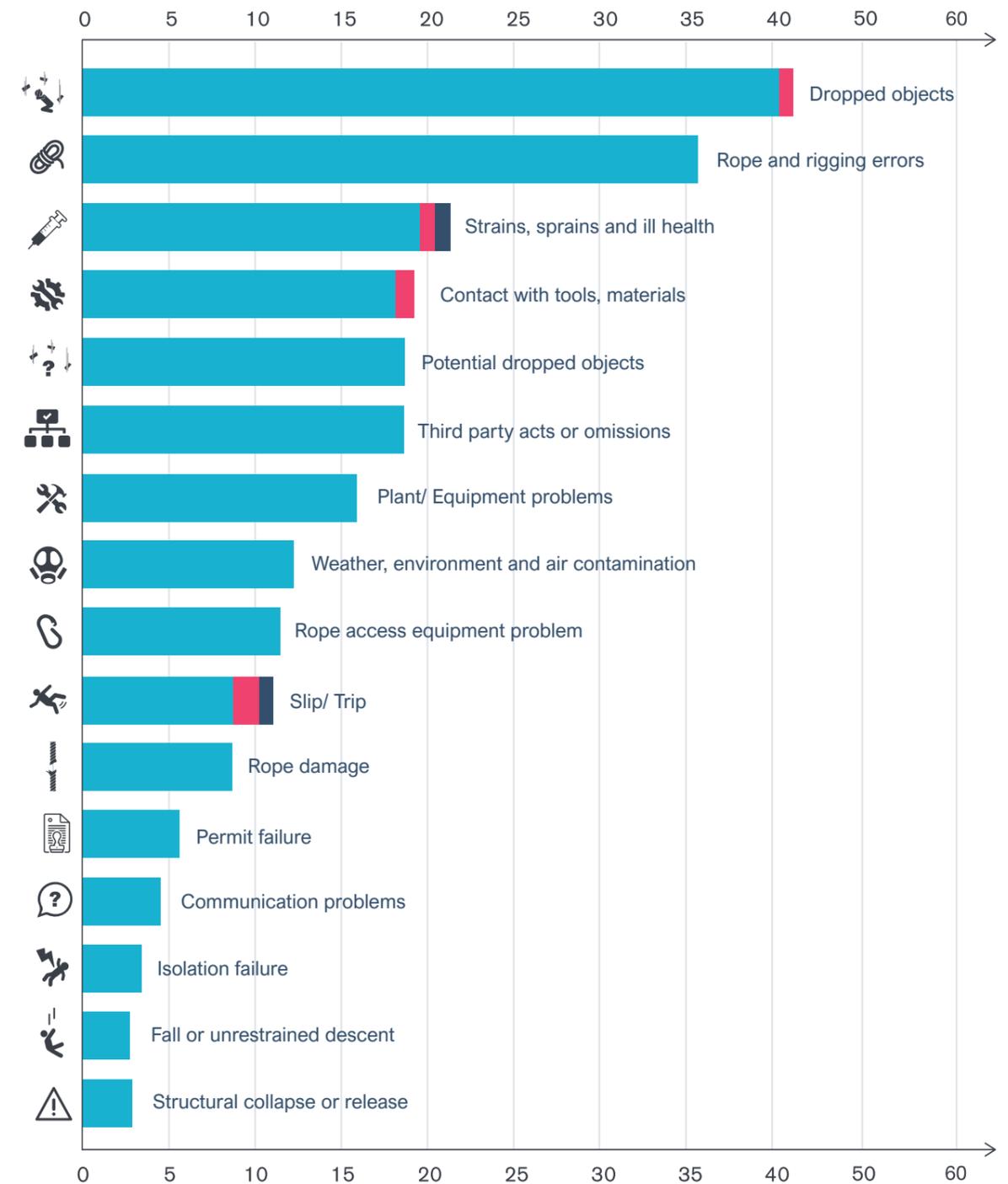
Only the category that most closely described the *immediate* cause of an accident or 'near miss' were submitted in reports. It is accepted that this is a

weakness of the analysis as data provided frequently did not identify root causes.

The most numerous cause in reports was 'Falling objects', but it was obvious that many referred to loose objects discovered by RATs, to their credit, that could be dislodged. Accordingly, these are separately identified as 'potential dropped objects' (17) and actual dropped or falling objects (42). The former included a large range of tools (e.g. a hammer, 3 wrenches and a jack), sections of pipe and plate, steam lance, shackles and even rope access gear left by previous workers.

Actual dropped objects (42) included approximately 17 rope access devices mostly dropped by trainees. The remaining items dropped by RATs included rope access devices and tools, a battery, 2 phones, a helmet, beam clamp and various structural materials and dislodged ice. One dropped item struck a third party but, fortunately, only minor bruising resulted. Dropped objects, collectively, continue to be a serious concern and threat, fortunately only one resulted in serious injury when a finger tip was badly injured by a grating which slipped during handling (perhaps not strictly a 'dropped object?').

Figure 7 | Identified Causes of All Reports



4.7 MANAGEMENT

Although not included in the formal reporting format as an option, it is clear that many accidents and incidents reported involved errors and omissions in rope handling and rigging. These have been identified from reports (36) and are included in the chart. They include numerous incidents of single point, inadequate protection, rope errors, misuse of devices and incorrect rigging. The majority, in numerical terms, relate to trainee errors.

The 23 reports of strains, sprains and ill health predominantly involve arm and leg injuries brought about by excessive loading, poor technique when suspended or injuries sustained off rope on site, on stairways (one a 'Major Injury') or just moving around on site. Several strains were incurred by trainees whilst on rope which is not surprising. The total included 4 reports of heat stress and 2 of the reports involved injuries incurring 'over 7 days off work'. Of the 18 reports of 'contact' with tools and site materials, 2 resulted in 'Serious Injuries'.

Conflict or failures associated with third parties (17) generally involved such things as site intrusions or work group interference, probably associated with poor site control by clients. Included were some bizarre events such as discharge of fire pump water over RATs, welders appearing above a rope access team, anchors found to be dismantled and exclusion zone markers removed. A common problem was failure by clients to ensure the work site was properly prepared prior to start of work. In one case, this resulted in the work being abandoned by the team. The frequency of events involving third parties appearing possibly reflects the increasing acceptance and familiarity with rope access working on sites, but this brings with it an even greater need for supervisors to ensure adequate site preparation, maintenance of site protection and close liaison with site controllers.

Slip and trips were also responsible for 2 'Serious Injuries' and the 1 major shoulder dislocation; but the 2 falls, actually unrestrained descents on rope, only resulted in 1 minor foot injury. Rope damage was limited to 7 reports with 4 caused by contact with hot pipes, 1 cut by an angle grinder and 2 damaged by a sharp rock and a sharp edge. This is a significant reduction from the 13 incidents of rope damage recorded in 2019.

Environmental conditions were cited in 13 reports, varying from excessive heat, icing and various gaseous releases or atmospheric contaminations, to a fire breaking out in close proximity. Three isolation failures and four radio communication problems were also recorded as problems encountered, were 3 isolation failures and 4 radio communication problems.

Figure 8 presents management causal factors identified in reports of incidents and accidents. The results are almost identical to those submitted in 2019.

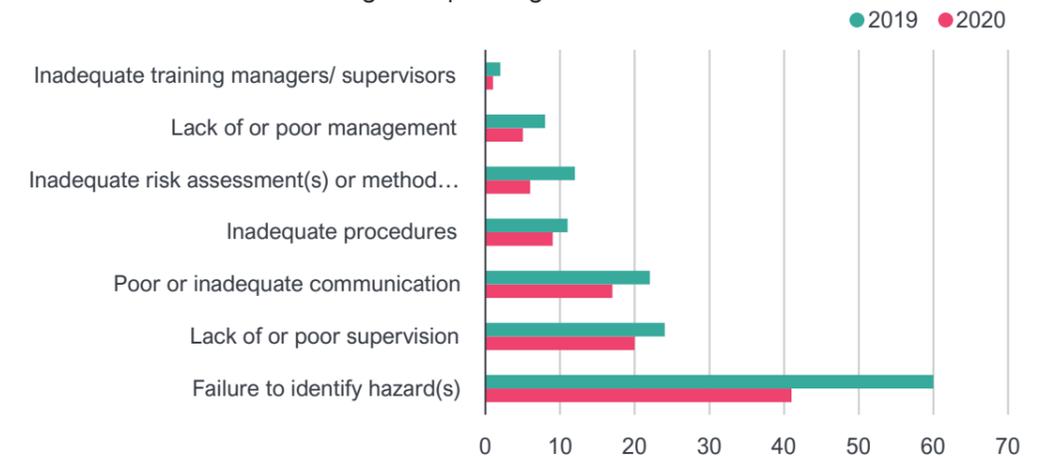
Many reports will have been submitted under direction of managers or supervisors who may have been involved in events. Thus, recognition of management factors that may have contributed to accidents or incidents may not be identified in many reports. Of the 260 reports, only 72 identified one or more management factors. In some cases this was reasonable. For example, reports of potential falling objects, tripping over obstacles, slipping on stairways, deliberate individual 'failings' and 'third party' intrusions may be beyond management or supervisor control.

Nevertheless, the analysis is carried out with significant reservations of the data supplied. It must be very difficult for managers and supervisors to be truly objective when submitting reports.

As in 2019, the most numerous item in reports was failure to identify hazards or potential hazards. In some cases, this may have been a shared failing with clients or site controllers. Immediate supervision of technicians is also identified as an important factor but, surprisingly, this was linked to a need for better or improved training of managers and supervisors in only 1 report. The ability to identify or recognise potential hazards by managers and supervisors may be considered a primary test of their competence, experience and training.

Poor or inadequate communications was reported in 17 cases, mainly with client/site controllers or third parties. Only 5 reports specifically identified 'lack of or poor management'. Surprisingly, only 2 of the 9 'Serious Injury' accidents identified any management factors were involved.

Figure 8 | Management Factors



4.8 WORKING ENVIRONMENT

Working environment problems were identified in 55, or about 1 in 5, reports with some having more than a single factor identified. **Figure 9** presents the results alongside those for 2019 which showed broadly similar trends.

Before considering the results in Figure 9, it should be noted that significant inconsistencies were found in the data and, therefore, the chart should be viewed with care. As for 2020, the most numerous concerns (18) were related to problems with access/ egress to work sites, closely followed by lack of room at work sites (12). These included confined space working in vessels or tanks and congested areas amongst pipework.

'Poor housekeeping' (8) may be taken to refer solely to rope access working and included a range of items. A scan of reports revealed the following:

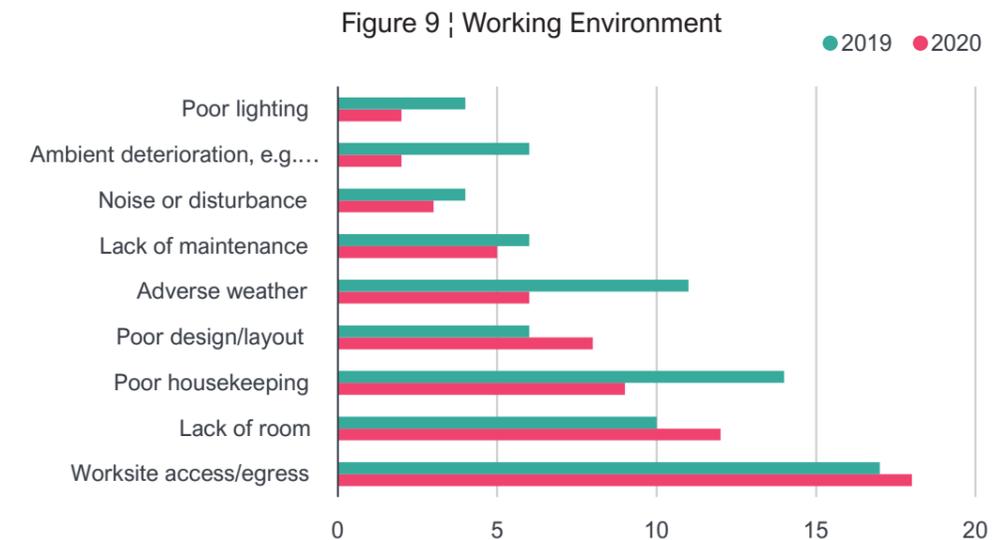
- 4 untethered items (3 being radios)
- 4 tether failures
- 2 harness problems
- 1 faulty ASAP
- 1 inspection out of date
- 1 broken cement float
- 1 tool bag opening

i.e. significantly more than as reported, several of which related to site house keeping and were not specific to rope access anyway.

If *site* housekeeping is considered, not specific to actual rope working, it could be argued that all 'potential dropped objects', identified in Figure 7, should be included. A further 9 items would also be added including unsecured cable trays, unmarked hot pipe, unprotected holes in structures, barrier deficiency, missing grating, steel wire sling corrosion and excessive bird excrement encountered at a work site. Thus, at least 36 instances of poor site housekeeping were encountered by RATs and, presumably, the responsibility of the site controllers.

Adverse weather or ambient conditions were identified to be a problem in only 6 cases. A superficial examination of reports reveals that at least 8 should have been cited; 3 due to wind, 2 due to icing, 2 due to high temperatures, and 1 due to unpredicted approach of a storm.

Lack of maintenance (5) included 3 items of deficient protective steelwork (balustrade, barrier and ladder safety bar), the corroded steel wire sling and the broken string holding a radio. Again, there were other items in reports that could have been included but were not. There was insufficient diligence in reporting to rely on Figure 9 for detail, however, the general trends were broadly similar to those in 2019.



4.9 PLANT AND/ OR WORK EQUIPMENT

Figure 10 shows the results of the analysis of problems encountered with plant and work equipment. The highest number of problems encountered was 'incorrect installation' (42) dominated by 23 items of dropped objects during installation, removal or improperly installed rope access devices. There were 9 reports of 'single point' attachments also included but are omitted in Figure 10.

Use of an inappropriate point for anchor attachment was one of other miscellaneous items that also included misuse of harness attachment points, cable tray insecurities (2), deficient barrier installation, insecure insulating blanket on pipework and 2 problems with scaffolding in use.

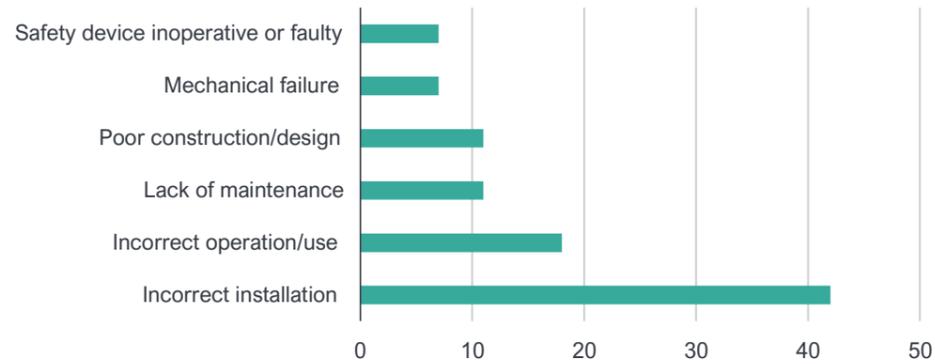
Of the remainder, highlighted for interest were:

- Of 18 **incorrect operation and use**, 11 related to rope devices. One item resulted in serious finger injury during an attempt to remove grating.
- **Lack of maintenance** (11) included the broken safety bar at the top of a vertical

ladder, an apparently unserviceable fire extinguisher, electrical hoist malfunction, faulty latch on a chain hook and corroded steel sling amongst other items.

- **Poor construction/ design** (11) included an unexpected hydraulic cylinder operating and creating chain tension trapping a foot and causing injury, grasping an unmarked hot pipe (hand injury), air supply to face mask failure and a fall on a stairway due to a missing step (serious knee injury).
- **Mechanical failures** (7) included the electric hoist malfunction, an air hose detachment during use, 2 valve failures leading to releases of gases, and the leak of hot condensate leading to a burn.
- **Safety device failures** were noted in 7 cases, some previously identified. Additional items include faulty radio communications between crane operator and deck crew during a lift, anchor sling ferrule coming undone and a descender failing to default to lock.

Figure 10 | Plant and/ or Work Equipment



4.10 PPE PROBLEMS

Of 49 reported items, 16 were removed as they did not refer to PPE. Most deleted items referred to work equipment, tool tethers and items unrelated to PPE. Distribution of the remaining 33 reports is shown in **Figure 11** alongside that for 2019. The major difference in the two is 'Incorrectly used'. The primary reason seems to be related to a difference in reporting 'errors and omissions' by trainees, only some of which were indicated in 2020. Examination of the data suggests an additional 8-12 should have been added, closer to the figure in 2019.

'Suitability' queries covered a variety of items, surprisingly only 1 highlighted goggles despite several reports of particles entering eyes past eye protection, and 2 involved the need for improved gloves after hand injuries were sustained.

Failure to use PPE, reported in only 6 cases, included one covering welder boots not used (leading to a foot burn), absorbent clothing worn leading to hot condensate burn (but not supplied prior to the accident), failure to use personal lanyard protection and temporary failure to use a helmet mounted face shield. Other examples could have been added by several other reports such as a second case of welder burns to the groin when no apron or protective clothing was worn. Only 4 items of defective PPE were reported, 3 relating to harnesses; the fourth a descender damaged during training.

Maintenance items included the problems of maintaining face mask air supply. The 2 other items involved more strictly a faulty fall arrest item and misuse of a rope device. As such, these items do not fall into the 'Poor maintained' category. There was no confirmation of several other items that could have been identified (e.g. corroded steel wire sling and ferrule failure on a sling). 'Not available items' (3) were a welder's apron (leading to the groin burn), gloves (knife cut hand) and a hand rope burn. The last item appeared to do with a trainee error on rope.

Given 10 million work hours on rope, ~16,000 qualified technicians and ~0.6 million hours training, the number of PPE problems reported seems very low, as in 2019.

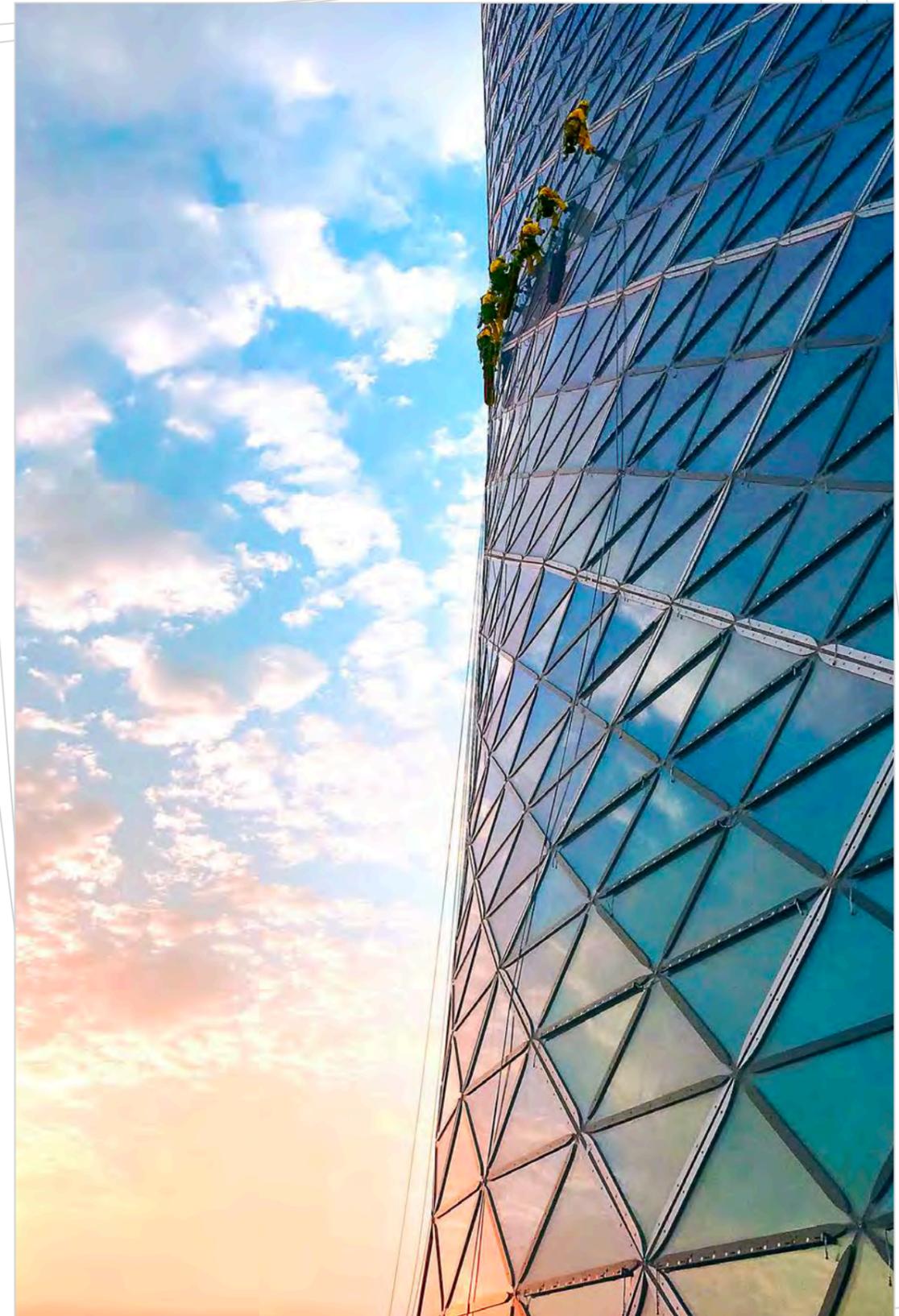
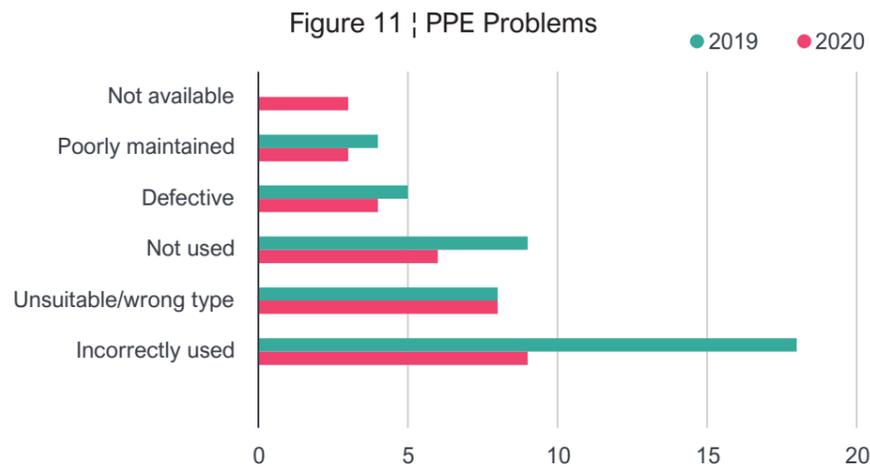


Image courtesy of Spider Access © 2021



4.11 HUMAN FACTORS

Before examining the data it is important to recognise limitations of this analysis. Although immediate causes may be presented in the summary reports supplied, the true underlying cause(s) may be omitted for various reasons. For example, ‘Undue haste’ may, in fact, have an underlying cause of excessive supervisor pressure, or ‘Instruction misunderstood’ might be due to poor or ineffective instruction or language communication difficulties. There may be the temptation to ‘blame’ the individual rather than identify a more appropriate underlying cause.

It could be argued that each and every reported event must be allied to a human factor or failing, albeit in many cases that might be with third parties (e.g. items left as potential dropped objects by previous workers) or others unrelated to rope access.

Of the total 260 reported events, 158 identified 218 ‘Human factors’ that were involved, with several identifying up to 4 factors in given events. **Figure 12** presents the distribution of responses within the identified categories alongside those obtained in 2019; they show surprising consistency. The most common factor identified was ‘Lapse of concentration’ with 67 cases, a factor in a quarter of all

accident and incident reports. Of the 9 serious injuries, 3 included lapse in concentration as a contributory cause of the accidents. ‘Lack of experience and/or knowledge’ (46), more common than in 2019, figured in 5 of the ‘Serious Injuries’. In some cases it appears that unexpected problems were encountered but many were associated with trainees, not surprisingly.

‘Failure to follow rules’(35) included 8 trainee errors, 8 failures to follow work methods, 4 events related to tether failures or failure to use tethers and 2 failures to declare pre-existing medical conditions (1 leading to ‘Serious Injury’ when a pre-broken arm was re-broken). Miscellaneous items, including misuse of work tools and PPE related issues, and including the 2 welders not employing correct protective clothing, complete the total.

The distinction between ‘Failure to follow rules’ and ‘Not adhering to risk assessment’ may be difficult to define and some contradictions between the 2 sets of reports were apparent. However, of the 16 events identified in reporting as ‘Not adhering to risk assessment’, 4 occurred during work when actions were taken

by technicians that did not comply with risk assessments; one of these resulted in a serious injury (finger tip damaged). Failure to use tethers were identified in 3 cases; detachments occurred in 3 reports; 3 involved trainees and 1 included the absence of a supervisor. PPE failings completed the list, although only 1 of the 2 similar welder items was included.

‘Fatigue’ was identified as a factor in 13 reports, predictably the majority being with trainees (11). Notably, one was a Level 1 trainee attempting to combine day training with night shift working! Most trainee cases of fatigue were associated with some form of strain injury or other minor injury. There were only 2 cases of fatigue during work, 1 involving heat stress. Fatigue might have been an underlying cause in other cases.

‘Undue haste’ was cited as a factor in 12 reports, split between working and training. Of the 6 training related, 3 occurred during assessment; were the candidates trying to impress assessors? ‘Of the remaining 3, 1 included two candidates racing each other! The 6 work related items included 3 that resulted in dropped objects through undue haste whilst working on ropes. Whether any of the work items had other underlying causes, such as pressure to complete a task, was not apparent. ‘Unsafe attitude’ was displayed in 12 cases. The majority (9) occurred whilst working and not adhering to or ignoring work instructions. Two involved third parties intruding into work sites, one of whom made changes to scaffolding whilst in use by RATs. One was related to work on rock blasting operations, although the reason for the marking was unclear. The remaining 3 items involved trainees, two of whom

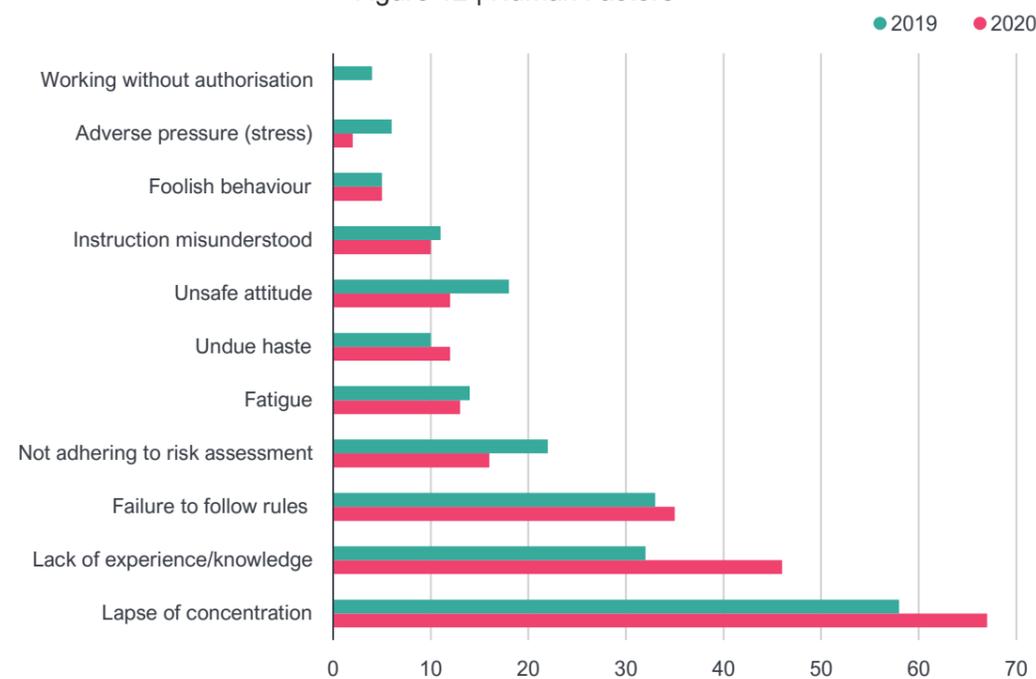
refused to accept instructions or advice on technique.

The 10 instances of ‘Instruction misunderstood’ included 6 work items, 3 of which involved use of work tools. One was confusion over the status of pipe isolation with the client and a second was a change in work instruction during conduct of the job by the client. Trainees were involved in the remaining 4 items, with two ending up on single point attachment.

‘Foolish behaviour’ was exhibited in 5 cases, 3 during work and 2 in training. One work item led to a ‘Serious Injury’ when a technician struck his own hand whilst wielding a flogging hammer. Two workers detached from their rope at height while the supervisor was absent. The welder working without correct boots was considered to be acting foolishly (but notably not the other welder working without an apron). The trainees racing each other were acting foolishly whilst a second trainee, failing assessment, became upset and threatened self harm by jumping.

Only 2 instances of ‘Adverse pressure or stress’ were recorded, both whilst working. One was a lower back strain incurred whilst on rope, the second an uncontrolled swing out of position, restrained by the Level 3 working alongside. There were no recorded instances of ‘Working without authorisation’. The categories in Figure 12 relate predominantly to individuals. Excluded are wider issues that may underlie individual acts or omissions such as quality of supervision, adequacy of recruitment, selection and training, issues that lie within the remit of managers and supervisors. The relatively high figure for ‘Lack of experience/knowledge’ exemplifies the comment.

Figure 12 | Human Factors



4.12 OTHER FACTORS

A number of specific areas of concern were selected for particular examination from the supplied data as well as a summary of time lost data.

Third party acts or omissions and site intrusions

A total 61 items of 'Third party acts or omissions' together with 8 'Site intrusions' were identified in reports. The following is a summary, broken down into main headings with some examples;

- **Potential dropped objects - 22** (Only 17 identified in section 4.6), (Objects encountered by RATs at or near work sites, unrelated to their own activities. Included a wide range of tools, pipe lengths, plates, rope access gear, clamps and other assorted debris.)
- **Site defects - 13** (Not necessarily directly interfering in the rope access work but of concern to the rope access workers. Included several unguarded holes in structures, missing or loose grating and flooring, deficient barriers/balustrades, loose or unsecured cable trays, defective fire extinguisher and a missing step on a ladder that actually led to a 'Serious Injury'.)
- **Interference by third parties - 13** (Rope access work directly affected by clients and other workers. Included nearby fire break out, various gas releases and alarms in vicinity, failure to maintain air supply to face masks, ice build up, seized panels, and fire pump water discharge over RATs on rope.)
- **Site control problems - 5** (Usually involving Permit to Work lack of control leading to severe intrusions by other work groups into the work site such as scaffolders and welders appearing above and below and commencing work. On one occasion scaffolding changes were being made whilst RATs were actually working from them!)

- **Site intrusions – 8** (Personnel appearing within site boundaries. Includes the scaffolders and welders as well as individuals. In 2 cases boundary markers were removed and one set of rope anchors.)

It must be of concern that so many instances of site intrusions leading to actual interference of work were reported, some potentially serious. Managers and supervisors should be alerted to this apparent increase with a view to improving site security with client support, where appropriate.

Asphyxiation (and threat of asphyxiation)

Although there were no actual cases of asphyxiation identified, there were 5 cases of threats; predominantly caused by various gas releases. In 1 case the gas release was a 'normal venting' but the team had not been warned of such an event. In another case, workers wearing face masks, supplied by an external pumped air supply, suddenly found the air supply had failed. The client had failed to ensure the pump supplying the air had sufficient fuel. There was an additional case of a technician affected by residual product left in a pipe, noted under 'Rescue' below. Included here was one event where RATs, whilst suspended on ropes, were suddenly engulfed by water discharge from a fire pump started up nearby. Perhaps threat of drowning would be more appropriate in this case!

Rescue

Rescue was reported in 6 cases, 3 occurring to trainees on rope, one of which was a fraught 'extraction' of an upset trainee who had failed assessment whilst still on rope. One technician, involved in x-ray of pipework, suffered a knee dislocation that was 're-located' whilst in situ. However, he had to be lowered to ground to facilitate evacuation from beneath the pipework. A Level 1 injured a rib by pressure from his harness when abseiling into a vessel. He was rope hauled back to the top of the vessel. After exposure to flare pipeline residual product and taken unwell, a technician was evacuated using a pre-installed tramway recovery system.

Time Lost

Only 20 cases reported time off work. Reported days off work for all injured persons was 178.5 days with a further 2 days lost by others, giving a total of 180.5 days lost. With an equivalent full time workforce of about 9,700 (see section 3.4), gives time lost of less than 0.02 days per employee. The equivalent rate for, say, UK HSE would be ~1 day per employee, some 50 times greater for injuries alone. Similar figures would be found elsewhere. The difference extends much further if illnesses were also taken into account in other agency figures. Thus, time lost due to accidents was well below normally reported figures. These figures remain almost identical to 2019 figures.

The continuing low figure of time lost may be partly explained by the low injury rate and possibly by a degree of under-reporting. It may also reflect the age range, general fitness and inherent resilience of workers involved in rope access. (Lost time is sometimes calculated on a per million hours basis, termed Lost Time Injury Frequency Rate or LTIFR. This would give 178.5/19.4 or about 9 days per million work hours).

SUMMARY OF ACCIDENT DATA

Total reports	260
Fatalities	0
Major injuries	3
Serious (> 7 day) injuries	7
Minor (< 7 day) injuries	62
Near misses	188

5. RATE FOR REPORTABLE ACCIDENTS

'Reportable' injuries, at least in UK and EU statistics, usually only include certain injuries that either have associated 'days off work' as a result of the injury, usually termed 'serious', or involve certain defined 'injuries' or medical conditions brought on by the work undertaken and termed 'Major'. These latter 'Major' injuries or medical conditions are defined by IRATA and coincide with generally accepted definitions (see Appendix II for further explanation). Whilst the two classifications, 'Serious' and 'Major' may be separately identified, in calculations of overall 'reportable rates' there is no distinction; both being 'reportable'.

5.1 INJURY RATES

Statistics for reportable accidents generally are based on accidents per 100,000 workers. To convert the accident data, and maintain a pessimistic analysis, a workforce corresponding to the hours worked is used. For 2020, this was **9,704** workers. The 'multiplication factor' per accident becomes $100,000 / \text{number of full time workers} = 100,000 / 9,704 = \sim 10.3$ per accident. The accident rate in 2020 then becomes 10 (reports of 'serious' and 'major' injuries) x 10.3 = **103 reportable injuries per 100,000 workers** (71 in 2019, and only 50 in 2018).

'Over 4 Day' injuries totalled 11, giving **113 injuries per 100,000 workers** (for comparison with EU Eurostat data).

'Any time off work' injuries totalled 18, giving **185 injuries per 100,000 workers** (for comparison with USA BLS data that does not define seriousness only necessity to take any time off work). In any comparisons, injury rates will be found to be well below any and all statistics produced by the agencies indicated.

The figures for injury may be queried when compared to previous years. Simply, the reduction in reported worked hours resulted in a lower 'population', increasing calculated rates.

5.2 FATALITY RATE

Although, thankfully, there were no fatalities in 2020, the five year time period used to assess the low frequency event of fatalities remains to be taken into account. The 5 fatalities in 2016, 2017 and 2019 in a 'working' population of about 50,000 full time

equivalent workers gives **10 fatalities per 100,000 workers**. As in recent years, the fatality rate is above 'all industry' rates, but roughly of the same order as fatalities suffered in related industries.

SUMMARY OF ACCIDENT DATA

- Reportable accident rate for major and 'Over 7 Day' injuries was ~103 per 100,000 workers, a small fraction of other rates provided by international agencies.
- Fatality rate continues to be 10 per 100,000 workers, higher than 'All industry' rates but within the ranges of related industries.

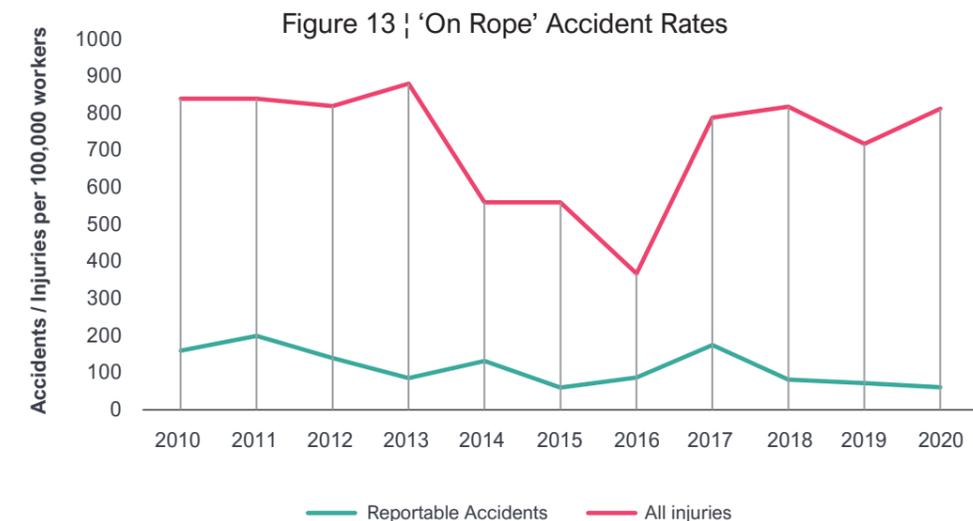
5.3 WORKING 'ON ROPE'

The Association has understandable interest in 'On Rope' working taken in isolation. The number of accidents for 'On Rope', summarised in section 4.3, are as follows:

- Major Injury 0
- 'Over 7 Day Injury' (Serious) 3
- 'Less than 7 Day Injury' (Minor) 37
- **TOTAL 40**

The total hours worked 'On Rope' was 9.84 million hours. Thus, the accident rate, converting to 100,000 full time equivalent workers (at 2,000 hours per worker per annum) gives total injuries of **813 per 100,000 workers whilst 'On Rope'**. A similar calculation for the **3 reportable accidents** gives a rate of **61 per 100,000 workers**, lower than the overall serious injury rate of 103 per 100,000. The accident rate per year over the previous 10 years is shown in **Figure 13**.

The graph shows little change in 'On Rope' accident rates over the last four years. The **Table in Appendix I** is extended to include the figures for 2020. It is emphasised that the graph in Figure 13 is based solely on accidents that occurred whilst 'On Ropes'. Comparison with other sources of 'reportable' data can only be made based on the blue line in Figure 13 which includes fatalities.





6. SUMMARY AND CONCLUSIONS

Interest will be in the possible effect of the COVID-19 pandemic on members of the Association throughout 2020 (see also later specific comments). Hence, the conclusions will focus results on this aspect where appropriate. The following are highlighted from the analysis with associated conclusions.

Membership and Employment

- Membership of the Association continued to rise, reaching 530 members by Q4 December 2020. The rate of increase fell significantly from previous years.
- The associated workforce fell from ~19,500 to ~16,400 despite the rise in membership, spread across the three working grades Level1-3. The change in workforce numbers varied considerably between regions, some actually increased whilst others suffered significant reductions.
- Working hours also fell, from 22.6 million work hours to 19.4 million. Again, there was no consistent pattern with regions. Some with increases in manpower had reduced working hours and vice versa.
- Training hours fell significantly, from 0.75 to 0.57 million hours. Some regions increased training by 50% or more but many reduced training by significant amounts.
- Work hours spent 'Onshore' was 12.3 million, slightly less than the 13 million in 2019. 'Offshore' working suffered major reductions, falling from 9 million to only 6.6 million.
- 'On rope' working approached 9.9 million hours, a fall from 11.1 million hours in 2019.

It is concluded that:

- * COVID-19 appears to have had a significant effect in reducing both the working manpower and the worked hours by ~ 15% despite increasing membership.
- * There was no consistency between regions, some unaffected, others sustaining significant reductions either in manpower or work hours, or both.
- * Offshore working incurred the majority of loss of work, probably a result of COVID-19 restrictions.

Accidents

- There were 72 injuries; 3 major, 7 serious and 62 minor injuries.
- Accident rate for all reportable injuries remained low at 103 per 100,000 employed. Injury rate 'On Rope' was even lower at 61 per 100,000.
- Despite thankful absence of fatality, the five-year fatality rate of 10 per 100,000 remained.

- 'On Rope' working accounted for 37 of 62 minor injuries but only 3 of the 10 reportable injuries.
- On a 'time at risk' basis, highest injury risk was encountered during training.
- All injuries to Level 1-3 technicians remained at about 2-5 per thousand.

It is concluded that:

- * Accident data confirmed the excellent safety record was maintained, with reportable injuries well below international figures. The 5 year fatality rate remained above 'All Industry' rates but within the range for related industrial sectors.
- * Possible influence of COVID-19 on accident data cannot be assessed.
- * The indirect impact of COVID-19 was to reduce the work hours with consequent reduction in full time employees or 'population', thus increasing the injury rate.

Data from Accident and Incident Reports

Immediate Causes

- Falling or dropped objects by RATs (40) was the greatest single cause of reported incidents. Half were rope access devices. There was one reported serious injury as a result.
- Technicians reported 22 potential falling objects left by third parties.
- 'On Rope' and rigging errors did not result in any serious injuries.
- Rope damage or severance reports fell to 7, none leading to injury.
- Primary cause of 10 major and serious injuries were slips/trips, contact with tools and materials and strains (shoulder dislocations).
- Site intrusions were a significant concern.

It was concluded that:

- * The incidence of dropped objects remains very high and should be addressed.
- * Threat of dropped objects left by third parties was also high.
- * Strains/sprains and incidents of ill health were a cause of nearly half of all 'over 7 day' and major injuries.
- * Site security – see below.

Management Factors

Failure to identify hazards continued to be the single most frequently identified management failing.

It is concluded that:

- * Managers and supervisors, together with site controllers, need to ensure hazard identification is thoroughly carried out prior to and during work.
- * Both 'direct' hazards to technicians from site conditions and 'indirect' hazards caused by external factors, such as site operations and third party intrusions, should be included in hazard assessments.

Work Environment

Primary concerns involved access/egress problems (18) and lack of room at work sites (12). 'Poor housekeeping' by RATs was reported in only 8 cases. Inspection revealed 37 items of 'site' housekeeping problems, unrelated to rope access workers. In the majority of cases, failure to identify potential or real hazards appeared at the root of many problems encountered.

It is concluded that:

- * Site access/egress difficulties, congested work space and space limitations should be addressed in hazard assessments. (This supplements the previously identified conclusion of hazard identification).

Human Factors

'Lapse in concentration' continued to be the highest reported factor and an identified cause in three serious accidents. 'Lack of experience/knowledge' also featured in reports, five of which contributed to serious injuries.

It is concluded that:

- * The most significant personal factors involved in serious injury events were 'lapse in concentration' and 'lack of experience/knowledge'; factors to be considered in the recruitment and selection of rope access workers.
- * 'Failure to follow rules' and 'not adhering to risk assessment' by technicians were frequently identified causes of reports; factors that also need to be taken into account when recruiting and selecting technicians.

Other Factors

Serious concern was the numerous reports of site deficiencies combined with site intrusions by work groups during rope access working. Fortunately, only in one case was actual serious injury incurred, caused by a site deficiency.

It is concluded that:

- * Infringement of site working areas by third parties and site deficiencies has been highlighted above.

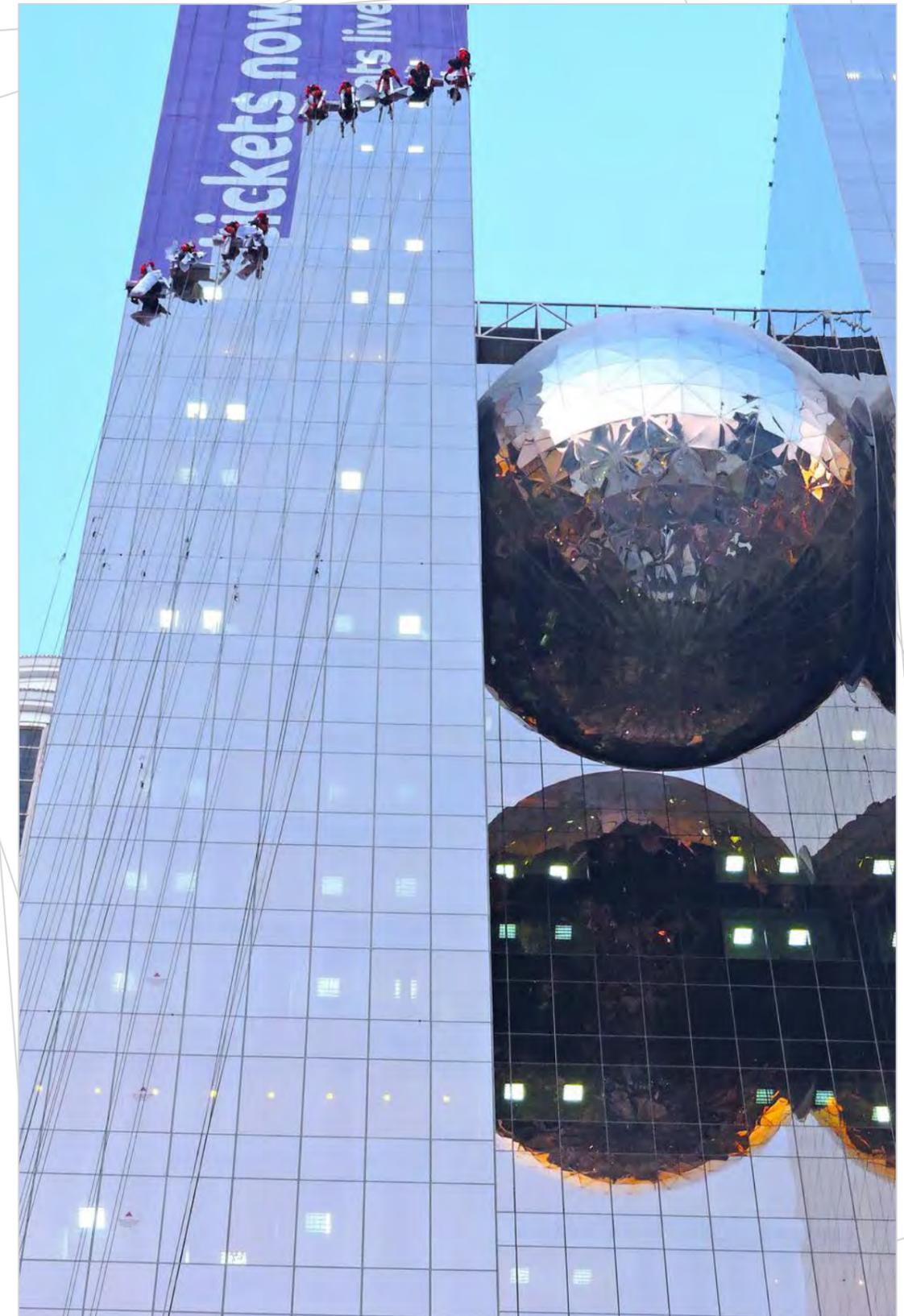


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7. RECOMMENDATIONS

Based on the data presented and the conclusions, the following recommendations may be presented for consideration:

- 1. Members of the Association** should be congratulated on maintaining a high level of employment and work wherever possible in most regions despite the threats from the COVID-19 pandemic.
- 2. Managers and Supervisors** should focus attention and be alert to all aspects of hazard identification, particularly with respect to (not in any order):
 - Dropped items (e.g. tool box talk, tether inspections).
 - Site ‘housekeeping’ deficiencies including potential dropping objects and congested site conditions prior to work start.
 - Need for emphasis on site intrusion threats by third parties and site operations that may impact on rope access working; requiring cooperation of site controllers to ensure site security at all times.
- 3. Managers and Supervisors**, in recruitment and selection of technicians, should include in assessment the ability to maintain concentration and adequacy of knowledge and experience alongside other criteria relevant to anticipated employment duties.
- 4. Managers, Supervisors and Trainers** should all remain alert to conditions that may result in strains/sprains and ill health including excessive physical effort, particularly in heat conditions (due to serious ‘injury’ reports). Trainers particularly should try to be proactive in prevention of fatigue and/or strain problems of trainees.
- 5. Individual Technicians** should:
 - Behave responsibly and sensibly at all times on site and during training/assessment so as not to endanger themselves or others.
 - Raise personal concerns, such as pre-existing medical conditions and any other issues, that may impact on rope access performance in a timely manner whether training or working.
 - Follow all written and oral instructions whether training or working.

NOTES ON COVID-19

In the report produced in 2020, based on 2019 data, it was indicated that the pandemic, raging at the time of writing, would be expected to have an effect on 2020 working. This report of 2020 data has revealed that there were effects of COVID-19 on Association figures:

- Membership numbers, here based solely on number of members supplying employment data, continued to rise but the rate of increase was significantly reduced compared to previous years. The relatively small increase in membership may be

a net gain of increased membership against a loss of members due to lack of work caused by COVID-19.

- However, there is the possibility that some members were unable to submit data due to staffing difficulties caused by COVID-19 isolations and illness, effectively reducing the apparent number of members.
- Reported totals of employment numbers, down by 16%, and work hours, down by 14%, both appear to indicate significant effects of COVID-19. If comparisons were based on ‘predicted’ increases that could have been enjoyed in 2020, the reductions would have been even greater.
- Examination of regional data showed great variance, with some actually continuing to improve on both counts and some hardly affected at all, but outweighed by some suffering severe reductions; most notably UK in terms of both ‘lost’ hours and reduced work force.
- It was not known if reductions in manpower were due to unavailability of technicians due to isolations, illness or enforced lay off due to COVID-19.
- The highest reductions were associated with offshore working, responsible for a 1.5 million ‘On Rope’ and 1 million in ‘Other’ work hours. This is the majority of the ~3 million work hour reduction from 2019 figures.
- Working onshore ‘On Rope’ actually increased slightly with only a small reduction in onshore ‘Other’ work; thus, onshore working was hardly affected overall.

Two ‘Near Miss’ reports did indicate minor problems with adherence to COVID-19 issues but, otherwise, there was no apparent ‘direct’ effect of COVID-19 on incident reports and no indication of any effect on injuries. There was an ‘indirect’ effect on the injury rate calculations in that the ‘full time employed’ figure was reduced significantly by the reduced work hours reported. This had the effect of reducing the ‘population’ that suffered injuries, marginally increasing the calculated rates of injuries per 100,000 workers.

This report was prepared during the Tokyo Olympics 2021 where the results of the pandemic continued to blight the games. This exemplified continuation of the pandemic around the world. It remains to be seen if the resilience of the Association overall is maintained in 2021, despite the persistence of the COVID-19 pandemic.

ACKNOWLEDGMENTS

The assistance of IRATA staff in compiling, arranging and presenting data is gratefully acknowledged. Also recognised is the considerable effort of member companies staff who produce and submit the data required. This report could not be prepared without their collective effort.

This report contains reference to public sector information published by the UK Health and Safety Executive and licensed under the Open Government Licence. Not presented but acknowledged is the information available from EU Eurostat and US BLS.

Appendix I • Accident Rates for 'On Rope' Working 1989 - 2020

Year	No. of Members	Work hours on ropes	No. 'not reportable (less than 7 days injuries)	Reportable all accidents (fatal, major, over 7 days injuries)	Reportable all accident rate (per 100,000 FTE)***	Rate for all accidents****
1989	9	267,504	8	0	0	6000
1990	12	327,645	7	0	0	4260
1991	16	457,928	17	0	0	7420
1992	22	537,920	13	1	380	5200
1993	23	327,000	21	0	0	12840
1994	32	348,749	11	0	0	6300
1995	32	484,285	16	0	0	6620
1996	26	559,035	18	2	720	7160
1997	31	699,688	11	9	2580	5720
1998	37	1,006,538	23	10	1980	6600
1999	33	803,365	29	3	740	7980
2000	34	887,206	21	3	680	5420
2001	49	999,010	25	4	800	5800
2002	49	1,225,930	12	0	0	1960
2003	56	1,634,482	9	0	0	1100
2004	67	1,457,848	22	1	140	3160
2005	81	2,311,265	10	3	260	1120
2006	95	2,132,141	21	1	100	2060
2007	130	2,765,483	21	2	140	1660
2008	149	3,859,584	25	8	420	1700
2009	170	4,582,642	15	14	660	1260
2010	184	5,247,365	18	4	160	840
2011	217	5,209,056	17	5	200	840
2012	247	5,655,637	19	4	140	820
2013	277	7,012,270	28	3	86	880
2014	315	7,591,977	16	5	132	560
2015	333	10,096,489	25	3	60	560
2016	353	9,232,382	13	4	87	368
2017	389	9,124,565	28	8	175	789
2018	443	9,784,618	37	4	82	818
2019	516	11,151,476	36	4	72	718
2020	530	9,845,327	35	3	61	772
TOTAL		117,626,410	627	108		

Based on 2,000 hours per person per annum
 ** Col 5 divided by col 3 (x 2000 x 100,000)

* Units for Accident Rate (AR) number per 100,000 workers
 *** Col 4 + 5 divided by col 3 then x 2000 x 100,000

Appendix II • Glossary of Terms Used

Throughout the report, reference is made to the following categories of work location:

'On Rope' – Arranging, using and directly involved in rope access work. It also includes access and egress activities to rope access work sites and setting up belays, rigging and de-rigging. Thus, this does not necessarily require a person to be 'roped up' or physically connected to active ropes.

'Other' – Typically includes all other work, both on and off-site, in offices and elsewhere that is in support of rope access and related activities. 'Other' also includes all hours not accounted for by the above category including rope access trainers (unless actively on rope) and all non-rope access training.

'Training' – Activities undertaken at rope access training facilities and establishments by trainees, including assessment. It excludes all trainers and training staff, whose work hours should be reported under either of the above categories. All other training, induction courses, trial work, specialist courses (e.g. use of breathing apparatus, first aid) are excluded, and are reported under 'Other'.

For the purpose of this report, the distinction is made between:

'Accident' - An unintended event when personal harm, injury or fatality occurs at work or is caused at work. This will include sprains, strains, illnesses or ill health issues brought on by or made worse by work, and

'Incident', 'Near Miss' or 'Dangerous Occurrence' – Any event or situation where no personal harm or injury occurred but which could have led to injury or fatality. In response to comments received, the terms 'incident' or 'Near Miss' replace 'Dangerous Occurrence' throughout the report although are synonymous. Identification of the grade(s) of personnel involved is not required for 'Near Miss' events.

In dealing with accidents, the following terms are used:

'Fatality' – Death within one year as a result of an accident or illness at work or caused by work.

'Major' Injury – Injuries that meet criteria common to most European agencies and other countries and as listed in IRATA reporting arrangements. 'Major' injuries would include, for example, broken major bones, amputations, major dislocations, loss of eyesight and need for resuscitation. There is no associated criterion for 'days off work'.

'Over 7 Day Injury' or 'Serious Injury' – Not a 'Major' injury but an injury requiring more than seven days away from normal work irrespective of cause. 'Serious' is synonymous with 'Over 7 Day Injury' and may be used to minimise confusion with:

'Less than 7 Day Injury' – The criterion for a non-reportable accident is now 'less than 7 days off work' (although required to be recorded in the UK by duty-holders). If any injury is incurred, no matter how trivial, the minimum reporting level is 'Less than 7 Day Injury' and, in this report, includes all incidents of ill-health and sprains/strains (see below) unless resulting in 'Over 7 Day Injury' or 'Serious'. 'Less than 7 Day Injury' is synonymous with 'Minor Injury'.

'Ill Health' – A medical condition that leads to interruption or suspension of work due to non-injurious cause e.g. psychological, heat- or cold-stress, taken unwell (headache, stomach upset) or other non-trauma medical condition brought on by or made worse by work. Reported as either 'Over 7 Day'/Serious or as 'Less than 7 Day' injury or, if death occurs within 12 months, fatality.

'Sprains/ Strains' – Muscular injuries that result in prevention or cessation of work. As above, reported as 'Over 7 Day'/Serious injury, otherwise as 'Less than 7 Day' injury.

'Reportable Accidents' – For comparative purposes, this term is the total of all fatalities, 'Major Injuries' and 'Over 7 Day' or Serious injuries. Thus, 'Less than 7 Day' injuries and 'Incidents' are excluded when comparisons are made with international statistical data, although Eurostat and BLS data are based on different criteria of time off work.



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