

**WORK  
& SAFETY  
ANALYSIS  
2023**





# ABSTRACT

The report examines employment, incident and accident data submitted by IRATA members over the period January 2022 – December 2022. Data submissions by Q4 were received from 604 members (558 in 2021). Total average employed rose to 22,075, exceeding the 19,257 recorded pre-pandemic. Associated work hours increased to 25.5 million, also exceeding the 22.6 million recorded in 2019. The resulting 'full-time equivalent' (FTE) workforce increased to 12,750. Training hours increased to over 1 million, ~4% of total hours, equivalent to ~48 hours per employee.

Recovery from the pandemic continued, with almost all regions virtually back to normal, with only one or two yet to fully recover in terms of employment and/or work hours.

There were 258 incidents and accidents reported, along with 38 minor injury-free

training 'errors'. Reported 'Near Miss' events totalled 174. Calculated injury rates were in the range of 72–224 per 100,000, depending on the criteria applied. These rates were in the range of 4-13% of 'All industry' rates in comparative UK, EU and USA latest figures. No fatalities were reported in 2022.

The most common cause of injuries was contact with tools, materials or equipment, frequently associated with incorrect operation or use of tools. The most common management issue was failure to identify hazards. Lapse in concentration and lack of experience were cited as 'human factors' contributing to many accidents and incidents reported. Most positively noted was the very low reporting of negative behaviour factors such as 'unsafe attitude'.

**IRATA International**  
**29 September 2023**



# TABLE OF CONTENTS

List of Figures	
List of Tables	
1. Introduction	06
2. IRATA Membership	
& Employment Statistics	07
2.1 Membership	07
2.2 Employment	07
2.3 Hours Worked	08
2.4 Location of Hours Worked	11
2.5 Training	11
3. Accident and Incident Statistics	13
3.1 Introduction	13
3.2 Distribution of Accident and Incident Reports	13
3.3 Risk Data of Accidents	14
3.3.1 By Activity – On Rope/Other/Training	14
3.3.2 By Location – Onshore/Offshore/Training	16
3.3.3 By Grade	18
3.4 Body Part Injuries	19
3.5 Causes of Accidents and Incidents	21
3.6 Management Factors	23
3.7 Working Environment	24
3.8 Plant and/or Work Equipment	25
3.9 PPE Problems	26
3.10 Human Factors	27
3.11 Injury-free Training Reports	30
3.12 Other Factors	30
3.12.1 Isolation Failures	30
3.12.2 Exclusion Zones	31
3.12.3 Third Party Acts or Omissions	31
3.12.4 Weather	31
3.12.5 Rescue	32
3.12.6 Time Lost	32
Summary of Accident/Incident Data	32
4. Accident Rate	34
4.1 Injury Rates	34
4.2 Fatality Rate	35
4.3 Working ‘On Rope’	35
Summary of Accident/Incident Data	36
5. Summary & Conclusions	37
6. Recommendations	39
Notes on the future	40
Acknowledgements	40

# APPENDICES

Appendix I	
Glossary Of Terms Used	41
Appendix II	
Summary Table Of RAC Employment By Grade	43
Appendix III	
Summary Table Of RAC Work Hours By Grade	44
Appendix IV	
Summary Of RAC Work Hours By Location	45
Appendix V	
Accident Rates For ‘On Rope’ Working 1989-2022	46

# LIST OF FIGURES

Fig 1	Number of members at Q4 2022	07
Fig 2	Employment by grade	08
Fig 3	Reported work hours by grade	09
Fig 4	Location of work hours	11
Fig 5	Distribution of accident & incident reports	13
Fig 6	Injuries suffered by grade	18
Fig 7	Injuries per million work hours suffered by grade	18
Fig 8	Body part injuries	19
Fig 9	Immediate cause of accidents & incidents	21
Fig 10	Management factors	23
Fig 11	Work environment	24
Fig 12	Plant and work equipment	25
Fig 13	PPE reported problems	26
Fig 14	Human factors	28
Fig 15	Non-Injurious Training Errors	30
Fig 16	On Rope accident data	35

# LIST OF TABLES

Table 1	Training Hours	12
Table 2	Injury Rate Comparisons	34

# 1. INTRODUCTION

This report presents a summary of employment data submitted by all Members of the Industrial Rope Access Trade Association (henceforth IRATA) for the period January 2022 - December 2022. The report continues with analysis of all accident and incident data also submitted by Members. Calculation of accident rates requires details of employment numbers and associated work hours.

Gratitude is due to those tasked to assemble and present data, both within individual member companies and the IRATA secretariat.

All data, both employment and accident or incident events, was subjected to checks and, where necessary and possible, corrected, supplemented or amended. Data supplied for analysis included regional identification but excluded identification of individual members. It is important to note that all data relates to member company employees only. This report does not cover IRATA-qualified individuals who were not employees of member companies.

In 2012, regions around the world were established, each overseen by a Regional Advisory Committee (RAC). Member's data was reported under the corresponding RAC. There were 15 RACs in 2021, now increased to

16 by the addition of Sub Sahara and renaming South Africa to Southern Africa:

- 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 (two individual members in 2022)
- Scandinavia
- South East Asia
- Southern Africa
- Sub Sahara
- UK

This report is arranged with figures, graphs and tables generally incorporated within the text to which they apply. This report presents conclusions and makes recommendations based on the data supplied.

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

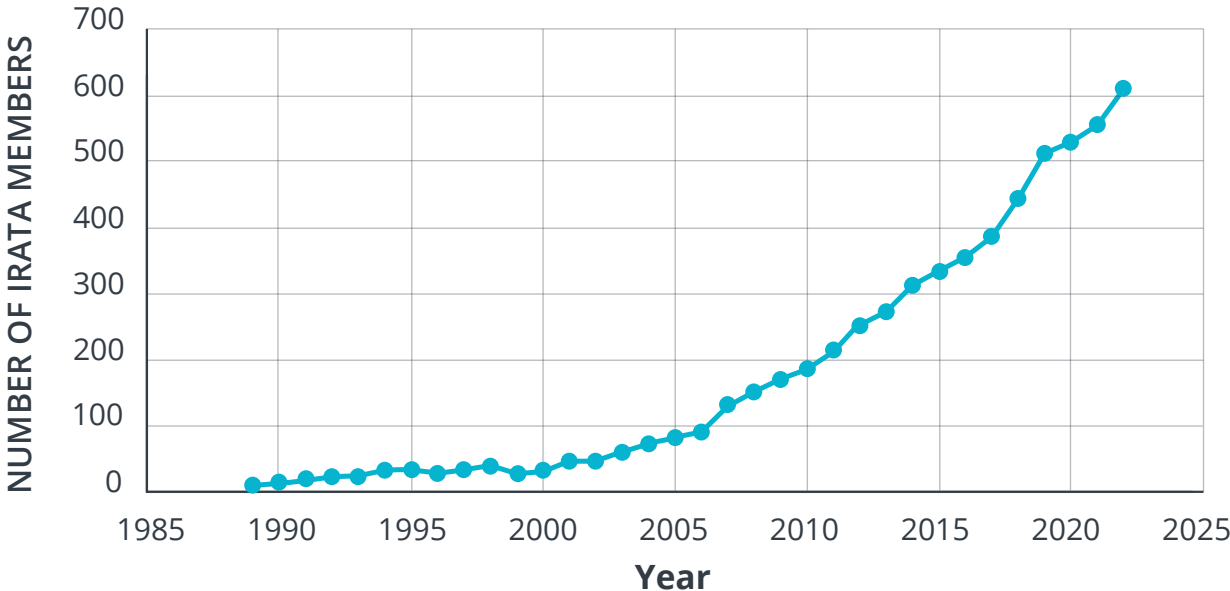
# 2. IRATA MEMBERSHIP & EMPLOYMENT STATISTICS

## 2.1 MEMBERSHIP

**Figure 1**, the number of members submitting data by Q4, shows the continuing increase in membership of the Association from **558 to 604 in 2022**, resuming the rate of increase in membership prior to the onset of the Covid-19

pandemic. The effects of the pandemic are clearly visible as a small 'kink' in the otherwise almost linear rate of increasing membership since about 2005/6

Figure 1 : IRATA Membership Numbers at Q4 2022



(The 'membership' referred to in this report is the number of companies submitting data by Q4 of the 2022 year required by April 2023. This may not equate to membership figures recorded by the Association but is consistent with results for previous years).

## 2.2 EMPLOYMENT

Distribution of employment between the grades is shown in Fig 2. Total employed in 2022 averaged **22,076**. Figures for 2019, 2020 and 2021 are shown alongside to show how recovery from pre-Covid 2019 progressed. However, these figures are the worldwide averages. Data for individual RACs show a large

range, with some still struggling to recover whilst others were barely affected, if at all, by the pandemic. The training figures examined later will be used to reflect these variations between RACs in more detail, being simpler to demonstrate. Recovery from the 19,527 figure for employed in 2019 was an increase of 13%.

Based on an average 6% per annum increase, full recovery would be expected to reach ~23,000.

As may have been predicted, Manager numbers were hardly affected throughout the last four years. Recovery of Level 3 numbers

was greatest, with Level 1 numbers close behind after having the largest fall in numbers at the outset of the pandemic. But, again, this is based on an average worldwide set of data that hides large variations between individual RACs.

**Figure 2 : Employment by Grade**



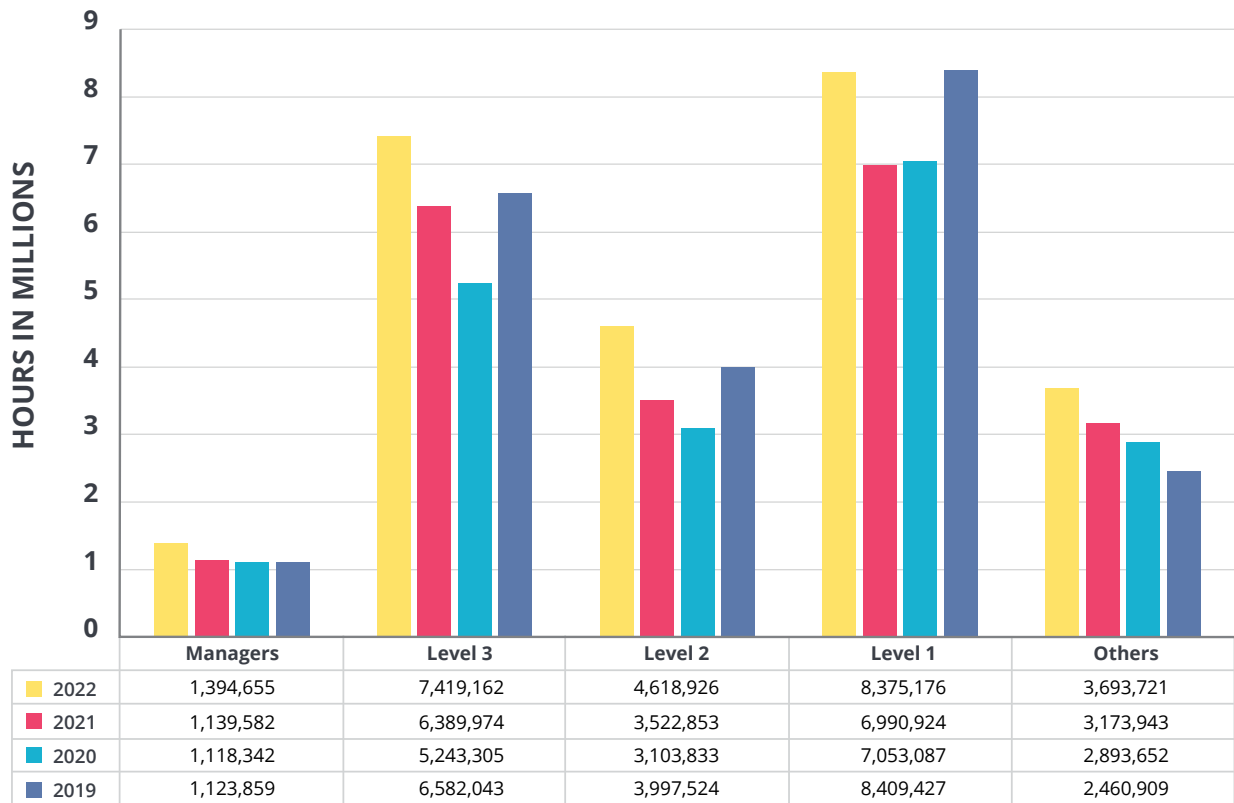
### 2.3 HOURS WORKED

Fig 3 shows the distribution of reported work hours in 2022 alongside those for 2019-2021, again to demonstrate recovery, or partial recovery, from pre-pandemic 2019 data. Although, at first sight, the chart appears similar to that for employment, significant differences will be apparent. The total hours

worked in 2021 were 21,217,276 and increased by 20% to **25,501,640 in 2022**, and, like employment, was only 13% more than in 2019. As with employment, a 6% average increase per annum would have resulted in ~26-27 million hours.



Figure 3 : Reported work hours by grade



The point to note is that the majority of increased work hours over 2019 were regained mainly by Level 3 technicians. Level 1 technician work hours had still to exceed the 2019 total. Also noted may be the increasing work hours for 'Others', which may have included the significant increase in training hours that will be seen later. As before, these are cumulative figures from all 16 RACs; individual RACs will have experienced considerable variation from the overall.

They are well below a full-time equivalent (FTE) utilisation of 2,000 hours per worker per annum. Traditionally, it has been assumed that the low figure probably reflects a tendency for technically trained technicians also having employment in non-rope access-related work. It appears that the pandemic had little influence on utilisation for those fortunate to retain employment.

Utilisation figures (hours worked divided by number of employees) for the last four years show little change:

Year	Utilisation (Hrs/Worker per annum)
2022	1,156
2021	1,184
2020	1,145
<b>2019</b>	<b>1,155</b>

The importance of submitted work hours lies in the need to calculate accident rates, which are normally based on 100,000 worker population in full time equivalent (FTE) employment of 2,000 hours per annum. The reported workforce of 22,075 reduces to a full time equivalent (FTE) workforce of 25,501,640 work hours / 2,000 hours per employee to give only **12,750**, which is the figure that will be used later in calculating accident rates (10,609 in 2021).



Image courtesy of Training Team Rescue, S.L. © 2023

## 2.4 LOCATION OF HOURS WORKED

The only area that recovered fully from 2019 was working 'on ropes' onshore. However, although offshore working increased, it hardly reached the 2019 figures. The proportion of onshore working was 63% of the total as of 2020/21, up from the 59% in 2019. However,

there would be large variations between individual RACs, with some virtually dedicated to either offshore or onshore work.

Work hours are shown distributed between onshore and offshore working and training in Fig 4.

Figure 4 : Location of Work Hours



## 2.5 TRAINING

The health or otherwise of a body engaged in rope access work will be reflected in the extent of training and related refreshers undertaken because it is a mandatory requirement for IRATA Members. This is irrespective of the working environment, whether onshore or offshore, on high rise buildings, construction sites, forestry or other civil works. Accordingly, the following summary table of changes in the training hours reported by each RAC may be used to assess their resilience to and recovery

from the pandemic. Table 1 presents the summary data for all RACs from 2019 to 2022.

In many cases, a decline from pre-pandemic 2019 figures will be seen, eventually showing a near recovery to post-pandemic levels, such as with East Europe, North America and the UK. In other cases, more erratic changes will be observed with spectacular resurgences in MECASA and North Sea Operators. Although SE Asia shows some recovery, failure to regain

2019 figures might suggest that residual pandemic conditions may still remain. Figures for Others should be ignored as Members were reduced to only two, presumably due to the re-allocation and introduction of another RAC, Sub Sahara, confusing the situation.

The Training totals closely reflect the same changes in employment and work hours, with a sharp decline in 2020 followed by a stepwise increase, eventually reaching the 2022 figures above the pre-pandemic level. However, the table below demonstrates in a simple format that the changes to individual RACs frequently did not follow the overall trends,

hence the warnings on the interpretation of summary data.

Training increased its share of the total work hours to 4%, perhaps reflecting a surge in regaining lost ground and deferred training. If training hours were equally distributed across all grades, it equates to 1,063,549/22,075 or 48 hours per employee for the year, well above the usual circa 35 of previous years. This may also reflect on the apparent increases on 'Other' category employees during the period that could have included potential rope access trainees (i.e. Level 0).

**Table 1 : Training Hours**

	2022	2021	2020	2019
Australasia	42,054	30,627	46,133	40,095
Benelux	9,460	6,822	8,530	7,800
Brazil	214,658	145,496	103,169	119,711
D-A-CH	2,719	2,161	2,266	5,423
East Europe	54,867	48,100	40,065	58,536
Far East Asia	34,637	*	*	**
Mediterranean	36,671	30,193	25,598	19,984
MECASA	157,146	112,015	41,104	88,570
North America	75,636	62,730	48,156	78,107
North Sea Operators	65,682	7,626	9,437	10,456
Others	3,683	30,627	70,323	42,807
Scandinavia	4,448	3,316	3,976	4,315
South East Asia	81,315	49,726	77,706	94,404
Southern Africa	28,892	24,816	16,732	12,671
Sub Sahara	87,861	Previously included elsewhere		
United Kingdom	162,820	97,058	75,927	152,537
<b>TOTAL</b>	<b>1,062,549</b>	<b>651,313</b>	<b>569,122</b>	<b>735,416</b>

\*Added to South East Asia \*\*Previously within SE & Far East Asia

## SUMMARY OF EMPLOYMENT DATA

Members (Q4)	604	
Total number employed	22,075	(average quarterly figure)
Total work hours	25,501,640	million (incl Training)
Equivalent workforce	12,750	
Total training hours	1,062,549	

# 3. ACCIDENT AND INCIDENT STATISTICS

## 3.1 INTRODUCTION

(See APPENDIX I 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'. There is variation in reporting accident data worldwide. IRATA reporting has historically used 'Over 7 Days' as the trigger for 'Serious' injuries and less for 'Minor' injuries. This will continue to be used in what follows. When the first letter is capitalized, e.g. Serious, this means the term refers to actual data. When not capitalized, it is being used generically).

A total of **321** reports were received, a considerable increase over the 265 and 260 in 2021 and 2020, respectively. After initial examination, some reports were deleted or discarded as irrelevant (e.g. motor vehicle

incidents). Also, it was decided to separate relatively minor training 'errors' that incurred no injury from the bulk of reports. The training errors would be subject to separate analysis for the benefit of trainers.

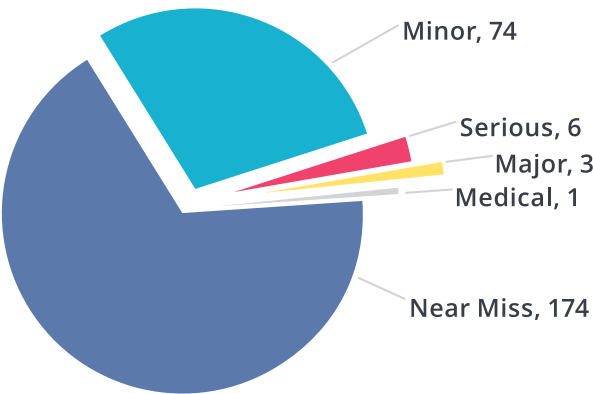
Accordingly, the number left for the main analysis is as follows:

Total	321
Pre-dated 2022	14
Double count	1
Discarded (not relevant)	10 (e.g. motor vehicles)
Training 'errors', no injury	38
Remainder for initial analysis	258 (includes Training injuries)

Training events that did lead to injury or were not due to training 'routine' errors are included within the main analysis where necessary.

## 3.2 DISTRIBUTION OF ACCIDENT AND INCIDENT REPORTS

Figure 5 : Distribution of accident & incident reports



Of the 258 remaining reports, the majority were 'Near Miss' reports, as displayed on the pie chart of Fig 5 along with the other categories:

Taking the more serious accidents aside, the table below compares these with those for the previous four years.

Fatalities And Serious Injuries	Fatal	Major	Serious*
2022	0	3	6
2021	3	4	8
2020	0	3	7
2019	1	2	7
2018	0	1	4

\* 'Over 7 Day Injuries'

The following table summarises the data for the remaining 'Minor Injuries' and 'Near Misses' or injury-free incidents (excluding Training Near Misses noted above):

Minor Injuries And Near Misses	Minor Injuries/ Medical	Near Misses
2022	75	174 (205)
2021	59	182
2020	62	188
2019	63	173

No significance should be given to 'Near Miss' figures as these relate primarily to the reporting vigilance of members and are obviously encouraged. Note that the higher

figure in brackets includes those 38 Training Near Miss reports that have been removed and will be reported on separately.

### 3.3 RISK DATA OF ACCIDENTS

#### 3.3.1 BY ACTIVITY – ON ROPE/OTHER/TRAINING

All reports are tabulated according to activity in the table below.

	Major	Serious Injuries	Minor Injuries	Near Miss	Medical/Illness
On Rope	3	3	38	118	0
Other	0	3	16	50	0
Training	0	0	20	6*	1

\*Excludes 38 Trainee 'errors'



All three 'Major' injuries were sustained On Rope. 'Medical/Illness' was only reported in one case of feeling unwell. The numbers do not take into account population. It is necessary to divide the figures by the reported hours for each of the activity headings and

divide by 2,000 to convert work hours to full time equivalent workers (FTE). From Fig 4, work hours for 'On Rope' were 13.15, 'Other' 11.29, Training 1.11 million hours: For 100,000 workers, the table now changes to:

	Major	Serious Injuries	Minor Injuries	Near Miss	Medical/Illness
On rope	46	46	624	1,750	0
Other	0	53	283	885	0
Training	0	0	3,600	1,080*	180

Numbers per 100,000 \*Excludes the 38 Trainee 'errors'.

The higher Minor Injury risk, on an hourly basis, during Training is obvious. At its simplest, the risk of major injury was restricted to working On Rope with little difference to

Other working for risk of serious injury. A similar relationship exists when comparing Onshore and Offshore working against Training, as will be apparent next.

### 3.3.2 BY LOCATION – ONSHORE/OFFSHORE/TRAINING

A similar summary table, based on the locations of work, gives the following (Training will be the same figures):

	Major	Serious Injuries	Minor Injuries	Near Miss	Medical/Illness
Onshore	3	3	33	147	0
Offshore	0	3	21	21	0
Training	0	0	20	6*	1

Taking reported hours into account, with Onshore of 15.50, Offshore of 8.95 and Training, as before, 1.06 million hours, the figures transform to now give a more realistic comparison of the figures between the

different locations on a per 100,000 FTE worker basis. The risks of injuries were similar whether working onshore or offshore, although all three major injuries occurred onshore.

	Major	Serious Injuries	Minor Injuries	Near Miss	Medical /Illness
Onshore	39	39	426	1,900	0
Offshore	0	67	468	468	0
Training	0	0	3,600	1,080*	180

Numbers per 100,000 \*Excludes the 38 Trainee 'errors'



The significantly greater risk of minor injury associated with Training is a consistent finding year after year, probably reflecting a combination of novice trainees unaccustomed to rope work, the intensity of training exercises leading to a higher frequency of minor injuries or muscular complaints, which may also reflect a higher likelihood of reporting by trainers.

The smaller proportion of 'Near Miss' reports from Offshore compared to Onshore may be related to commercial concerns leading to a reluctance to disclose errors when possible, higher standards of work control, supervision, personnel selection, appreciation and awareness of hazards when working offshore by all workers on the platform. However, combined, more serious injuries were the same.



Image courtesy of Sparrows Offshore Services Ltd © 2023

### 3.3.3 BY GRADE

Injuries sustained by individuals, according to grade, are shown in Fig 6. Although the chart shows considerably more injuries were sustained by Level 1 technicians than by other grades, it does not consider the 'populations' of the grades or, better still, work hours for 'time at risk'. Using the employment hours,

7.42 for Level 3, 4.62 for Level 2, 8.38 for Level 1 and 1.06 million for Training and dividing gives Fig 7. Clearly, the risk of injury is three or four times greater whilst training than working, albeit mainly minor injury. Training members will already be aware of hazards and increased risks when dealing with trainees.

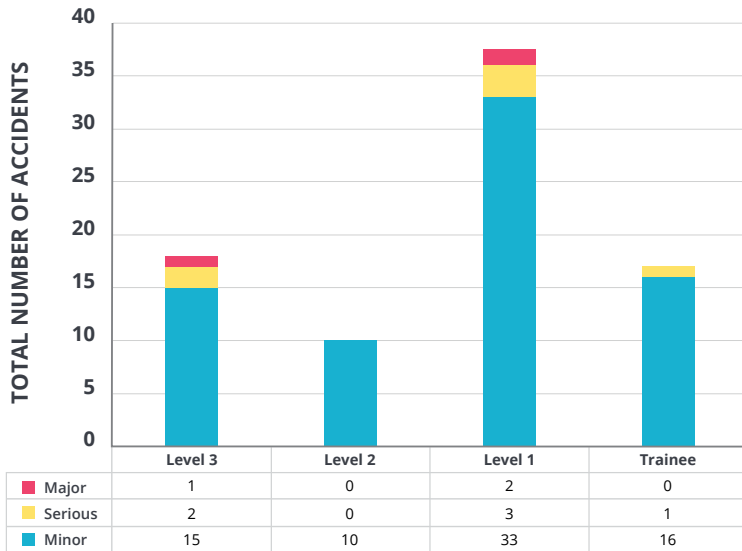


Figure 6 : Injuries Suffered By Grade

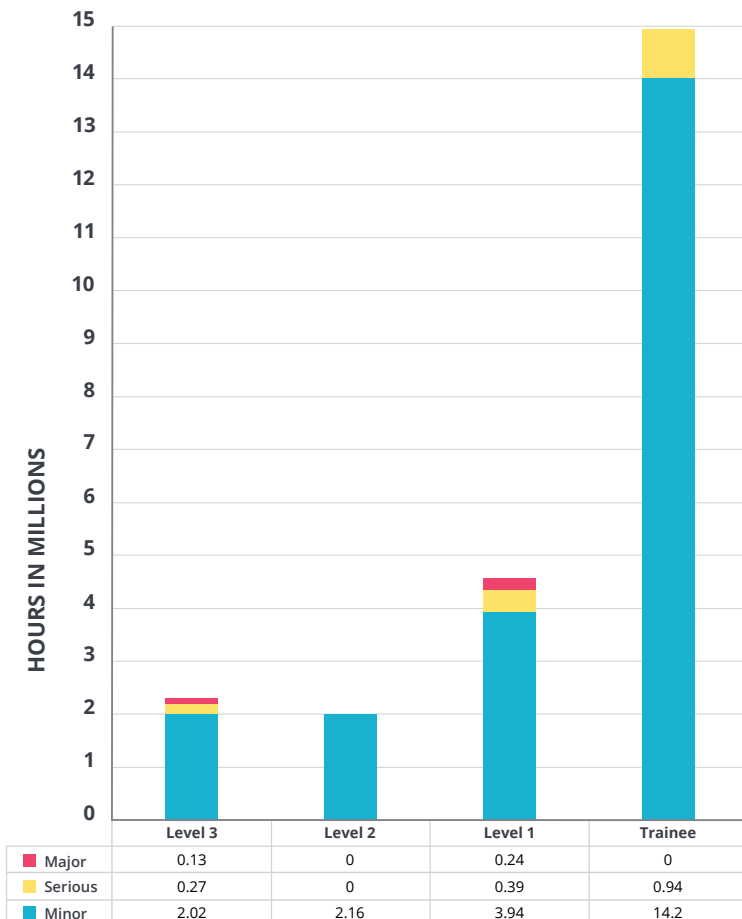


Figure 7 : Injuries Per Million Work Hours Suffered By Grade

Before examining the various factors involved in accidents and incidents, it is important to recognise that the data in the charts to be presented include numerous instances of 'linked' markings. This occurs when an

individual event may be associated with more than one factor. For example, in Fig 8, some accidents incurred more than one injury, or in Fig 14, some events were associated with several Human Factors.

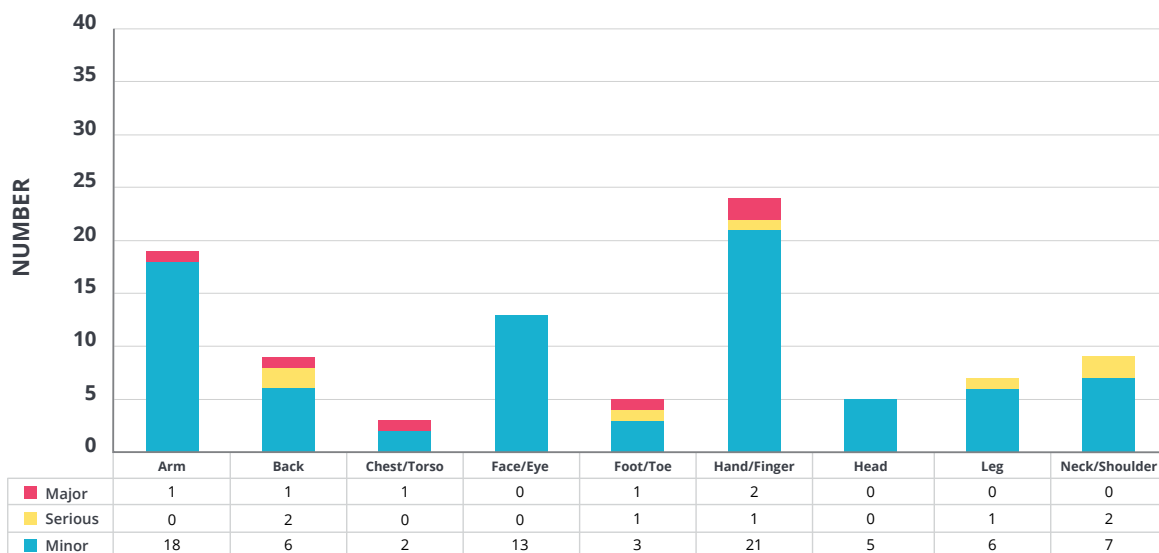
### 3.4 BODY PART INJURIES

Fig 8 shows the distribution of body part injuries sustained in 2022. It should be noted that the chart shows actual numbers of injuries and does not account for 'populations'. The total of injuries (94) in the chart exceeds reported accidents because of multiple injuries in individual accidents.

Of the 19 arm injuries, one was a 'Major' broken elbow sustained by one of two technicians who fell together unrestrained 4m whilst setting up rope access for window

cleaning. The technician also sustained a serious hand injury in the fall. The remaining 18 Arm injuries were all Minor, 7 of which were strain injuries during training sessions. Amongst the 11 work related injuries may be noted, two arm burns from contact with hot pipes, three strains during rigging, two whilst handling tools and two slips whilst walking. An unrestrained 5-6 m swing into a boarded window resulted in stitches to an elbow cut and, simultaneously, a minor back injury.

Figure 8 : Body Part Injuries



The second technician involved in the 4 m fall sustained a back injury as well as a Major broken ankle injury. The two Serious back injuries occurred after a descent on rope caused back strain and, the second, a similar back strain after awkward positioning whilst handling tools. Two of the Minor six injuries related to back strains during training, one

of which was an aggravated old injury. The remaining four back injuries included back strains associated with lost balance and a slip on stairs.

All 13 face/eye injuries were Minor. Six were debris in eyes problems, in one case despite wearing double eye protection (face mask and

goggles). Six minor facial injuries occurred by strikes from equipment and tools, two during training. One report concerned caustic contamination causing eye inflammation.

Although there were only five foot/toe injuries, one was the Major broken ankle, noted above, and one was a serious twisted ankle on a stairway. Two other, less serious, twisted ankle injuries occurred leaving a boat and, the other, climbing over a guardrail. One ankle injury was caused by an impact from a falling chain. Another, a foot burn, was caused by slag falling from hot gouging into a boot.

The 24 hand/finger injuries, twice as many as in 2021, included two Major injuries. One was the fractured hand associated with one of the two technicians who fell 4 m. The second was a serious hand injury sustained during a horizontal tension line traverse when a hand was trapped in the pulley. Not strictly a 'Major' injury, but clearly considered a sufficiently serious accident to warrant the grading by the reporting member. The two Serious injuries involved the loss of a fingertip due to trapping during pipe removal and a fractured

thumb caught by a bolt tightening tool. Of the remaining Minor injuries, 11 were various injuries from handling tools, and 7 were during training. Trapped particles beneath a fingernail, impact with a cable tray and being struck by a loose scaffold clamp, were three other events of hand/finger damage. The last was a wrist burn during gas axe use.

Of the remaining injuries, mention may be made of a coincident leg injury to a Serious back injury following a descent on rope, noted above. Two other Serious injuries were associated with shoulders in both cases. One, a fall of 17 m into the sea when a deck handrail failed, was followed by rescue to the standby boat by a fast rescue craft. A shoulder injury was the result of the event. The second Serious shoulder injury occurred whilst pulling up onto a beam. The action was accompanied by a 'pop' and a numbed shoulder resulted. One shoulder injury was a dislocation that should have been reported as a Major injury. However, the trainee had experienced the condition frequently and could deal with the injury promptly.



Image courtesy of Bilfinger UK Limited © 2023

### 3.5 CAUSES OF ACCIDENTS AND INCIDENTS

Figure 9 : Immediate Cause Of Accidents & Incidents

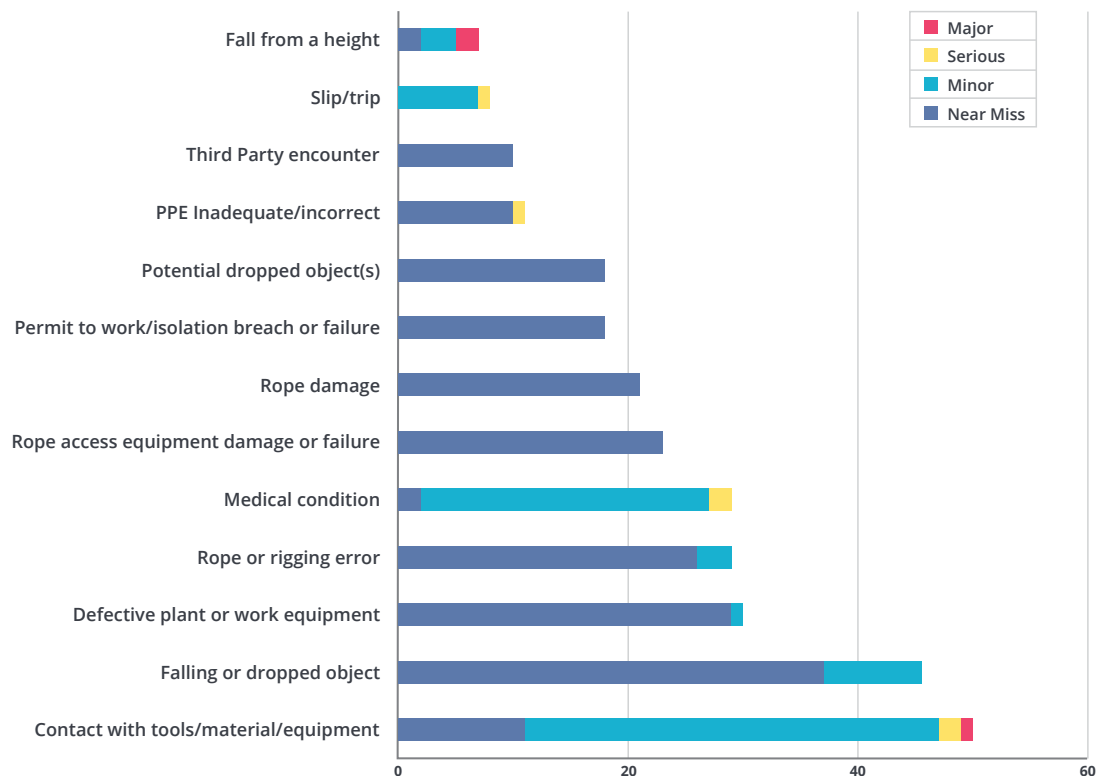


Fig 9 presents the data for immediate causes of accidents and incidents.

Note that some events were associated with more than one 'cause'. Only categories that described the immediate cause of an accident or near miss were generally submitted in reports. This is a weakness of the analysis as the information provided did not usually identify root causes. The chart is largely self-explanatory, but the following highlights some of the findings.

Contacts and impacts with fixed items, tools and various other site materials and substances were the most reported causes of injuries, some serious, and over one in every five of all reports. The Major injury was the severe hand injury incurred by a Level 3 when his hand was caught in a pulley during a horizontal transfer. The other two Major injuries resulted from the two technicians falling unrestrained 4 m together.

The next most numerous cause was dropped or falling objects, which continue to persist in rope access activities. Of the 44 events (29 in 2021 and 42 in 2020), fortunately, only 7 resulted in Minor injuries and none more serious. Note that several items dropped by trainees are not included unless associated with an injury. The majority of dropped objects were directly attributed to technician work activity. Objects include a radio, gas monitor, battery, various tools and their parts, rope access equipment and beam clamp, bits of cable tray, concrete and ash, ice and sheets of metal, special mention may be made of a complete welding machine and a working platform.

The 18 potential dropped or falling objects also included a range of items, mainly plant components as well as equipment left by

previous workers. In some cases, these items were capable of delivering fatal or severe injury and emphasises the need and value for site inspection before work starts.

Although not included in the formal reporting format, there were 29 reports in which 'Rope and rigging errors' could be identified (15 in 2021). Three were associated with minor injuries, one a rib strain, one a finger pinch endured by a trainee, and, the third, a downward swing of 5-6 m leading to impact and bruising, cut elbow and spinal injury, although still a Minor injury (also reported as a Fall). Strictly, the three were really misuse of their respective rigging systems.

The 'Rope access equipment' problems (23), combining both failed and malfunctioning hardware, reinforced the need for pre-use inspection of rope access equipment. One point of concern was items with evidence of pre-existing wear and/or damage that should have been detected before being issued to technicians.

Perhaps the most concerning was the **21 instances of rope damage** reported, although, very fortunately, none were associated with injury (16 in 2021 and only 7 in 2020). Three cases were identified of rope protectors slipping or being inadequate, leading, in one case, to severe rope damage on a shotcreted surface. Three others were rigged without edge protection but spotted before

use. Two ropes were burnt on hot pipes. Three ropes were damaged by teeth in contact tools, including one powered ascender. Over-stressing or snagging during hauling resulted in two damaged ropes. Only one in-use rope was actually cut through by a tool and the backup damaged to the core. A length of rope was cut from a rigged rope by a third party contractor and used elsewhere.

Perhaps a reminder of IRATA's recommendation regarding edge management, in order of preference:

**Remove**  **Avoid**  **Protect**

In addition to the two unrestrained 4 m falls noted above, there were five further falls, three of which resulted in Minor injuries. The 'swing' restrained fall has already been noted. A short fall onto a cow's tail by a trainee resulted in a finger rope burn and a fractured ring finger. One unrestrained fall was a Level 3 who fell off a beam but managed to catch onto it and then attach his cow's tail until rope rescued. Failure of a handrail, leading to a 17 m fall to sea and resulting shoulder injury before rescue by a fast rescue craft to the standby boat, which has also been noted previously. The seventh 'Fall' was a training report of a 'semi-uncontrolled descent' due to an incorrectly threaded descender by a candidate.

### 3.6 MANAGEMENT FACTORS

Figure 10 : Management Factors

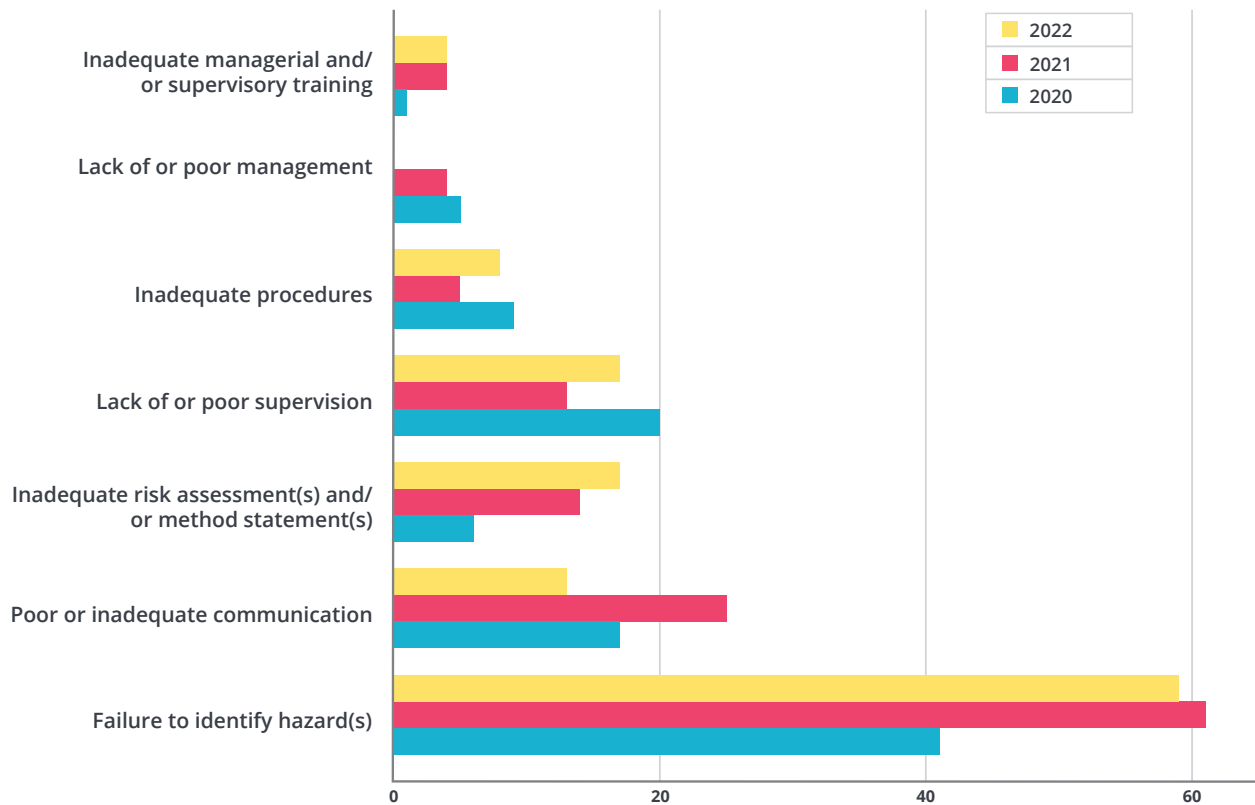


Fig 10 presents management related factors identified in reports of incidents and accidents alongside those for 2021 and 2020 that were similar in most respects. Of the 258 reports, 100 identified one or more management factors in accidents or incidents (in some cases, up to 3 or 4). In the other remaining reports, the absence of management factors might be considered reasonable. For example, reports of potential falling objects, individual errors such as tripping and slipping, and, in many cases, damage to rope access hardware during use may be beyond management or supervisor control.

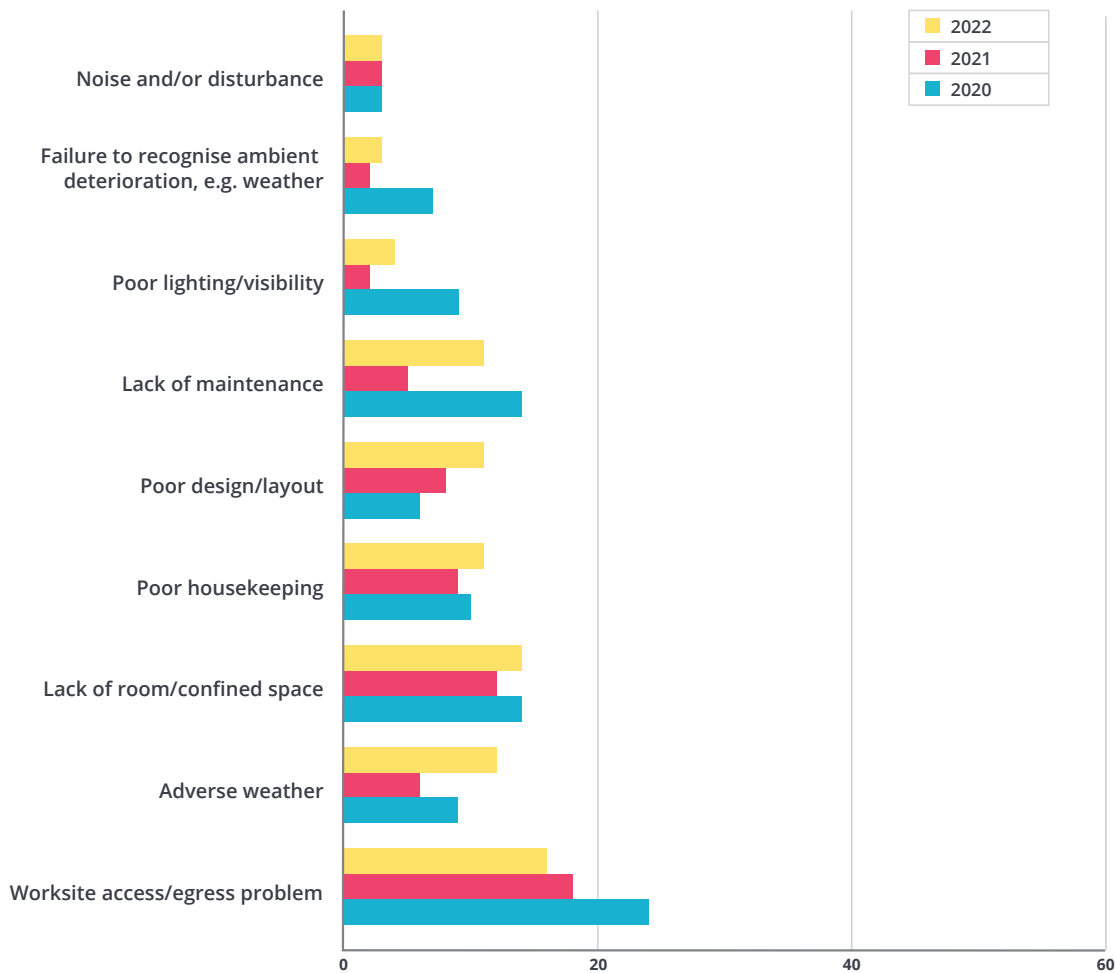
Many reports will have been submitted under the direction of managers or supervisors who may have been involved in the events

recorded. Thus, the analysis is carried out with some reservations about the data supplied. It must be very difficult for managers and supervisors to be truly objective when submitting reports if they were involved in any capacity themselves. However, there is not a single report for 2022 that identifies 'Lack of or poor management' as a contributory cause. 'Lack of or poor supervision' was identified in 17 cases, but only 4 reports recognised a need for managerial or supervisory training. This is further compounded by only 17 reports that identified the inadequacy of risk assessments or method statements as contributory causes.

'Poor or inadequate communication' was reported in only 12 cases.

### 3.7 WORKING ENVIRONMENT

Figure 11 : Work Environment



Working environment problems were identified in 68 reports, with some having more than a single factor identified. Fig 11 presents the results alongside those for 2020/21. However, diligence in reporting and obvious confusion about the interpretation of the pro forma, as in previous years, makes the data in Fig 11 unreliable. For example, a further 10+ items could have been added in 'Poor housekeeping' in a scan of reports. There were at least 2 further examples of 'Confined space', 3 more 'Lack of maintenance' and a similar number for 'Worksite access/egress'. In the case of 'Adverse weather', ice and low temperatures were the dominant concerns.

The confusion seems to arise from deciding whether the response to the pro forma should

be in relation to the rope access work in isolation, the site as a whole, or a combination of all, irrespective of responsibility.

Despite the concerns, the data shows that a wide variety of working conditions are frequently encountered since 27% of all reports highlighted various concerns. As in previous years, marginally the most numerous (16) related to problems with access/egress to work sites, including tight hatchways or openings, such as vessel entries, remote locations and congested plant layouts. Some of these problems were closely allied to 'Lack of room at work sites' with 14 reported.

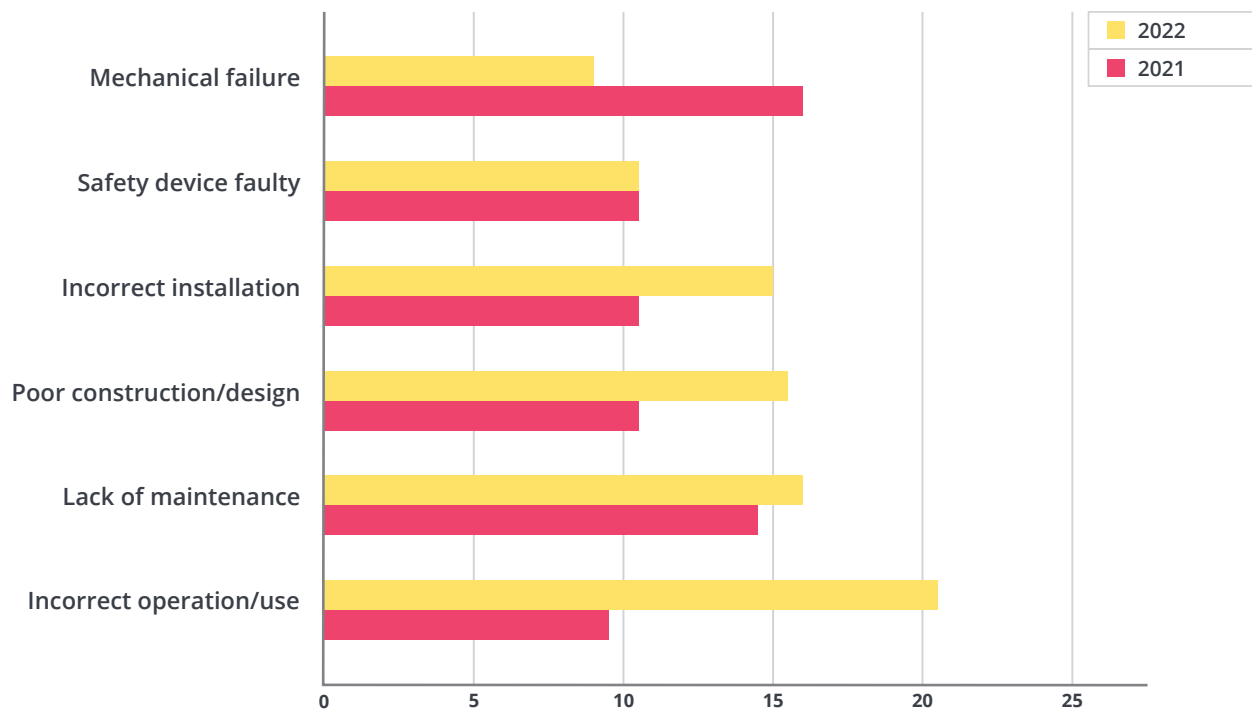


### 3.8 PLANT AND/OR WORK EQUIPMENT

Problems with reporting accuracy with significant failures to identify factors that, in most cases, were reasonably obvious but not applied. Fig 12 presents the data as presented in 66 reports, supplemented by further reports from injury-free training events. The total of items identified was 88, including 9

from the training events. The 2022 data is set alongside the 'as received' data from 2021 for comparison. Clearly, there is little consistency between the figures, primarily between 'Mechanical failure' and 'Incorrect operation and use', which exchange positions.

Figure 12 : Plant And Work Equipment



The 21 reported 'Incorrect operation and use' items included six instances of crane and lifting/lowering operations, one a dummy lowering during training. A further six were associated with hand tools such as grinders, a rock drill, burns from a gas axe and a power ascender. Rigging faults accounted for four, two of which involved rope protectors failing to protect ropes. Additionally, training reported instances of incorrectly threaded descenders, one of which resulted in a 'semi-uncontrolled' descent to the ground.

Closely behind, the 16 'Lack of maintenance' items included two defective tools, three rope access devices (worn sling, cracked pulley and

defective handle on a descender), two fire extinguishers and two cases of rigging doused by fluids released from above and linked to the incorrect operation of shower washing by a third party in both events. The remaining items included unguarded rotating equipment, end of I-beam unattached, concrete debris falling from a chimney (linked to poor construction), defective door latch at ground floor of a wind turbine, a dummy defect (training) and a dropped redundant electrical junction box.

'Poor construction/design' was blamed in 16 reports. In addition to those already linked above, highlighted are two defective handrails, one of which led to a fall to sea, a pulley design

(presumably) allowing finger entry resulting in a Major injury and a torque injury.

'Incorrect installation' (15) occurred in 3 rope rigging operations (at least), one of which was anchorage emplacements. Other examples included a power cable cut because it passed over a cable tray lip, anchorages for a mast not placed correctly, an incorrectly placed rope protector, and a grinding tool incorrectly assembled and falling apart. Training reported two trainee errors, including loading a protection device improperly.

The 11 faulty safety devices included an assortment of items, some apparently unrelated to the title, such as an uncontrolled descent of a crane boom and a faulty valve.

The list did include two cases of damaged or missing rotating shaft guards, hot pipe damage of a rope and a faulty crane hook, but the list omitted several other items that should have been included. It is suspected that there may have been some 'misdirected' recording or confusion with 'Mechanical failure' that follows.

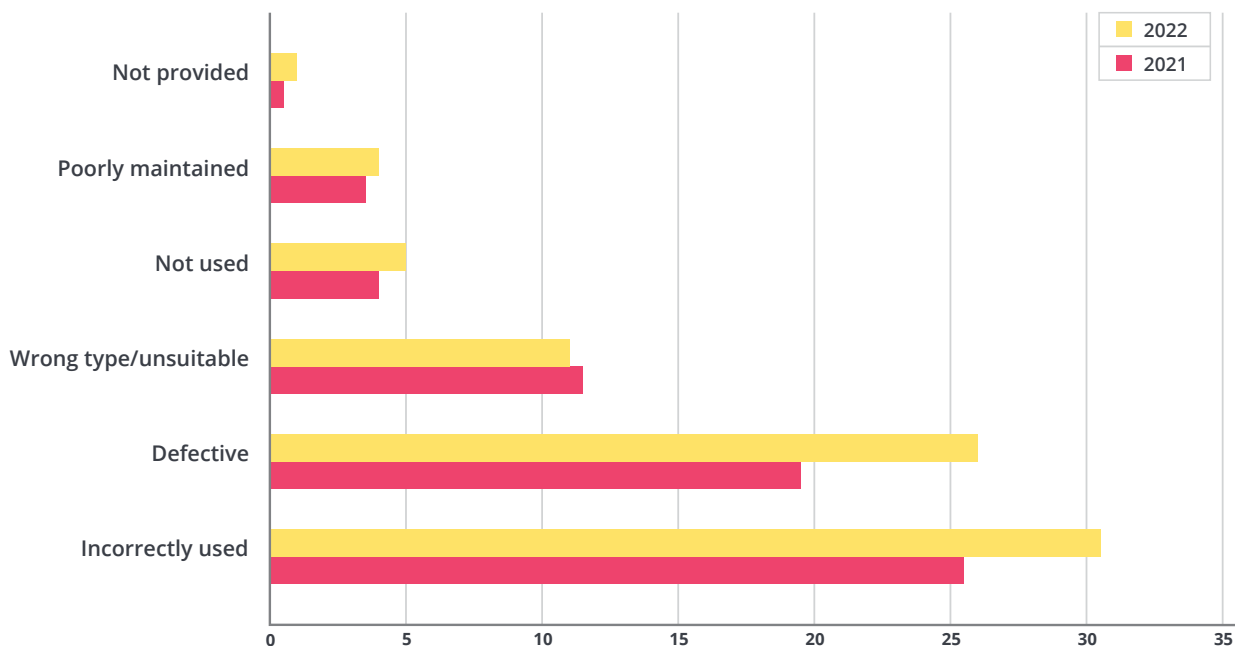
'Mechanical failure' (8) was linked to several items already reported above, including the crane boom uncontrolled descent, the unsupported end of an I-beam, a training dummy fault and a rope protector failure. Chain link failure during lifting and winch failure whilst operating were also reported. Some of the items under 'Safety device faulty' would be more appropriately reported under this heading.

### 3.9 PPE PROBLEMS

The pro forma provided excludes 'damage to PPE'. Reports that include damage to rope access equipment, including the ropes in use, have been added to the data provided, either as 'Defective or damaged'. 'Unsuitable' and 'Wrong type' have been merged as the distinction is considered unnecessary.

The results of the analysis are shown in Fig 13. Similarity with the results for 2021 may be noted. Consistency with 2021 figures is clear. Four items were imported from Training, three being failing to thread descenders properly and one relating to a defect on a training dummy.

**Figure 13 : PPE Reported Problems**



The chart is largely self-explanatory. 'Incorrectly used' (33) applied to 9 concerns with the ropes, mishandling leading to damage, tangling or even severance in two cases. Rigging, belaying and protection measures were involved in a further 9 and an additional 10 in handling various rope connection devices (ascenders, descenders and so on), with two being dropped.

'Defective or damaged' equipment occurred in 27 events that included 17 instances of damaged or severed ropes, somewhat less than the 21 reported in 3.5 above, probably because the latter included identification of 'potential' rope damage. The main causes were burns on hot pipes (2), cuts by various tools or equipment (3) and, most frequently, abrasion against structures. There were two cases of worn ropes and a further two from gross over-loading leading to failure, one during hauling. One rope was cut by a third party.

### 3.10 HUMAN FACTORS

By the nature of the topic, it is not possible to assess the accuracy of input data, and reliance must be placed on as-received data. Before examining the data, it is important to recognise that true cause(s) involving human factors may be subjectively 'redirected'. For example, there may be the temptation to 'blame' the individual rather than identify other underlying causes, such as 'undue haste' actually caused by 'undue pressure'. Fig 14 presents the data as received and set alongside results for the two previous years. The correlation is surprisingly good and gives some confidence in the data. The 'switch' between 'Lapse in concentration' and 'Lack of experience' was due to a relatively high incidence of the latter from Training input of 19 items, increasing the total from 39 to 58.

The 258 reported accidents and incidents, together with the 38 separate training

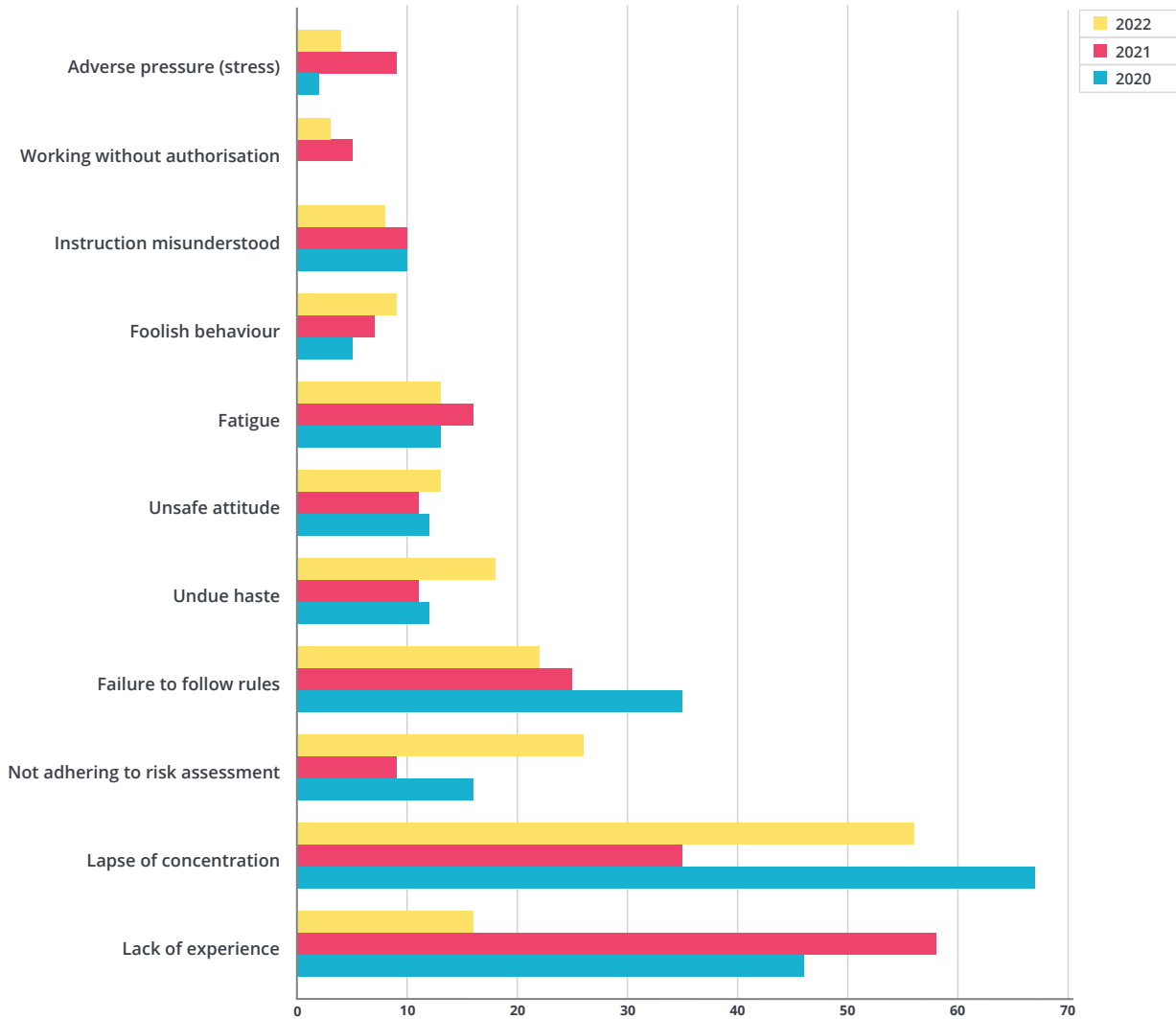
Various connectors, pulleys, slings and a burnt cow's tail accounted for a further 8 'Damaged or defective' items. Two harness wear and damage were also reported, along with three rope protectors, one of which was responsible for rope cutting.

'Wrong type/unsuitable' applied to two sets of rope anchors, three pairs of gloves (one involving welding), two face masks (one unsuitable for H2S when alarmed) and two eye protection glasses ineffective. Included under 'Not used' and responsible for the two 4 m falls was failure to connect to rope protection, leading to an unrestrained fall. An additional failure to use protection was a Level 3, but he managed to hang on to the beam he was walking on when he slipped. Also not used were gloves provided to protect against burn from hot pipes.

incidents included here, yielded 230 items in Fig 14 submitted in 120 reports. It is important to note that the factors identified are not 'additive' as many reports identified more than one factor in a single accident or incident.

'Lack of experience', cited in the 19 training incidents, was further increased by 8 injury related training accidents leaving 31 work related items. Seven were involved with handling tools, five during lifting, lowering or hauling operations and 12 handling ropes and rigging. The two 4 m falls of Level 1s, resulting in Major injuries, were identified with 'Lack of experience' but also linked to 'Unsafe attitude' and 'Not adhering to risk assessment'. Although generally Level 1s were involved in accidents and incidents displaying 'Lack of experience', this was not always the case and a Level 2 and a Level 3 were not immune from

Figure 14 : Human Factors



rigging and rope handling errors, in one case also linked to other factors including 'Unsafe attitude'.

'Lapse in concentration' was reported in 56 cases. Of the remaining 49, there were two further trainee accidents involving minor injuries. Handling tools was a factor in 10, contact with materials and hot pipe in three, dislodging or dropping items in nine and four slips or trips. Errors or events in rope and rigging accounted for a total of 14, some involving Level 2 and Level 3s, one of which was the Major hand injury to a Level 3.

'Failure to follow rules' (25 including three trainee errors) and 'Not adhering to risk

assessment' (28 including 2 trainee errors) are examined together with 11 linked events, which is not surprising as the distinction between them is slight. Eight failures to adhere to risk assessments were reported for rope and rigging, one of which was shared with failing to follow rules by a Level 3. Only three items covered the misuse of tools. 'Failure to follow rules' included the use of a powered ascender by a Level 1 that was also linked to 'Working without authorisation'. The 4 m fall of two Level 1s was also linked to both failure to follow rules and risk assessment. Amongst others, dropped or dislodged materials were reported as working without authorisation in two cases. Eight cases of 'Not adhering to risk assessment' and four in 'Failure to follow rules'.

In the latter, of five factors, including 'Unsafe attitude' and 'Undue haste', were associated with a dropped spanner.

The analysis of some of the more negative factors, such as 'Foolish behaviour', 'Unsafe attitude' and 'Working without authorisation', revealed very modest numbers, some of which

were linked anyway. Set against employment of over 20,000 with a combined 25 million work hours, this must be considered a very positive result overall and indicative of a professional and reliable workforce that, only rarely, encounters unacceptable behaviour at work sites.



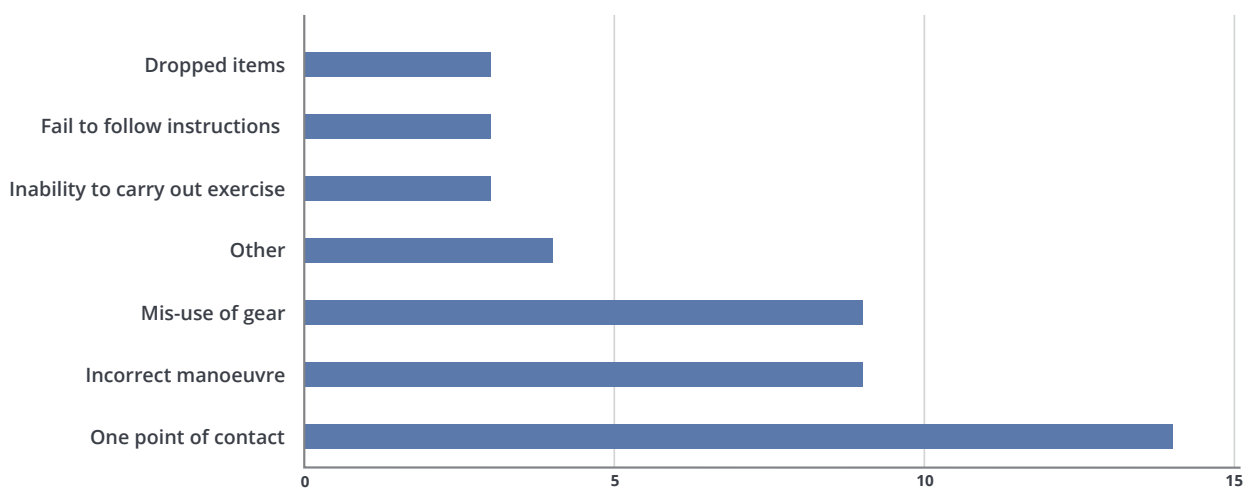
Image courtesy of Absafe Pty Ltd © 2023

### 3.11 INJURY-FREE TRAINING REPORTS

By the nature of the topic, it is not possible to assess the accuracy of input data, and reliance must be placed on as-received data. Before examining the data, it is important to recognise that true cause(s) involving human factors may be subjectively 'redirected'. For example, there may be the temptation to 'blame' the individual rather than identify other underlying causes, such as 'undue haste' actually caused

by 'undue pressure'. Fig 14 presents the data as received and set alongside results for the two previous years. The correlation is surprisingly good and gives some confidence in the data. The 'switch' between 'Lapse in concentration' and 'Lack of experience' was due to a relatively high incidence of the latter from Training input of 19 items, increasing the total from 39 to 58.

**Figure 15 : Non-Injurious Training Errors**



Excluded from the main accident/incident data analysis were reports of non-injury training errors. (There were some exceptions where relevant training errors were included in specific items of analysis). From the 38 reports, 45 items were extracted for inclusion in Fig 15, which attempts to categorise them and their frequency in the hope it may be of interest to trainers. Note that training reports of accidents are included within the main analysis and excluded here.

Clearly, numerically, the major concern was trainees being on a single point of contact, particularly when re-anchoring. Seven events of the 45 were associated with errors whilst undertaking rescue exercises and two whilst handling dummies. 'Mis-use' included five rigging and loading errors, two equipment selection errors (leading to overloaded devices) and two threading errors (ascender and descender). The four 'Other' items included three defects, one a dummy 'defect' and two rope device defects. The last was failing to monitor a backup during a vertical aid climb.

### 3.12 OTHER FACTORS

#### 3.12.1 Isolation Failures

Six isolation failures were identified in the reports. A flare suddenly ignited when

operations 'stroked' a venting valve, releasing gas which was ignited by the pilot. Rope access technicians, working by a flare, evacuated by

rope and ladder rapidly. A second event was hot air suddenly released to two technicians following an unexpected plant shutdown. Technicians working in one vessel were suddenly enveloped by catalyst dust carried over from the adjacent vessel, which should have been isolated from the one they were working in. In another incident, an electric arc was seen on a corroded cable rack. Whilst entering a confined space to clean an HVAC duct, the fan was still running. Finally, a major isolation accidentally had been left locked off and had to be removed for work to proceed.

### 3.12.2 Exclusion Zones

There were 7 identified problems involving exclusion zones. Four involved potential hazards due to falling ice or interfering in work, in one case, threatening to damage fragile equipment. Another problem occurred when dislodged pipework cladding fell outside the exclusion zone. A permit failed to identify that overhead power lines were within close proximity to the work zone. Finally, rope access technicians accidentally entered another contractor's work area because marking tapes had been damaged by hot process pipework.

### 3.12.3 Third Party Acts or Omissions

There were 11 validated Third Party acts or omissions involving rope access working either directly or indirectly. Several more reports were rejected as they mainly referred to items left by others and were not directly associated with actual rope access working. Unauthorised entry to working areas occurred in four cases, from a farmer working beneath a wind turbine being worked on, to an electrician without authorisation, entering a work zone and removing pre-installed rope anchors to gain access to a junction box. Combined crane operations with a third party and miscommunication resulted in a load being lifted instead of being released. A section of installed rope was cut and later found to be

used nearby by another contractor. Permit confusion or related issues were involved in four further incidents. In two related incidents, conflicting working resulted in ropes and rigging being rained upon by released washings from above.

### 3.12.4 Weather

The pro forma did not ask if weather or ambient conditions were a factor in the accident or incident reports, necessitating a full search of data. A total of 20 events involved weather as a factor, distributed as follows:

- **Sub-zero** – of 15 events, nine involved ice either falling or a potential of falling. Two of them were build up of ice on leaking pipework. Other miscellaneous items included a monitor battery affected by cold, freezing up of safety glasses (leading to a cut), two cases of rope access items affected (frozen gate on a karabiner) or potentially affected ASAP, and missed footing on frozen ground (leading to a twisted ankle).
- **Hot** – 1 report involved the transfer from sub-zero conditions to hot inside working, resulting in over-dressed technicians suffering overheating. Interestingly, there were no reports of technicians suffering heat effects from working in hot ambient conditions, usually featured in previous reports.
- **Wind** – 3 events involving high winds or gusts were reported, one inflating an empty water weight bag that wrapped itself around ropes that were in use. The suspended technicians, unable to escape, required a set of additional ropes be lowered, but transfer of essential rope attachment devices required the trapped ropes to be cut. Only then could they retrieve the equipment to complete their escape. Pre-installed ropes were blown

onto hot pipework and were damaged. Similarly, loosely tied off ropes suffered serious damage from high winds, causing severe abrasion.

### 3.12.5 Rescue

The need for rescue of individuals was reported for 15 cases, but the majority (10) were cases where assistance to evacuate to safety and, when necessary, medical help was required. Actual rescue to a 'place of safety' was required in 5 cases. A trainee suffering severe leg cramps required rescue using a mobile elevating work platform (MEWP). A second rescue was required following a shoulder injury whilst pulling up on a beam within a work area and transit to the site medic.

Increasing gusts of high wind forced the evacuation of technicians engaged in building façade cleaning. Whilst most made their escape, eight were left trapped by entangled ropes. After 1 hour, the ropes were untangled by helpers, and descent from the 15th floor could then be made. After twisting his knee, a Level 1 needed lifting up to the spider deck from his position below on a platform jacket bracing. Finally, the Level 3, who had severely injured a hand trapped in a pulley acting on a horizontal steel tension line, would have required rescue.

### 3.12.6 Time Lost

Reported days off work for injured persons totalled only 142. This is clearly underreporting when 3 Major injuries, 6 Serious injuries and

75 Minor injuries are taken into account. For example, the two 4 m falls resulted in Major injuries, albeit reported as minor bone fractures of the ankle in one case and hand/elbow in another, yet only 7 days off work were reported in each case. Other instances of 'modest' lost time reports were evident, such as a dislocated shoulder suffered by a trainee leading to abandonment of training, yet no lost days were recorded.

Accepting the figures as reported and an equivalent full time workforce of about 12,750 gives time lost of ~0.011 days per full time employee (0.025 in 2021). The equivalent rate for, say, UK HSE would be ~1 day per employee. Similar figures would be found elsewhere. Thus, time lost due to accidents remained well below normally reported figures.

The continuing low figure of time lost may be partly explained by under-reporting. Even doubling the reported time lost would still result in a significantly lower lost time rate than reported for other industries and occupations. It may also reflect the age range, general fitness and inherent resilience of workers involved in rope access, as well as close adherence to safe working practices encouraged by the training and certification regime, insistence on close supervision and, no doubt, by the obvious hazards of working at height.

(Lost time is sometimes calculated on a per million hours basis, termed Lost Time Injury Frequency Rate or LTIFR. This would give  $142/22.5 = \sim 6.3$  days per million work hours).

## SUMMARY OF ACCIDENT/INCIDENT DATA

Total reports	258 plus 38 'no injury' Training reports
Fatalities	0
Major Injuries	3
Serious (>7 Day) Injuries	6
Minor (<7 Day) Injuries	74
Near Misses	175





# 4. ACCIDENT RATE

'Reportable' injuries, at least in UK and EU statistics, usually only include injuries that either have associated 'days off work' (7 in UK and 4 for EU) as a result of the injury or involve defined 'injuries' and termed 'Major'. These latter 'Major' injuries or medical conditions,

typically such as major broken bones and dislocations or need for resuscitation, are defined and coincide with generally accepted definitions (see Appendix I for further explanation). In US BLS data, any time off work would be reportable.

## 4.1 INJURY RATES

Statistics for reportable accidents are based on accidents per 100,000 full time equivalent (FTE) workers. The 'multiplication factor' per accident becomes  $100,000 / \text{number of FTE} = 100,000 / 12,500 = \sim 8.0$  per accident. There were 9

Major and Serious accidents reported for 2022, 15 Major and **Over 4 Day** injuries and 28 Major and **Over 1 Day** injuries. The accident rate for each of these different reporting levels then becomes:

Major and all Over 7 Day injuries (9 x 8) = 72 per 100,000  
 Major and all Over 4 Day injuries (15 x 8) = 120  
 Major and all Over 1 Day injuries (28 x 8) = 224

These figures can be used to compare against other data available such as the International Labour Organisation (ILO), with nearly worldwide coverage. Here, a comparison only against the latest available UK HSE Labour Force Statistics (LFS), EU Eurostat

and USA Bureau of Labor Statistics (BLS) is made. Over-simplification of imported data is acknowledged, but the table does give an approximate indication of the status of the above accident rates relative to the nominated agency figures for All Industries.

**Table 2 : Injury Rate Comparisons**

	<b>UK HSE LFS (Nov 2022) (based on 7 Days off work)</b>	<b>EU Eurostat (2020) (based on 4 Days or more off work)</b>	<b>USA BLS (2021) (Incl illness and 1 or more Days off work)</b>
All Industries	1,650	1,466	1,700
IRATA	72	120	224

(Note that Eurostat figures for individual members vary within the range 0-3,000 per 100,000. The figure given is the average of all member states).

Numerous caveats, both positive and negative, can be applied to the figures in the table. For example, 'All industries' is used whereas figures for more closely related industries, such as 'Construction' would give positive results. If age range was considered, noting that rope access would normally be limited

to a younger age range than average, comparisons might be more negative. And so on. However, the under-reporting suspected may equally apply to all other data too. Irrespective of all caveats, it is clear that IRATA member accident rates are well below those of other agency figures. Comparison with

other worldwide figures is beyond the scope of this report, but, in general, they are expected to confirm that accident injury rates will be

below related industry rates by an even greater margin.

#### 4.2 FATALITY RATE

Every casualty is a tragedy. A fatality, the extreme tragedy of all, brings with it incalculable distress and grief. There were no fatalities in 2022. For such a low frequency event, it has been common practice in these

reports to sum over a five year time period all fatalities. Continuing this practice, even in the absence of any fatality, in the period 2019-2022, four fatalities were suffered.

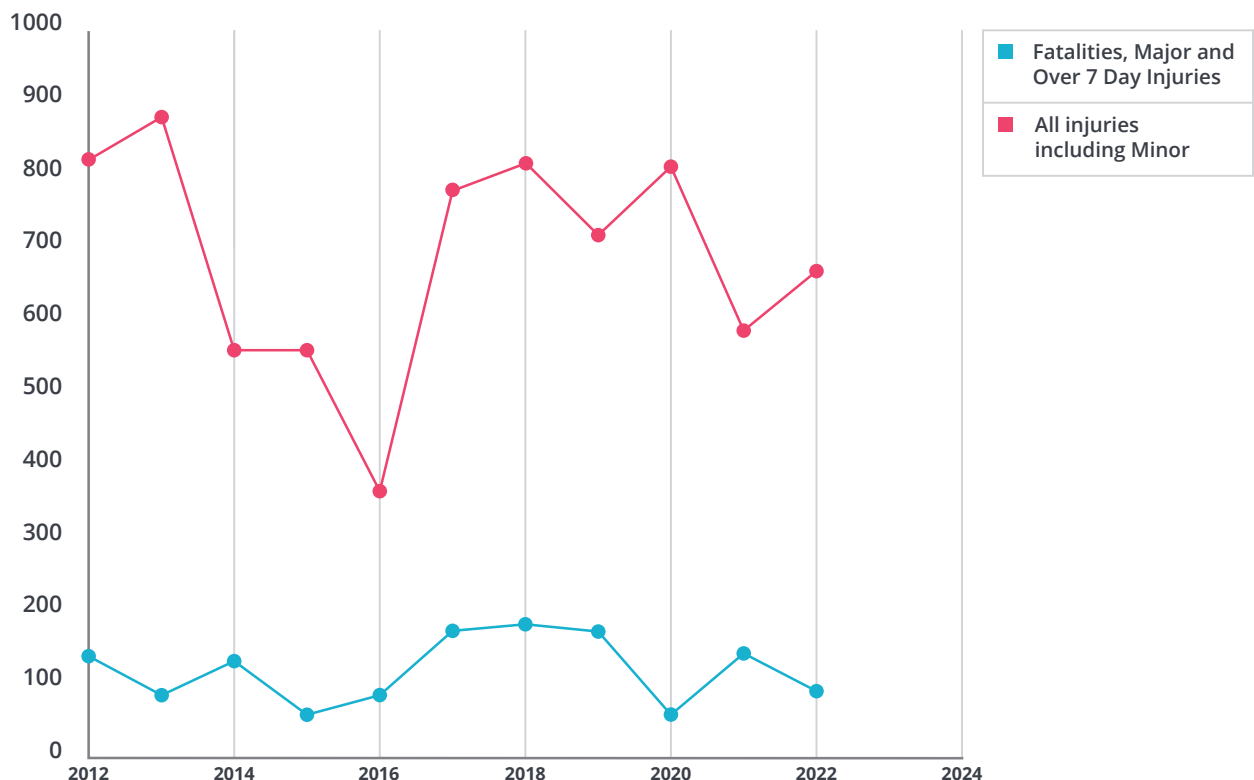
#### 4.3 WORKING 'ON ROPE'

The Association has an understandable interest in 'On Rope' working taken in isolation. The number of accidents for 'On Rope' was as follows:

Major Injury	3*
'Over 7 Day Injury' (Serious)	3
'Less than 7 Day Injury' (Minor)	38
<b>TOTAL</b>	<b>44</b>

\*Although the 4 m falls suffered by two technicians occurred whilst 'unroped', they were in active 'On Rope' working at the time of the accident.

Figure 16 : On Rope Accident Data



The total hours worked 'On Rope' was 13.15 million hours. Thus, the accident rate, converting to 100,000 full time equivalent workers (at 2,000 hrs per worker per annum), gives total injuries of **669 per 100,000 workers whilst 'On Rope' for all injuries** (587 in 2021). A similar calculation for the 6 Reportable Accidents gives a rate of **91 per 100,000 workers** (142 in 2021).

The accident rates per year over the previous 10 years are shown plotted in Fig 16. The Table in Appendix V was extended to include the

figures for 2022. In effect, whilst working 'On Rope', one technician in about every 1,000 working full time would have suffered a serious injury or fatality during the course of the year.

**It is emphasised that the graph in Fig 16 is based solely on accidents that occurred whilst 'On Rope'.** Comparison with other sources of 'Reportable' data cannot be made based on the red line in Fig 16 because this includes fatalities together with other Reportable injuries.

#### *SUMMARY OF ACCIDENT/INCIDENT DATA*

- The accident rates for Major and reportable accidents were in the range 72 to 224 per 100,000 workers, depending on the criteria applied, but all were well below rates provided by other agencies.
- No rope access fatalities were reported in 2022.



Image courtesy of C.A.M.P.S.p.a © 2023

# 5. SUMMARY & CONCLUSIONS

The following conclusions from the analysis may be noted.

1. The rate of membership of the Association had returned to pre-pandemic levels, reaching 604 by Q4 2022.
2. Employment had risen 19% over 2021 figures to reach an average of 22,075 (but only ~13% more than in 2019).
3. Associated work hours showed a similar increase, reaching 25.5 million hours, an increase of 4.3 million hours from 2021 (but, like employment, only ~13 % more than in 2019).
4. Based on an average increase of ~6% per annum over the period 2008 to 2019, work hours from 2019 to 2022 should have increased to ~27 million and employment to ~23,000.
5. Work hours gave a full time equivalent (FTE) workforce of 12,750.
6. Onshore working was responsible for the bulk of the increase and had been consistently rising throughout the pandemic. Offshore On Rope working had yet to reach pre-pandemic level.
7. The above relate to the overall figures, but there were large variations between RACs in terms of recovery from the pandemic. Some recovering well, but others are still to recover fully in terms of employment, work hours or both.
8. Training hours reflected the above. Overall, a significant increase in training hours was recorded, reaching ~4% of work hours, equating to about 48 hours per employee, well above the usual ~35 hours.
9. Accident and incident data for full analysis totalled 258, with an additional 38 injury-free training error reports.
10. There were 3 Major injuries, 6 Serious injuries, 75 Minor injuries and medical cases; 174 Near Miss reports (and the 38 training Near Misses) and no report of fatality.
11. All 3 Major injuries were sustained 'On Rope' together with 3 Serious injuries and 38 Minor injuries, giving an injury rate of 669 per 100,000 for all injuries and 91 per 100,000 for Major and Serious injuries.
12. Risk of any injury, on an hourly basis, was greatest whilst training at ~15 per million hours. Of the working grades, the risk of injury was greatest for Level 1 at ~4.5 per million hours; Level 2 and Level 3 risk of injury was similar at ~2 per million hours.
13. Body parts most susceptible to injury were hands/fingers, arms and face/eyes.
14. Most frequently identified cause for reporting accidents and incidents was contact with tools, materials and equipment with 40 causing injury, some serious.
15. Falling and dropped objects continued to be of concern, but, fortunately, only minor injuries occurred in 7 of 44 reports.
16. The 21 reports of damaged and severed ropes and 23 reports of damaged and failed rope access equipment were also fortunate in not being accompanied by any reports of injury. **Rope protection at all times must be a priority.**

17. Seven falls were reported, two of which were two technicians falling 4 m unrestrained in one event, leading to broken bone injuries and a 17 m fall to sea requiring rescue.
18. Failure to identify hazards was, once again, by far the most widely reported management factor, with nearly 60 reports. Conflictingly, only 17 inadequate risk assessment or method statements were reported. Not a single report identified lack of or poor management as a contributory cause.
19. Results for work environment analysis were unreliable due to confusion in reporting. However, the usual concerns included access/egress to work sites along with congested or constricted and confined spaces working.
20. The reporting accuracy in identification of plant and work equipment problems was poor. Incorrect use of equipment was a primary problem.
21. Again, as above, reporting PPE problems was a combination of incorrect use and defective items were the main problems identified with PPE.
22. Collectively, pre-use inspection of all ropes and rope access equipment frequently identified defective or damaged items; this confirmed the value of checking equipment immediately prior to use and placing no reliance on previous inspection of in-use or as-issued equipment.
23. Human factors were dominated by lack of experience and lapses in concentration. The very low incidence of 'negative' behaviour (e.g. foolish behaviour, unsafe attitude and working without authorisation), set against a workforce of over 20,000 and 25 million work hours, is, by any standards, remarkable. It was such behaviours that contributed to the two major injury falls.
24. In examination of 38 injury-free training errors, the most common error was trainees on a single point of contact.
25. The injury rate calculations lay within the range of only 4-8% of other agency rates, a creditable performance, however viewed. No fatalities were reported in 2022.

In summary, it was a good year, with recovery reported by most RACs to pre-pandemic work levels. Accident rates were well below those reported elsewhere. Some issues remain of concern, notably falling or dropped objects, rope damage and failure to identify hazards.

## 6. RECOMMENDATIONS

Based on reported employment figures and accident and incident data, the following recommendations are made:

1. Members of the Association should be congratulated on pandemic recovery of employment and work hours for most regions during 2022.
2. Members should also be congratulated on achieving very low injury rates.
3. Members should note items raised in the report, particularly with respect to:
  - Ensuring technicians were trained in the correct use of tools and that tools and work equipment were properly maintained
  - Recognising the value of pre-work site inspection to identify hazards, potential dropped or falling items, site defects, congestion and access/egress problems and potential conflict with other work or operations (particularly in lifting/lowering combined operations).
  - Reinforcing the necessity to check all rope access equipment immediately prior to use, irrespective of any previous inspections.
4. Emphasising the need to install and protect all suspension equipment properly and particularly noting IRATA advice on edge management for ropes.
5. Ensuring that risk assessments or related job method statements remain 'alive' throughout and are subject to revision in light of any changes, such as hazards developing or not previously identified.
6. Whilst the above is largely the province of 'immediate supervision' at the worksite (e.g. toolbox talks), it is suggested that, in some cases, managers could have taken a more active role in preventing accidents or incidents by ensuring adequacy of backup support. For example, in the selection of personnel with the necessary training and experience for the task envisaged, ensuring the availability of appropriate tools and their maintenance, including rope access equipment, supplied to site. Accordingly, managers should endeavour to ensure they fulfil their role in providing the support needed at the worksite.
7. Modifications and revisions to the accident/incident reporting pro forma is required.

# NOTES ON THE FUTURE

For the rope access industry, various global scenarios create threats and opportunities. For example, the repair and inspection of a multitude of structures, from dams and bridges to high rise buildings and power distribution lines, will create an increasing need for rope access, as will the need for a multitude of civil repairs, restorations and stabilisation apart from new build.

Just one example, already, an increasing number of reports associated with wind turbine maintenance was noted. As existing structures age and the drive for yet more units to meet carbon reduction targets progress, this one area alone will expand, even ignoring the fact that many are even now approaching

end of life and will need either major renewal or decommissioning. Similar arguments will apply to a multitude of industrial plants, from refineries and chemical plants to even nuclear facilities, bridges and many other civil structures worldwide constructed over 50 years ago.

So, one of the main threats to the industry will be the need to ensure that there is an adequate workforce available to meet demand. Whilst the necessary rope access training can be achieved readily, the problem will be marrying this up with the technicians who have the technical or trades skills required that take much longer to achieve.

# ACKNOWLEDGEMENTS

The assistance of the IRATA secretariat in compiling, arranging and presenting data is gratefully acknowledged. Also recognised is the considerable effort of member company staff who produce and submit the data required. This report could not have been 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. Also acknowledged is the information available from EU Eurostat and US BLS.



# APPENDIX I - 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. This does not necessarily require a person to be 'roped up' or physically connected to active ropes. For example, it would include harnessed standby workers such as supervisors or rescuers but exclude workers at the work site such as fire watchers who have no intent to move onto ropes. Trainers, even if harnessed and prepared to go 'on rope' should report work hours as 'Other'.

**'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 should be 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.

**'Near Miss', 'Incident' 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.

Deliberate acts intended to cause harm or injuries are excluded, considered to be criminal act.

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'** – In UK reporting, 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'.

**'Less than 7 Day Injury' or 'Minor injury'** – The criterion for a non-reportable accident is now 'Less than 7 days off work' in UK (although required to be recorded by duty-holders).

If any injury is incurred, no matter how trivial, the minimum reporting level is 'Minor injury' or '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 un-well (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 or training. As above, reported as 'Over 7 Day/Serious injury, otherwise as 'Less than 7 Day' injury. Pre-existing conditions made worse by work, including training, would be included.

**Reportable Accidents** – For comparative purposes, this term is the total of all fatalities, 'Major Injuries' and 'Over 7 Day' or Serious injuries. When comparisons are made with international statistical data, EU Eurostat and BLS data, differences in 'time off work' have to be taken into account. EU is based on 4 days off work and BLS on any days off work.



Image courtesy of Heads Up Limited © 2023

# APPENDIX II

## SUMMARY TABLE OF RAC EMPLOYMENT BY GRADE

	<b>Manager</b>	<b>Level 3</b>	<b>Level 2</b>	<b>Level 1</b>	<b>Other</b>	<b>Total</b>
Australasia	106	796	403	969	139	2,412
Benelux	41	212	90	166	36	545
Brazil	46	371	234	775	144	1,569
D-A-CH	9	25	8	16	14	71
East Europe	53	268	114	276	81	791
Far East Asia	24	85	44	67	6	226
Mediterranean	45	216	117	215	64	656
MECASA	156	742	864	1,377	498	3,637
North America	135	585	268	798	116	1,901
North Sea Operators	98	1,312	514	1,300	281	3,503
Others	1	7	2	16	5	30
Scandinavia	26	129	61	66	51	332
South East Asia	54	403	252	602	78	1,388
Southern Africa	50	202	151	280	82	765
Sub Sahara	39	122	131	155	100	547
United Kingdom	203	1,268	590	1,314	329	3,703
<b>Total</b>	<b>1,083</b>	<b>6,741</b>	<b>3,842</b>	<b>8,389</b>	<b>2,021</b>	<b>22,075</b>

# APPENDIX III

## SUMMARY TABLE OF RAC WORK HOURS BY GRADE

	<b>Manager</b>	<b>Level 3</b>	<b>Level 2</b>	<b>Level 1</b>	<b>Other</b>	<b>Total</b>
Australasia	153,898	900,590	441,985	979,187	108,223	2,583,883
Benelux	42,115	185,314	83,572	109,360	24,165	444,526
Brazil	54,078	228,402	110,424	338,245	207,646	938,795
D-A-CH	8,625	28,693	11,506	14,779	15,078	78,681
East Europe	41,762	234,349	109,083	218,588	62,792	666,574
Far East Asia	19,071	51,980	31,330	37,364	5,537	145,282
Mediterranean	53,712	203,110	117,455	151,937	38,948	565,162
MECASA	265,356	1,085,050	1,375,576	1,989,959	955,565	5,671,506
North America	168,773	638,464	262,163	785,575	137,200	1,992,175
North Sea Operators	109,660	1,263,594	541,042	1,338,421	1,019,075	4,271,792
Others	2,007	2,993	400	468	3,858	9,726
Scandinavia	29,879	134,970	51,245	52,834	57,528	326,456
South East Asia	57,515	393,181	272,588	557,901	97,432	1,378,617
Southern Africa	57,140	286,791	232,396	369,190	82,223	1,027,740
Sub Sahara	61,397	174,702	187,183	191,993	211,528	826,803
United Kingdom	269,667	1,606,979	790,978	1,239,375	666,923	4,573,922
<b>TOTAL</b>	<b>1,394,655</b>	<b>7,419,162</b>	<b>4,618,926</b>	<b>8,375,176</b>	<b>3,693,721</b>	<b>25,501,640</b>

# APPENDIX IV

## SUMMARY TABLE OF RAC

### WORK HOURS BY LOCATION

	Onshore		Offshore		Training	TOTAL
	On Rope	Other	On Rope	Other		
Australasia	1,474,725	654,263	207,768	205,073	42,054	2,583,883
Benelux	205,716	113,877	83,743	31,730	9,460	444,526
Brazil	99,996	216,701	285,162	122,278	214,658	938,795
D-A-CH	27,348	42,147	2,655	3,812	2,719	78,681
East Europe	125,414	225,061	125,533	135,699	54,867	666,574
Far East Asia	40,804	46,747	16,224	6,870	34,637	145,282
Mediterranean	168,072	209,630	78,730	72,059	36,671	565,162
MECASA	2,427,976	1,920,502	451,579	714,303	157,146	5,671,506
North America	1,349,249	468,949	75,258	23,083	75,636	1,992,175
North Sea Operators	386,715	616,858	1,426,409	1,776,128	65,682	4,271,792
Others	320	3,846	1,154	723	3,683	9,726
Scandinavia	86,688	132,515	64,736	38,069	4,448	326,456
South East Asia	406,025	328,771	244,071	318,435	81,315	1,378,617
Southern Africa	234,582	221,739	249,282	293,245	28,892	1,027,740
Sub Sahara	110,069	260,348	193,203	175,322	87,861	826,803
United Kingdom	1,712,026	1,175,572	789,678	733,826	162,820	4,573,922
<b>TOTAL</b>	<b>8,855,725</b>	<b>6,637,526</b>	<b>4,295,185</b>	<b>4,650,655</b>	<b>1,062,549</b>	<b>25,501,640</b>

# APPENDIX V

## ACCIDENT RATES FOR 'ON ROPE' WORKING 1989-2022

Year	Nos. of Members	Work Hours on ropes	Minor Injuries	Reportable Accidents	Reportable Accident Rate ***	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
2021	558	11,241,943	25	8	142	587
2022	604	13,150,910	38	6	92	669
<b>TOTAL</b>		<b>142,019,263</b>	<b>690</b>	<b>122</b>		
Based on 2,000 hours per person per annum						
* Units for Accident Rate (AR) number per 100,000 workers						
** Col 5 divided by col 3 (x 2000 x 100,000)						
*** Col 4 + 5 divided by col 3 then x 2000 x100,000						





**IRATA International**

1st & 2nd Floor Unit 3 Eurogate Business Park  
Ashford, Kent TN24 8XW  
+44 (0)1233 754 600  
[www.irata.org](http://www.irata.org)

The work contained herein is protected by copyright © 2023 IRATA International, it should not be reproduced, copied, edited or published without written permission from the copyright owner. Any questions or doubts concerning permissible use must be directed to [info@irata.org](mailto:info@irata.org). All rights reserved.