

Welcome to the third issue of *In Survey* – Maritime New Zealand's (MNZ's) surveyor newsletter.

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This newsletter is for people directly linked to safe ship management (SSM) – SSM companies, marine surveyors, radio surveyors/inspectors, boat builders and maritime safety inspectors (MSIs).



Editor's intro

After sending out the second issue of *In Survey* in July, which was somewhat beefier than the first issue, I took some time to reflect and sort through the material for the next issue.

Thank you to my colleagues in MNZ who have supported me and given me great advice and some interesting ideas for future issues, and also thank you to all the surveyors, naval architects, boat builders, and even the occasional owner, who have kept a steady stream of complex issues coming in. I hope these will be interesting topics for the future.

Please keep sending in questions and follow-up letters on the subjects covered, as you may have an opinion/idea that can be developed further.

At present, a couple of surveyors have begun a very interesting discussion on RIBs and other types of vessels, which is developing into a rules bulletin.

Photographs are also urgently needed, with small stories about surveying you found interesting, that you would like to share.

There have been two recent maritime disasters in our area of the world – the Kiribati and Tongan ferry sinkings – with tragic loss of life.

Never say it couldn't happen here – my experiences over the last year suggests it is very possible, having seen a number of vessels in very poor condition, requiring immediate structural and watertight remedial work to be undertaken.

Everyone in the industry must take ownership of safety – whether the boat builder raises question about the design, welding or other construction details, the surveyor is unhappy with any aspect of the survey, or MSIs feel they should investigate something in more depth. We must all stop and think, and not be afraid to stand up and say a vessel is unsafe and should not operate.

I have also been reflecting on my life at sea since joining my first ship in Singapore as a naïve 16-year-old, and realised how lucky I have always been.

I have never had a serious ship fire, apart from the occasional scavenge fire and a small number of minor electrical and fuel fires that were easily extinguished by hand (although they all had the potential to become serious).

I have never lost a ship mate through a shipboard accident, drowning, or entry into a confined space (although I did have a minor role in pulling a cook, a little worse for drink, from the chilly waters of Scapa Flow), and I've always been on well run vessels with professional seafarers who took pride in their ships.

Good seamanship, good engineering practices, and good moral judgement (even though we were certainly not saints, I do believe we were moral) generally make for a happy, well maintained and safe ship.

With such a huge variety of humanity in a relatively small space, for long periods of time, mutual respect and understanding was paramount to a happy ship.

I believe most MSIs and surveyors can tell in a few seconds how well (or badly) a ship is run, and the deficiencies generally reflect this initial assessment.

On the downside I have witnessed shore-side personnel killed in terrible accidents with mooring ropes and wires, falls into dry docks and holds, a few finger amputations and broken bones – all from accidents that should never have occurred. I myself have suffered the occasional trip or fall that could easily have been prevented if proper hazard identification and control procedures had been in place.

SSM? Just focus on the three words, throw in a pinch of common sense, and hopefully we can all make a difference. Well-designed and well-built boats, correctly maintained with well-trained and motivated crew equal a safe industry for us all.

Ken Wyatt (Technical Advisor – Marine Survey)

Letters to the editor

Question: *Could you please advise what the flag requirements are for compass adjustment periods?*

Answer: Maritime Rule Part 45 Appendix – Compass Adjustment, clause (b) – Compass adjustment on ships to which SOLAS is not applied. This clause spells out the period as being:

- whenever necessary to comply with Maritime Rule Part 45, and
- within 1 month of the 4-or-5-yearly out-of-water survey required by Maritime Rule Part 46.17(1)(b).

The appendix does not have a number, only the title “compass adjustment”. This makes it a bit awkward to refer to it.

Question: *I have a boat coming from another surveyor who has stated that a vessel does not require survival craft (life boats, rescue boats, liferafts and buoyant apparatus).*

The vessel is 20 m in length and carries 80 passengers on the inshore limits (restricted limits vessel).

My interpretation of the rules is that a vessel under Maritime Rules Part 40A, Appendix 4.3, Survival Craft (4) that carries more than 36 passengers is to carry lifeboats, rescue boats, liferafts, and buoyant apparatus for at least 20% of the total number of people the vessel is certified to carry. Which for this boat would be enough for 16 people.

The interpretation I have been given is that lifejackets are buoyant apparatus, but I disagree. Can you please clarify?

Answer: You are correct. The vessel is operating in the inshore area and is certified to carry 80 people.

The vessel must have on board a combination of liferafts, rescue boats or buoyant apparatus for 16 people.

It is also required to carry a lifejacket for every person on board. As the vessel is certified to carry more than 12 people it should also have at least 8 children's lifejackets.

“Buoyant apparatus” is described in Maritime Rule Part 42A.31 and can not be lifejackets.

A spanner in the works curly questions from maritime rules

Last issue's question, from Phil Norman:

If a chartered fishing boat skipper holds a Commercial Launch Master (CLM) certificate, are there any circumstances in which he/she is allowed to operate beyond the 12 nautical mile limit?

Answer: A holder of a CLM may be allowed to skipper a boat beyond the 12 nautical mile limit only if he holds an exemption to do so. Such exemptions are only considered for skippers who have a record of operating the same boat in the areas given in the circular letter below.

MSA circular letter 86, 1996

Boats approved on an individual basis may be permitted to go directly to one of the areas specified from a stipulated area on the mainland.

For the skipper with a CLM certificate the areas are:

- an area within the territorial sea around the Three Kings Islands, and including two contiguous areas as follows:
 - an area within a radius of 7 nautical miles from the position 34°S 171°50' E which encompasses the Middlesex Bank
 - an area within a radius of 10 nautical miles from position 34°S 172°12'E which encompasses the King Bank.

Vessels are to proceed direct from North Cape to this area.

- An area bounded by the limits of the territorial sea of New Zealand between Cape Runaway and Tokomaru Bay, and including a contiguous area within a 10 mile radius of the centre of the Ranfurly Bank in position 37°34'S 178°53'E.

For boats going to Three Kings Islands and Ranfurly Bank – minimum manning is master and one crew member, both of whom hold CLM certificates.

The master in all cases is to be familiar with, and experienced in the particular boat, and the prescribed area to which the boat is permitted to go. Also either the master or crewmember holding a CLM shall have undertaken approved Restricted Radar Observer and Restricted Radiotelephone Operator courses.

This issue's question, from Sharon Whittaker:

The master of a 47 m passenger vessel with inshore limits has been approached by a crewmember complaining of sexual harassment, and takes appropriate action. Is the master required to record this in the New Zealand official logbook?

The first correct answer, quoting the appropriate rules, sent to ken.wyatt@maritimenz.govt.nz will win. The answer will appear in the next issue, along with the name of the first person who correctly answered our curly question.

If you have a curly question about rules, please email it to Ken at the address above.

Just for the hull of it

The photo below was taken during a recent out-of-water survey of a 10-year-old 30 m barge.

This is an excellent example of how internal structures should look, hopefully for the life of the vessel.

Thanks to surveyor Robin Williams for these photos.



Internal structure of a 30 m 10-year-old barge.



Crack testing propeller shafts is not a waste of time!

The previous photo shows one end of two propeller shafts on a privately owned launch, built in Taiwan. The grade of steel is not known but it is highly magnetic.

The shafts were not very old and both shafts were affected. It may be of interest to our surveyors.

Thanks to Peter Chard for this. There was some discussion at an Auckland surveyor seminar regarding propeller shaft crack detection. Some surveyors have never found cracks in shafts, while others had found cracking around keyways on a number of shafts.

It's also a timely reminder that when vessels are constructed overseas and not to stringent survey standards, it pays to be prepared for the unexpected.

Boat launching procedure

I just bought a new boat and decided to take her for the maiden voyage last weekend. This is my first boat and I wasn't quite sure of the exact standard operating procedure for launching it off a ramp, but I figured it couldn't be too hard.

I consulted my local boat dealer for advice, but they just said "don't let the trailer get too deep when you are trying to launch the boat".

So please tell me – what am I doing wrong? I don't know what they meant by that, as I could barely get the trailer in the water at all!

Thanks to Jean Reynolds at Survey Nelson Ltd. for this.



General

Vessels that do not comply with existing requirements in the Maritime Rule Part 40 series

The last issue of *In Survey* contained a question regarding vessels that came into SSM as an existing ship that has a certificate of survey that was issued before 1 February 1998 (grandfathered). I have received quite a lot of feedback from surveyors on this issue.

MNZ has therefore revisited the problem, and the decision has been made to take a more pragmatic approach to existing ships that were brought into the current SSM system via Maritime Rule Parts 21.13(2)(b) and 40A.7(3), which were compliant with previous legislative standards/requirements, but are unlikely to meet the new more prescriptive maritime rule requirements.

In taking such an approach, consideration should be given to the circumstances and operation of the vessel, compliance with maritime rules that apply to that vessel, and the risk to safety.

For other existing vessels which may have a certificate of survey that is not to prescriptive legislative standards, a strict application of Maritime Rule Part 40A.7(3) will be applied, as well as compliance with the stricter maritime rule requirements. Where this may result in difficulties for the existing vessel, it is suggested consideration be given to whether an exemption is required.

One surveyor has taken a very practical stance on this – when any work is carried out on non-compliant areas, he convinces the owner to raise the standard to the new rules, eg wheelhouse windows – if work is carried on in the wheelhouse, he points out that the huge array of delicate electronic equipment could be damaged if the old windows fail, therefore giving both safety and financial incentives to fit stronger wheelhouse windows.

I hope this gives surveyors a greater confidence in dealing with these vessels.

SSM certificate extensions

There is a misconception among surveyors that they are able to extend the validity of an SSM certificate for up to 1 month.

Maritime Rule Part 46.17(2) allows the SSM company to extend the survey date by 1 month, however, they cannot extend the SSM certificate expiry date.

MNZ has a procedure in place to grant exemptions from holding a valid SSM certificate when a suitable slip or dock is unavailable.

However, this exemption is not to cover tardy dock bookings, and at the last SSM company seminar it was agreed to grant a 3-month early survey without incurring a time penalty.

There is also an exemption option should surveyors be unable to complete survey/paperwork in time, but it is MNZ's expectation that this is a short-term solution and that they need to ensure operators plan their surveys at an earlier date than at present.

There have been a number of occurrences recently where surveyors have advised owners they are extending the validity of their SSM certificate.

Health & safety

Stuff you see at boat builders – the first aid station – what the heck?

Thanks to Hans Grimbergen for the photo below.

I guess the adhesive may be required if the circular saw was needed, and the contents of the fragile cardboard may well be grog for anaesthetic purposes prior to the saw use.



Confined space entry

As surveyors and MSIs we tend to think of confined space entry as those tanks found on larger ships, where we are used to the normal shipboard controls that a good shipping company or repair facility will have put into place, such as gas freeing, chemist analysis, entry control, monitoring and rescue plans.

The International Maritime Organization (IMO) has recorded 101 enclosed space incidents, resulting in 93 deaths and 96 injuries, since November 1997.

The following vessel types and figures are from the IMO's incident statistics, for vessel types that are commonly inspected, repaired or surveyed in New Zealand, and the corresponding number of deaths or injuries that occurred on board these vessels that resulted from an enclosed space incident.

- Fishing vessels – 17
- Barges – 3
- Tugs – 2
- Ro-ro passenger ferries – 2
- Offshore – 2
- Dredge – 1
- Workboat – 1
- River launch – 1

Enclosed spaces are found on a wide variety of vessels.

"Enclosed space" means a space that has any of the following characteristics:

- limited openings for entry and exit
- unfavourable natural ventilation
- not designed for continuous worker occupancy
- capacity to accumulate or contain hazardous atmosphere.

This includes, but is not limited to: cargo spaces, double bottoms, fuel tanks, ballast tanks, pump rooms, compressor rooms, cofferdams, void spaces, duct keels, inter-barrier spaces, engine crankcases, sewage tanks and fish rooms.

Many forms of chemical reaction can cause low oxygen levels or dangerous gasses to build up, for example the decay of waste material or the exhaust from machinery (fixed or portable).

One common type of reaction is corrosion or rusting, which can significantly reduce the oxygen content in a space.

All enclosed spaces therefore need to be treated with caution before opening or entering.

Investigations into the circumstances of the casualties that have occurred show that accidents on board ships are in most cases caused by an insufficient knowledge of, or disregard for, the need to take precautions, rather than a lack of guidance.

It is tempting to "just pop into the void tank", and it may seem easier to not tell anyone than to follow the correct procedure, but stop, think and act safely – it may not be only your life at risk, others may come to rescue you without stopping to think.

My own experience of this, as a first trip cadet, was when the engineering superintendent, as he was leaving the engine room, told me to carry out a hammer test in the main engine crankcase, which was a Doxford.

This was in Singapore, with high engine room temperature and humidity. The top end of the bottom piston was quite high up, no-one knew I was in there and I wasn't 100% sure of what I was doing – I only knew you hit the huge nuts with a hammer.

The inevitable occurred – I was overcome by heat and lack of oxygen and fell, striking my head and ending up in a pool of oil. Luckily I was noticed by a crewmember and dragged out.

The chief was extremely unhappy with the superintendent, and I now don't like being in small places.

Courses and seminars

IOPP certification course

Following on from the articles in previous issues of *In Survey* regarding the international oil pollution prevention (IOPP) certification required by vessels greater than 400 gross tons, MNZ has realised that there is a serious shortfall in the number of surveyors who have the recognition to undertake IOPP surveys on behalf of the Director of MNZ.

In the past vessels have been overlooked, and the class societies have generally issued the certificates as part of the hull and machinery survey – class will of course continue to do this in the majority of cases.

However, there are a number of vessels that do not come under the classification societies that require IOPP certification, including annual survey.

Presently there is only one surveyor who holds recognition through one SSM company. It was therefore agreed that MNZ would hold a course so that other surveyors could be recognised for IOPP certification.

To gain recognition as a surveyor, IOPP surveyors need to:

- be a recognised SSM surveyor for vessels greater than 24 m with 5 years' experience as a recognised SSM surveyor
- be Class 1 Marine Engineer with 5 years' experience as chief engineer
- meet the training in IOPP requirements (this course)
- undergo peer review.

A 1-day IOPP course was held for SSM surveyors with the appropriate qualifications and experience in MNZ's Wellington office on 10 September 2009.

Tom Battrick kindly agreed to deliver the bulk of the material, and Ken Wyatt reinforced the maritime protection rules and explained the reasons behind the course – to allow a small number of SSM surveyors to undertake initial, intermediate and annual IOPP surveys and apply for IOPP certificates from MNZ on SSM vessels over 400 gross tons (excluding tankers).

Tom gave an interesting overview and history of MARPOL, and Annex 1 in particular, followed by details of how an oily water separator (OWS) operates, the types of OWS and details of installation. He also talked about the forms and checklists necessary for undertaking surveys, and the development of shipboard oil pollution emergency plan (SOPEP) manuals.

He explained the importance of the oil record book, the tank plan, certificates of approval – as issued by an independent authority, not a manufacturer – and the importance of having the OWS manual on board for maintenance cleaning etc.

Tom explained the survey process, beginning with the paperwork inspection, and type approval for an OWS and/or bilge water monitor, if fitted. He then explained the entries in oil record books, that receipts need to be kept for 3 years, and the tank plan and amounts of sludge that may be retained on board, along with records of discharges pumped ashore.

The requirement of each type of survey was discussed – initial, intermediate and annual.

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Moving on to the actual physical inspection, Tom explained the requirement to inspect: piping – and if concerned have a section before the overboard valve removed; the base of the OWS for damage or corrosion; the capacity of the sludge tank; the standard shore connection; and the test the OWS.

Tom showed examples of some of the deficiencies found during PSC inspections.

A detailed discussion was held regarding the prohibition of carrying oil in the forepeak and the problems and rules for ballast water in fuel tanks.

Marine Protection Rule Parts 120, 121B, 122, 123B and 101A were explained in detail, and a number of interesting in-depth questions were brought up by surveyors.

The proposed peer review was also explained and how MNZ would instigate this.

At this stage the surveyors with little practical experience would be required to undertake more peer reviews, while those who had more experience (provided they marked well on the test at the end of the day) would have fewer reviews.

At the end of the IOPP course presentations the surveyors in attendance sat an exam.

The feedback received from the attendees was very good, with everyone giving very positive comments about the course content and delivery.

Surveyor seminars

Preliminary dates for the surveyor seminars are:

- Auckland – 14 & 15 October 2009
- Christchurch – 21 October 2009
- Nelson – 28 October 2009
- Wellington – 4 November 2009.

Confirmation of these dates and agendas will be sent out to SSM companies and surveyors as soon as they are finalised.

Nuts & bolts technical section

New builds

Following a recent road trip, during which I hopefully assisted in solving a problem with a new build vessel involving a designer, naval architect, boat builder and owner, I also came across another build where both the surveyor and builder were unhappy with the welding standards that had been carried out at a previous boat yard.

The surveyor had correctly raised serious concerns regarding the construction of the vessel, with special consideration to the poor welding procedures, and refused to survey the vessel any further.

This led to another surveyor becoming involved, who thankfully endorsed the previous surveyor's observations.

As an industry we are going to have to address the whole commercial new build process, and identify how each of the parties interacts with all the other people involved, including the designer, naval architect for plan approval, surveyor and boat builder, and learn what each expects and requires from everyone else.

One builder has promised to write an article for the next issue of *In Survey* which will ask questions to stimulate a discussion.

I know of three builders who have experienced difficulties with this process, and in each case it has resulted in costly delays or less than ideal compromises.



New build – with welding deficiencies.

EPIRB service and battery expiry

In response to the articles in the last issue of *In Survey*, Dave Chapman, Southern Region Manager at RFD NZ Ltd, has sent in the following.

ACR EPIRB battery replacement and EPIRBs in liferafts

Most EPIRB manufacturers use a distribution network in New Zealand for the sale of their product, but only ACR use a New Zealand agent who also has the ability to service their product on a nationwide basis.

RFD NZ Ltd has 12 ACR-certified service technicians in four main centres across New Zealand, with the ability to carry out battery replacement and testing of all ACR EPIRBs and PLBs.

This service is available now, and can be carried out quickly without incurring excessive freight costs and associated delays.

More importantly, there is no need to re-register the beacon with RCCNZ.

Any EPIRB exchange programme runs the very high risk of the owner forgetting to register the replacement EPIRB.

This could ultimately place RCCNZ in the extremely frustrating position of responding to an EPIRB that is either not registered or is registered to a previous owner. The resulting delay could hinder a timely rescue operation.

RFD is also the only EPIRB manufacturer's agent to have carried out extensive liferaft drop tests (in accordance with industry best practice and with MNZ's knowledge) in order to ensure that any ACR EPIRB packed into a liferaft will not only survive the stresses of the packing process, but will be in a fully serviceable condition when the liferaft is boarded in an emergency.

A recent advisory from ACR states, "ACR Electronics Inc. has a long tradition of standing behind its products and will warranty any ACR brand survival equipment that experiences a defect in workmanship or materials, whether it is packed in a liferaft or not".

New SSM resources

MNZ has produced two new resources for operators and SSM companies.



Safe ship management: your guide to entry

This is an A5 illustrated booklet that clearly explains what SSM is; the steps into SSM; the various responsibilities in SSM; 10 golden rules of a SSM system; plus MNZ contacts and other information sources.

It replaces the three MNZ leaflets on SSM, which should no longer be used.

MNZ will send a box of 200 booklets to each SSM company before the end of September. Feel free to post or hand them out to any clients or potential clients wanting more information on SSM.

Safe ship management ring binders

We also have available a limited number of printed ring binders with heavy clear pockets. These are suited to hold documents, certificates and the SSM manual contents if the operator requires it.

If you are interested in these free publications please contact MNZ Technical Trainer Darren Guard by email darren.guard@maritimenz.govt.nz or phone 0508 22 55 22.

We are also working on a small, simple resource about the documents and certificates required for SSM and SOLAS. This will explain the purpose of documents and certificates, what vessels need them and why, how they are obtained and so on. We will update you on progress with in the next issue of *In Survey*.

If you have any other ideas for useful resources please contact Darren Guard with your suggestions.

The MNZ Safety Management Systems Team



(Back row, from left to right)

Sharyn Forsyth, General Manager Maritime Services; Darren Guard, Technical Trainer; Sharon Whittaker, Administration Assistant; Phil Norman, Exemptions; Minnie Locke, Data Administrator; Ken Wyatt, Technical Advisor; Arthur Jobard, Manager Safety Management Systems.

(Front row, from left to right)

John Whiteley, Nautical Advisor; Murray Fairweather, Consultant; Briar Foster, Administrator.

Absent: Lynn Irving, Health and Safety Co-ordinator.



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New Zealand Government

Maritime New Zealand Guidelines

SAFETY BULLETIN ISSUE 21 – SEPTEMBER 2009

ENCLOSED AND CONFINED SPACES CAN KILL

This safety bulletin is for:

- New Zealand ship owners, masters and crew
- any contractors, ship builders or repairers working on board ships
- safe ship management companies and surveyors
- classification societies in New Zealand and class surveyors
- MNZ maritime safety inspectors.

Purpose

This bulletin is issued to highlight dangerous confined spaces onboard ships, some of the lethal hazards present, how best to reduce the risks involved and to alert people to the hazards of poorly planned rescue attempts.

Warning – risk of death

Life is risked every time someone enters an enclosed or confined space without following the correct procedures.

The space may be deficient in oxygen. Oxygen deficiency can be caused by:

- rusting steel or chain
- rotting organic matter
- drying paint or coatings
- motors/petrol pumps
- refrigerants and other gases
- hot work (torching or welding).

The space may also contain flammable or toxic fumes, gases or vapours. Carbon monoxide damages your ability to absorb oxygen and this effect can also accumulate for days after exposure. Hydrogen sulphide is highly poisonous, often lethal and can evolve from fuel tanks, pipes, sewage and organic decomposition.

Enclosed or confined spaces

A dangerous enclosed or confined space is a space with the following characteristics:

- severely limited natural ventilation
- capacity to accumulate or contain hazardous atmosphere
- exits that are not readily available
- designs that are not meant for continuous occupancy.

Examples of enclosed spaces are:

- cargo holds
- pump rooms
- fuel/bunker tanks
- chain lockers
- paint/chemical lockers
- sanitary/waste tanks
- pipe tunnels
- peak tanks
- any other poorly ventilated confined space
- battery lockers
- boiler furnaces
- ballast tanks
- void spaces
- fresh water tanks
- double bottom tanks
- engine crankcases
- cofferdams

Precautions and procedures

Familiarise yourself with the health and safety advice provided in the Maritime New Zealand *Code of Safe Working Practices for Merchant Seafarers*, the Department of Labour information sheets - *Safe Working in a Confined Space*, and IMO Resolution A.864(20). These documents describe how to establish procedures for entry into enclosed spaces and should be considered in addition to identifying all of the confined spaces on board that may pose a hazard. Procedures include examples of permit to work systems and the rationale on how to apply them on board for both the ship's crew, and importantly, all contractors working on board.

Before entry

The space should be assessed by a person with sufficient knowledge and experience to ensure that:

- the potential hazards of the space are identified
- the space is prepared for entry
- the space is secured for entry
- the atmosphere of the space is safe for entry, involving a test of the atmosphere whenever necessary.

On entry

On entering a dangerous space ensure that:

- you never carry out entry work alone
- you have a person assigned on safety standby for each entry
- the person on standby is equipped with the right equipment to be able to raise an emergency alarm, adequate protective clothing and sufficient equipment to initiate a rescue
- the space is well ventilated.

If things go wrong

If you see someone lying motionless, even if at the bottom of a ladder in an enclosed space, **DO NOT rush in to carry out a rescue by yourself**. Typically, personnel react by rushing into lethal atmospheres under the misconception that they will be able to save colleagues. But unplanned rescues are likely to end in tragedy.

When an emergency occurs the alarm should be sounded so that back-up is immediately available to the rescue team. Under no circumstances should the attendant enter the space before help has arrived and the situation has been evaluated. The safety of rescuers entering the space must be ensured.

Rescue procedures

Full consideration should be given to rescue procedures and specifically that:

- rescue procedures should be planned before entry and taken into account in any risk assessment.
- the rescue procedure should be specific for each type of dangerous enclosed or confined space.
- rescue equipment should be immediately available.
- breathing apparatus should be **self contained breathing apparatus (SCBA)** and **NOT** emergency escape breathing devices (EEBDs).
- any rescue procedure should be practised frequently enough to provide a level of proficiency that eliminates life-threatening rescue attempts and ensures an efficient and calm response to any emergency.

Further reading

Maritime New Zealand *Code of Safe Working Practices for Merchant Seafarers 2007*, Chapters 16 and 17.
<http://www.maritimenz.govt.nz/Commercial/Shipping-safety>

Department of Labour *Safe Working in a Confined Space*
<http://www.osh.govt.nz/order/catalogue/pdf/confined.pdf>

IMO recommendations for entering enclosed spaces aboard ships, annex to Resolution A.864(20) adopted 27.11.97 [http://www.imo.org/includes/blastData.asp/doc_id=10569/864\(20\).pdf](http://www.imo.org/includes/blastData.asp/doc_id=10569/864(20).pdf)

Further Information

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