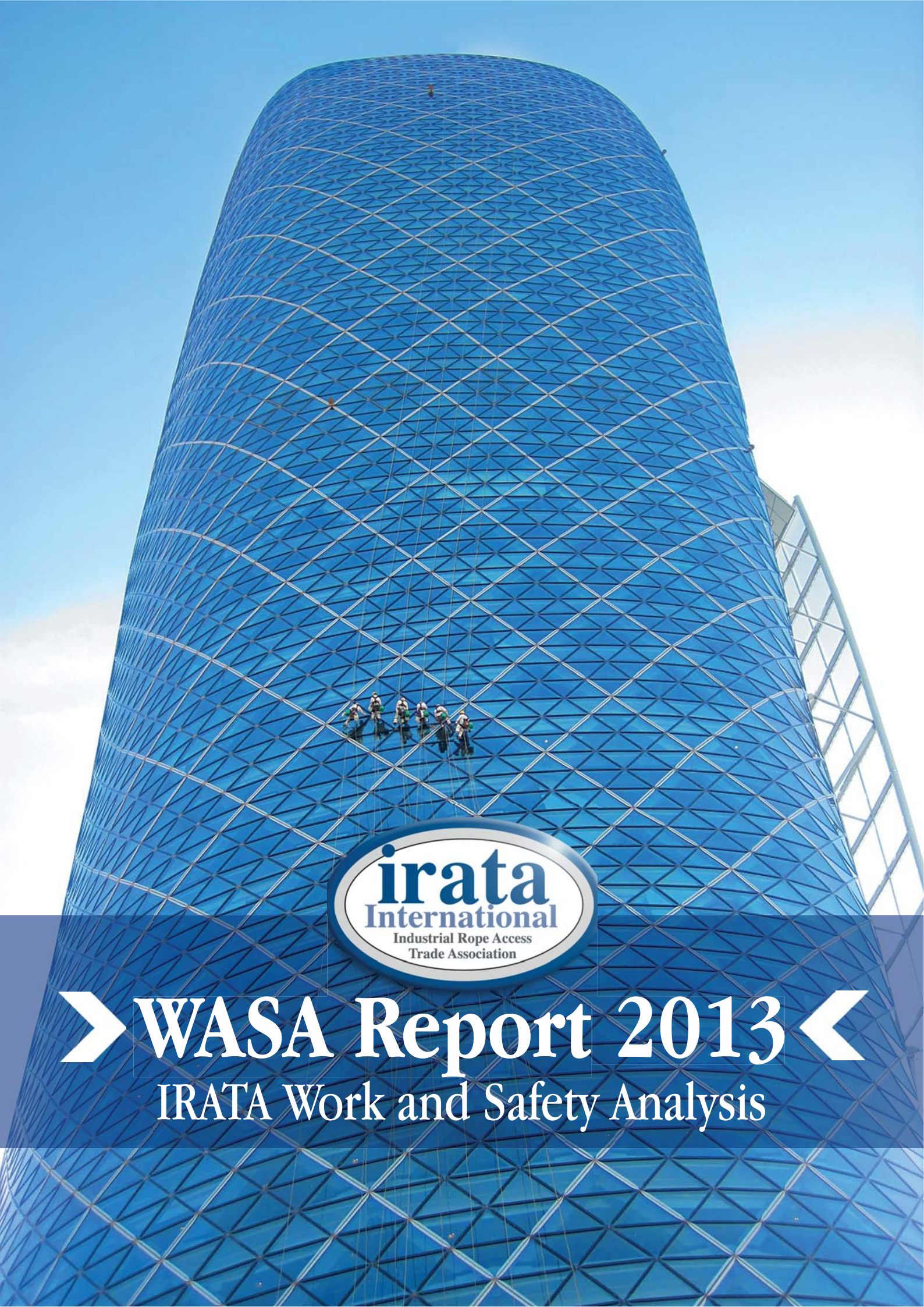

irata International
Industrial Rope Access Trade Association

WASA Report 2013

IRATA Work and Safety Analysis


irata
International

Image courtesy of Megarme

Abstract

Membership of the Association increased to 277 worldwide, representing a reported work force of over 12,500 by year-end 2013. Total working hours closely approached 16 million of which 7 million was for work 'on rope'. Employment data was supplied by members operating from nine zones located worldwide.

There were 48 injuries and illnesses with eight reportable injuries including, sadly, one fatality. The reportable injury rate was 85 per 100,000 workers; this was only a small fraction of any of the latest UK, Eurostat EU27, EU28 and USA work injury statistics, maintaining a remarkable record. There were four reportable injuries to those working on rope, one of which was the fatality. There was little difference in injury rates between the three qualified working Levels which all lay in the range 3-6 per 1,000 workers, including all none reportable injuries.

The major causes of accidents and dangerous occurrences were human error followed by falling objects, being caught by tools and equipment failures. Body part injuries were mainly to legs, head, neck and face/eyes.

A number of areas are identified in the report where improvements in safe working could be achieved including better communications with site management and personnel.

Generally, the 2013 health and safety statistics, as in previous years, were a credit to the members of the Association although the single fatality, when taken in isolation, was very detrimental compared to other fatality data.

Dr C H Robbins
29 September 2014

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Image courtesy of HOEHENWERKSTATT

Introduction

The first work and safety report, for 1989, covered a membership of nine companies. This report continues that process as IRATA approaches its 25th year with 277 member companies. The report maintains the same format as predecessors summarising employment and work hour data followed by analysis of accident and incident data.

The data was subject to 100% quality checks prior to commencement of analysis and, where necessary and possible, corrections or amendments were made to ensure the validity of subsequent analysis.

Image courtesy of IRT Access

Members submitted two sets of reports:

• Quarterly employment figures, including working hours and numbers employed in various categories (020R submissions);

Both sets of data are essential in order to calculate accident/incident rates.

In 2013 members were also requested to submit additional data specifying regions where work was carried out, as defined by Regional Advisory Committees (RACs). The complexity of submissions required inevitably led to errors and omissions in the data supplied.

Therefore, the data was subject to 100% quality checks prior to commencement of analysis and, where necessary and possible, corrections or amendments were made to ensure the validity of subsequent analysis. Recent changes to help clarify and simplify the reporting format for both incident and employment data has not improved the accuracy of submissions, hence the necessity for extensive data checking.

The 'days off work' criterion for injuries and accidents, revised upward to over 7 days, is now established and a Serious injury or accident is now defined as one that necessitates more than 7 days absence from work (see later for further definitions).

Accident data is now largely consistent with UK and European statistics. Throughout the report, reference is made to the following categories of work location that have the distinctions noted next:

• '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 and rigging. Thus, this does not necessarily require a person to be 'roped up' or physically connected to active ropes.

• 'Off Rope' – includes all site work including at height but not involving rope access, such as on scaffolds, roof work and provision of 'remote' support to rope access teams (e.g. communications, site surveys etc).

• 'Other' – typically includes all work offsite, in offices, etc. This would include, for example, equipment inspection prior to removal to work site. 'Other' now also includes 'On Ground' or secure areas for working hour reporting; in effect, all hours not accounted for by the above categories including non-rope access training.

• 'Training' – all activities undertaken at rope access training facilities and establishments. For the avoidance of doubt, this will include all personnel, trainers, training staff and trainees, solely for rope access training.

All other training, induction courses, trial work, specialist courses (e.g. use of BA, First Aid) are excluded and should have been reported under a different category.

Additionally, for the purpose of this report, the distinction is made between:

• 'Accident' - an unintended event where actual personal harm, injury or fatality occurred at work and

• 'Incident' or 'dangerous occurrence' – an event or situation where no personal harm or injury occurred but which could have led to injury or fatality.

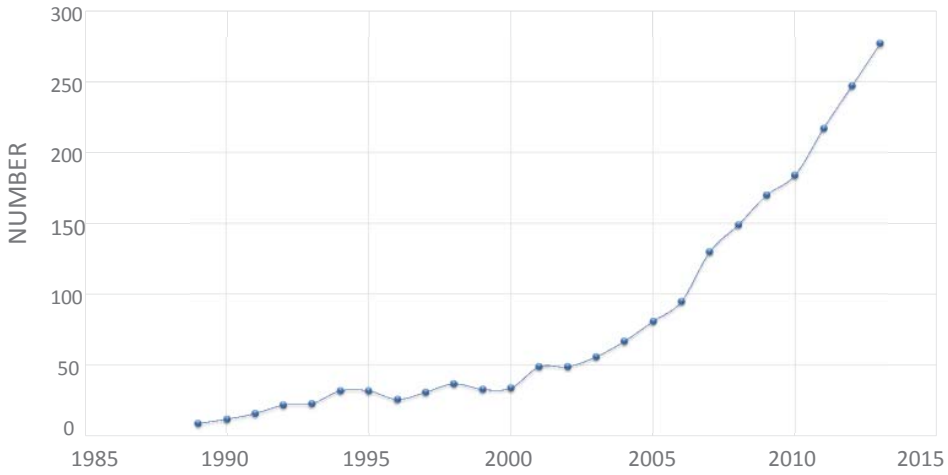
One limitation of the revised reporting format is that work hours for the various grades (Level 1 etc) are no longer identified and, hence, risk by grade can only be apportioned according to employment numbers.

The report is arranged with figures and graphs incorporated within the text to which they apply. Tables, summarising data, are included in Appendices. The report first considers overall employment, examines the employment data for each region (RAC) and, finally, the accident and incident data is analysed.

IRATA Membership

The number of members rose during 2013 from 246 to 277 (excepting those leaving or suspended). The continuing increase in membership since 1989 is shown in Fig.1. The nearly linear increase in membership of the Association over the last 10 years was maintained with a further increase of 30 new members.

Fig. 1 Member Companies



Employment Statistics

Summary of Employment Levels

Average employment of Managers and qualified rope access workers was 9,961, a 20% increase over 2012, excluding 'Others'. Fig 2 shows the numbers distributed by grade. If 'Others' is included, the total rises to 12,039. It is suspected that some submissions included 'total' workforces, rather than just those actually involved in supporting rope access. The small reduction in Managers may be noted. (Note that quarterly employment figures must be averaged).

The Association places great emphasis on training, omitted in Fig.2, for reasons to be given. The average quarterly total reached 4,196 individuals, as submitted by members. However, this would be ~30% of the combined total and unrealistically high if treated as full time persons. Training numbers may be identified by training companies but also by the trainees own companies, giving a double count. One solution to the problem is to rely, instead, on the training hours supplied by members.

This is examined in 3.4 below, the result of which is to show that training accounts for, in arithmetic terms, a further 505. Thus, the overall employment total for 2013 would be 12,544. It is emphasised that this does not imply that only 505 were in training; it merely represents the effective number of personnel in full time employment that would correspond to the summed training hours.

Concerns with under-reporting employment, as in the last quarter of 2012, do not appear to have been repeated, largely due to the efforts of IRATA secretariat.

Fig. 2 Employment by Grade

Summary of Hours Worked

The total hours worked was 15,944,873, some 30% greater than the 12.1 million in 2012. (Note that quarterly work hours are summed). Fig 3 compares the distribution of work hours between onshore and offshore. Total hours are almost identical for Onshore (7.95 million) and Offshore (7.92 million) working. Training and Assessment accounted for 0.668 million hours, about 4% of the total work hours, a realistic percentage. Profiles are similar although 'Onshore' shows a slightly higher proportion of 'On Rope' working.

Turning to how the working hours were distributed, Fig. 4 shows the distribution between 'On Rope' and 'Off Rope' and includes the data for 2012. The largest increase was in 'Off Rope' working and accounts for about 2.3 million of the 3.8 million increase in work hours from 2012 to 2013. However, 'On Rope' remains the higher category. 'Training' hours are omitted from the above chart and will be dealt with in the next title.

Utilisation

With a workforce of 12,039 and total working hours of 15.944 million hours, the utilisation was 1,324 hours per person, ignoring the training numbers, and reverses the decline in utilisation over the previous three years:

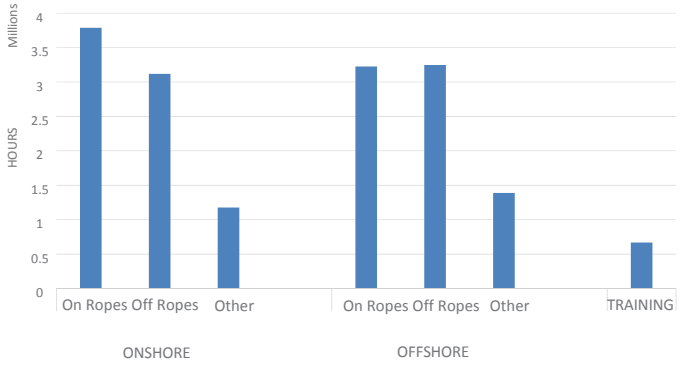


Fig. 3 Work Hours Distribution

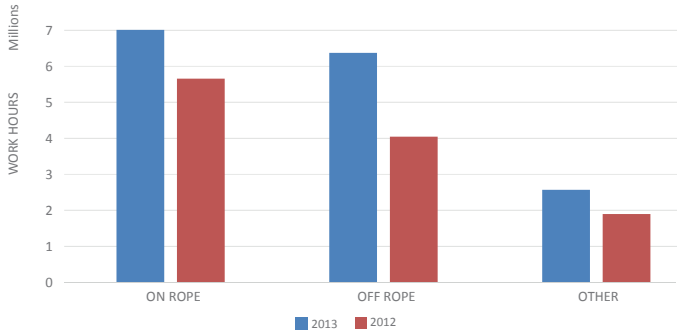


Fig. 4 Deployment of Hours Worked

Training

As in previous years, there is an apparent inconsistency between the number of personnel recorded under training and the number of training working hours reported. With about 4,194 identified personnel and associated hours of about 0.668 million hours, this gives about 160 hours per annum per person which seems excessive when it is noted that a typical trainee doing one rope course in a year would only require ~40 hours.

If reported training hours (668,373) are relied upon instead of reported numbers of personnel, and the same utilisation figure of 1,324 hours per annum used, the 'effective' number of training personnel would be 505. This is not the same as the number of personnel who actually underwent training. In effect, it helps overcome the problem of 'double counting' technicians who undertake training. It corresponds to about 4% of employment. These figures confirm and reflect the emphasis IRATA places on the importance of training.

Regional Advisory Committees (RACs)

In 2012, it was decided that nine zones or regions around the world, each overseen by Regional Advisory Committees (RACs) be formed. Members were to submit their data according to the zone or region in which they operated. Where a member operated in more than one RAC, the data should be apportioned to the different RACs. The nine RACs identified were as follows:

‘ Australia, Benelux, Brazil, Middle East, North America, North Sea, South Africa, South East Asia and other

It is now necessary to consider the returns from each of the RACs. Their respective data are presented in chart form, covering employment numbers against grade and distribution of work hours by location. Training numbers are excluded from charts.

The training figures given are those as supplied and the ‘calculated’ training number is given in brackets, based upon the RAC’s own training hours and utilisation figure. This number reflects training hours. It indicates the effective number of personnel as though they were in full time training. It is an attempt to minimise ‘double counting’ where technicians may be counted within employed numbers and again as trainees. The absence of UK as a specific region was noted by several members. Accordingly, an attempt to extract and compile statistics for UK is included for interest.

Australia

Twenty four to twenty six companies submitted returns for work in Australia with perhaps 7or 8 providing the larger workforces. The dominance of onshore work may be noted but appears to fluctuate quarter by quarter, particularly for on rope working. The almost one for one relationship between L1 and L3 is noteworthy.

Total work hours was 566,253 and total average workforce was 454, excluding training. This gives an utilisation of about 1,259 hours per person. Training numbers submitted averaged 273 (24) per Q with associated training hours of 29,681.

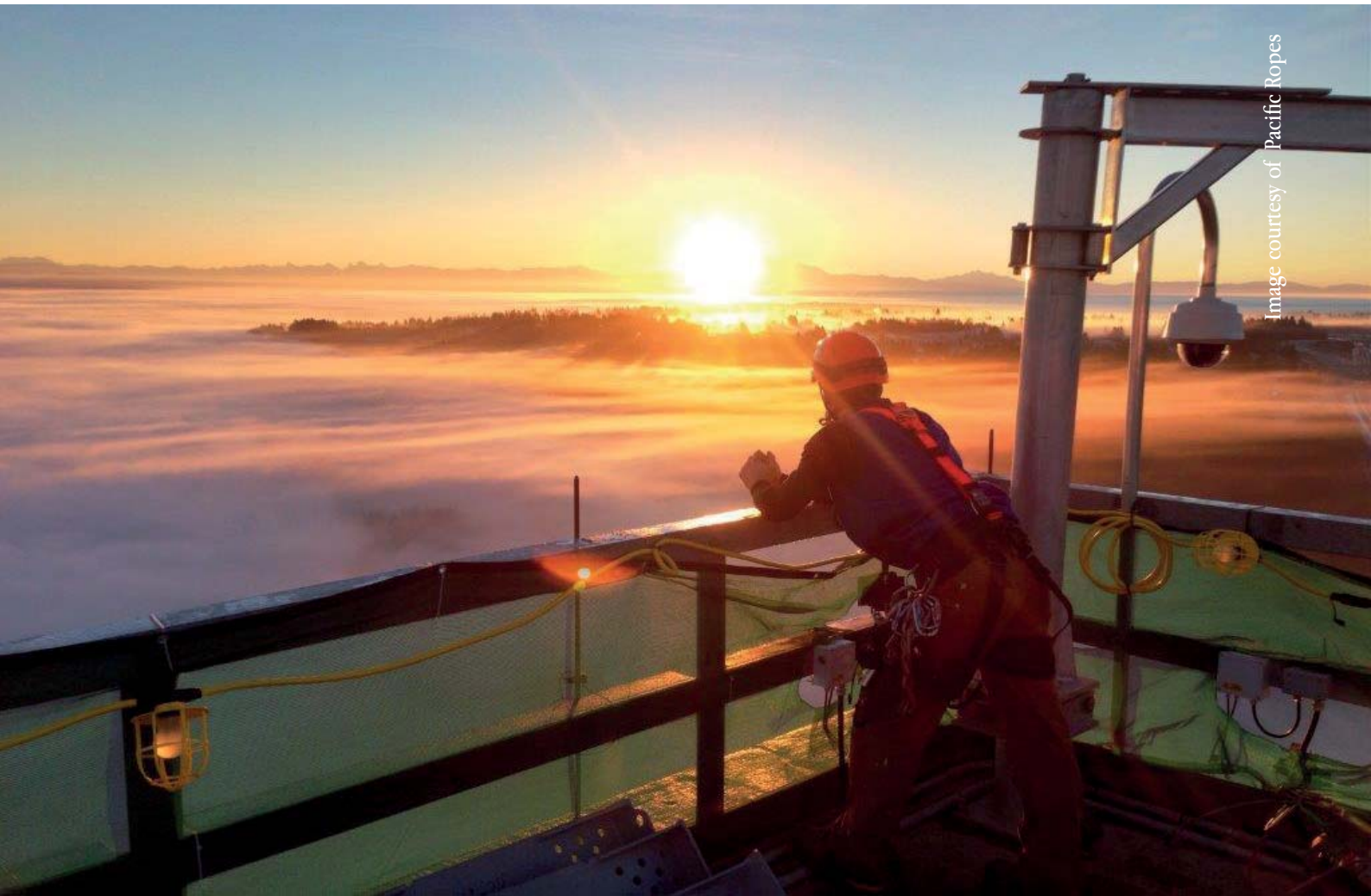


Image courtesy of Pacific Ropes

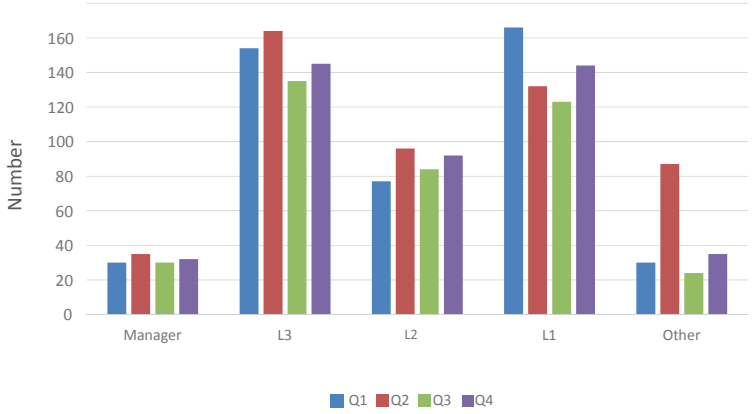


Fig. 5 Australia - Employment

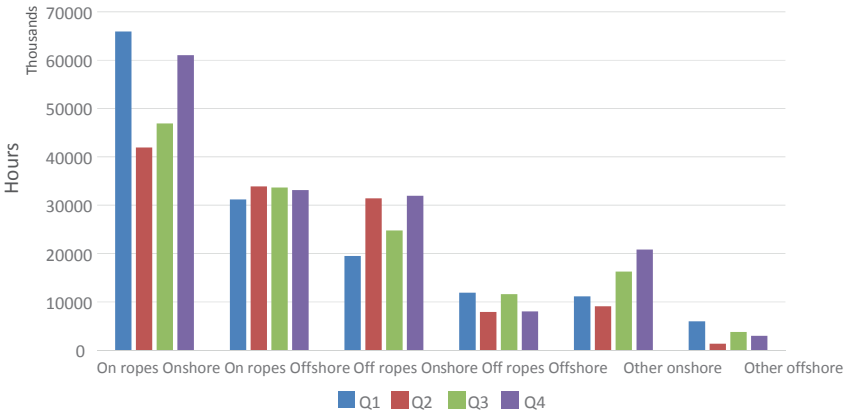


Fig. 6 Australia - Work Hours

Benelux

An average of 16 companies contributed to the Benelux data, with 5 or 6 predominating. The surge in Q3 offshore working was dominated by a single company and is reflected by the spikes for L1 and 'Other' workers employed. The temporary increase in Q3 offshore employment for L1 is consistent with some increases in work hours.

Work hours totalled 402,132. The average workforce was 466, giving an utilisation of only 864 hours per worker. The high level of employment in Q3/4 for 'Others' may have contributed to this result. There was an average of 82 (16) per Q in training with 13,397 training hours consumed.

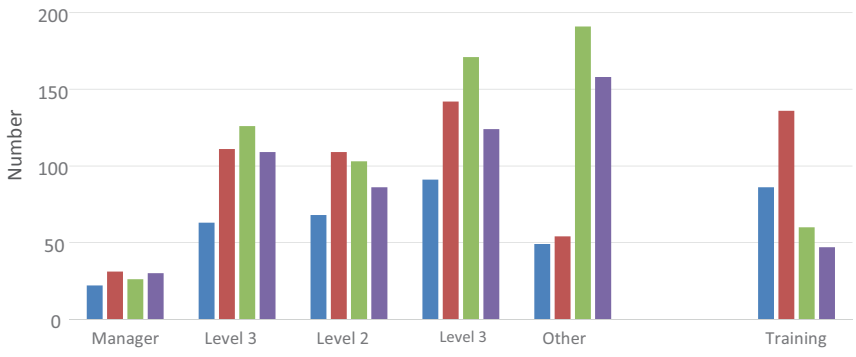


Fig. 7 Benelux - Employment

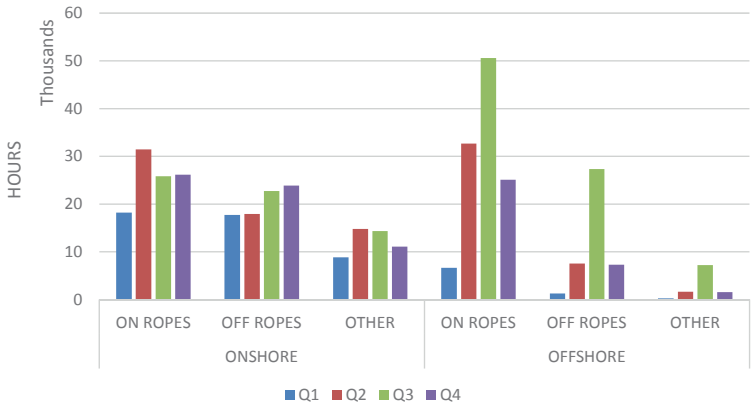


Fig. 8 Benelux - Work Hours

Middle East

The single outstanding Q4 figure for 'Other' is probably anomalous reporting as it does not correspond to any increase in work hours either onshore or offshore. Between 14 and 21 members reported work in the Middle East. Five or six members dominated the data with a single company being outstanding in its contributions.

The unusual distribution between the rope access Levels may be highlighted with Level 1s well exceeding Level 2s and 3s. Also of note is that Onshore working far outstripped Offshore, reflecting the majority of Middle East work.

Work hours totalled 1,975,511 and workers 1,206, giving an utilisation of nearly 1,640 hours per person, significantly higher than average and approaching full utilisation. Training numbers submitted averaged 401 (41) with associated training hours of 66,652.

Fig. 11 Middle East - Employment

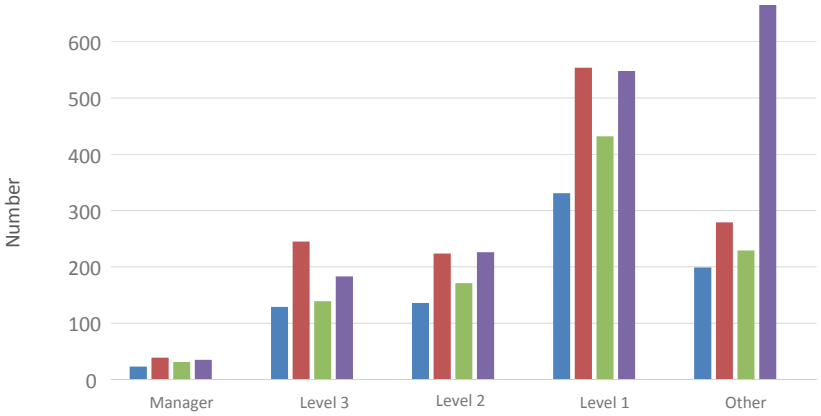
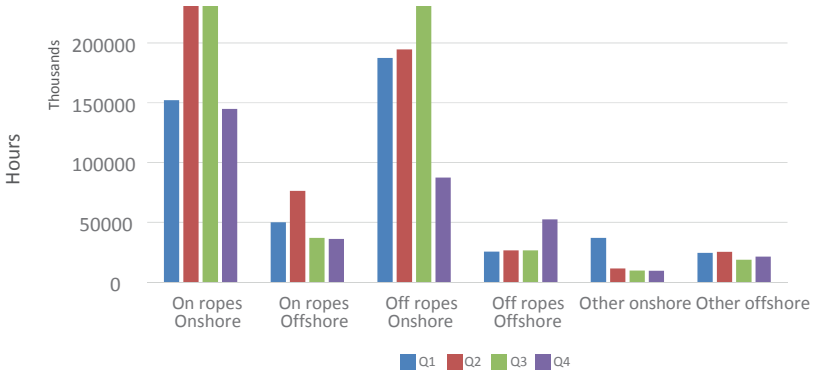


Fig. 12 Middle East - Work Hours



Brazil

Twenty four to twenty six members were listed but the major contributors, in both employment and work hours, varied quarter by quarter, from 5 to 9. The fluctuating hours are largely mirrored by the fluctuating workforces, most extreme in Q2 and generated by three members primarily. The Q2 peak loading is spread across all sectors but is greatest in 'On Rope' working offshore and utilising L1s and 'Others' (perhaps suggesting major offshore projects, seasonal working and shutdowns?).

Unusually, overall there is a significantly greater proportion of Level 1s than Level 2s and 3s combined.
Work hours reached 1,214,432 and work force averaged 1,203, giving a utilisation of only 1,010 hours per worker, possibly related to the relatively high level of support workers. Training figures include a single large entry giving a total of 430 (92) with training hours of 92,813 in total.

Image courtesy of Megaline

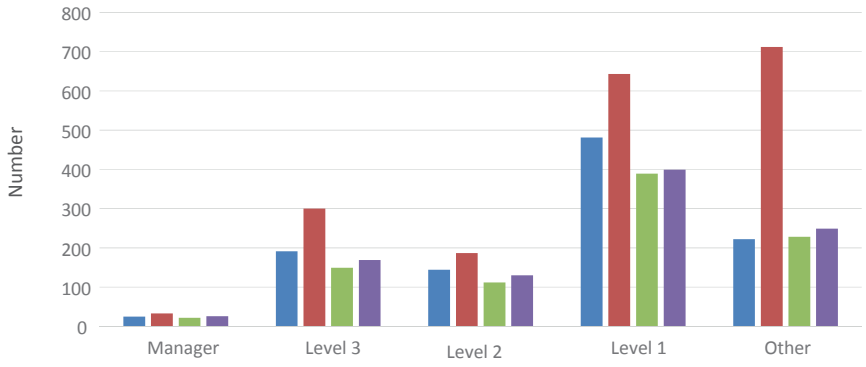


Fig. 9 Brazil - Employment

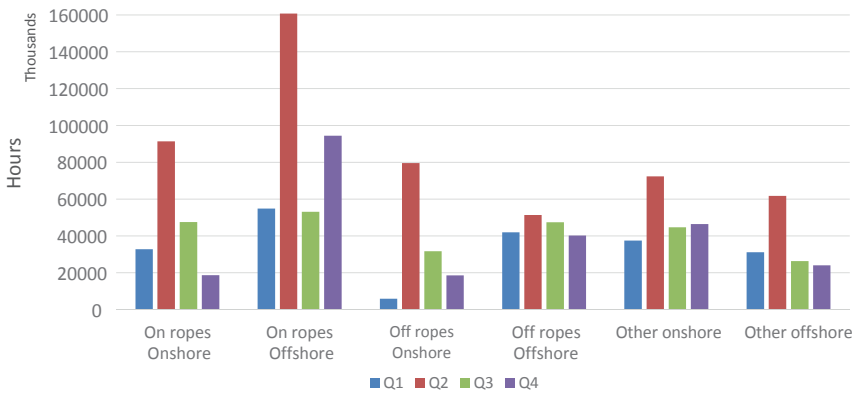


Fig. 10 Brazil - Work Hours

Image courtesy of Negarme

North America

Only nine member companies, rising to 13 in Q4, reported data. Of these, one was responsible for the majority of employment and work hours.

However, the charts show increases, particularly in the number of Level 1s and 3s as the year progressed although the rise is not reflected by significantly increasing work hours. Onshore working far outstripped Offshore work although two member companies solely worked offshore.

One apparent anomaly was Q2 figures for 'Others', both in hours reported and numbers employed. The average employment level was 500 and total hours worked reached 585,474; this gives an utilisation of 1,170 hour per person, which is marginally below average. Training numbers submitted were 315 (39) and training hours of 45,995 hours.

Fig. 13 North America - Employment

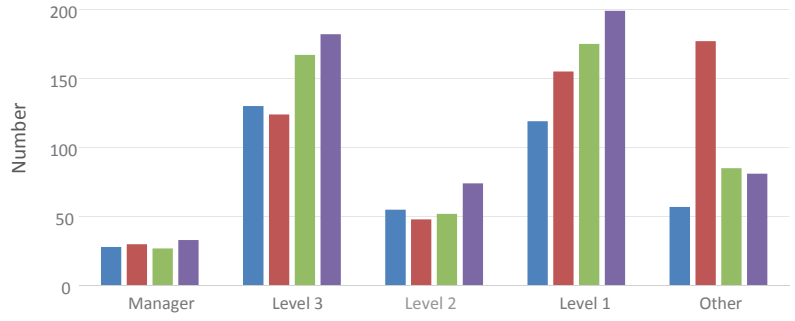
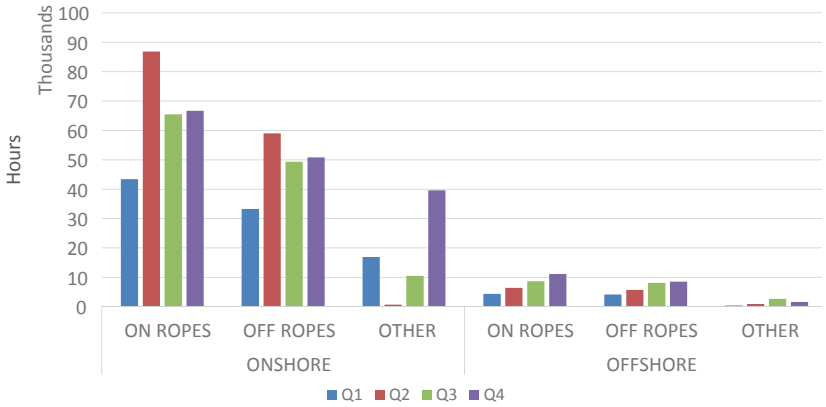


Fig. 14 North America - Work Hours



North Sea

Members reporting rose from 43 to a peak in Q3 of 56. As expected, the major working arena was 'On Rope Offshore'. Presumably the 'onshore' hours were expended primarily to support the offshore work although it is suspected that some UK members who are not working in the N Sea may have reported under the N Sea heading rather than the 'Other' category.

The average employed workforce was 3,790 with associated work hours totalling 4,474,437. Thus, utilisation was 1,180 hours/worker. Training numbers were reported to be for a further 366 (44) and training hours of 51,911. These seem very low figures in relation to nearly 4.5 million working hours. It may be that N Sea 'imports' much of its required qualified technicians.

The very low proportion of Managers, relative to the workforce, may be noted. Given the high level of Offshore working, it may be presumed that platform management takes over the role when rope access teams are on board.

Fig. 15 North Sea - Employment

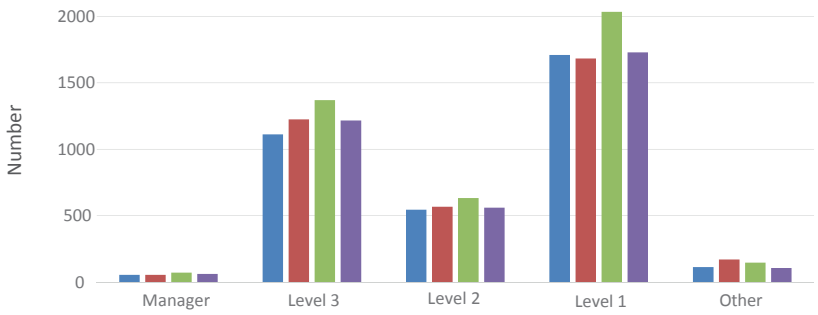
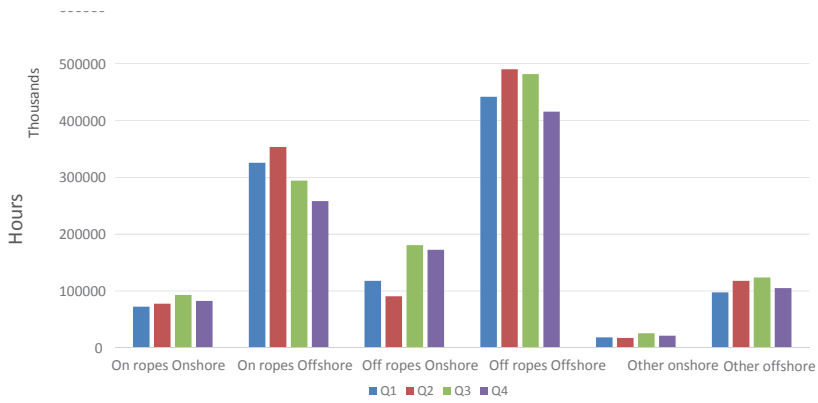


Fig. 16 North Sea - Work Hours



South Africa

Between eight and eleven members reported data with one particular member predominating; however, several others also contributed substantially. Clearly, Offshore working was the major interest with a balance between all three categories of location. The very low level of supporting workers may be noted.

The steady increase in employed L1s, 2s and 3s is apparent and this is also reflected in the rises in work hours Offshore. The total average employed was 691 and the generated work hours reached 1,192,605. The utilisation of 1,730 approaches full employment.

Training numbers submitted averaged 358 (39) per Q with training hours of 67,314.

Fig. 17 South Africa - Employment

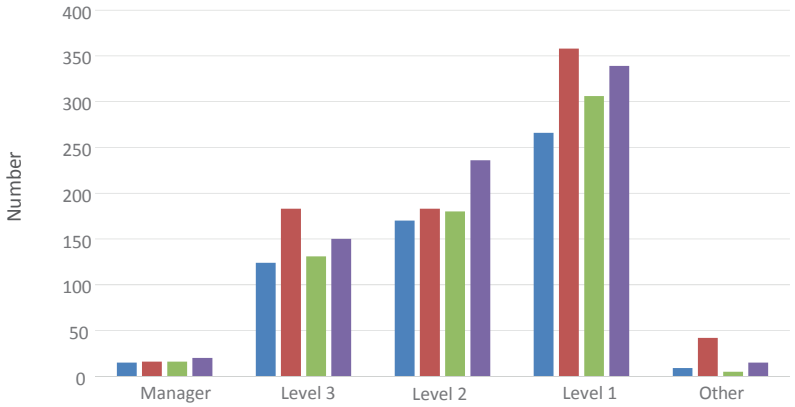
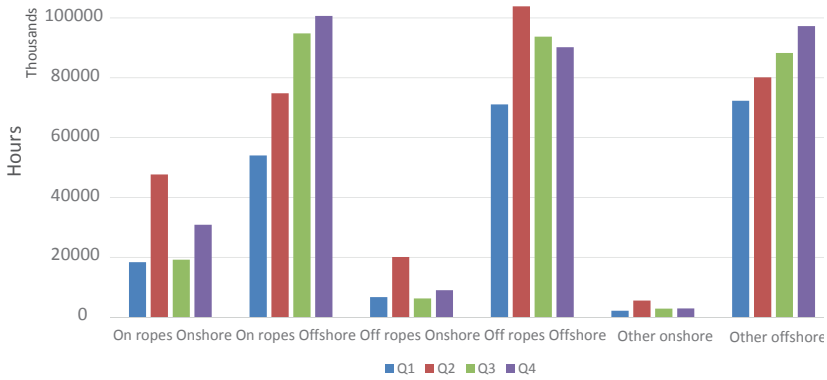


Fig. 18 South Africa - Work Hours



Other

Members reporting under 'Other' numbered from 99 to 118 in Q4. Total work hours reached 2,648,078 and employed an average of 2,209 at an average of 1,400 hours per worker. The dominance of Onshore working is clear, not surprisingly because the majority of 'Other' is occupied by UK members who would report under 'N Sea' if they worked offshore.

The associated higher level of Managers is also apparent along with a considerably higher proportion of 'other' workers presumably required to support the onshore working sites.

The training average number was 1,487 (149) with associated training hours totalling 208,728. This is a high ratio of training to work-force and, hence, suggests that the 'under' training for the North Sea is indeed supplemented from this source.

Fig. 19 Other - Employment

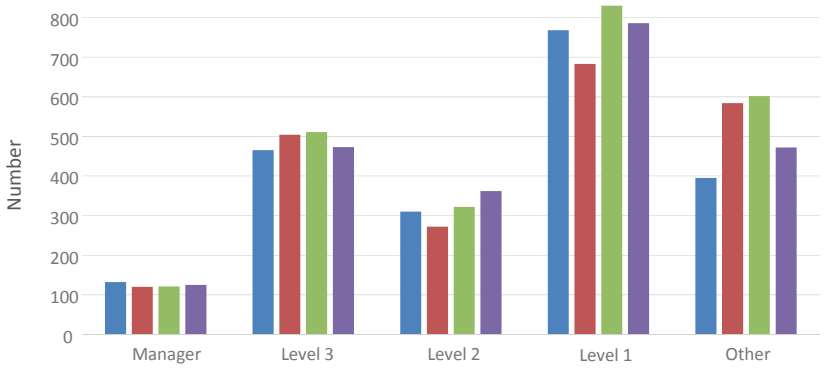
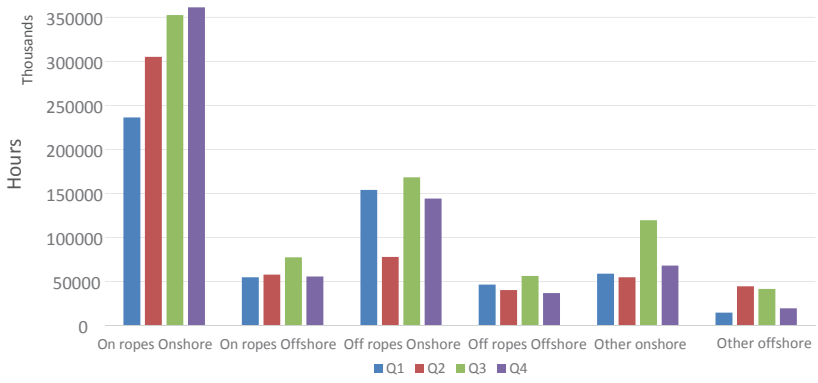


Fig. 20 Other - Work Hours



South East Asia

About 30 members contributed data with a general spread of significant contributions from 15-20 companies. The apparently erratic Q2 work hours are an accumulation of many entries from several members. There is no parallel increase in employed for Q2 (except 'a modest increase in 'Other'). The increased hours are spread across most work categories. This implies the increases may have a seasonal link.

Total average employed was 1,520. Accumulated work hours totalled 2,885,951 which gives an average per worker of 1,900 hours, and this represents virtually full employment overall. Given the almost level employment, quarter by quarter, for all three rope grades, the implication is that there would have been considerable overtime working in Q2. This is born out by the fact that work hours for Q1, 3 and 4 were consistently about 64,000 per quarter whereas for Q2 the figure rose to 95,000 hours.

The training numbers given totalled 484 (48) per Q with reported training hours of 91,882.

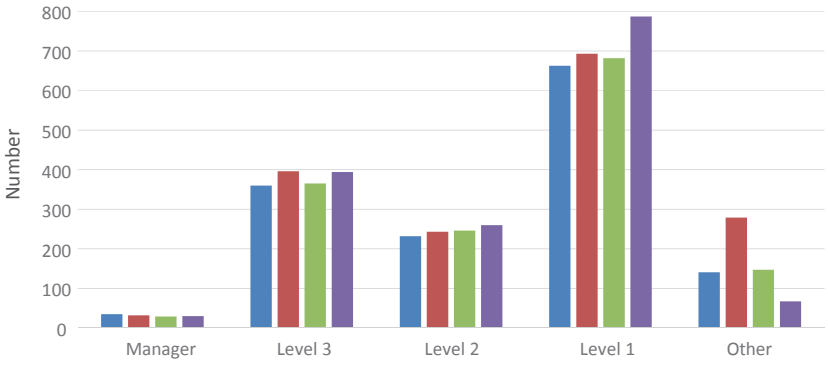


Fig. 21 South East Asia - Employment

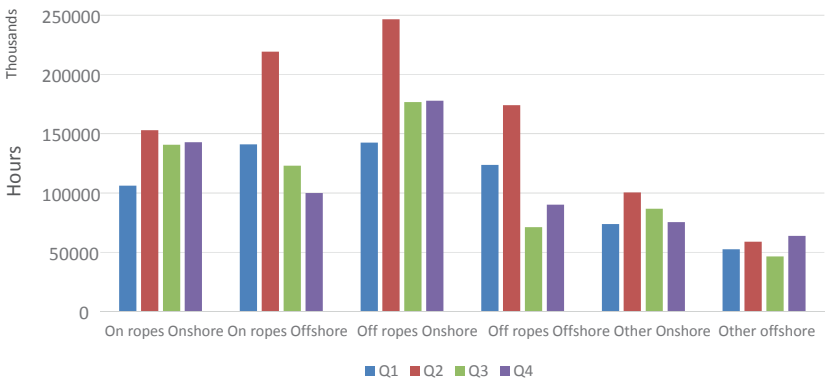


Fig. 22 South East Asia - Work Hours

Image courtesy of Rope Access Group

United Kingdom

UK was not identified as a specific RAC. Accordingly, this summary is based on extracting UK members' data from two RACs – 'North Sea' and 'Other'. It will not be strictly accurate but should provide a reasonable estimate. Quarterly employment figures are available but only averages are shown in Figs 23 & 24 in favour of revealing the distribution between the two RACs.

The general dominance of offshore working, both in terms of employment numbers and work hours, is apparent. Total employed offshore was 3,238 with work hours of 3,667,512 giving an utilisation of 1,133 hours per worker. Onshore figures were 1,563 employed, 1,699,121 hours worked and an utilisation of 1,087. Combining the two sets of figures gives a total employment of 4,801, work hours of 5,366,633 and average utilisation of 1,118. Thus, offshore is virtually double onshore in terms of both employment and work hours.

The submitted training figures are the inverse with only 381 (38) for N Sea and 1,380 (134) for onshore UK. Respective training hours were 43,207 and 145,105. In the summary table, the UK figures cannot be incorporated within the body of table because this would lead to extensive double counting. Instead, they are shown 'below the line'.

UK was not identified as a specific RAC.

Accordingly, this summary is based on extracting UK members' data from two RACs – 'North Sea' and 'Other'.

Fig. 23 United Kingdom - Employment

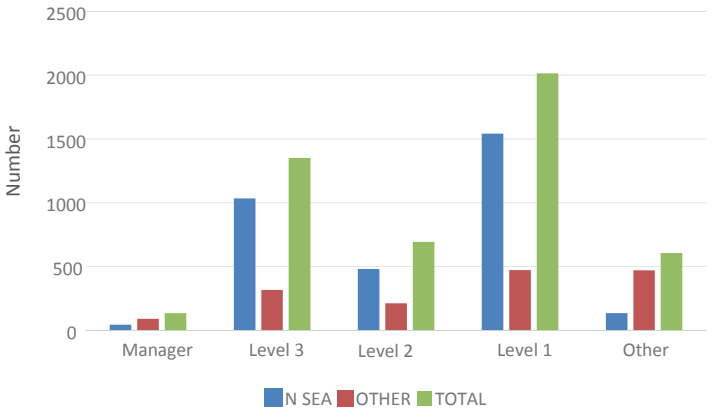
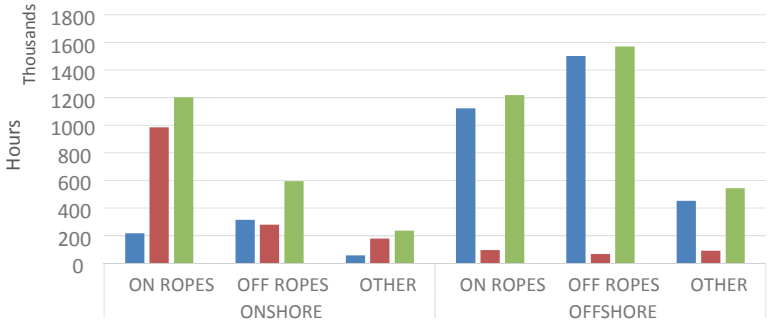


Fig. 24 United Kingdom - Work Hours



Summary of RAC data

To anticipate the inevitable requirement to compare RAC data, the table summarises the employment and work hours along with training data including the percentage of work hours contributed by each RAC to the total. It may be noted that the total calculated training number is close to the overall estimate of 505.

RAC	Nos MEMBERS *	TOTAL EMPLOYED **	TOTAL WORK HOURS	% of Total	UTILISATION (Hrs per worker)	TRAINING HOURS	TRAINING (Av. Nos.) ***	TRAINING NUMBER Calculated
AUSTRALIA	24-26	454	566,253	3.5	1,250	29,681	273	24
BENELUX	15-19	466	402,132	2.5	864	13,397	82	16
BRAZIL	24-26	1,203	1,214,432	7.6	908	92,813	430	92
MIDDLE EAST	14-21	1,206	1,975,511	12.4	1,640	66,652	401	41
NORTH AMERICA	9-13	500	585,474	3.7	1,170	45,995	315	39
NORTH SEA	43-56	3,790	4,474,437	28.1	1,180	51,911	366	44
SOUTH AFRICA	8-11	691	1,192,605	7.5	1,730	67,314	358	39
SOUTH EAST ASIA	29-31	1,520	2,885,951	18.1	1,900	91,882	484	48
OTHER	99-118	2,209	2,648,078	16.6	1,200	208,728	1,487	149
TOTALS / AV		12,039	15,944,873	100	1,324 #	668,373	4,196	492
UK (estimate)		4,801	5,366,633		1,118	188,312	1,761	172

*Members reporting data. Range is due to variation from Q to Q.
**Manager, Levels 1-3 and 'Others' summed average per Q. Excludes training.
***Averages per Q, as submitted.
Based on 'Totals', not above rounded numbers.

Image courtesy of Crane Inspection Services

Accident Statistics

The total number of accident/incident reports submitted for 2013 was 109 (164 in 2012). The number of individuals injured, suffering sprains/strains or ill health was 49 (54 in 2012) including, sadly, one fatality. Eight were reportable, from a total workforce of 12,544. This gives an injury rate of 3.90 per 1,000 irrespective of injury criteria, a fatality rate of 0.08 per 1,000 and 0.64 per 1,000 for reportable injuries.

Summary

The total number of accident/incident reports submitted for 2013 was 109 (164 in 2012). The number of individuals injured, suffering sprains/strains or ill health was 49 (54 in 2012) including, sadly, one fatality. Eight were reportable, from a total workforce of 12,544. This gives an injury rate of 3.90 per 1,000 irrespective of injury criteria, a fatality rate of 0.08 per 1,000 and 0.64 per 1,000 for reportable injuries.

Nomenclature

For the purpose of this report, the following meanings apply to terms used in the sections that follow:

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

• 'Over 7 Day Injury – Not a 'Major' injury but an injury requiring more than seven days away from normal work irrespective of cause. 'Serious' is the term used in Eurostat statistics and is synonymous with 'Over 7 Day Injury'.

• 'Less than 7 Day Injury' – The reporting criterion for a non-reportable accident changed and is now 'less than 7 days off work' (although required to be recorded in the UK by duty-holders). 'Less than 7 Day Injury' directly equates to a Not Reportable Accident (NRA). If ANY injury is incurred, however trivial, the minimum reporting level is 'Less than 7 Day Injury'.

• 'Dangerous Occurrence' (DO) – Incident that could have resulted in injury or death but none was incurred. DOs are not allocated to specific worker or grade category because many incidents may
not be attributable to or affect specific individuals. There must be no actual injury but there must be potential for injury. ative data to coincide with other statistical data.

• Ill Health – Medical conditions leading 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. If 'over 7 days' lost, reported as 'Serious'.

• Sprains/Strains – Muscular injuries that result in prevention or cessation of work. As above, if 'over 7 days' lost, reported as 'Serious'.

• Reportable Accidents – for the purpose of this report, and used for comparative purposes later, this term is the total of all fatalities, major injuries and serious injuries (>7-days off work). Thus, NRAs and DOs are excluded from comparative data to coincide with other statistical data.

Consequence of Accidents / Incidents

The chart (Fig 25) compares the actual numbers of accidents and incidents for the last two years The dividing line separates reportable accidents from, generally, not reportable events. Thus, eight accidents would be reportable in 2013, four Serious and three Major (two fractures and a dislocation) and the fatality.

The single fatality reported in 2011 data still remains subject to legal process; HSE has submitted a report on the event to the Procurators Fiscal, Scotland.

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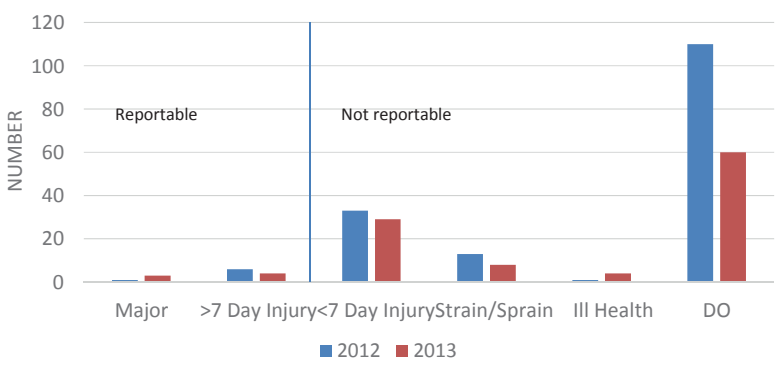
Fig. 25 Outcome of Accidents/ Incidents



The single fatality reported in 2011 data still remains subject to legal process; HSE has submitted a report on the event to the Procurators Fiscal, Scotland.

Location of Accidents / Incidents

Fig.26 shows the distribution of all 109 reported accidents/incidents, according to location, for 2013 alongside the 164 events in 2012 taking into account the difference in working hours between years for each location.

The above includes all events including Dangerous Occurrences which were very much higher in 2012 (110) than 2013 (60). The chart is somewhat misleading because, for example, the training bar represents only four events (in 0.668 million hours). The distribution of the reported events are tabled below and, when compared to 2012, they are dominated by 'On Rope' reports.

Generally, low numbers, such as for the majority of the table items, make analysis of dubious validity. What is apparent, however, is that a general downward trend continues with some exceptions, sadly including a fatality.

Perhaps the most notable decrease, unfortunately, is the reduction in Dangerous Occurrence reports. IRATA members traditionally were proud of the open and diligent reporting of all events. Therefore, this reduction in reporting is surprising given the continued increase in membership, employment and work hours.

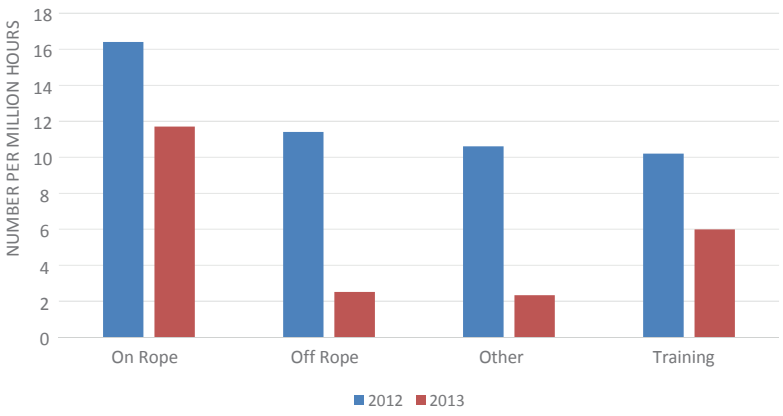
It is to be hoped that the decline in DO reporting is not symptomatic of reluctance to report accidents also.

The very much higher number of DOs reported for On Rope working, compared to other categories, probably reflects a greater awareness of potential problems when 'on rope' compared to usual site working events.

The three 'Ill Health' items on rope will be discussed later. Two of the three Major injuries occurred on rope (fractured leg when thrown against crane sheave, slipping and dislocated shoulder) and the third off rope working on gratings (trip and broken ankle). The single fatality will be discussed later.

Again, applying significance of such small numbers to such a large population would be unjustified; the only conclusion is that the three 'working' Levels were most prone to injury – hardly surprising.

Fig. 26 Location of All Accidents/ Incidents



Accident Events by Grade

Fig.27 shows the rates of fatality, injury, sprains/strains and ill-health for each Level or grade, excluding managers, obtained by dividing the actual numbers by the average population of each Level or grade. This was to take into account the large differences in population for the different Levels/grades.

The immediate finding is that there was a substantial fall in injury rate for Level 2s and Others. The rates for L1s and 3s remained almost the same as for 2012 so that now there was little difference between all three Levels which now lie in the range 3-6 injuries per thousand although the single fatality was that of a Level 3.

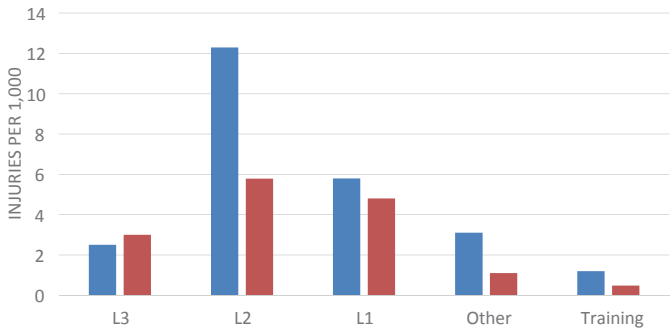


Fig. 27 Injuries by Grade

What the chart does not show is the seriousness of the injuries sustained. The next table summarises the data for all injuries etc according to Grade.

Body Part Injuries

The body part injuries sustained during 2013 are shown in Fig. 28 alongside those for 2012. These are actual numbers and do not take account of different employment levels or work hours (i.e. time at risk). Once again, the relatively low numbers inhibit a close analysis but some points do arise from the limited data.
Although there was a fall in injury total, there are some areas of concern, notably the combination of head, neck and face/eye injuries.

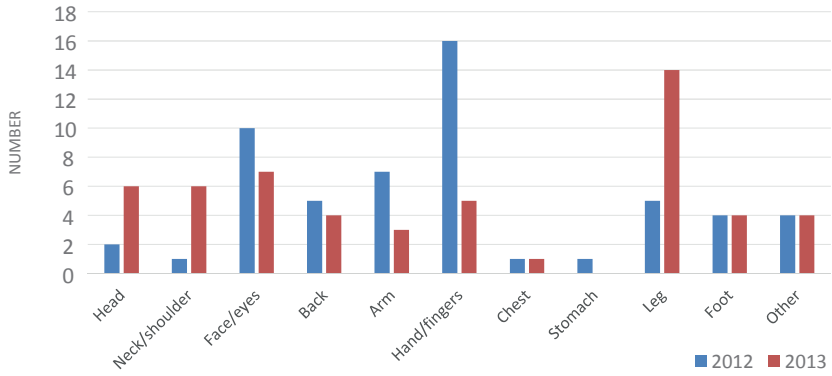
Of the seven face/eye injuries, five were caused by debris from wire brushing, grinding or chipping entering eyes – all preventable had more effective eye protection been used?

Of the six head injuries, four were caused by individuals striking their heads against fixed surfaces and the remaining two were struck by moving objects – fortunately none seriously. Similarly, three neck injuries were caused by falling or moving objects (moving vehicle, tool and dropped pipe component).

Three shoulder injuries were reported, two due to strains but a third was a dislocation.

The four 'Other' items covered a case of dehydration, dizziness induced by a combination of heat and fumes, LV electric shock and potential exposure to asbestos. One positive finding was that injuries caused by HP jetting appear to have disappeared. Additionally, one potentially serious fall accident was ameliorated by a stopper knot.

Fig. 28 Body Part Injuries



2013	Fatality	Major	>7 Day	<7 Day	Strain/Sprain	Ill Health	DO
On Rope	1	2	1	19	7	3	60
Off Rope	0	1	2	7	1	0	5
Other	0	0	0	2	0	0	4
Training	0	0	1	1	0	1	1

2012	Major	>7 DAY	<7Day	Strain/Sprain	Ill Health	DO
On Rope	1	3	13	6	0	70
Off Rope	0	2	14	3	0	27
Other	0	1	4	2	0	13
Training	0	0	2	2	1	0

GRADE	FATALITY	MAJOR	>7 DAY	<7 DAY	SPRAINS/STRAINS	ILL HEALTH
L3	1	1	0	8	1	0
L2	0	2	0	8	1	0
L1	0	0	2	12	6	3
Other	0	0	1	0	0	1
Training	0	0	1	1	0	0

Image courtesy of Singing Rock

Causes of Accidents/ Incidents

Allocation of a single specific cause for an accident or incident is rarely simple or even accurate. However, for the purpose of this report, only the category that most closely describes the immediate cause of an accident or a dangerous occurrence is used in analysis. It is fully acknowledged that this is a serious weakness as it fails to identify true root causes; but, since these are rarely identified in accident and incident reports, it is only possible to analyse the more simplistic 'immediate' causes as submitted by members.

In Fig.29, it should be noted that about one third of 'causes' resulted in actual injury. The chart shows an accumulation of over 129 items because more than a single cause is sometimes ascribed to reported events; frequently, 'other' and 'human error' is included alongside other immediate causes. 'Collapse or overturning' is omitted from the chart because none were recorded in 2013. Eight 'slips and trips' events have been separated from 'falls'. It should also be noted that, again, absolute numbers are used with no account of populations. 'Other' and 'Human error' categories will be examined later.

The most common cause of accidents and incidents involved 23 'falling objects', four of which led to injury. Rope access workers dropped 14 of the objects. Objects falling or dropped varied from personal equipment (monitors, radio, rope access equipment, tools) to rocks, paint, wet potash dust, vessel insulation collars, shattered glass from a broken safety gate and a large section of hose. Fourteen injuries (out of 16 reports) were sustained when using tools or from debris arising. (See later).

The 'gassing' report related to an individual suffering dizziness due to heat and fumes. Burns were caused by a welder's glove trapping hot slag that burnt through to his hand and a leg burn from a heating iron.

Note that there are five other instances of rope damage to follow. A hose blowing off a pneumatic rock drill injured two technicians. Other miscellaneous reports included accidental foam release over two technicians, caused by a faulty fire alarm, and several instances of power tools suffering mechanical failure during use.

It can be argued that human error occurs in all reported events, irrespective of immediate cause. However, in 31 cases human error was specifically identified as a cause. Examination of all instances revealed that 20 were directly related to rope access working. These varied from poor technique, mal-operation of equipment and not following procedures to failure to protect ropes adequately. Six cases of lack of communication were noted although many other reports could probably have also included this as a contributory cause.

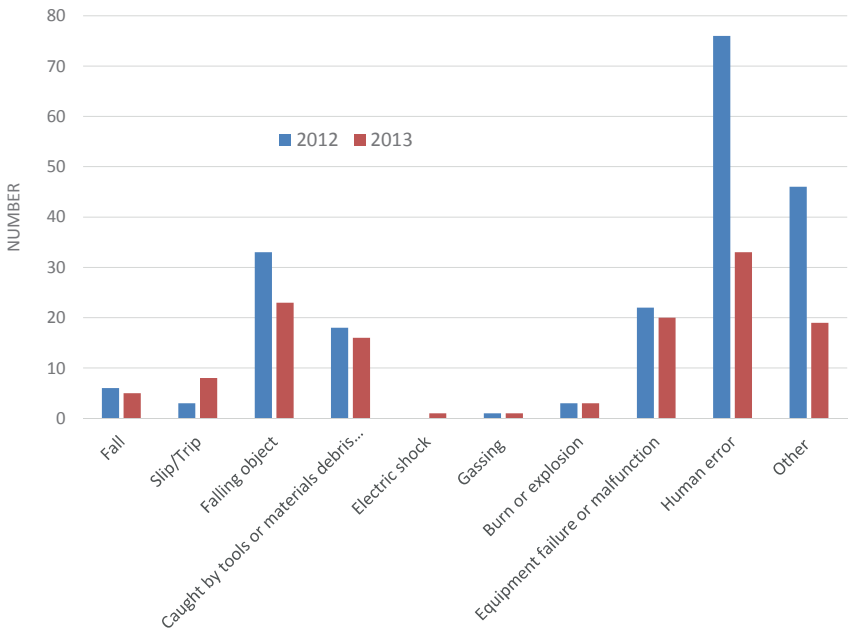
One in particular may be noted where a client changed plant work plans without informing the rope access team who had already prepared their work site and rescue equipment. Work errors accounted for the remaining five reports. In ten cases of injury, human error was identified as a contributory or primary cause, although, arguably, it should be much greater.

'Other' included a variety of 18 items, from bee sting to someone struck by a vehicle. Four items were environment connected with wind causing two, a grass fire ignited by welding sparks and a glass gate shattered when blown against a parapet. High temperatures were responsible for a case of dehydration and partly responsible for a case of dizziness.

There were eight rope related cases including a case of ropes cut by a third party, ropes blown by wind onto hot pipework and melted and a video showing misuse of a shunt. A lack of communication was responsible for accidental crane movement while rope access technicians were working in the same area; another example of lack of communication between rope access workers and site personnel.

Of particular importance in the above was the identification of eight instances of damaged ropes, some seriously so including a severed rope involved in the fatality. There were 13 reports of damaged ropes in 2012 so the problem persists. The single fatality occurred when a Level 3 was caught by an ascending elevator in a drilling derrick structure. His primary lanyard anchor was caught and severed and he fell 34m/112ft down the elevator enclosure.

Fig. 29 Causes of Accidents/ Incidents



Time Lost

Days off work totalled about 136 or about 136/12,544 = ~ 0.01 days per person, well below the figure of 0.3 days per person in 2012 (excluding the fatality). However, under-reporting historically has been common and several reported accidents were not accompanied by time lost data.

If some realistic allowances are made for the described injuries (dislocated shoulder, broken ankle) and added to the total, this would give about 240 days, ~0.019 days per person. EU 28 days lost in 2012 was ~ 2.4 million. Population of EU 28 in 2012 was about 500 million.

Assuming a 40% working population, this gives about 2.4 million days lost per 200 million working population = ~ 0.012 days per person which equates very closely with the figure on the right. (http://appsso.eurostat.ec.europa.eu)

The amended time lost incurred for the 48 accident injuries (3x Major, 4x > 7 Day and 41x < 7 Day, Ill Health and Strains/Sprains) totalled about 240 days which gives an average of 5 days per accident.

(http://www.hse.gov.uk/statistics/industry/index.htm)
(http://www.bls.gov/iif/home.htm)

If only the reportable accidents are considered (7), the average becomes 28.6 (based on ~200 days lost). The provisional HSE figure for UK 2012/13 was 5.2 million days lost in 175,000 reportable injuries which equates to a figure of 29 days per accident. (No ill health figures were available for 2012/3 as it moves to biannual data collection). US private industry median figure for 2012 was only 8 days but the range over various industries was wide and includes all injuries, without days off work criteria and, thus, equates more closely with the overall IRATA figure of 5 days per accident.

Overall, days lost per reportable injury are reasonably consistent with other data if the amendments made to data supplied are accepted; this confirms that the 'under-reporting' overall is related to the very low incidence of accidents. Lost time for ill health and strains/sprains (12 cases) was 3 days in total and this is almost certainly well below international statistics.

Overall, days lost per reportable injury are reasonably consistent with other data if the amendments made to data supplied are accepted; this confirms that the 'under-reporting' overall is related to the very low incidence of accidents.

Image courtesy of Ramsden Rope Access

Other Factors

Weather Conditions - Seven reports cited weather as a factor in incidents, varying from wind blowing ropes onto hot pipes, causing glass gates to slam and fragment to wet conditions leading to slips and hot dry conditions causing ignition of a grass fire by weld spatter. Two ill health conditions were linked to high ambient temperatures. It would be for discussion if handling adverse weather and ambient conditions could be improved.

Rescue – Rescue was required in five cases.

Tools – There were 14 instances of problems with tools handled by operatives. Four minor injuries were a result of mishandling or errors by the technicians. In two cases design faults were revealed during use (power ascender and grinder switch). However, in 8 cases the tools themselves failed in use. This suggests that pre-use checks of all tools, hand or power, should be more thorough.

Working on Ropes

Understandably, there is interest in the statistics for On Rope working in isolation. The number of injuries during on rope working only for 2013 was as follows:

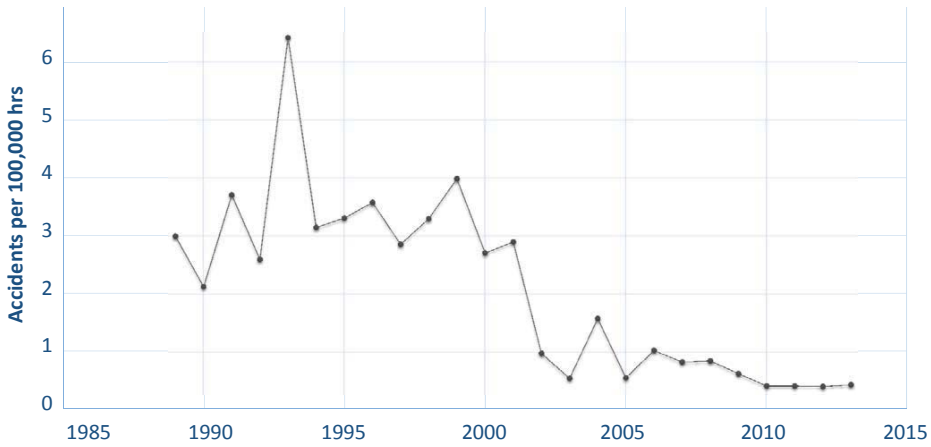
Fatality..... 1 (Reportable)
Major Injuries..... 2 (Reportable)
Serious (>7 Day)..... 1 (Reportable)
< 7 Day + Strains/Sprains..... 25
Ill Health..... 3
TOTAL..... 32

Total hours worked on rope..... 7,012,270

Table 1 in Appendix is a compilation of data since 1989 and extended to include the above figures. A graphical presentation of the accident rate per year is shown in Fig 28. The accident rate (column 7 in Table 1) is calculated as follows:

Accident Rate = Total Number of injuries X 100,000 / Work Hours on Rope
= 32 X 105 / 7.012 X 106
= 0.46 accidents per 100,000 hours, where 'accidents' includes all above categories, and marginally greater than 0.41 in 2012.

Fig. 30 Rate of all Accidents on Rope



The continuing maintenance of an accident / incident rate of less than about 1 per 100,000 hours of work on rope since 2005 and less than 0.5 for the last four consecutive years is a notable achievement but marred by the fatality.

It is emphasised that the graph is based solely on accidents that occurred whilst on ropes and includes all accidents including < 7 Day, Ill Health and Strains/Sprains. Thus, it cannot be used to compare against other sources of data that are based on reportable accidents.

Whilst the achievement of such a low accident rate is recognised, the following are highlighted to temper complacency:

- 4 instances of defective rope access gear
- 20 unsafe acts, omissions or mishand--ling associated with rope access techniques, including three instances of uncontrolled descent
- 16 objects dropped by rope access technicians when on rope
- 8 damaged or severed ropes

There were two cases of groin injury, suspected to be due to harness suspension. In addition, there were at least six cases where subjective assessment suggests that an act or omission by supervisors contributed to compromising the safety of their teams and eight cases where failure of com munication with clients or site operators occurred that also threatened the safety of rope access technicians and, in one case, may also have contributed to a fatality.

More searching investigations of accidents and incidents by members would almost certainly reveal more such cases.

Basis for Comparison

Conventionally, accident statistics are based on accidents per 100,000 workers. To maintain consistency with this practice, it is necessary to convert actual accident numbers to that equivalent to a workforce of 100,000. Here there is a dilemma. The declared workforce for 2013 was 12,544, but, as shown earlier, this does not equate to the hours worked of 15.944 million for a fully employed workforce and 0.668 million for training.

To maintain a pessimistic analysis and to avoid any possibility of criticism, a workforce corresponding to the hours worked, including training, will be used i.e. time at risk. This gives 15.94 + 0.67 million hours / 2,000 hrs per person per annum = 8,300 which is considerably less than the reported workforce. This will lead to an increase in the accident rates to be calculated.

The 'multiplication factor' for accidents now becomes:
100,000 / Number of Employees = 100,000 / 8,300 = 12.1

This figure is, in effect, the multiplication of any single event to reach the equivalent for a workforce of 100,000. Using the above, IRATA members figures for injury rates in 2013 are:

- Fatality 1 x 12.1 = 12.1
- Major Injuries 3 x 12.1 = 36.3
- Serious 4 x 12.1 = 48.4

(> & Day) Injuries

Total 97 injuries/fatal per 100,000

Comparison against UK, EU and USA Data.

The UK Health and Safety Executive (HSE) website key figures for 2012/13 provisional data for selected industries are tabulated below together with equivalent IRATA figures.

Overall, the IRATA figures in the table over remain well below all categories including 'All Industry'. HSE acknowledges that Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) data is now more than 50% under-reported. Additionally, it will be recalled that IRATA figures are pessimistically based on a workforce deduced from hours worked.

Therefore, overall IRATA injury rate is less than a third of the UK All Industry rate and perhaps 20% or less than that for comparable industries.
(http://www.hse.gov.uk/statistics/tables/index.htm#riddor Table RIDIND – 2012/13)

Direct comparison against EU figures, discussed below, is limited for several reasons not least because they include road traffic accidents (but not commuting).

Hence, a significant allowance would be needed to align them with IRATA figures. Latest available EUROSTAT figures are for 2012 and, hence, lag one year behind.

The significant differences between EU 27 and EU 28 figures for the same year may be noted. The figures below are for injuries only and exclude the fatality – see later).

Industry	Major Injury	Serious (>7 Day injuries)	Total (including fatal)
Agriculture, Forestly & Fisheries	239	324	569
Mining and Quarrying	157	272	431
Manufacturing	124	401	525
Construction	156	255	414
All Industries	78.5	233	312
IRATA	**36.3**	**48.4**	**97**

(All figures in rounded numbers of injuries per 100,000 employees).

Image courtesy of Megarme

Comparison of Accident Data

US PRIVATE INDUSTRY SECTOR	Incidence of non fatal Injuries and Illnesses with days away from work 100,000
Agriculture, forestry, fishing and hunting	2,000
Mining	900
Manufacture	1,100
Construction	1,400
IRATA	85*

http://www.bls.gov/news.release/osh.t01.htm
http://www.bls.gov/iif/oshwc/osh/os/osch0046.pdf
*Injuries Only

INDUSTRY	EU 27	EU 28
Agriculture, forestry, fishing	1,413	313
Mining	1,356	446
Manufacturing	1,630	1,521
Construction	1,989	743
All	1,110	771
IRATA	85*	85*

*Injuries only

(To aid finding the Eurostat data, select 'Accidents at Work ESAW 2008 onwards'; then select 'Details by economic activity and age….' Hsw_n2_03). http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Health_and_safety_at_work_statistics

http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do?dvsc=2 | www.hse.gov.uk/statistics/european/tables.htm

Even allowing a large margin, the IRATA rate will be less than about 12% of the 'All' EU-28 figure and about 1/3rd of the lowest figure reported above (Agriculture…EU 28).

Care is also needed in comparing IRATA data to US data due to differences in the way injuries and illnesses are defined and classified. The table below presents some injury and illness data presented by US Bureau of Labor for 2012 which are little different to 2011. Figures have been converted from 'per 100 workers' to 'per 100,000'. US data is based on full-time workers working 2,000 hours per annum. In this respect, US figures are comparable to those in this report.

The US figures selected here relate solely to those taking time from work as a result of injury and illness at work and exclude job transfer or job restriction cases (DART). However, US figures do not have a 'days off work' criterion and inevitably will be much higher. Even adding all 48 injuries to IRATA data will result in a figure of 500, still well below US figures:

Despite adopting pessimistic assumptions and allowing for significant differences in reporting in all cases above, there can be little doubt that IRATA members continue to enjoy an enviable safety record with an injury rate only a small fraction of the figures presented by other international agencies. However……

Turning now to the fatality. This represents a fatality rate of ~1 in 8,300 or ~12 per 100,000. It will be noted from previous reports that a fatality also occurred in 2011. It will also be recalled that, when dealing with such low numeric events it is common practice to 'sum' over a period of time, typically, say, a three or five year period in this case. Over a five year period 2009-2013 the two fatalities would represent a fatality rate of 2 in a 'working' population of about 30,000 (based on accumulated hours not on the much higher reported population of about 40,000). This would give a fatality rate of ~7 per 100,000. The UK figure for 2013 was ~0.5 per 100,000 and the EU28 figure for 2011 was, on average, ~ 2.45 with some countries reporting double that rate.

The significance of the single fatality is clearly seen from these comparisons, resulting in a several fold greater fatality rate. The negative effect on overall accident / injury data may not be very great but, when considered in isolation against other fatality data, it is seriously detrimental. It is particularly saddening when the circumstances of the fatality indicate that third party action may have been a contributing factor – irrespective of the more obvious concern for those who may be directly and indirectly affected by the sad loss of a life.

Despite adopting pessimistic assumptions and allowing for significant differences in reporting in all cases above, there can be little doubt that IRATA members continue to enjoy an enviable safety record with an injury rate only a small fraction of the figures presented by other international agencies.

Accident and Incident Data and Regional Area Committees

No attempt is made to apportion accident/incident data to RACs for the following reasons:
RACs operate under differing conditions, environments and circumstances. Further, the types of work typically carried out vary from one to another with differing risk elements.

Presenting a ranking order could conceivably lead to a competitive attitude that, counterproductively, may result in temptation to withhold submissions particularly of none reportable incidents where most data resides.

Finally, if low numbers of accidents and incidents are distributed between nine RACs, the resulting statistics would be virtually meaningless; 109 reports would give, on average 12 per RAC, 48 injuries and ill health reports would give only ~5 per RAC and eight reportable accidents would mean less than one per RAC – effectively a pointless statistical exercise.

Image courtesy of C.A.M.P.

Summary and Conclusions

The following summarise basic points from the report

Membership/Employment

- Membership had risen to 277 companies by December 2013.
- Average employed increased to 12,544 including an allowance for training.
- Nearly 10,000 qualified IRATA technicians were employed, roughly split:
  Level 1 of 5,000
  Level 2 of 1,900
  Level 3 of 3,000
- Managers accounted for 382 (a drop from 2012 figures) and 'Others' 1,900. Training numbers reached 4,200.
- Work hours reached 15.944 million hours including 7 million hours spent on ropes.
- Hours spent offshore and onshore were almost identical at nearly 8 million each.
- Training hours totalled 0.668 million which equates to 505 full time personnel.
- The nine Regional Areas varied in employment from 400,000 to over 4 million work hours and work forces varying from 450 to nearly 3,800.

Accidents/Incidents

- Accident / incident submissions totalled 109, with 49 involving fatality, injury or illness to individuals distributed as follows:

1 Fatality
3 Major injuries
4 Serious injuries (>7-Days Off work)
41 Less than 7 Day Off Work injuries , Ill Health and Strains/Sprains

- There was a significant fall in Dangerous Occurrence reporting with only 70 recorded, 60 of which were related to 'On Rope' working. This falling trend is discouraging.
- Risk of injury for the three working Levels were in the range 3-6 injuries per 1,000.
- Legs were the most vulnerable to injury, accounting for 14 reports.
- A single Fatality occurred whilst 'on rope'.
- Two Major injuries occurred 'on rope', and one 'off rope'.
- There were three uncontrolled rope descents.
- There were 8 instances of damaged or severed ropes from various causes.
- The accident rate for work on rope was 0.46 per 100,000 hours worked for all injuries, maintaining a rate of less than 0.5 for the last four consecutive years, although this does include the fatality of a Level 3 technician.
- The reportable injury rate of only 85 per 100,000 workers remains well below international statistics, being typically in the range 10-25% of the lowest reported rates for UK, EU-27, EU-28 and USA.
- The two fatalities in 2011 and 2013 represents a fatality rate of ~7 per 100,000 over a five year period which is well above the 0.5-5 range reported by Eurostat.

Recommendations

1. The favourable safety record could be further improved in the following areas:

a) Selection and pre-use inspection of all hand and power tools used on rope.
b) Prevention of dropped objects particularly when 'on rope'.
c) Compliance with procedures particularly when descending on rope
d) Prevention of rope damage (e.g. use of rope protection, removal of ropes when not in use to prevent abrasion by wind, interfer ence by third parties, avoidance of contact with potentially damaging materials, surfaces, hot pipe-work etc).
e) Improvement in communication with site management and personnel by managers and supervisors.

2. Reporting Dangerous Occurrences should be encouraged, particularly when relevant to rope access.

3. Membership should be congratulated on a continuing generally excellent health and safety record but the effect of the single fatality highlights the need for continuing vigilance particularly when working alongside third parties.

Acknowledgements

The assistance of IRATA staff in compiling, arranging and presenting data is gratefully acknowledged. This report could not be prepared without their help.

TABLE 1
Accident Rates for "on rope" Working
1989 - 2013

Year	Nos. of Members	Hours on ropes	None reportable Accidents (NRA)	Reportable Accidents on ropes	Accident Rate for Reportable accidents * **	Accident Rate for All Accidents * ***
1989	9	267504	8	0	0	3
1990	12	327645	7	0	0	2.13
1991	16	457928	17	0	0	3.71
1992	22	537920	13	1	0.19	2.6
1993	23	327000	21	0	0	6.42
1994	32	348749	11	0	0	3.15
1995	32	484285	16	0	0	3.31
1996	26	559035	18	2	0.36	3.58
1997	31	699688	11	9	1.29	2.86
1998	37	1006538	23	10	0.99	3.3
1999	33	803365	29	3	0.37	3.99
2000	34	887206	21	3	0.34	2.71
2001	49	999010	25	4	0.4	2.9
2002	49	1225930	12	0	0	0.98
2003	56	1634482	9	0	0	0.55
2004	67	1457848	22	1	0.07	1.58
2005	81	2311265	10	3	0.13	0.56
2006	95	2132141	21	1	0.05	1.03
2007	130	2765483	21	2	0.07	0.83
2008	149	3859584	25	8	0.21	0.85
2009	170	4582642	15	14	0.33	0.63
2010	184	5247365	18	4	0.08	0.42
2011	217	5209056	17	5	0.1	0.42
2012	247	5655637	19	4	0.07	0.41
2013	277	7012270	28	4	0.057	0.46
TOTAL or AV		**50799576**	**437**	**78**	**0.20**	**2.10**

*** Units for Accident Rate (AR) number per 100,000 hours worked**

**** - Col 5 divided by hours** x 100,000

***** - Col 4 + 5 ditto**

Note that Not Reportable Accident (NRA) now equates to 'Less than 7 Days Off Work' injuries plus Strains/Sprains and Ill Health (if less than 7 days off work).

TABLE 2
Summary of Employment by Grade
2013

Average Quarterly Number

RAC	MANAGERS	LEVEL 3	LEVEL 2	LEVEL 1	OTHER	TRAINING
AUSTRALIA	32	150	87	141	44	273
BENELUX	27	102	92	132	113	82
BRAZIL	27	202	143	478	353	430
MIDDLE EAST	32	174	189	466	344	401
N AMERICA	30	151	57	162	100	315
N SEA	61	1230	577	1789	134	366
SOUTH AFRICA	17	147	192	317	18	358
SOUTH AST ASIA	32	379	245	706	159	484
OTHER	125	488	317	767	513	1487
TOTAL	380	3023	1899	4959	1778	4195

Rounded numbers

TOTAL EMPLOYED EXCLUDING TRAINING: 12,039
TOTAL TRAINING NUMBERS 4,195

TABLE 3
Summary Date of Working Hours
2013

Hours worked in various locations

	On ropes		Off Ropes		Other		Training
	On Shore	OffShore	On Shore	OffShore	On Shore	OffShore	& Assessment
Q1	745713	722777	685032	767803	264648	299406	167627
Q2	1084049	1015500	817763	907375	2867222	392353	200685
Q3	1022434	772700	900172	823886	330211	358961	140474
Q4*	934700	714397	715839	749364	295738	337330	159587
TOTAL	3786896	3225374	3118806	3248428	1177319	1388050	668373

TOTAL WORK HOURS: 15,944,873

TOTAL TRAINING & ASSESSMENT HOURS: 668,373
(Data for Tables 2 and 3 courtesy of IRATA secretariat)

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