



AUSTRALASIAN INSTITUTE OF MARINE SURVEYORS

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NEWSLETTER

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It is now only seven weeks until the biennial AIMS conference will be held in Western Australia. If readers have not made the appropriate arrangements, time is running short. Please be reminded that our conference follows that of the NMSC, making the journey all the more worthwhile. Invitations, programs and speakers abstracts are available online for further review for both conferences.

As would be expected, the Maritime Reform Agenda, including the Single National Jurisdiction, is well represented within discussion topics and the extent of these changes continues to become more apparent. For those not directly involved at very high levels (including myself) it would appear that extensive deliberations have been held and possible decisions reached on the future progress of these topics. The extent of the industry consultations required to achieve the reforms proposed is wide ranging. They involve amendments to Commonwealth, State and Territory Legislation, including the Navigation Act and Marine Orders, and it would take too long within this Newsletter to even attempt to summarise the extent of these intended changes. It is apparent that all necessary areas of reform are under review and although the timeframe for delivery may be ambitious (for completion mid 2011), a deadline appears to have been imposed across all deliverables and stakeholders involved.

AIMS is participating in some areas of the reform process and have been asked to be part of the Steering Committee, reporting to the Maritime Advisory Committee, in particular on the recommendations of the Technical Reference Group and are also involved in the development of Marine Surveyors Competencies. To this end AIMS welcomes input and comment from members and readers, as the outcomes of these reforms are likely to stand for a very long time. If any readers doubt this comment, then they should consider the time that has elapsed since the Navigation Act 1912 was last significantly amended?

For further details regarding these reforms I suggest that interested parties visit the following sites:

[www.amsa.gov.au/Maritime Reform](http://www.amsa.gov.au/Maritime_Reform)

and/or

www.nmsc.gov.au

click on the tabs “nmsc and you”, then “have your say” and finally “documents for comment”, where a number of papers / drafts are available for review and comment. As previously mentioned AIMS would welcome any comments being forwarded to us (or directly to myself). This will help in our endeavours to provide the appropriate representation with which we have been tasked

The Executive have also had further, recent communications with AQIS, after we became aware of the Ministerial Task Force set up to explore alternative service delivery arrangements for AQIS Grain inspection in line with recommendations of the Beale Review and in order to promote efficiencies and improve productivity.. It must be mentioned that we were disappointed with the lack of advice from AQIS about this review, particularly in the light of the efforts AIMS has made over several years to with the delivery of services in this industry. Fortunately the level of co-operation between AIMS Members & AQIS Officers at a local level continues to remain strong and the Executive and Grain Sub-committee (yes they continue their efforts) will endeavour to re-establish similar courtesies at a management level.

It is again pleasing to welcome several new Members including Capt. Huda, Mr. Behan and Mr. Hill in Queensland, and Capt. Rampal in Victoria. Five more applications are currently under review.

In closing, I look forward to catching up with both Members and readers in Perth in late August, and shall be available to meet all and any interested individuals at that time.

Steven Beale
President. AIMS

The Australian Ship Handling Centre.

(The following is an edited version of a presentation by Captain Cliff Beazley, Chief Instructor of Port Ash, Australia to a combined meeting of NISEA and CMMA on 12th. May 2010)

The aviation industry has used flight simulators for many years, for training new pilots, training qualified pilots on new aircraft types, periodic 'checking' of qualified pilots and refreshing or updating qualified pilots. In contrast, ships' masters and marine pilots, apart from those employed by progressive cruise companies, pilotage organisations and some tanker owners, have very little opportunity to learn or practice ship handling except through 'on the job' training. When the monetary value of a Panamax bulk carrier (approximately US\$ 40m), loaded with a full cargo of grain for example (approximately US\$ 18m) is considered, not taking into account any risk assessment for possible environmental damage claims, this really does not make economic sense.

Full flight simulators are said to be very realistic to pilots when they are the ones 'flying' them, because they are mounted in pods with six degrees of freedom of movement. Ship simulators are unable to give this sensory input, are somewhat limited in their realism and do not project a sense of emergency when things are programmed to go wrong. A manned model is a scaled model ship, manned by an instructor and a trainee at least, that closely replicates the handling characteristics of the type of vessel on which it is based. There are now five manned model training establishments in the world – at Warsash (Southampton, U.K.), Ilawa (Poland), Port Revel (France), Massachusetts (U.S.A.) and Australia.

Port Ash, located approximately 20 kms north of Newcastle, is the home port of the Australian Ship Handling Centre, a facility dedicated to practical training. It is a purpose built, five acre lake that uses manned models for courses in ship handling, with and without tug assistance. The Chief Instructor Capt. Beazley served at sea with Blue Funnel Line, MacAndrews, Howard Smith Industries and then as a Newcastle NSW pilot for 27 years.

In the early nineteen nineties Cliff was considering a manned model simulator. There was a lack of experienced masters looking for pilots' positions and the AMC simulator was valuable but of limited use for pilot training. The end result was considerable real life, on the job learning. Cliff had always been a keen model builder and was able to obtain the plans for an Ampol Handymax size tanker, m.v."Palmerston". He decided to build a 1/25 scale model in his garage, helped by his son Andrew and son-in-law Ian Powell, using soft wood and plywood. The completed prototype hull was covered in GRP and became the plug for a GRP mould, stiffened with steel sections for further use. After a successful flotation test on Lake Macquarie the model was stored on a trailer, awaiting use.

The search for a suitable lake or a place to build a lake was made within the Newcastle Hunter Valley area, for practical reasons. A viable property was found at Raymond Terrace with the advantage of a watercourse. After it was purchased tenants were moved in while the project was put into place. A grant of \$250,000 was made by the NSW Skills Centre on the proviso that it was matched by the project principals. In 1996 the lake was dug out, with channels, shallow areas, a dock and a narrow canal. The bed was lined just in time for a period of abnormal, heavy rain that filled and then flooded the lake. There was no time to build the planned wharfs and a temporary dam was erected to permit that work.

The Port covers about 5 acres of waterways and features a canal with a 115 degree bend. The canal represents a 100m.wide waterway and together with the basin areas has a depth of 14 scale metres. A large flat bottomed area of open water at the same depth has been designed to

demonstrate squat and depth transition/bank effect at speed. Other areas represent 25m, 40m, and 50m depths for deep and shallow water manoeuvring comparison. Shallow water effects are experienced in the confined waterways. There are three different mediums for anchor dredging comparisons, clay, sand and gravel

There are several berths on the lake and in the basin areas. These are placed so as to have at least one upwind berth at all times. Some of these are sheet pile berths, some open dolphin type so that the different hydro-dynamic forces can be demonstrated. There is an offshore loading dolphin jetty, two SPM buoys and several anchoring areas of varying bottom type. A current generator produces local currents and these can be used to demonstrate lateral forces. Berthing can be practiced with the current either ahead or astern. A current can be produced in the canal and transition effects experienced while entering and departing the basin areas.

The centre has three ship-models built to a scale of 1/25 which comply with STCW95 Code:

“Triton” (named after the brand of work centre used for its construction) 40,000 dwt ‘Handymax’ of dimensions 179m. loa x 32m. beam x 16.4m depth x 11m draft. The model is 7.16m. long with an actual load displacement of about 3.3 tonnes It has two anchors, a bow thruster unit and is fitted with log and wind speed displayed in scale knots.

“Mentor” 70,000 dwt ‘Panamax’ of dimensions 225m loa x 32m. beam x 18.3m.depth x 13m. draft. The model is 9m. long, and has a load displacement of about 5 tonnes.

These models have fixed pitch, right hand propellers. They are easily de/ballasted to reproduce light ballast through to full load conditions. Advantage has been taken of state-of-the-art technology to provide ship's controls and monitors on touch screens in each position, displaying at 1:25 scale where appropriate. Main engine characteristics can be altered to simulate diesel or steam turbine. Power settings can be altered to simulate an individual ship's speed settings. Rudder characteristics can also be altered to change advance and transfer figures and, if required, simulate a poor steering ship. In case of computer failure, both steering and main engines can be manually controlled.

“Centurion” This model was funded by the RAN in response to a noticeable drop in incident rates after training with manned models. It is an adaptation of the two Toll Bass Strait ro-ro ships modified to train with any combination of 3 propellers and 3 rudders so that nearly all classes of RAN ships can be simulated. The power/scale ratios are adjusted through the computer Ship Configuration System developed by Ian Powell.

There are several radio controlled tugs for use in berthing operations and these are usually operated by Newcastle tug masters during courses. They are conventional drive “Shell Cove”, “Rattler”, “Trusty” and “Tantrum” and the twin Z-peller tugs “Wilga”, “Warrawee” (built to museum standards), “Baru” and “Sirius”, which is twin drive tractor type.

Any of the models can be modified to accurately represent particular ship types. The Panamax “Mentor” is fitted with a thruster at each end to simulate a Wilhelmsen car carrier and is also used as the elderly, steam driven FPSO “Cossack Pioneer” for connecting off-shore to a well riser. The same model was once altered to simulate an aircraft carrier, reversing into Fleet Base East as an exercise in controlling four tugs, something not otherwise possible even with a simulator. The “Triton” has been fitted with clear plastic panels to simulate navigating a car carrier through a 50 m. wide bridge.

The physical scaling affects the time and speed of manoeuvring but the outcome is the same as real life, in performance and sensation. All lengths are $1/25^{\text{th}}$ actual size or distance. All times and hence speeds are the square root of the scale, $1/5^{\text{th}}$ of real time. An hour becomes 12 minutes. The log and wind speed sensors' data is automatically multiplied by 5 (square root of the scale), so that the displays show scale knots. For example, a real wind speed or ship model speed of 3 knots will display as 15 knots.

The simulator has been used by pilots from most of the Australian port authorities for new entrants and for refresher courses for existing personnel. It has also been used by a number of shipping companies (mostly tanker owners), pilots from the West Coast and Gulf ports of the U.S.A. and to an increasing number of R.A.N. & R.N.Z.N. officers.

The models are sub-divided internally. When under instruction, the trainee pilot sits in the bridge aft with the other trainee in front of him in No 2 hold, with his own control touch-screen panel, for steering, engine, anchors and thrusters (if in use). The display shows course, speed, rudder angle, rate of turn, number of cable shackles out, engine rpm and relative wind. The course for pilots concentrates mainly on enclosed water navigation. It encompasses theory and practical experience in:-

- Ship handling in shallow water port approaches with traffic and weather complications.
- Ship handling in channels and docks.
- Working and communicating with tugs and use of athwartship thrusters.
- Dead ship manoeuvres and barges.
- Channel and berthing emergencies and contingencies.
- Anchor work.
- Emergencies and contingencies.
- SBM & STS ship handling.

The course runs over five consecutive days with the last three days concentrating on close water channel and dock work with tugs, emergencies and mechanical failure. A similar course is run for pilot exempt masters.

For masters and ships' officers, whose experience is principally that of open water navigation, the course covers theory and practical experience in:-

- Ocean emergencies and contingencies (smooth water only).
- Ship handling in shallow water port approaches with traffic and weather complications.
- Safe ship handling in channels and docks.
- SBM & STS ship handling.

This course is also run over five consecutive days, with the last two days concentrating on channel navigation, berthing and the use of tugs.

RAN officers have made very good use of the facility. Prior to their attendance there was an average of 21 'incidents' per year in ship handling and similar exercises. This has been reduced to single figures, with 3 last year.

The courses are intensive but not to the exclusion of some relaxation. The models' anchors are fitted with anchor buoys which happen to be wine bottle corks. It seems that there is a plentiful supply of these essential items.

Port Ash and other manned model centres have a promising future as long as ships and tugs are operated by humans in ports as we know them today. While full-bridge simulators such as the one at Australian Maritime College play a large part in training with specific port models in real time, manned models offer the opportunity of complex test tank accuracy in accelerated time to provide highly cost-efficient training. Port Ash and the AMC simulator work co-operatively in the knowledge that each complements the other to provide comprehensive training for Australian and overseas seafarers of all persuasions.

(M.J. Bozier)

Safe Return to Port

The IMO has defined performance requirements for the functionality of essential systems on passenger ships under predefined casualty scenarios. The SOLAS requirements for "Safe Return to Port" require, for defined flooding as well as fire casualties, the application of different risk based methods. The relevant amendments to SOLAS refer to both Chapter II-1(new regulation 8-1) and Chapter II-2 (regulations 21-22). The regulations are mandatory for passenger ships constructed on or after July 1, 2010, having a length of 120 metres or more or having three or more main vertical zones. The new safe return to port guideline (GL Rules and Guidelines VI-11-2) gives guidance on the new SOLAS requirements.

These vessels have to be able to return to port after a casualty case, not exceeding a defined flooding or fire casualty threshold, and provide all persons on board basic services in so-called 'safe areas'. For fire casualty cases exceeding the casualty threshold but not exceeding one main vertical fire zone, systems for supporting orderly evacuation have to be available for 3 hours.

In addition to the increased safety for passengers and crew a ship design which conforms to Safe Return to Port regulations will offer further benefits for the operator. Not only will the operation of the vessel be more efficient and flexible through additional system capabilities but also the down time of systems during normal operation will be reduced to ensure a smooth operation of the vessel.

Hatch Cover Seal Defects

Hatchways are the means of access to a ship's holds and the bigger the hatchway the better the access. Large hatch openings result in a loss of stiffness in the hull girder and require large covers. In a seaway the hull moves and changes shape slightly, especially in way of hatchways. This means that a flexible seal is needed between the hatch covers and the deck structure and also between adjacent cover sections. Almost all sealing methods incorporate rubber gaskets and steel compression bars, in some form. The alternative is a sliding rubber seal system.

It is generally agreed in the shipping industry that hatch cover defects are the largest contributor to damaged cargo claims. The most common defects, not in any particular order, are:

- ♦ Seal rubber worn/torn, displaced or missing
- ♦ Seal rubber permanently 'set' (compressed or grooved) so that no, or insufficient contact, is made with the compression bar.

- ♦ Improper or temporary seal rubber repairs.
- ♦ Blocked drain holes in hatch covers or coaming corners.
- ♦ Damaged or wasted cross joint drain channels
- ♦ Coaming side plates or steel support pads wasted.
- ♦ Hatch cover section alignment or cross joint cleating faulty.
- ♦ Side/end cleats and stools missing or wasted.
- ♦ Localised wastage in cover plating, leading to holes.

On a new building hatch covers are set up under the guidance of a specialised contractor such as McGregor Navire. With age, problems tend to appear but it is not necessarily all ‘down hill’. Good practice, correct maintenance and an appreciation of the relationships between the various parts will keep covers effective.

Hatch covers are required to be ‘weathertight’ not ‘watertight’. The International Convention on Load Lines, regulation 3(12) states: *“weathertight” in relation to any part of a ship other than a door in a bulkhead means that the part is such that water will not penetrate it and so enter the hull of the ship in the worst sea and weather conditions likely to be encountered by the ship in service’*. Weathertightness can be checked by hose or ultrasonic testing but this is almost always done under static conditions. In a seaway conditions are very different and good maintenance becomes most important.

If a leak is found in a hatch cover the fault may not be in the sealing rubber. It is essential that a logical sequence of checks is carried out. If the drains are defective then any water that passes the seal rubber, as is normal in small quantities when in rough sea conditions, will not return to the deck. If the coaming drains do not have effective non-return arrangements then waves washing over the deck will force seawater back up the hatch drain channels. If the steel support pads or coaming side plates are worn there will be an overload on the rubber seals, causing premature wear or a permanent set. The correct steel to steel contact between a cover and the coaming, controlled by the support pads or coaming side plate, is of vital importance. Steel repairs should be carried out before rubber seal repairs.

Repairs to rubber seals can be carried out providing the hatch cover manufacturers’ manual and spare parts and other materials are to hand. The manual should have full information on the size and type of seal rubber, the method of cutting, type of glue and the fitting procedure. There should also be information on the minimum length of an inserted piece of seal. If possible it is preferable to replace an entire length. Packing up a seal that has excessive set will not be successful. Corner or end pieces are usually supplied separately and fabricated ones are not effective.

Seals lose their elasticity after 4 – 5 years and acquire a permanent set. A new seal will be compressed 12 – 16 mms. against a sealing bar when a cover is closed. The correct figure should be shown in the manufacturer’s manual. When a section of seal rubber has a permanent set of 50% of its designed compression its effectiveness will be suspect. If the set reaches 70% of the designed compression then the seal will almost certainly not be effective.

Side and end cleats are intended to keep a hatch cover in place not to pull a cover down and create an effective, weathertight seal. It follows that cleat rubber washers have to be in good condition and cleat nuts adjusted so as to give an even tension around a cover.

Traditionally, hatch covers have been checked as weathertight by either a chalk or hose test. Classification societies require a hose test, using a specified water pressure, nozzle diameter and

application distance. Such a test cannot be used if there is cargo in the hold. A modern alternative, now being accepted by Class, is ultrasonic testing. A noise transmitter is placed in a hold, the covers are closed and secured and a detector is moved along the hatch seals on the exterior. Any failure in the seals can be heard by the operator and its position identified. The drawback is that any such tests can, under normal circumstances, only be carried out in calm conditions

The above has considered seals and sealing systems. Hatch covers, especially large ones, are complex and need frequent, regular inspections, in accordance with the manufacturers' recommendations. Any indicated maintenance should be carried out at the first opportunity. In line with ISM requirements, all such inspections and maintenance should be recorded, to demonstrate compliance with the ship's safety management system.

Useful guides have been produced by Standard Club, North of England P&I and London Steamship Owners Mutual, among others.

(M.J.Bozier)

Container structural loading capacities.

Floor

If a container is loaded to its maximum permitted weight that weight must be distributed as evenly as possible over the floor area. The weight on the floor is transmitted by the floor to the cross members and then to the bottom rails. Any cargo weight must be carried by as many cross members as possible. Localised or point loads on the floor must be avoided i.e. heavy weights on a small area.

If a heavy load with a small footprint has to be carried in a container the weight must be spread over as much of the length of the floor as is practicable, using longitudinal bearers. Care must be taken that the maximum 'line load' limit is not exceeded, i.e. cargo weight divided by load length or length of cargo bearers. The maximum line load limit is normally the maximum allowable tare weight divided by the container length. There must be at least two longitudinal bearers on the floor, spaced approximately 80 cms. apart, equal distances from the container longitudinal centre line. Longitudinal bearers must have sufficient cross sectional area to transmit the cargo load to the floor over their full lengths.

Fork Lift Trucks

Container loading and unloading is frequently carried out using fork lift trucks. The International Standards Organisation publication ISO 1496 specifies the following load limits for fork lift truck use in general purpose containers:

Maximum axle load	5460 kgs.
Minimum wheel bearing area	142 sq. cms.
Wheel width	approx. 180 mms.
Track width	approx. 760 mms.

A 2 ts. load capacity fork lift usually weighs 5 ts. when loaded and can be used in a container. A 2.5 ts. capacity fork lift may exceed the maximum axle load of 5460 kgs. but should not damage a floor. Care must be taken with electric fork lifts as their batteries give them a relatively high dead weight. Care must also be taken to allow for the weight of additional fork hoist fittings, such as paper clamps.

Walls.

The Container Safety Convention and ISO 1496 stipulate that a container must withstand a loading in a longitudinal direction corresponding to an external acceleration of 2g, acting horizontally on the floor fastenings. This loading may be transmitted to the container through the twist locks fittings by a carrying vehicle.

The CSC stipulates that end walls must withstand a load of 0.4g, corresponding to 40% of the maximum payload of the container applied evenly over the end wall area. Similarly, side walls must withstand a load of 0.6g, or 60% of the payload applied evenly. Point loads on container walls will very easily result in localised damage.

Cargo must never be loaded on a container roof – there is minimal inherent strength. All vertical weights must be conducted through the corner posts.

Weight Distribution.

It is important that the centre of mass of cargo is as close as possible to the centre of a container. It should lie at the transverse centre and within 60 cms. of the longitudinal centre of a 20ft. unit or 90cms. of the longitudinal centre of a 40ft. unit.

(Thanks to Transport Information Service)

Light Relief.

After twenty years of marriage a couple was lying in bed one evening when the wife felt her husband start to fondle her in ways he hadn't for quite some time. It almost tickled as his fingers started at her neck and then began moving down past the small of her back. He then caressed her shoulders and neck, slowly worked his hand down over her breasts, stopping just above her lower stomach.

He then proceeded to place his hand on her left inner arm, caressed past the side of her breast again, working down her side, passed gently over her buttock and down her leg to her calf. Then he proceeded up her inner thigh, stopping just at the uppermost portion of her leg. He continued in the same manner on her right side then suddenly stopped, rolled over and started to watch the television.

As she had become quite aroused by his caressing she asked in a loving voice: "That was wonderful – why did you stop?"

He said: "I found the remote."