



Work and Safety Analysis 2008

**Report by
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1. INTRODUCTION

This report summarises employment and accident/incident reports submitted by member companies to the Industrial Rope Access Trade Association (IRATA) during the period Jan-Dec 2008. Reports were submitted by members quarterly and covered number and grades of employed with estimates of working hours for various work situations (Form 020R). In addition, details of specific incidents or accidents were supplied separately (Form 021R) by companies for each event or person injured.

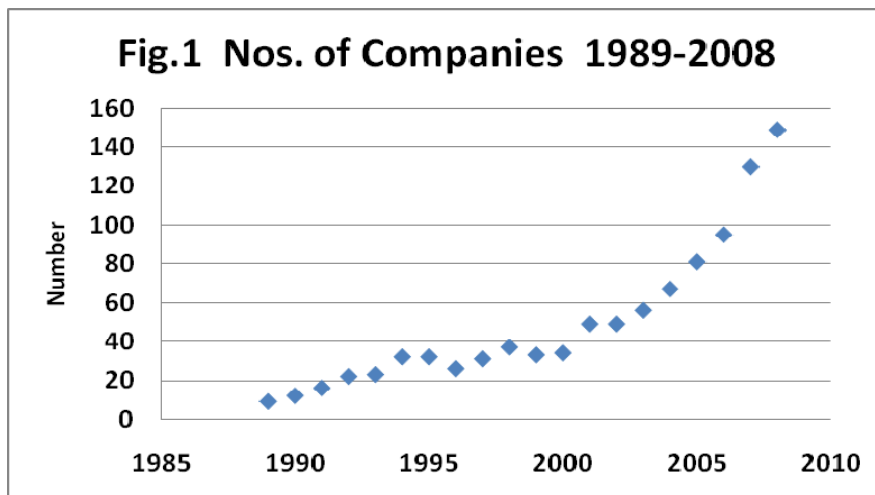
Members employment submissions were compiled and supplied on a spreadsheet by IRATA Administrators (with grateful thanks) together with paper copies of all 020R and 021R forms submitted. Member companies were not identified to the analyst. Therefore, it is not possible to differentiate between UK and non-UK data.

The report is arranged with figures and graphs incorporated within the text to which they apply. Tables of some data are included at the back of the report. It is not reasonable to provide all data used in tabulated form; spreadsheets have been used for analysis.

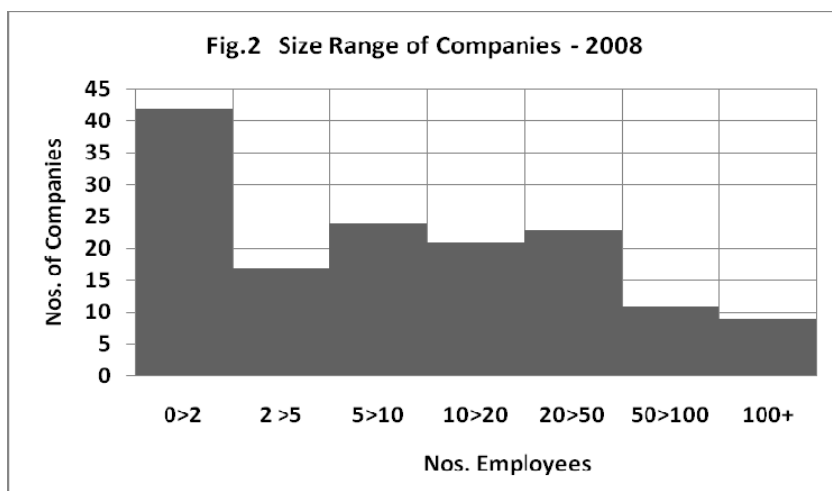
The report first considers overall employment figures, and then examines the accident and incident data before finally comparing IRATA incident rates with those of previous years and other industries.

2. IRATA MEMBERSHIP

The total number of companies registered to Dec 2008 was 149, an increase of 19 over the 130 for the previous year (15%). Thus, although the rate of increase has declined since last year, the overall upward trend in membership is being maintained. It will be interesting to see if this continues through the economic downturn. The graph below shows the increase in membership since 1989:



The range of company size in 2008 is shown on the graph below. About 30% of member companies had 2 or less employees and about 30% of all employed by 9 companies.

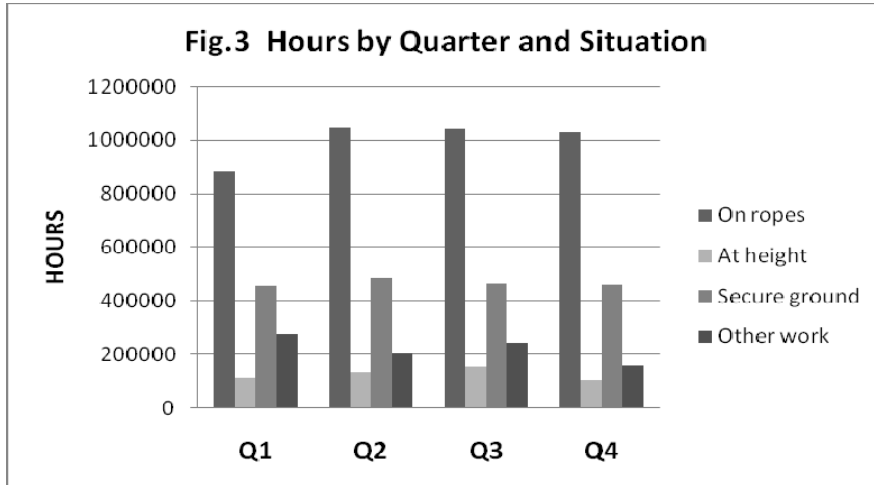


3. EMPLOYMENT STATISTICS FOR 2008

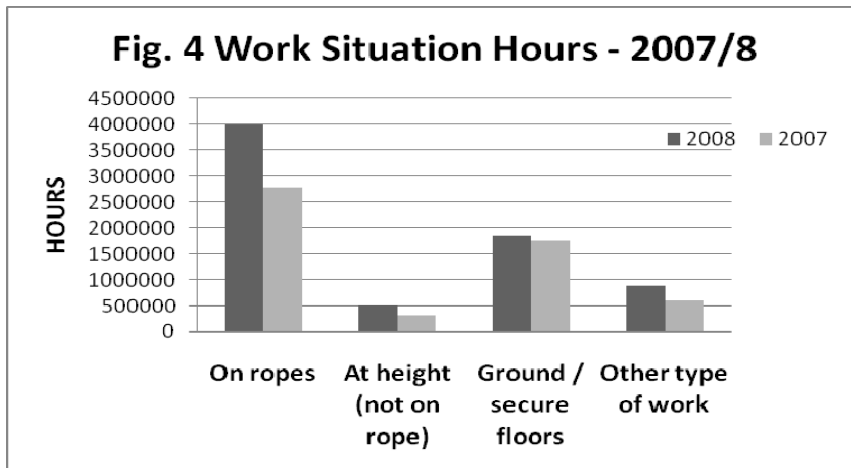
The potential maximum number of quarterly employment submissions for 2008 was 560 (allowing for part-year joining companies). Actual submissions up to 17 April 2009 were 510, a 91% submission rate (as for 2007). With a few exceptions, quality of employment submissions was good. Data from missing submissions was not taken into account.

3.1 OVERALL EMPLOYMENT AND HOURS WORKED

Total hours worked worldwide in 2008 was 7,221,408, a 33% increase over the 5.42 m for 2007. This increase is over double that expected from a simple rise in membership over the period (15%) and will be discussed later. The breakdown by quarter is shown in Fig.3 below which also shows the breakdown by work situation. The bar chart shows a significant increase after the first quarter for work on ropes, thereafter level, with remainder showing minor variation by quarter.

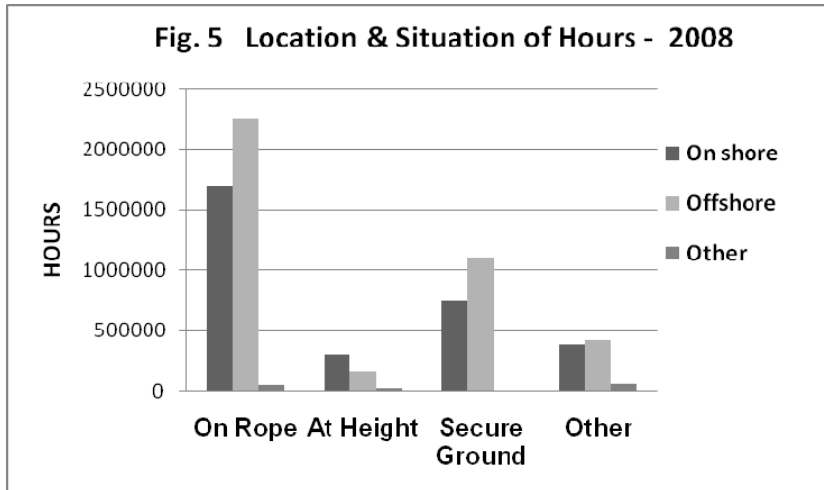


'On rope' working now accounts for 55% (4.0 m) of all reported hours compared to 50% in 2007. The graph below compares yearly totals of situation hours for 2007 and 2008.



The point of Fig. 4 is that it demonstrates that the bulk of the 07/08 increase in hours is due largely to an increase in 'On Rope' working.

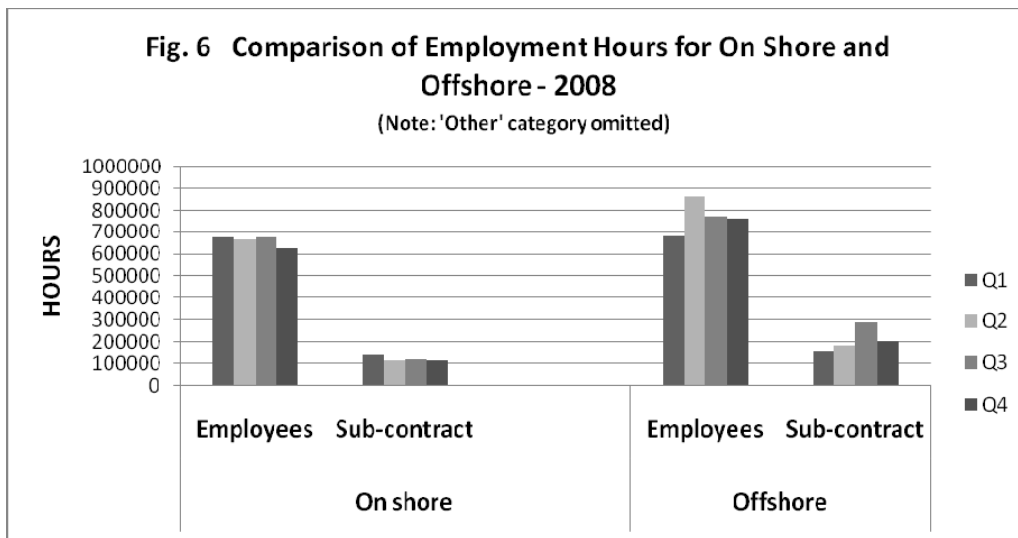
A breakdown can also be made by combining Situation (i.e. On rope, At Height etc) and Location (On shore, Offshore and Other):



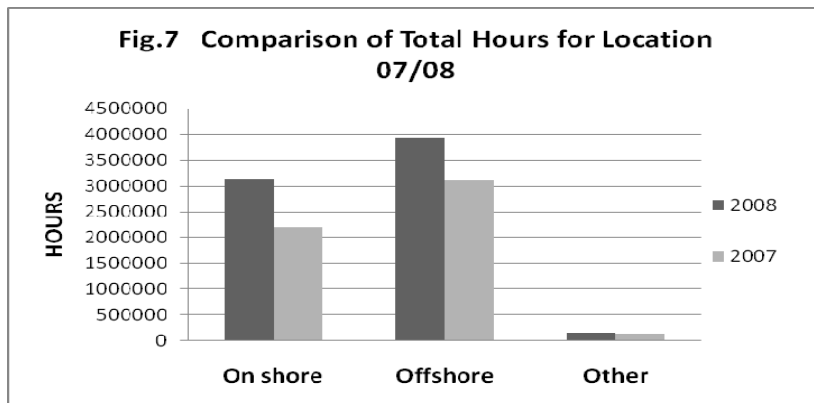
As usual, offshore working predominates with total hours of 4.27 m and 3.89 m for on shore. The ratio of on shore to offshore working has closed. In 2007 offshore work accounted for 57.4% whereas in 2008 the figure has fallen to 54.4% with onshore figures rising from 40.4% to 44.5% of the total. 'Other' still accounts for about 2%.

3.2 DIRECTLY EMPLOYED V SUB-CONTRACT

The chart over shows the comparison between the directly employed and sub-contractor hours for both on shore and offshore work. The 'Other' category has been excluded as it accounts, in total, for only 145,000 hrs.

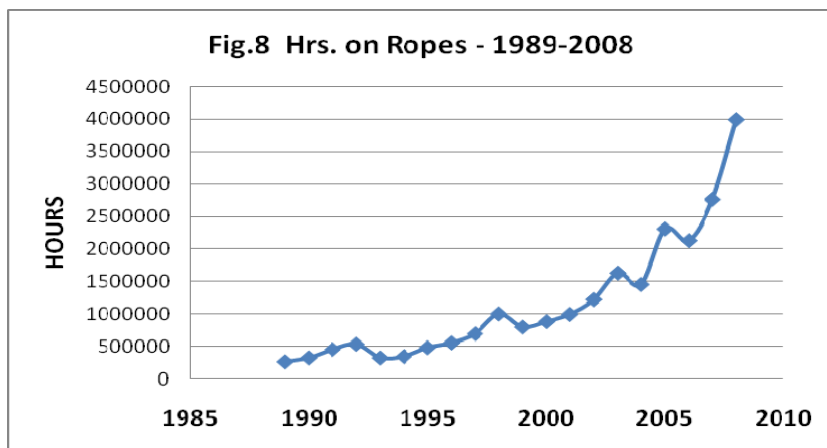


The chart reflects the higher level of offshore work but it also demonstrates a higher variability, quarter to quarter, and a higher dependence on sub-contract working offshore (~25%). Sub-contact/Self employed accounted for 19% of total working hours.

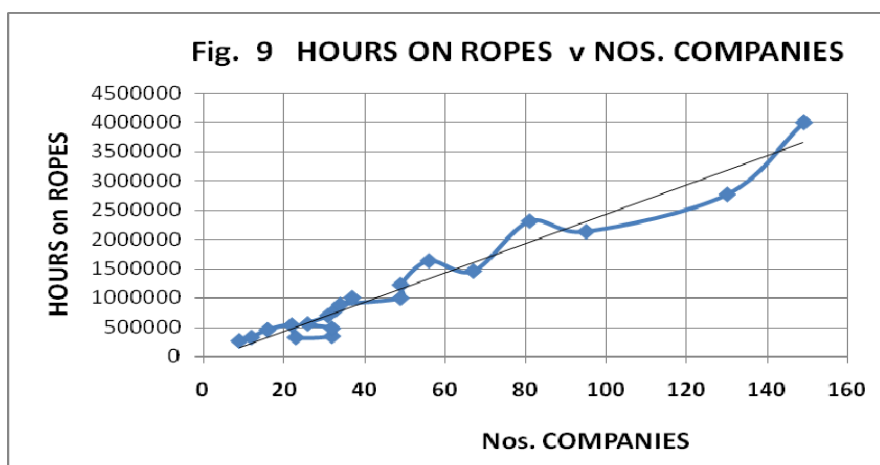


The primary reason for the closing of the gap between offshore and on shore working is that, whilst both increased from 2007 to 2008, the increase in on shore working was greater, as the bar chart above shows.

3.3 COMPARISON OF HOURS ON ROPES WITH PREVIOUS YEARS / AVERAGE COMPANY WORKFORCE



Taking only the hours on rope data from previous years the graph above (Fig. 8) shows an almost identical trend to that of the number of IRATA member companies in Fig 1. This relationship is confirmed by plotting Hours on Rope against Number of Companies (Fig. 9 below). The trend line now gives an average of about 24,300 hours per annum per company, an increase over the 23,000 from last year. The value for 2008 was 26,850 hrs per company. Thus, not only is the number of companies increasing in IRATA but also the average hours worked on rope for each company. It is emphasised that only hours on rope is being considered here.



In the 2007 Report the average annual work hours was calculated - it was assumed that a typical working year for an individual was 220 days with an 8 hour day. This equates to 1,760 hours per annum per person*. Hence, 26,850 hours represents an average front line workforce of about 26,850 / 1,760 = 15 per company (13 in 2007). If due allowance is made for the total reported hours (as against just rope working) of 7.22 m hours, this rises to about 27 employees per company (23 in 2007). Again, this suggests average IRATA company workforces are increasing.

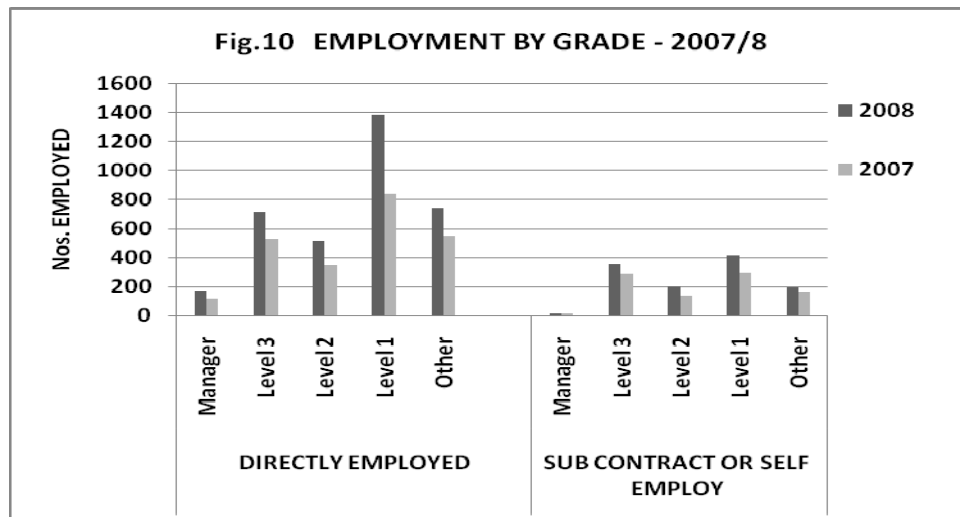
With a total of 7.22 m hours, and assuming 1,760 hours per annum per worker, this yields a figure of 7.22 m / 1,760 = 4,100 for fully employed employees. This figure will be examined in 3.4 below.

* [Offshore hours are complicated by several factors, however, here no differentiation is made between on and offshore working hours].

3.4 EMPLOYMENT LEVELS DURING 2008

The quarterly total employment levels during 2008 increased during the year from 5,184 in Q1 to 5,868 in Q4, with an average of 5,593. The chart below shows the breakdown of the average totals according to grade of employee and status (employee or sub-contractor/self-employed). 'Other' category employees (none IRATA qualified employees etc) are omitted from the graph to simplify presentation, although this averaged 602 in 2008. The similarity in profiles for 2007 and 2008 figures is clear.

The continuing predominance of IRATA trained Level 1 – 3 in direct employment may be noted, representing 50% (2,805) of the total.



Also significant is the increase in all grades from 2007 to 2008, particularly for Level 1. This has increased by 540 (64% on 2007 figure). Since this is essentially the entry level for rope access, it represents a very positive indication for the future. The continuing rise in Level 2 and 3 will probably be due to grade 'promotions'. Hence, the additional influx of Level 1 operatives should be very welcome in maintaining the balance between grades and ensuring adequate trained workforce for future development and grade progression.

Whilst the influx of Level 1 personnel would be welcomed, it also brings with it the increased demand for vigilance by supervisory grades, particularly in view of the historical susceptibility of Level 1 to accidents and incidents.

The lower number of Grade 2, compared to Grade 3, previously reported is being maintained, as the graph above shows. Although the number of sub-contractors and self-employed has increased for all grades from 2007 to 2008, the increase is not as great as for directly employed personnel. One possible implication of this is that it reflects confidence in the future of the business.

In 3.3 the total working hours equated to a fully employed workforce of about 4,100 whilst submitted returns for employed persons averaged 5,593. This suggests a significant level of 'under-employment' in terms of hours worked per employee. However, it is likely that many employees were also engaged in other, non rope access related work, and, therefore, these hours may not be submitted. It may also suggest a degree of spare capacity.

3.5 TRAINING

As with the previous reports, it is not possible to assess the extent of training. Last year, an estimate of ~4% of total hours for formal training was made, representing about 9 days per annum per person or 10 days if restricted to Level 1-3 workers. This is possibly still the case but until the specific category is created on submissions it cannot be verified. One point may be raised, however, and that is that the original estimate included time spent by trainers and assessors themselves. Therefore, the figure of 10 days per person may be less for individuals, the balance being taken up by trainers / assessors.

Last year it was estimated that the Level 1 to 2 transitions might reach 280 and Level 2 to 3 about 160. The actual tabulated increases from 2007 to 2008 were 230 for Level 2 and 258 for Level 3. Thus, slightly fewer sought to gain Level 2 status than predicted but significantly more than predicted were elevated to Level 3.

If the same basis for prediction is used for 2008, i.e. that 1/3rd of Level 1 and level 2 will seek training/assessment to the next grade, the figures become 1/3 of 708 = 236 and 1/3 of 1072 = 357 respectively. As before, these figures will necessarily be approximate.

4. ACCIDENT STATISTICS FOR 2008

4.1 SUBMISSION RATE/QUALITY

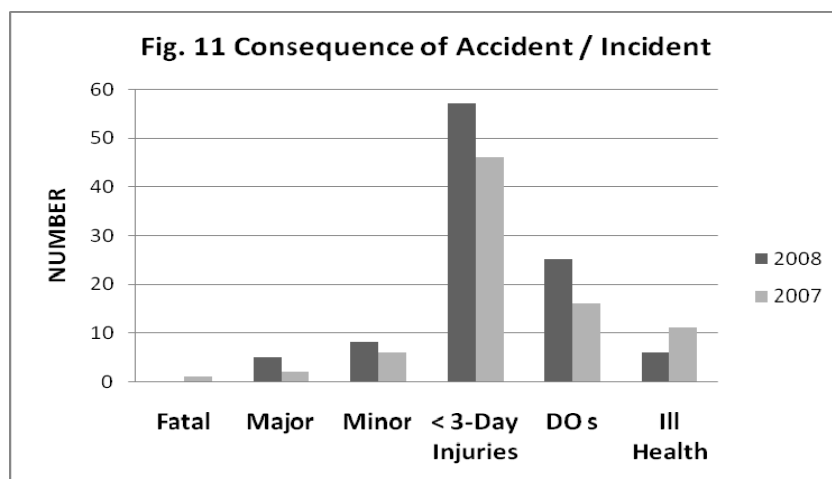
The total number of accident/incident 021R reports submitted for 2008 was 99 (82 in 2007) from 25 companies (20 in 2007). Four companies submitted 10, 12, 14 and 21 incident reports each. The 21% increase in reported incidents initially appears disappointing but this should be viewed against a 34% increase in reported hours from 5.37 m to 7.22 m. This assumes similar levels of reporting integrity to previous years.

Of concern was the poor quality of 021R returns revealed by quality checking. Significant errors, sufficient to require category rectifications, were found in 29 submissions. A further 7 had omissions requiring rectification. Whilst a modest error level may be expected, a figure of 36% is clearly unacceptable since it requires a 100% data check before analysis may commence.

It is tempting to suggest that the cause is solely poor attention to form completion. However, given the extent of errors and omissions, a more logical conclusion is that the 021R form profile is confusing or sometimes inappropriate, concentrating on plant/equipment and largely ignoring people (human elements) and procedures. Additionally, the basis for the form is UK-based regulation (RIDDOR), particularly in respect of definitions for accident categories and Dangerous Occurrences. This will be unfamiliar to overseas companies, an increasingly important element of IRATA growth. It will be a recommendation of this report to re-examine the 021R form format.

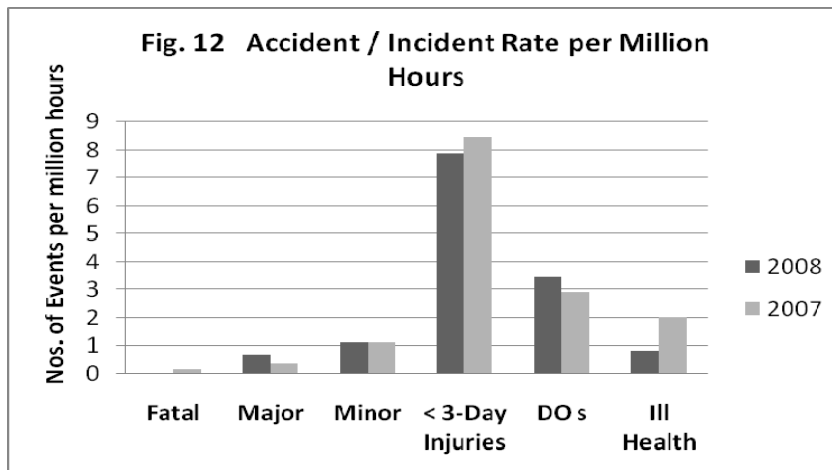
4.2 CONSEQUENCE OF ACCIDENT / INCIDENT

Unfortunately, it is primarily the outcome or consequence of an accident or incident that is conventionally used in generation and analysis of data. The advantage of this approach is that the outcome of an event is tangible, measurable and readily analysed even though underlying cause may be un-revealed in analysis. The chart below compares the absolute numbers of accidents / incidents for 2007 and 2008. The profiles are essentially similar with relatively minor injuries and dangerous occurrences (DOs) predominating in both years. As in 2007, a common error in 021R submissions was categorising events as 'Minor' or '<3-day injuries' when no actual injury was recorded.



The predominating category was clearly 'less than 3-day injury', accounting for 57 of the total of all 99 incidents. The five 'major' incidents involved a fall from improper use of rope access in descent, hydroblast- inflicted injury while on rope, fall during rope transfer, trip and fall after egress from rope access work and head injuries due to falling object whilst on ropes. In other words, all major accidents reported were directly or indirectly associated with work on ropes. Four of the five injured were Level 1; the other was Level 2 qualified. The significance of the increase in 'Major' accidents will be revealed later, both for 'Lost Time' and in comparisons with UK HSE data.

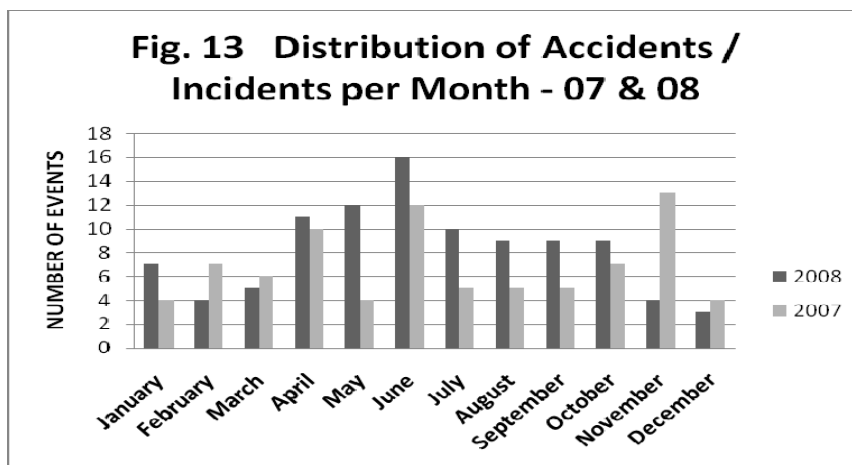
The absolute numbers in Fig 11 do not take account of the 'hours at risk'. For this it is necessary to divide the number of accidents/ incidents by the work hours – 7.22 million for 2008 and 5.42 m for 2007. It will be noted that the y-axis units in the chart below are given in number of injuries/incidents per million hours worked:



It is clear that there is little difference between the two sets of figures except in ill health where an improvement may be noted. However, further analysis may reveal changes within the overall figures. One point of concern is the increase in 'Major' accidents particularly as they were all directly or indirectly associated with work on ropes.

4.3 MONTHLY DISTRIBUTION OF ACCIDENTS / INCIDENTS

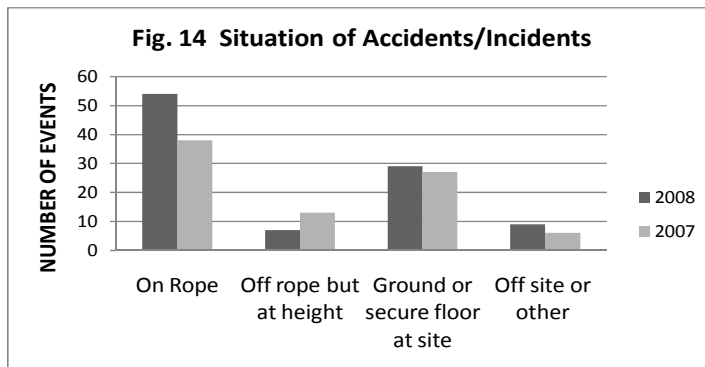
The distribution of events by month for 2008 is shown in the chart below together with those for 2007. Unlike 2007, there appears to be a more distinctive profile, with a rise towards midsummer, and a decline at year end. Average accidents per month was 8 events.



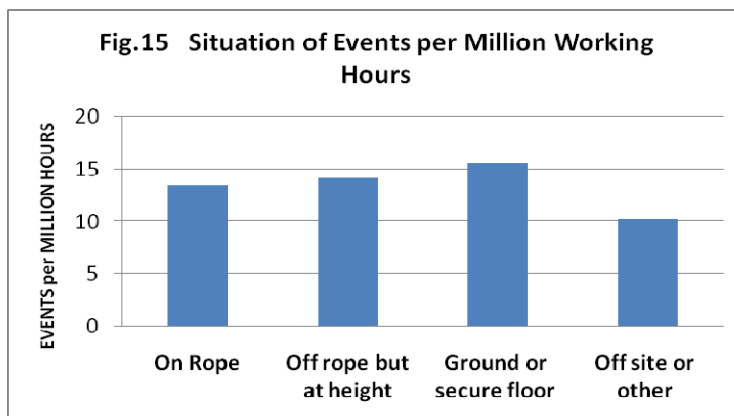
There are no obvious reasons for the distribution. For example, there was no single company or accident that accounted for a particular high monthly figure. Similarly, the employment figures do not show significant quarterly variations that could account for the above simply on the basis of busy periods although Q1 was slightly below the remainder of the year. The isolated November 'high' in 2007 was not repeated.

4.4 SITUATION OF ACCIDENTS/INCIDENTS

Categories for the situation in which accidents or incidents occurred on O21R forms are 'On rope', 'Off rope', 'Ground' (or secure place) and 'Other type of Work'. The chart below gives the locations of all 99 reported accidents/incidents for 2008 alongside those for 2007.



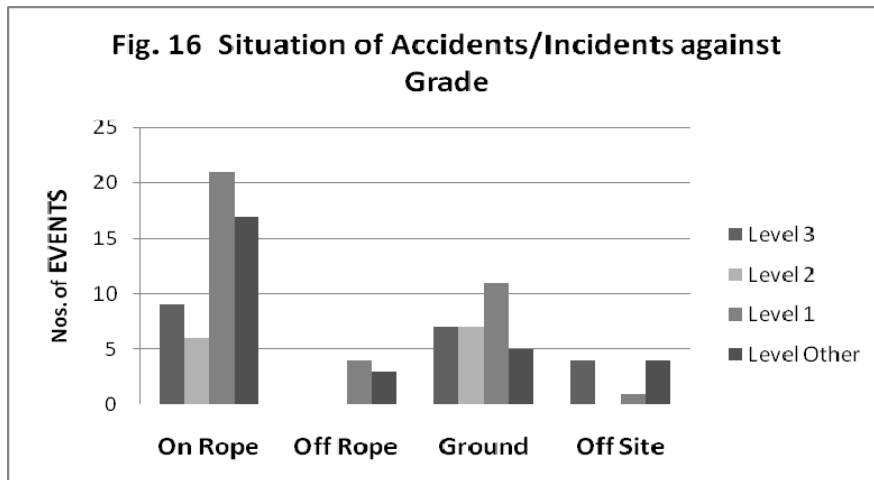
The overall profile for 2008 is similar to that for 2007 with one notable exception. 'On Rope' now accounted for over 54% of all incidents which is significantly greater than the 41% for the previous year. However, when the number of reported working hours for each category is also taken into account (see Fig 4 for hourly data) and the significant increase in 'On Rope' hours takes effect, a different picture emerges. In effect, the time of exposure at the different locations is taken into account by dividing the number of incidents or accidents by the hours spent for each situation giving the chart below:



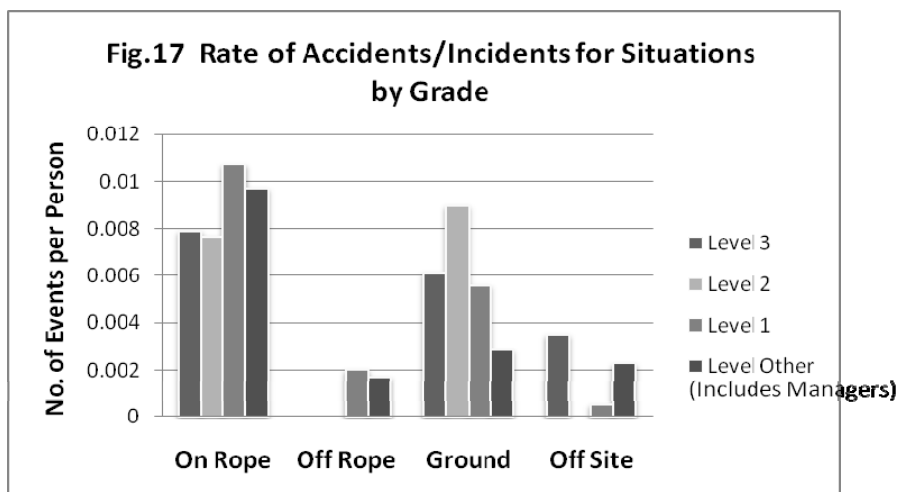
In effect, there is little difference in the rate of accidents or incidents between the different situations i.e. there is little difference in the risks associated with the different work sites. This reinforces the statement from the 2007 report – 'One lesson for supervisors and workforce is to remain vigilant at all times and not to ignore the risks when not on ropes'. However, sight should not be lost of the fact that 4 of the 5 'Major' accidents occurred 'On Rope'.

4.5 ACCIDENT/INCIDENT EVENTS BY GRADE

The chart below (Fig 16) shows the distribution of events by the various grades. The predominance of on rope working events is confirmed but the chart does not take into account the numbers within each grade.



A comparison of rate figure, derived by dividing the number involved for each grade by the 'population' or total number employed for the grade (i.e. events per person), is shown in Fig 17 below.



The effect is to demonstrate that all grades working on ropes have nearly the same rate of involvement in incidents as each other – with Level 1 only slightly higher than the remainder. There is an apparent anomaly of a high incidence of 'Other' associated with 'On Rope' work where only qualified employees should be expected. Examination of individual records shows that many cases do not involve specific personnel but are more general in nature such as damaged rope, defective equipment, third party dropped objects etc. However, it is suspected that some reports are related to operatives but are not disclosed and that many of these may be Level 1.

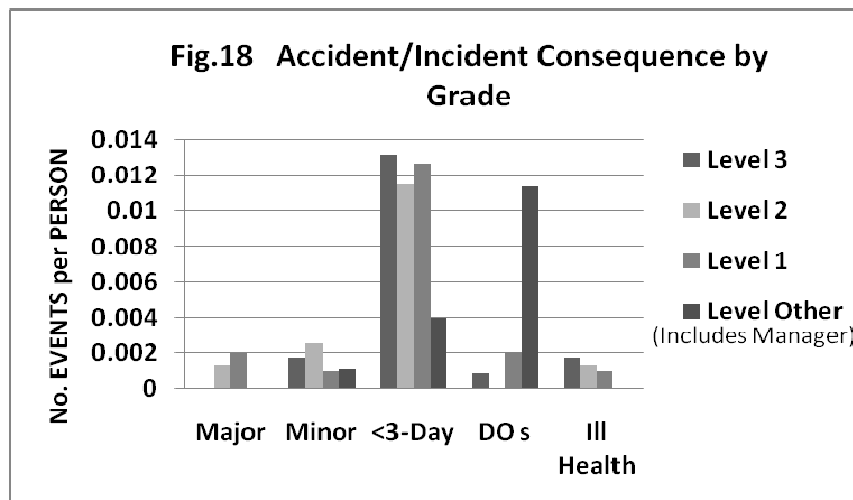
The incidence of events on secure ground is headed by Level 2 operatives, generally due to minor injuries sustained when working with tools. The main difference between the 2008 figures and 2007 is that the higher risk for Level 1 is not as significant as it was in 2007.

The above has considered the overall incidence of events. It would seem appropriate to now examine the seriousness of accidents and incidents.

4.6 INJURY CONSEQUENCE OF ACCIDENTS/INCIDENTS BY GRADE

In 4.2 the overall consequence of accidents and incidents was considered. It will now be necessary to break the totals down to examine the risks for each of the grades.

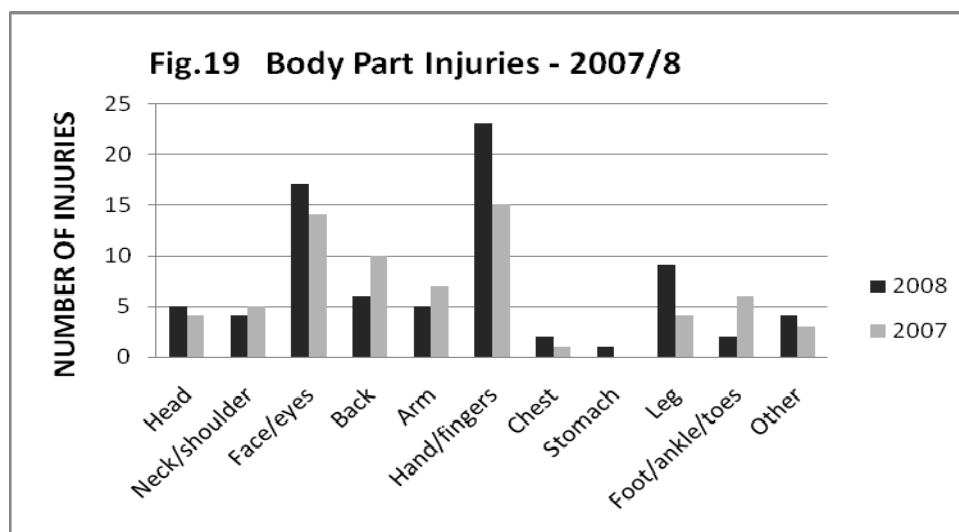
The chart over already incorporates the division of figures for each grade by the population for the grade. It is clear that the bulk of events leading to actual injury are 'less than three day injury' almost equally to the qualified Level 1, 2 and 3 operatives. But, again, there is a surprisingly low level of dangerous occurrence reporting except for the 'Other' category.



Attention will now be turned to the actual injuries sustained by personnel.

4.7 BODY PART INJURIES

The body part injuries sustained during 2008 are shown in Fig 19 together with those for 2007. The totals were 78 and 69 respectively. On a pro rata basis for total hours worked, 90 could have been expected for 2008 so a degree of improvement has been achieved. The profiles are broadly similar, as they were for 2006/7.



Injuries to hand/fingers and face/eyes again predominate; between them they account for more than 50% of total injuries. Significant reductions will be noted for back, arm and feet but face/eyes, hand/fingers and leg injuries were higher than in 2007.

Fourteen of the 17 face/eye injuries were caused by foreign materials entering the eye, despite the wearing of eye protection in most cases. To repeat last year's report: *'In most cases more effective eye protection would have mitigated or prevented injury. This is one specific area where injury reductions could be made by selecting and using more appropriate and effective eye protection.'*

Ten of the face/eye injuries occurred on secure ground and 5 whilst on rope.

Of the 23 hand/finger injuries, 12 were due to use of tools or equipment; six were due to crushing or trapping by dropped objects and five caused by a variety of cuts, burns or bruising. In many cases use of improved hand protection was cited as a preventative measure. There was an almost even split

for the majority of hand injuries (19) between 'on rope' and 'secure ground'. One report was a scissor cut sustained in offices.

The five 'major' accidents resulted in injuries to back, leg and head and neck/shoulder. The four 'other' category injuries were due to dehydration, fainting, earache and electric shock.

Finally, two of the 9 leg injuries reported were due to a fall from a bunk bed and the second whilst in the shower.

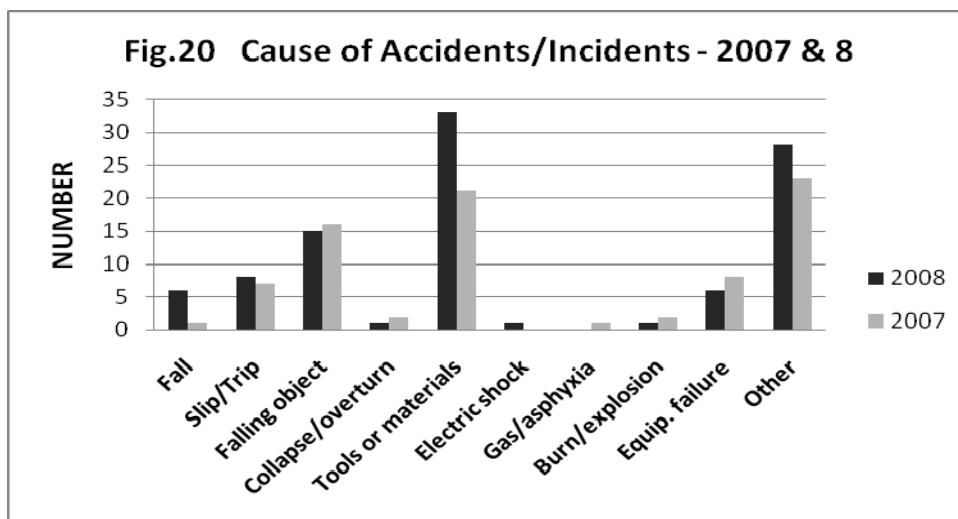
Unfortunately, the injury categories do not precisely coincide with those used by HSE*; however, for those that do (units in injuries per 100,000 workers) and using IRATA average workforce of 5,593 (Table 3) to obtain equivalent figures (x by 100,000/5,593 = 17.9), the table compares rates of injury per 100,000 employees:

			IRATA	HSE (LFS)
Back injuries	(6)	107	241	
Neck/Arms	(4+5)	161	213	
Legs/feet	(9+2)	197	86	

*HSE figures quoted here and elsewhere in the report are to be found in HSE Publication 'Health and safety statistics 2007/8' obtainable from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA or downloaded from www.hse.gov.uk/statistics/swi

4.8 IMMEDIATE CAUSES OF ACCIDENTS / INCIDENTS

The chart below shows the breakdown of causes for reported accidents/incidents for both 2007 (83 reports) and 2008 (99 reports).



There is a clear similarity between the 2007 and 2008 figures with respect to the major causes – Tools/Materials, Other, Falling Objects followed by Slips/Trips and Equipment Failures. As for the 2007 figures, an additional category of 'Slips/Trips' has been added and re-allocations to this category made from individual reports as appropriate. This is to maintain consistency with common practice.

Although it may be tempting to apply a 'correction factor' to account for the difference in hours between 2007 and 2008, as in previous sections, it is considered more useful in this section to retain actual numbers and types of accidents encountered. This allows an examination of actual events and possible lessons to be learnt.

Of concern, is the number of 'real' falls (i.e. uncontrolled descent). Six falls were reported for 2008, four of which occurred whilst on ropes with major injuries in two cases. This is a significant increase in direct rope-related accidents and, whilst representing only 4% of the total of all reported accidents/incidents, it is a particularly sensitive area. There was only one reported 'fall' in 2007 and that did not result in injury.

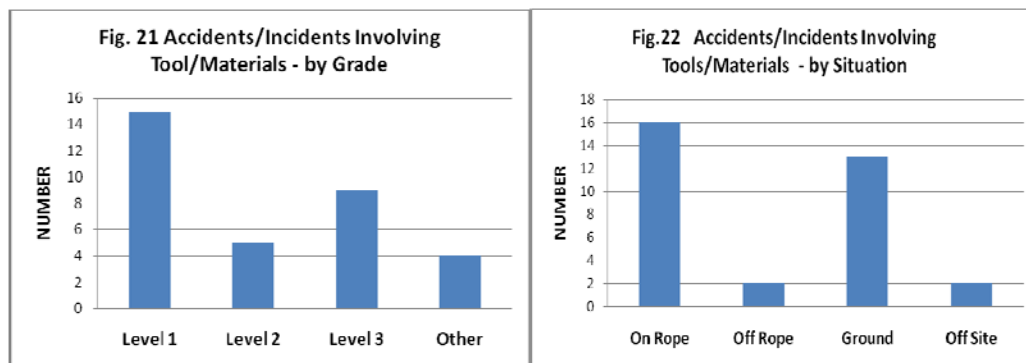
Slips and trips occurred in a variety of circumstances and locations, from wet floors (showers and plant room), stairs and whilst working on rope, to walking down an embankment. This last accident resulted in a dislocated shoulder (major accident).

Dropped or falling objects remained a significantly high cause of accidents/incidents (16 events). In virtually all cases, falling objects were dislodged, either by the operative himself or by a third party. Items dislodged and dropped ranged from barnacles, tree bark, various probes and tools to radios, cables and, in one case, a window panel. Whilst most dropped objects were recorded as dangerous occurrences or not reportable accidents, one was reported as a major injury with injury to head, neck and shoulder but no further details were provided. Eleven occurred whilst on rope and the remaining 5 on secure ground. As in 2007: *'Pre-work start inspections must address the potential for dropped objects. The vulnerability to dropped objects when working at height is obvious and requires continued vigilance to minimise potential dangers.'*

The handling of tools and materials was the largest single category of cause, unlike in 2007 when it was 'Other'. There was a significant increase in the number of incidents which rose from 21 in 2007 to 33 in 2008. Again, grinding (4 events), air impact tools (2), burning torch (2) and various other hand tools (drill, spanner, chainsaw, bush-cutter, jemmy bar and hydroblast lance) were involved in half of all events. The remainder involved handling of materials (pipework, threaded rod, beam clamp, metal panels, hoses) and miscellaneous other items. In only two accidents involving injury was a third party involved (fire pump discharge leading to arm injury and dislodged debris causing eye injury). In other words, the majority were self-inflicted.

Predictably, the majority of actual injuries were to eyes (13) and hands/fingers (13 also). Some mitigation, in the form of better or more effective hand and eye protection, was the usual preventative measure suggested.

Given the number of incidents involving tools and materials, and the significant increase over the 2007 figures, it may be useful to examine these figures more closely. Below are charts of the number of incidents plotted by Grade (Fig.21) and by Situation (Fig.22).



In Fig.21 the distribution of incidents between grades is approximately in proportion to the population of the grades (Fig.10). Therefore, risks for all grades appear to be essentially the same, effectively ruling out, for example, lack of experience or training as a prime cause for Level1 or Level 2 operatives.

Turning to Fig.22, and comparing it with the total hours spent at each situation (Fig.4), it is apparent that accidents/incidents on rope are directly in proportion to those for off rope and off site working. However, the incidence of accidents/incidents on secure ground is significantly greater than the proportion of hours. Therefore, the risk of accidents/incidents involving use of tools and materials is greater on secure ground than any other situation.

Following closely behind 'Tools and Materials' was 'Other' with 28 accidents/incidents. These ranged from various health threats (exhaustion, fainting, dehydration, insect bites, earache, allergic reaction) to strains (3) and head strikes (2). There were also some bizarre events including a tourist bus entering a barriered area and striking a rope access rope tied to a lamppost and an office heater overheating. However, there were also 6 events involving rope use and rigging. These ranged from inappropriate belay to damaged rope during personnel hoisting and lowering load onto rigging.

Of the remaining accidents/incidents, two may be highlighted which both involve rope access equipment failures. One involved failure of a stop handle on a descender (no injury, dropped 0.5 m onto shunt) and the second was failure of a dead man's handle that led to a minor thigh injury.

As a general comment on the above, most accidents/incidents appear to be 'subjective', that is caused by the personnel themselves. Reports very rarely considered other factors that could have mitigated or prevented the occurrence other than to suggest use of improved or more appropriate PPE or to point out failings of third parties. The role of supervisors and management, training, pre-site inspection, risk assessment etc apparently was very rarely considered or examined.

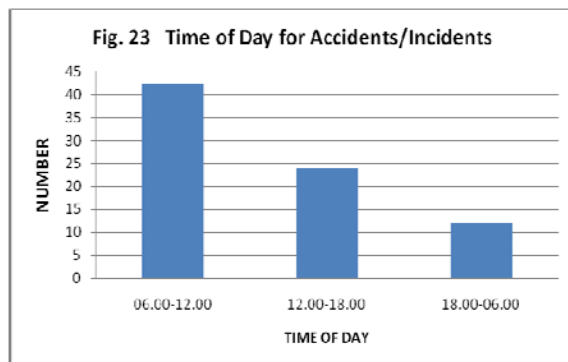
4.9 TIME LOST

Reported time lost was about 300 days but one major accident, resulting in a back injury during on rope working, was still on-going at time of report. A second major accident, resulting in an arm injury whilst changing ropes, reported a lost time of '>24 days'. Thus, the total for 2008 cannot be given accurately. If it is assumed that both accidents resulted in 6 months lost time apiece (~120 days each), then the estimated total time lost would be 540 days or about 4,500 hours. This represents 0.062% of the total 7.22 m work hours. This is double that recorded for 2007 (0.029%).

Despite this increase, it is still considered that overall reported time lost may be significantly underestimated as some accident reports gave no time lost whereas, from examining the reports, it was clear some time must have been lost in several cases of nil return. Despite a clear but unknown level of under reporting, the figure represents an average of about 1 day per employee but with the majority of time lost due to only 5 accidents. By comparison, HSE statistics for 2008 give 1.4 days lost per worker in the UK due to ill-health and injury and 0.26 due to injury alone. IRATA figures are below the overall national UK average but above that for injury alone if the assumptions above are accepted.

4.10 EXTERNAL FACTORS

Time of Day – If the time of day, when given, for occurrence of accident/incident is allocated to one of the three time periods am, pm or night, the following chart is obtained:



Without knowing the time distribution of overall working hours it is not possible to determine whether the above is a 'normal' frequency or whether there is an effect of time of day on incidence of accidents.

Weather Conditions - In only five cases was weather, or in one case, inside ambient conditions, a factor in the reported accident/incidents. These were: wind blown dust in eyes, dehydration, slip in wet conditions, wind gust blowing panel twisting wrist of handler, and nausea/dizziness in hot inside conditions.

Supervision and Training – With two exceptions, these factors were excluded as possible contributory causes. As in the 2007 report, it is difficult to accept that so rarely is lack of adequate training a factor. Similar comments apply to supervision.

4.11 MANUAL HANDLING

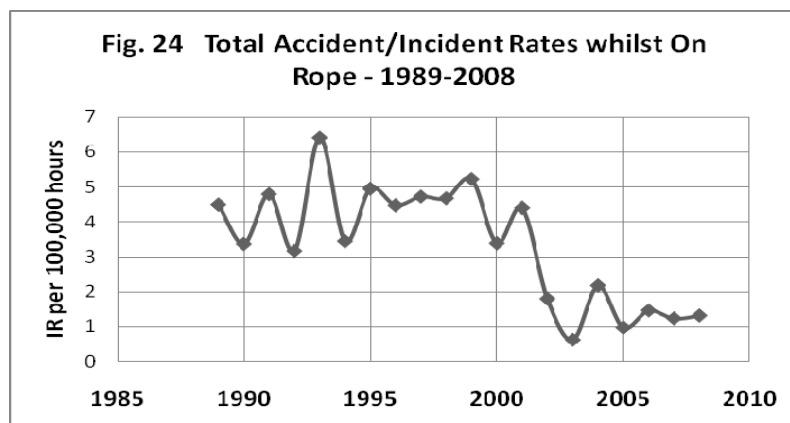
Although not a specific category within the 021R form a search was made of the 99 reports and in only 4 cases was there a suggestion of 'manual handling' related injury. This was in contrast to 2007 when 12 incidents were identified.

5. COMPARISON OF ACCIDENT/INCIDENT DATA WITH PREVIOUS YEARS AND UK HSE DATA

5.1 WORKING ON ROPES

To maintain consistency with historical IRATA data for work On Ropes in isolation, Table 1 is a compilation of data since 1989 and amended to include 2008 data. A graphical presentation of the total incident rate per year is shown in Fig 24 below where 'total' refers to the sum of RIDDOR reportable accidents (fatal, major, and minor), Dangerous Occurrences and None Reportable Accidents.

(Note: IRATA DO data cannot be compared to HSE data as it does not necessarily comply with RIDDOR definitions – see RIDDOR 1995 Sch.2)



Although there is a slight rise in the total accident/incident rate for work on ropes from last year, from 1.22 to 1.30 per 100,000 hours, the graph shows that the increase is well within the spread of results over the past 6 years. The relative levelling off for the last 4 years could suggest a close approach to a 'bottoming out' or minimal accident/incident rate has been reached. However, a similar conclusion might have been reached in 2001 when examining the 1989-2001 figures when the rate was about 3-5 per 100,000 hrs.

As noted in 2007, 'the sensitivity of the data to under-reporting means that encouragement to report could result in an artificial increase in the overall rate if a positive response was obtained from the membership' and this may be a factor in the small increase (which would be largely due to non reportable accidents, if this was the case).

5.2 BASIS OF CALCULATIONS FOR COMPARISON OF IRATA DATA

Although historically within IRATA there has been emphasis on the data for on rope working, this analysis will continue using total working hours for two reasons. Firstly, work off rope, on secure ground and other working account for more hours collectively than on rope working in isolation; secondly, to maintain consistency with general accident/incident reporting practice, particularly UK HSE, where all working hours are considered collectively.

It is also necessary to change the units used, moving from 'per 100,000 hours' to 'per 100,000 employees'. Thus, for the annual total of 7.22 m hours, numbers of incidents/accidents are multiplied by $(100,000/7.22 \cdot 10^6) \times 1,760$ (hrs/year per employee) = 24.4.

An alternative method is to simply take the employment numbers (Table 3) and apply a multiplication factor to accident and incident data to reach 100,000 employees:

Average employment (from quarterly figures) = 5,593 employees

To convert to 100,000 employees x by $100,000/5593$ = 17.9

This figure assumes 100% employment and includes sub-contractors; therefore, in reality, a slightly higher figure might be expected. Bearing in mind the approximations used for both calculations, it seems prudent to select a figure between the two – the mean would be **21.2** and this figure will now be used to convert IRATA accident figures.

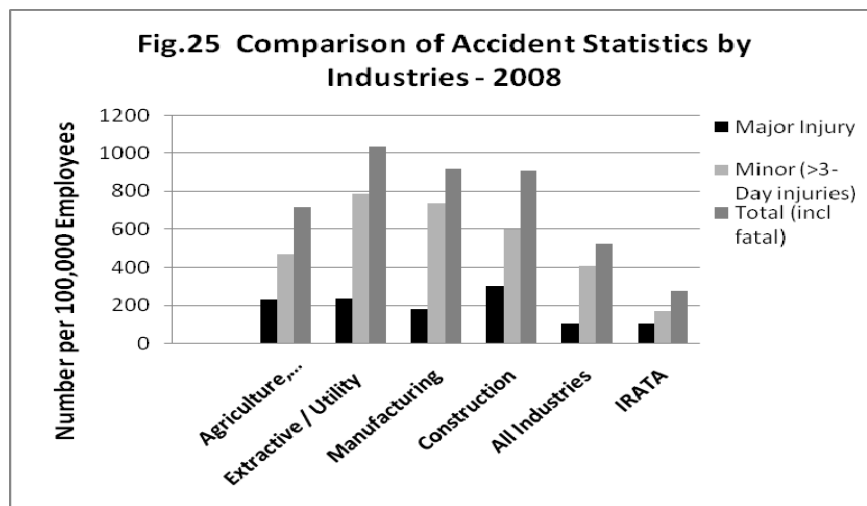
5.3 COMPARISON OF IRATA ACCIDENT AND INCIDENT DATA WITH UK HSE DATA

The UK HSE website key figures for 2007/08 data for various industries (*IND 1) are tabulated and charted below with equivalent IRATA figures.

www.hse.gov.uk/statistics/indexoftables.htm

Industry	Major Injury	Minor (>3-Day injuries)	Total (incl fatal)
Agriculture, Forestry & Fisheries	232	473	714
Extractive and Utility Supply	238	787	1031
Manufacturing	181	732	914
Construction	303	599	906
All Industries	106	412	529
IRATA	106	170	276

(All figures in number per 100,000 employees. Fatal injuries incorporated in 'Total' column).



The 2007 figures for IRATA were 61 for 'Major' and 182 for >3-Day Injuries; with the fatality this gives an almost identical total of 273 to the 276 figure for 2008.

The significance of the five 'Major' accidents reported in 2008 is now clear. Unfortunately, it raises IRATA up to the level of 'All Industries' in the 'Major Injury' category; however, this is still well below that for other related industries. But the 'All Industry' figures include a large population of 'low risk' workforce which must have a strong tendency to bring down the average figure. In addition, the degree in under-reporting via RIDDOR is estimated to be ~50% by HSE, further enhancing IRATA data. Although some under reporting may be expected in the equivalent IRATA data, it is unlikely to be of the same order.

It is worth noting that some caution should be applied to the IRATA data, however, because of its sensitivity to even single events. It will be remembered that the multiplication factor for the annual total hours was 21.2. Thus, a single event represents 21 'points' in the IRATA data within the table.

When the 'Minor' category (>3-Day Injuries) is included in the comparisons, the IRATA position improves still further, as the chart clearly shows. However, if a more strictly accurate comparison is made with HSE data that includes self-employed, the differences narrow slightly with a combined (Major and >3-Day) All Industry figure of 457 injuries per 100,000 compared to 276 for IRATA data – still about ½ the HSE figure.

The Labour Force Survey (LFS) figures, quoted by HSE, are about 1050 injuries per 100,000 – virtually double the HSE rates with an estimated reporting level of only 49%. A further comparison can be made with the LFS figures for some selected workforce categories. The table over shows that, whilst higher than for 'Admin', the IRATA figures are well below those for skilled trades and other machinery operators. Thus, by any standard, IRATA figures remain impressive.

LABOUR FORCE SURVEY	Major Injury	>3-Day Injury	Total*
Skilled Trades	212	681	895
Process, Plant and M/C Operators	363	1486	1852
Admin	31	86	118
IRATA	106	170	276

*Includes fatalities - see OCC1 data in www.hse.gov.uk/statistics/indexoftables.htm

For completeness, the Dangerous Occurrences (DOs) figure is $(25 \times 21.2) = 530$ and None Reportable Accidents $(57 \times 21.2) = 1208$ per 100,000 employees. Even these figures compare favourably with the above.

Attempts to compare data with US statistics are hampered by differences in data collection definitions. For example, US Bureau of Labor Statistics data is based on 'over 7 day' absence from work, 2000 hours per annum (40 hrs x 50 weeks) and 100 employees whereas UK uses 'over 3 day' and 100,000 employees.

There are other differences in definitions of injury but, if differences are set aside and the RIDDOR 'Major' plus '>3-Day Injury' equated to the US 'Non-fatal injuries'* (and excluding the US category of 'Cases with job transfer or restriction'), the following examples of comparisons may be made after converting US data (x by $100,000/100 \times 1760/880 = x$ US 'Rates' by 880) to approximately equate with IRATA data. The US data in the table below is for 2007. Additional EU data is included in the table but these figures were for 2005 (and should be lower by 2008).

SECTOR	US (2007)	EU (2005)	UK (2005)
Total or Average	1056	3098	1271
Agriculture, Forestry, Fishing	1584	4560	1970
Mining	1232		
Construction	1672	6069	1580
Manufacturing	1144	3505	1310
IRATA	276		

* US Figures extracted from www.bls.gov/iif/oshsum.htm. European figures extracted from www.hse.gov.uk/statistics/european/tables.htm. All numbers injuries per 100,000.

It may be concluded that the IRATA rates are also significantly better than US figures. However, as will be obvious from above, it would require further examination of the US data to derive a truer basis for comparison.

There were no reported injuries to members of the public in 2008 and, thankfully, no fatalities.

6. SUMMARY

The following summarise some key points from the report:

Data Submission

36% of accident/incident submissions (021R) contained significant errors and/or omissions.

Membership/Employment

Membership continued to rise with 149 registered companies by December 2008, a 15% increase in the year.

Total employed increased from 3,574 in 2007 by 56% to 5,593 in 2008.

Hours worked worldwide reached 7.22 million, a 33% increase over 2007.

Average qualified IRATA technicians employed were (2007 figs in brackets):

Level 1 - 1,966 (1,136)

Level 2 - 781 (484)

Level 3 - 1,138 (833)

The total hours 'on rope' was 3.86 million hours, 53% of total working hours.

Offshore working accounted for 54.4% of work hours, a reduction from 57.4% in 2007 with a consequent rise in percentage of on shore working.

Accidents/Incidents

Accident / incident submissions totalled 99, 70 involving personal injury. (Figures for 2006 were 82 and 69 respectively).

Five cases of ill-health were reported (10 in 2007).

There were 5 'Major' injuries, all associated with on rope working.

Taking into account work hours resulted in little difference between accidents/ incidents rates for 2007 and 2008.

Similarly, there was little difference in accidents/incident rate of about 10-15 events per million hours between on rope, off rope, secure ground or 'other' situations.

There was little difference again between grades when working on rope to risk of accidents/incidents with Level 1 technicians only marginally more at risk. Level 2 had the marginally highest risk when on secure ground (about 8 events per 1,000 persons).

Primary causes of accidents / incidents were again falling or dropped objects, use of tools/materials and miscellaneous other causes.

There were more injuries to hands/fingers than in 2007 (23 in 2008, 15 in 2007); also to eyes (17 versus 14) and to legs (9 versus 4).

There were fewer instances of injury to back, arm and foot.

Estimated time lost due to accidents was higher than in 2007 (better reporting?). Average lost time was assessed to be about 1 day per person per annum, significantly lower than the UK injury and ill-health national average reported by HSE of 1.4 but higher than the 'injury only' figure of 0.26.

Six falls were reported, four of which were on rope, two leading to serious injury – a significant increase over 2007 when only one 'fall' was reported and no injury resulted.

Vulnerability to dropped or falling objects remains a significant concern, with 15 events (16 in 2007); the potential danger was largely reported for on rope working (11 events) with the remainder on secure ground (4 events).

Manual handling, introduced as an added category, was a significant factor in only four of the 99 reported incidents.

For 'On Rope' working only, the calculated incident rates (IR) in number per 100,000 hrs were as follows (figs in () brackets for 2007):

None RIDDOR	1.09	(1.15)
RIDDOR Reportable	0.21	(0.07)
All accidents and DOs	1.30	(1.22)

Comparison of overall reportable accident and incident rates with UK national statistics reveals IRATA rates to be about half the All Industry rate for combined Fatality, Major and Minor (>3-Day Injury) accidents.

The IRATA rate for Major accidents is the same as for All Industries but only about 1/2 to 1/3 that of related industries.

In overall terms (Fatality, Major, Minor), reportable injury rates were again significantly below related industries.

Comparisons with Labour Force Survey figures demonstrated an even more impressive record for 2008 being 1/3rd to 1/7th of related trade figures

7. CONCLUSIONS

Based on the submissions made, the following conclusions may be reached:

In 2008, IRATA continued to expand in terms of company membership (by 15% over 2007), employment numbers (56%) and hours worked (33%).

The largest single employment increase was for Level 1 employees.

The accident/incident rate was similar to that of 2007 with the exception of 'Major' accidents which were higher (5 accidents in the year). This had a significant effect on the reportable accident rate which, nevertheless remained well below UK HSE industrial rates.

Overall, IRATA members maintained an enviable safety record in 2008.

8 RECOMMENDATIONS

Despite the continuing enjoyment of a favourable safety record, there are some recommendations that may be made:

1. Complacency should not hinder further improvements, particularly with respect to:
 - a) Eye protection
 - b) Hand protection
 - c) Fall prevention
 - d) Dropped objects
 - e) Tool handling
2. The large influx of Level 1 operatives brings with it an historical higher risk element. Supervisors and management should ensure vigilance is maintained at all times for their protection. Particularly highlighted may be pre-site inspection for threat of dropped or falling objects and use of tools.
3. IRATA should examine means to improve the quality of accident/incident reporting by members.
4. IRATA should give consideration to the distinction between UK and non-UK data submission.

Table 1 Accident and Incident Returns for IRATA Companies 1989-2008
(based on House Worked On Rope only)

Year	No of Companies	Hours on ropes	Dangerous occurrences (Dos)	Non reportable Accidents (NRA)	RIDDOR Accidents on ropes	IR for non RIDDOR incidents* **	IR for RIDDOR accidents*	IR for all Accidents and DO's* ***
1989	9	267,504	4	8	0	4.49	0	4.49
1990	12	327,645	4	7	0	3.36	0	3.36
1991	16	457,298	5	17	0	4.79	0	4.79
1992	22	537,920	3	13	1	2.97	0.19	3.16
1993	23	327,000	0	21	0	6.42	0.00	6.42
1994	32	348,749	1	11	0	3.44	0.00	3.44
1995	32	484,285	8	16	0	4.95	0.00	4.95
1996	26	559,035	5	18	2	4.11	0.36	4.47
1997	31	699,688	13	11	9	3.43	1.29	4.72
1998	37	1,006,538	14	23	10	3.68	0.99	4.67
1999	33	803,365	10	29	3	4.85	0.37	5.23
2000	34	887,206	6	21	3	3.04	0.34	3.38
2001	49	999,010	15	25	4	4	0.40	4.40
2002	49	1,225,930	10	12	0	1.79	0.00	1.79
2003	56	1,634,482	1	9	0	0.61	0.00	0.61
2004	67	1,457,848	8	22	1	2.06	0.07	2.17
2005	81	2,311,265	9	10	3	0.82	0.13	0.96
2006	95	2,132,141	9	21	1	1.41	0.05	1.45
2007	130	2,765,483	11	21	2	1.15	0.07	1.22
2008	149	3,859,584	17	25	8	1.09	0.21	1.30
TOTAL/AVERAGE		23,092,606	153	340	47	3.123	0.26	3.35
AVERGAE from running total						1.95	0.2	2.34

*units for Incident Rates (IR) in number for 100,000 hours worked

** (col 4+5)/hours/100,000

*** (col 4+5+6)/hours/100,000

TABLE 2 Summary Employment by Grade – 2008

	Q1	Q2	Q3	Q4	AVERAGE
AV NO OF PERSONS DIRECTLY EMPLOYED					
Manager	181	188	192	188	188
Level 3	683	752	782	792	752
Level 2	519	566	568	556	552
Level 1	1318	1541	1567	1576	1501
Other	674	784	807	829	774
TOTAL	3375	3831	3917	3941	3766
AV NO PF PERSON SUB CONTRACT OR SELF EMPLOYED (SC)					
Manager	10	9	16	9	11
Level 3	389	416	377	353	384
Level 2	238	248	225	191	226
Level 1	462	540	437	384	456
Other	163	162	200	246	193
TOTAL	1262	1320	1255	1183	1269
OTHER NON-IRATA COMPANY EMPLOYEES					
Manager	26	75	80	181	91
Level 3	1	0	7	1	2
Level 2	0	0	4	7	3
Level 1	13	4	7	16	10
Other	508	463	371	642	496
TOTAL	551	542	469	1562	602
TOTAL EMPLOYED	5184	5682	5637	5868	5593

TABLE 3 Summary Data of Hours by Grade – 2008

ESTIMATE OF HOURS WORKED IN VARIOUS SITUATIONS					TOTALS
Working on ropes					
On shore	Q1	Q2	Q3	Q4	
Directly employed	338435	3600402	387502	348940.5	1434920
Sub-contract	54409	63989	70609	72582	261589
Offshore					
Directly employed	385109	480140	440440	464838	1770527
Sub-contract	95031	127181	128498	125170	475880
Other					
Directly employed	9429	12736	12262	13961	48388
Sub-contract	893	1258	976	450	3577
					3994881
Working at Height					
On shore					
Directly employed	60577	76423	78276	47734	263010
Sub-contract	6622	12799	16384	9846	45651
Offshore					
Directly employed	23576	30758	40280	27315	121929
Sub-contract	8871	7296	12596	9103	37866
Other					
Directly employed	1724	336	162	122	2344
Sub-contract	5709	4998	5342	6327	22376
					493176
Work at ground or secure floors					
On shore					
Directly employed	144754.5	176206	157858.5	179469	658288
Sub-contract	42648	14866.5	17331	12860	87705.5
Offshore					
Directly employed	239157.4	257421.2	247988.2	232897	977463.8
Sub-contract	25966.6	29602.4	38997	31227	125793
Other					
Directly employed	1102	1847	851	1017	4817
Sub-contract	67	367	59	59	552
					1854619
Other type of work					
On shore					
Directly employed	132215	54286	53873	50068	290442
Sub-contract	35147	24729	18273	20586	98735
Offshore					
Directly employed	35771	97158	44507	39624	217060
Sub-contract	32762	22614	111498	42666	209540
Other					
Directly employed	19993	811	768	1265	22837
Sub-contract	18948	6828	11312	3030	40118
					878732
TOTAL					7221408

(Derived from 020R Forms and supplied courtesy IRATA Secretariat.)