

INTERNATIONAL SAFETY PANEL

RESEARCH SERIES #14

LASHING OF CONTAINERS

BY STEVE DURHAM

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NOTE: The Panel decided in agreement with the author that the full research paper should not be published by ICHCA International because, during the development of the work, an international initiative was taking place that meant that the outcome of the research was overtaken by events. The research did enable the author to obtain his Masters Degree. Any person wishing to see the full report should contact the author. What is published here is the substance of a summary of the report produced by the author and submitted to IMO's Dangerous Goods, Solid Bulk Cargoes and Containers Sub Committee (DSC) for its meeting in September 2007.

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LASHING OF CONTAINERS

1. Introduction

- 1.1 This report has been produced to enable a summary of the feedback from the survey conducted in the latter part of 2006. It does not cover the full findings but includes information that is most likely to be of interest. As all statistics are not included in this report the following data should not be taken in isolation.
- 1.2 The survey questionnaire was developed in conjunction with Loughborough University in the United Kingdom. It was circulated to 89 ICHCA ISP members and the 12 members of the Container Handling Workgroup at PSSL (UK). This in total represents a variety of organisations and roles within the maritime sector.
- 1.3 As far as the documentation was concerned, some of the replies appeared to have been corrupted, possibly due to e-mail transfer and different operating systems around the world.

Some of the question numbering and formats appeared to differ or had become muddled. Although this was difficult and time consuming to collate and re-format, the data itself was intact and this did not detract from the final analysis.

2. Results

- 2.1 From the above organisations there was a 16% return from the total potential respondents and this exceeds the 10%, deemed to be the normal response for this type of survey.

However, to put this in perspective, 6 of the organisations covered multi – sites and in total the 18 respondents covered 60 ports and terminals from 6 countries. Surveys were returned from USA, Canada, Australia, Europe and one anonymous.

- 2.2 The results were collated onto a spreadsheet to enable quantification of the statistics and the creation of graphs for the full report. Percentages quoted have been rounded for the sake of clarity.

3. Comments on the Questions and Answers

Q 1 to 3 (& 7) established that this group covered an estimated 23,850 shoreside workers that worked on an estimated 18,550 vessel calls (**Q8**) into ports per annum. The survey also revealed that many ports and terminal operators had multiple roles, with organisations often being the statutory harbour/port authority and port operator. These organisations will then either 'sub let' their various terminals within the port complex to terminal operators, or operate the whole port themselves.

Q 4 asked how often the land based work force worked on ships. 89% of respondents answered this question and 72% of these responded 'every day'. Taking the average numbers of employees given by respondents in question 7, this survey indicates that from the organisations that participated, an estimated 17,172 shore-side workers work on ships every day.

Q 5 - Asked whether the respondent's organisation permitted ships crew to perform lashing duties whilst in port. Only 44% of respondents stated they allowed this and in **Q6** they confirmed that 33% of these worked on ships every day. The follow on question from this,

Question 6a, was to analyse why this was permitted and only a small majority (34%) stated this was due to 'accident risk'.

If the statistics in question 26 are taken into consideration, with 44% of respondents, reporting between 30% to 50% of their total accidents occurring on board ships and 11%, stating it was higher than 50%, it is suggested that some ports permit ship's crew to lash in an effort to transfer the risk.

22% of respondents stated they allowed crew to work their own ships for commercial reasons, whereas a further 33% said this was in consideration of both these reasons.

Commercially, permitting crew to lash can save considerable costs for port and terminal operators, as they need not employ their own workforce. Alternatively, ports and terminal operators will employ the use of workers provided by agencies or 'labour providers' to cover the ad hoc arrival of ships whereby the crew do not undertake stevedoring work. Certainly one large port that services between 1,000 to 2,000 ships annually, employed only 50 people. This is an indication this port relies on stevedoring to be undertaken either directly by the ships crew, or land based agency workers directly employed by the shipping lines. Unfortunately, if it is the ships crew undertaking the tasks, as it often is, it allows little if no time for any shore leave.

Q 9 – asked whether risk assessments were performed. The response was encouraging as 94% of organisations said they did. There was no clarification of whether this was a legal requirement and perhaps such a question could be included in future surveys. However, it is clear modern ports are identifying the hazards and assessing the risks on board visiting ships. Conversely, it might also suggest that there exists a perception (rightly or wrongly) that access conditions on board vessels are poor, therefore port and terminal operators are having to respond by implementing pre-work inspections or risk assessments.

Q 10 – was the same question but in relation to manual handling assessments. The response was that 83% stated they performed manual handling assessments

Q 11 – 'Fall protection at outboard lashing stations, with risk of falling overboard - how often are they found missing or damaged'? A combined figure of 34% indicated they were exposed to unprotected outboard lashing stations every week. This being, 28% 'occasionally' and 6% 'often' during the week. By interrogating the spreadsheet and analysing this group further, they represent on average, 17,000 workers that are exposed to this hazard either occasionally or often during the week. A likewise comparison can be made with average vessel calls and this group represented around 6,000 ship calls per annum. A combined figure of 36%, representing around 5,500 workers and 7,000 ship calls, indicated they were exposed 'occasionally' or 'often' on a monthly basis.

To put this type of vessel deficiency into perspective, a worker is expected to handle a vertical steel bar (weighing 21kg), to secure a container. An outboard lashing platform is on the extreme edge of the vessel and sometimes overhanging. On a large container vessel, if no fencing or guard rail exists, this means there is a risk of falling approximately 20 to 30 metres, either onto the quay or into the water respectively.

Nobody responded that they were exposed to this 'every day' and only 1 respondent (a major vessel operator) stated they had never experienced this hazard at all. Interestingly enough, all port and terminal operators along-with workers unions indicated exposure in the higher categories, whereas the 3 vessel operators rated their exposure in the lower categories.

Q 12 - A combined figure of 41% of respondents (again representing 17,000 workers but nearly 10,000 ship calls), said they were exposed to missing and damaged fall protection on a weekly basis. A combined figure of 18% (2,200 workers and 500 ship calls) monthly and 35% (7,000

workers servicing 6,000 ships) stated they were exposed annually. None said 'every day' and only one respondent said they were 'always good' and again this was a major US vessel operator. In all fairness this may well be the case, vessels without major access problems do exist, particularly as some shipping lines in the last five to six years have responded well to this safety issue and installed considerable improvements.

Q 13 – 'Ladders and stairs to work places on ships, (such as lashing work platforms) – how often are they found missing or damaged'? Fixed ladders and stairs feature on most vessels to gain access to the varying levels on board ship. This might be to gain access to different decks above or below, or an arrangement of work or lashing platforms constructed to give access for the securing of containers.

Although by percentage of respondents only 22% said their workers were exposed weekly, this was by far the largest sector as it represented 16,500 workers and 6,000 ship calls. The monthly exposure figure was also 22% but this sector only covered 2,000 workers and 3,500 ships. 'Occasionally during the year', 28% (representing 3,000 ship-workers and a similar number of ship calls), stated they were exposed to missing or damaged ladders or stairs. A further 22% (1,000 workers on 1,000 ships) said they were always good without any defects. Slightly worrying is that one respondent who employed between 250 to 500 employees and serviced between 1,000 to 2,000 ships, came across this hazard every day.

Q 14 – 'Container lashing equipment – how often is it found to be deficient or incompatible with the cargo securing plan'? The majority of respondents (36%) that serviced around 9,000 ships per annum stated they came across this on a weekly basis. 12% (3,000 ship calls) said they witnessed this monthly and 34% (4,000 ship calls) witnessed this annually. Only 18% stated they were always good, but this group only covered 1,000 vessel calls and the majority of this group (66%) were shipping owners (or vessel operators). Nobody reported exposure every day.

Q 15 – This asked respondents to list what they considered to be the main hazards when boarding ships. Thirteen issues were identified but the main perception was poor, or no fall protection (69% listed this); slips, trips and falls (63%); falling lashing gear and poor access (44%). See Appendix 1

Q 16 – 'The introduction of the 45 foot/ 9 foot 6 inch container has led to securing difficulties on ships and unsafe working practices'. Respondents were asked to agree or disagree with this statement. Overwhelmingly out of 16 respondents 67% agreed (28% of which strongly agreed), that the introduction of high cube containers has led to securing difficulties and unsafe practices. 22% can be considered as having no real opinion or abstained from comment. Only 2 respondents (11%) disagreed with the statement and both these respondents were shipping owners or operators of high cube containers.

Q 17 – 'What do you think of the introduction of different sizes and configurations of freight container away from the standard ISO container? Is it beneficial to the industry or otherwise'? *Please comment.*

The response required free answers without any direction and this led to too many responses to include all of them in this summary.

Several requested that the organisations introducing these variants do so with consultation with those in the transport chain, so that adverse technical, training and safety issues don't arise.

In summary, 89% of responses gave negative feedback and considered such variants as not being a benefit to the container transport industry.

Q 18 – ‘When deficiencies are found with safe access or container securing equipment on ships, do you record the details for future reference?’ Disregarding the severity of hazards, the majority (72%) recorded every ship identified as having hazards on board. 17% only recorded serious hazards. Only an accident on board ship would prompt a further 10% of respondents.

Q 19 – ‘Do you place access and working restrictions or prohibitions on deficient ships (or deficient locations on ships) to ensure worker safety?’ It appears that although 72% of respondents recorded all hazards on ships however minor, only 50% of total respondents reacted to this by placing access or work restrictions on their workforce.

The majority of respondents were consistent in that they applied the same criteria to recording all hazards and applying controls by restricting their workers accordingly. However, approximately a third of those that record all hazards, were not prepared to act on them unless there has been an accident or workforce dispute. A minority would neither record hazards nor place restrictions, unless there has been an accident or a worker dispute.

It is possible to some degree to look at this response by national or organisational groups. For example the respondents from Holland and the Workers Unions would only record hazards after an accident and only apply access or working restrictions after an accident or worker dispute. Whereas the two respondents from Australia, only record and place restrictions on serious hazards. With the USA, Canada, Belgium and the UK, in the majority of cases, hazards were recorded and reacted upon, however minor.

Some caution must be exercised with such categorisation as the number and size of groups within the overall survey response is probably too small to be wholly reliable.

Q 20 – ‘If you risk assess deficiencies, do you assign a numerical score or risk rating to your findings?’ 40% confirmed that they did quantify their findings.

Q 20a – ‘If the answer to question 20 was ‘YES’, do you use these ratings in your decision to apply access and working restrictions or prohibitions on ships?’ Again the response was 40% indicating the proper use of risk assessments.

Q 21 – ‘Does your organisation employ, or have contractual arrangement for a qualified health and safety advisor(s) with sufficient knowledge of cargo handling risks?’ 83% stated they employed, or had the services of such a person.

Q 22 – ‘Does the country, or nation that you operate within, have an enforcement Maritime Authority, or similar agency that undertake IMO/Port State Control (PSC) inspections of vessels in port?’ The response was as anticipated with a 100% confirmation

Q 23 - If you answered YES to question 22, how frequently are PSC inspections undertaken?’ (*Please mark your most appropriate answer*) A short list of range statements was offered, rather than asking for a definitive number.

A visit by a maritime enforcement inspector, (Port State Control Officer), as implemented by IMO Conventions (under Port State Control), was considered rare or occasional (per annum), by over half (55%) of the respondents. A further 33% stated they would see such inspection visits on a monthly basis. Of interest, 11% said they experienced weekly visits from a PSCO, indicating that there exists some disparity in how inspections are being applied internationally. When the returns were analysed there was a clear indication that the ports experiencing the most frequent visits are those in the USA, whereby such inspections are performed by the US Coastguards. See Appendix 2.

Q 24 'Is there a legal requirement to report shore based worker injury accidents that occur on board ships in port to the Maritime Authority or similar agency'?

95% gave a positive response, indicating that the countries in which the respondents operate had legislated for accident reporting and required accidents to 'nationals' on board ships to be reported.

Q 25 'Is there a legal requirement to report ships crew injury accidents that occur on board ships in port, to the Maritime Authority, or similar agency'? 56% indicated that national legislation required the reporting of injuries to crew on board ships, albeit there appears to be confusion in the UK. Half of UK respondents said 'YES' and half said 'NO', indicating there possibly exists confusion and lack of clarity within UK safety legislation.

Q 26 'Compared with the total number of injury accidents that occur in your organisation, what approximate percentage occur on board ships whilst in port'? (*If you do not know actual figure please estimate*). **Q27** asked to confirm whether calculated or estimated

All the respondents offered accidents statistics and 61% were accurate calculated returns. They clearly identified that accidents that occur on board ships mostly account for 31% to 40% of all accidents that occur within the organisation. This is considerably high considering all the other possible risks within port operations such as workplace transport and engineering.

See Appendix 3

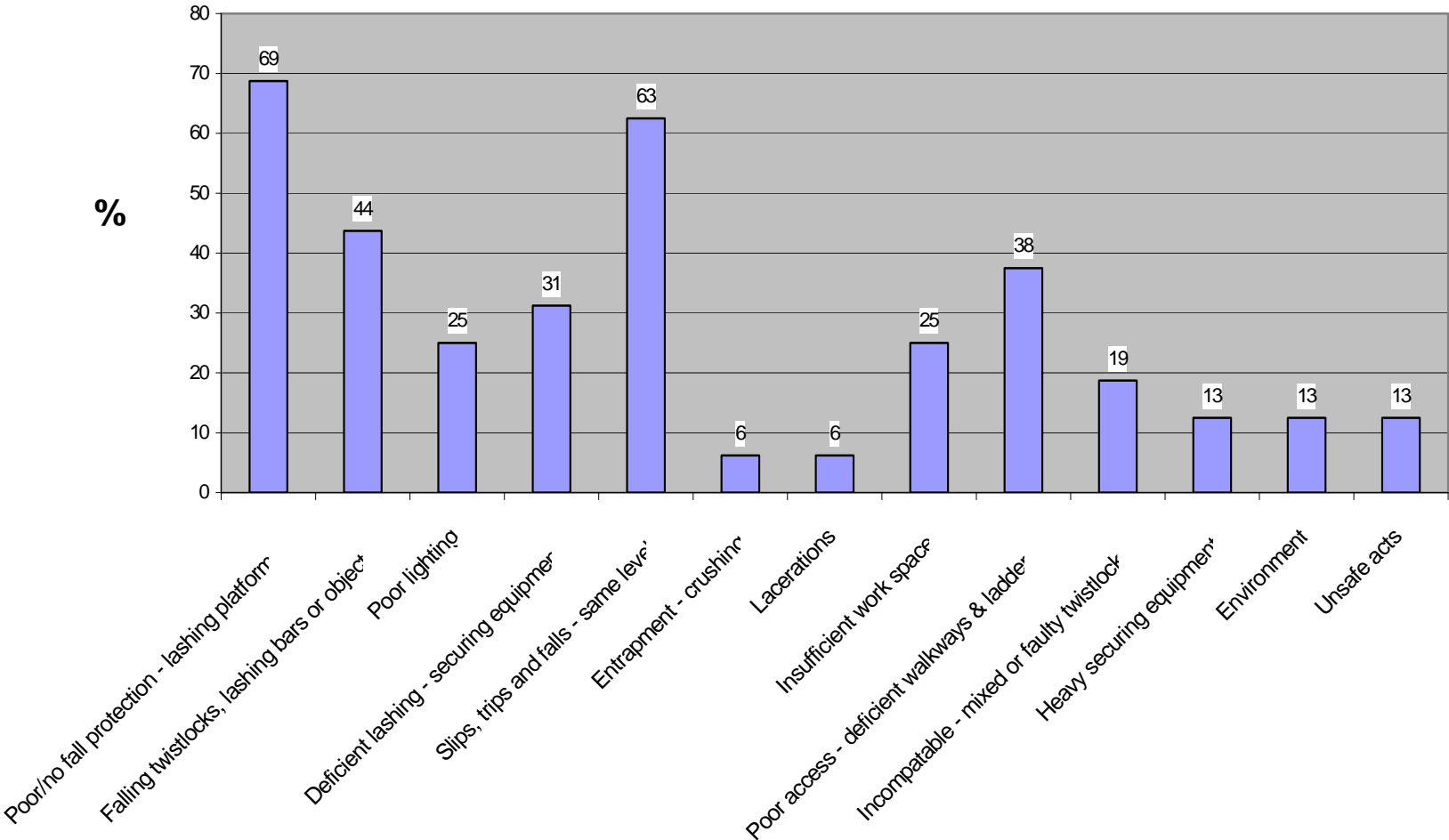
Q28 asked about the respondent's awareness of any injury accidents that had occurred whereby persons have fallen from lashing platforms. Half the respondents stated they were aware of such an incident within the last 12 months and to put this in to perspective, these particular respondents covered on average 10,000 vessels in total.

In Q29 they were asked of whether they were aware of any fatal accidents under such a scenario and 11% said never. Only 11% said they were aware of a fatal accident under these circumstances but included in this was an organisation that represents 12,000 shore-based workers. With 61% of respondents saying they have never heard of such occurrence, it is safe to say that fatal accidents of this manner are comparatively rare.

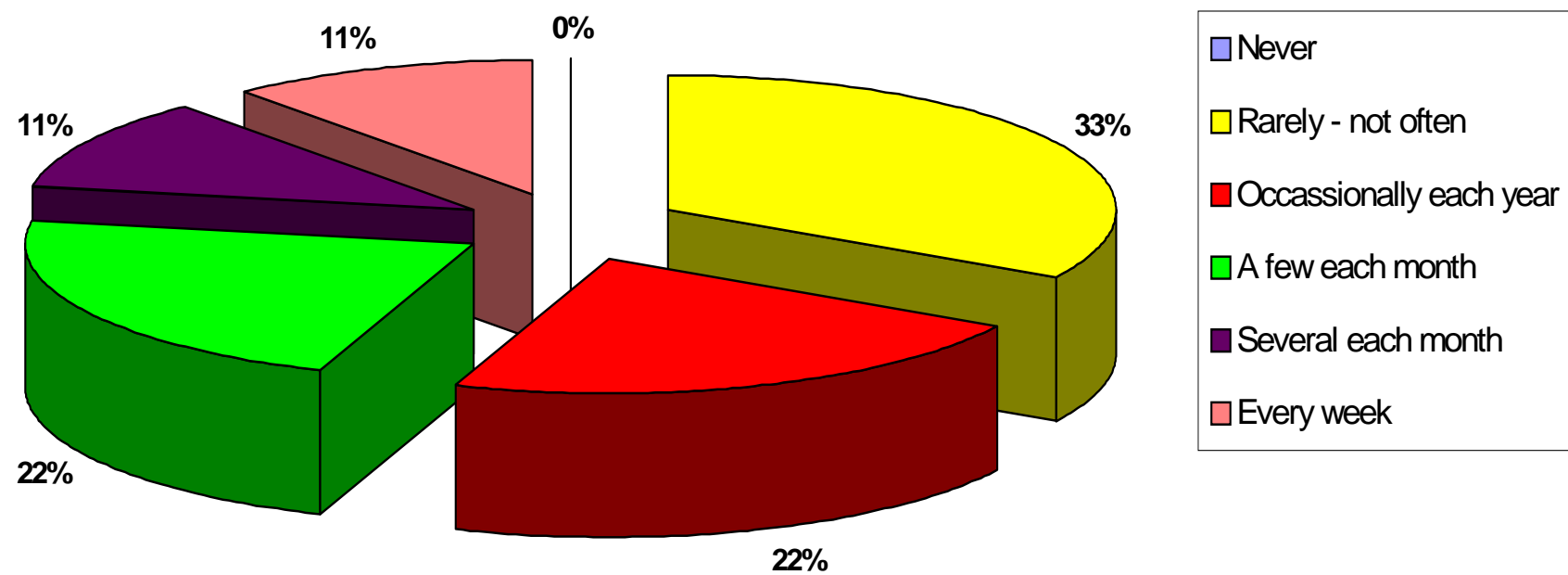
Q30 asked of their awareness of fatal accidents on board ships generally and there were fairly even returns. There had been an awareness of fatal accidents within the last 12 months for 22% respondents and a further 22% stated they were aware of such an incident within the last two years. If we take these two groups together and consider the number of ship calls they represent, collectively the risk of a fatal accident per ship calls is approximately 1:3,000 per annum, assuming they were aware of one fatality only

Q31/32. The last two questions asked whether they thought an International code should exist to cover safe access on board ship and the response was a 100% 'Yes', with several issues identified for inclusion in such a code. See Appendix 4 for the subjects that were considered relevant for any such code.

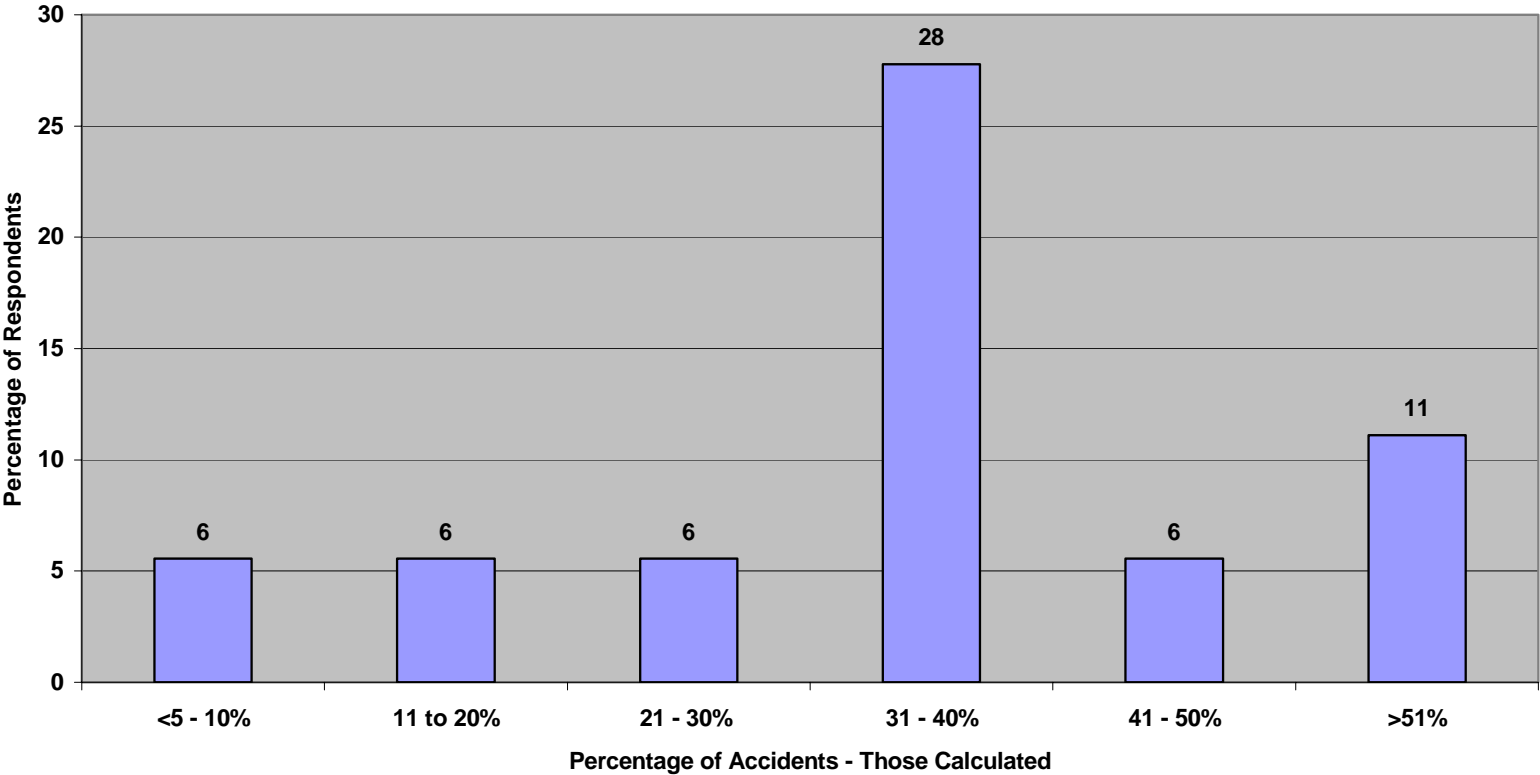
Q15 -Respondents opinion of hazards on board ships



Q23 - Frequency of Port State Control inspection of ships



Q26 – Percentage of accidents on board ship against total accident statistics.



Q31- Suggested issues for IMO Guidance

