



Australian Institute of Marine and Power Engineers

MARINE ENGINEER SKILLS SHORTAGE & TRAINING REQUIREMENTS 2008

A Discussion Paper
10 May 2008

Overview

In 2008 the Australian maritime industry finds itself critically short of Marine Engineers and other qualified seafarers to the extent that many ships sail short-handed at least part of the time, members are pressed to cut short their home-leave and stay longer and longer at sea, wages are being driven up by market forces even though industrial agreements are in-force, existing engineers cannot be released to study for higher certificates and new-entrant training is at such low levels that colleges are unable to maintain classes.

1. Skills Shortage

That there are insufficient qualified marine engineers for the available marine engineer positions can be concluded from the following:-

- For the last 3 to 4 years, increasingly unable to source enough engineers, vessels in the 'Bluewater' merchant fleet and the Offshore Oil & Gas sector frequently cannot attract enough marine engineers and consequently operate with less than the normal operational manning of marine engineers; this has adverse consequences for maintenance, fatigue and safety.

- The real scope of the shortage is partially disguised as employers respond by increasingly asking their marine engineer employees to extend their duty-swing by several weeks and/or after a short period at home ask them to work whilst they are supposed to be home with their families. However the pressure of this over-utilisation of engineers ultimately contributes to an acceleration in the rate of employees leaving the merchant fleet because:
 - The build up of leave accruals must at some point be taken.... But no relief engineer is then available and the ship will be unable to sail; this has happened on several occasions in the last 18 months.
 - The inability to take owed leave periods at home leads to personal-life / family-life pressures to resign and/or change career, either to employment nearer home or to a sector of the industry with better capacity to guarantee leave periods at home.

- employers introducing new vessels in any sector find it extremely difficult to employ already-trained seafarers: the response of the employer depends on their capacity to pay and is typically as follows:-
 - **The 'freeloader' companies [Towage, FPSO¹ and most of the Offshore Oil & Gas companies] do not pay/sponsor new-entrant trainees. However they have the capacity-to-pay so highly that they repeatedly/continuously out-bid the 'Bluewater' merchant fleet sector for the employees that the merchant fleet trained.**
 - In some cases even that capacity-to-pay has failed them, and 'freeloader' employers and unions have had to enter into unique arrangements involving S.457 Visa holders for a large number of positions.
 - The 'Bluewater' merchant fleet cannot compete on salaries, so in order to rebuild operational capacity they must spend more money to train new-entrant marine

¹ Floating Production Storage and Offtake facility; usually a converted oil-tanker ship with water-separation and filtration of crude oil and onboard storage until 'offtake' to a passing oil-tanker ship.

engineers.

- As a consequence, the 'Bluewater' merchant fleet is increasingly left with only the very-senior, or the very-junior engineers; they have lost much of their 'middle-order' of experienced engineers who would become their Chief Engineers in the future.
- Hunter TAFE [Newcastle], Challenger TAFE [Fremantle], and AMC [Launceston] have for many years been struggling to run one new-entrant training course per year and may lose the services of skilled lecturers in the face of failing classes. Challenger TAFE has in 2008 alerted AIMPE to a crisis in which courses currently half-completed will be cancelled unless replacement lecturers can be found. If not then Challenger TAFE may, like Melbourne's RMIT and Sydney TAFE several years ago, be forced to withdraw from marine engineer training altogether.

| Hunter TAFE new entrant Engineer enrolments 2002-2007 | |
|--|----|
| 2002 | 43 |
| 2003 | 16 |
| 2004 | 19 |
| 2005 | 0 |
| 2006 | 0 |
| 2007 | 0 |

- 275 of the 1607 Engineer Class 1, 2 & Watchkeeper holders [17%] are aged 60 years or more and can be reasonably anticipated to move into retirement in the next couple of years. [see Appendix B]. This is generally consistent with the aging of deck & engineer officers world-wide [see Appendix A].
- Each year we have LESS qualified engineers because new-entrant training continues to be far less than annual attrition [estimated; no industry structures left to gather data].

2. Why the Skills Shortage? What has changed?

2(a). demand for marine engineers

Over the last 20 years the Australian maritime industry experienced changes that produced very significant increases in employment of maritime skills:

- The 'Bluewater' merchant fleet is half the size it was 20 years ago.
- The Towage task has grown; more Ports with more tugs require more seafarers than before. Svitzer towage is the single biggest employer of marine engineers in Australia, on it's own employing approximately 250 marine engineers.
- The Offshore Oil & Gas sector is now double or triple the size it was 20 years ago; in 2008 it employs more marine engineers than does the merchant fleet. The offshore sector had previously been one in which there would be a surge in employment [lagging an oil-company surge in investment in exploration] on seismic-survey vessels, drilling vessels, pipe-laying vessels and support vessels for construction of oil-production platforms. When those specific projects were completed most of the skilled labour was then shed back to other sectors of the maritime industry, leaving only a base-load of employees on offshore supply / support vessels servicing the needs of oil-production platforms. However, the rising price of oil led to an end to these 'boom-and-bust' cycles with investment in oil exploration and drilling having become

continuous and producing gradual growth each year in total employment.

- The FPSO & FSO sector began in Australia in 1984 with a trial of the experimental FPSO 'Acqua Blu' and in 1985 FPSO 'Jabiru Venture' commenced permanent operations and is still in service. The attraction of an FSO2 is that it has the capacity to store onboard the oil produced thus not requiring construction of an oil pipeline to shore. An FPSO is even more attractive in that it can produce crude oil in deep water without need to build fixed platforms. As a result today Australia has 3 FSOs and 12 FPSOs in service. Market forces have caused FPSO employers to increase the leave offered to employees such that 2.5 persons are required per berth; as a result more employees must now be found to operate them even if there was no further increase in the number of these vessels. On top of that increase in employment there are 4 additional FPSOs already the subject of enterprise agreement negotiations and expected to commence in the next 18 months or so..... more are to come.

2(b). supply of new-entrant marine engineers

The capacity of the 'Bluewater' merchant fleet to *fund* the training of new-entrants has halved, commensurate with the reduction in the fleet from about 90 ships [of 2000 GRT and over] in 1985 to just over 40 ships in 2008; our primary submission [#35] details the structural inequality that has advantaged foreign shipping above Australian shipping and seafarers to produce this result.

Further, 12 years ago the last vestiges of industry-based support for new-entrant training were eliminated:

- the Howard Government ended the "Cadet Grant Levy Scheme" [a compulsory training levy on the major users of trained seafarers to pay for the training of new-entrant seafarers].
- Without which industry participation in the National Maritime Training Committee ["NMITC"] with it's comprehensive man-power assessment & planning and co-ordination of employer sponsored new entrants to maintain college-class viability, ceased.
- in first few years subsequently there was almost no sponsored training [Farstad and ASP Ship Management being the notable exceptions]
- AIMPE tried to deal with this lack of industry-wide training by encouraging commitment to sponsorship of new-entrants via our enterprise bargaining agreements.
 - In 1998 AIMPE and ASP Ship Management inserted in our merchant fleet industrial agreement clauses agreeing the company would sponsor the new-entrant training of at least 1 Trainee Engineer or 1 Cadet Engineer per 2 ships.
 - Most other companies in the merchant fleet followed suit in 2001.
 - In 2002 AIMPE commenced inserting similar clauses in our offshore sector industrial agreements, however most oil & gas sector projects are of less than 18 months duration and we understand that the hotly contested tendering processes with the oil-company client leads to thin profit margins with little scope for funding of new-entrant training. **Attempts by offshore employers to negotiate with the client oil-company to add to the contract price additional funding specifically for new-entrant training may lead to the loss of the contract to a lower bidder who plans to train no-one.**

² A Floating Storage and Offtake facility is a ship moored near an oil-production platform which receives the processed oil for onboard storage until 'offtake' to a passing oil-tanker ship.

- It was widely recognized that these minimum numbers [above] were of themselves probably less than industry attrition rates, but there was/is no process for collecting such manpower planning data and hence no certainty.

However due to normal attrition the consequence was a substantial real reduction in the number of qualified marine engineers in Australia.

Despite an abundance of persons interested in a career as a marine engineer, with little/no sponsorship of Cadet Engineers or Trainee Engineers the 5 colleges found it impossible to fill scheduled classes and Sydney TAFE and RMIT Melbourne withdrew permanently from marine engineer training. Class numbers in new-entrant marine engineer courses at Hunter TAFE [Newcastle], Challenger TAFE [Fremantle], and AMC [Launceston] are approaching unviability.

An oil company prepared to write contracts in which it pays it's contractor [an offshore employer] for ever-escalating salaries & bonuses for seafarers is still not easily inclined to consider responsibility for maritime training to be a part of their core business. Yet if the oil company doesn't agree to fund it then the offshore employers cant afford to sponsor. If we wait for such companies to identify their own 'business need' to pay for substantial new-entrant training this will most likely not occur until there are no more seafarers [trained at someone else's expense] to poach from the merchant fleet. Long before that point is reached, if nothing is done, vessels of the merchant fleet will grind to a halt as they will have insufficient trained seafarers left to operate.

3. retention, market forces & capacity to pay for training

'Bluewater' merchant shipping is unable to retain the marine engineers, and other seafarers, they pay to train; they are being stripped of trained seafarers by the 'free-loader' companies who themselves train few, or no, new-entrants at all.

The 'free-loader' companies have always had the capacity-to-pay much higher salaries/leave etc than the merchant fleet can sustain.

They have always been able to attract marine engineers, and other seafarers, who had been trained at the expense of a merchant fleet of 80 to 100 ships.

But whilst the freeloaders have grown enormously in their stripping of these trained seafarers, the merchant fleet is now too small to **fund** to train at a rate 300% of it's own needs so as to generate a 'surplus' sufficient that after the freeloaders have all they need the merchant fleet might still be left with enough employees to operate.

The free-loader companies are now bidding ever-higher salaries for a pool of qualified seafarers too small for the number of available jobs. The bidding and counter-bidding demonstrates that the free-loader companies have the capacity to pay for training. Unfortunately they see no commercial business need to train whilst ready-trained seafarers from the merchant fleet keep answering the job-adverts. Some examples of those market bidding-wars are as follows:-

| | SALARY typically paid to entry-level marine engineer officer or deck officer | Extra Retention Bonuses now paid |
|-------|--|--|
| FPSOs | from \$120,000 to as high as \$165,000 p.a. on | October 2007 Woodside offered all their FPSO employees 10% bonus to STAY another year. |

| | | |
|----------------------|------------------|---|
| | Woodside's FPSOs | April 2008 BHPBP followed in respect of FPSO 'Griffin Venture' in with their own 10% bonus, with another 5% available if safety / production targets were met. FPSO 'Crystal Ocean' offers a retention bonus of 5% after 1 year, another 5% after the second year, and another 30% after the third year. |
| Offshore supply boat | \$115,000 p.a | |
| Merchant Fleet | \$95,000 p.a | |

Unsurprisingly, the merchant fleet can not retain employees against such blandishments to leave.

Some in the merchant fleet have recently argued that they might get greater employee retention if only the length of time for training, training-standards and training cost were reduced?

This is a flawed argument as only money/conditions, or a job giving more leave-periods at home, will influences employees to stay-with or leave the merchant fleet, and it is clear that the merchant fleet can not afford to out-bid the cashed-up 'freeloader' companies.

Therefore the real issue is that **the 'freeloader' companies have the capacity-to-pay to train their own marine engineers, and other seafarers, but will not.**

4. Proposed Solution

There can be no solution that does not ensure that the 'freeloader' companies are required to pay to train their own marine engineers and other seafarers. It is evident there is no current commercial imperative to do so until the merchant fleet is stripped of all qualified employees.

That suggests a legislative solution, developed in consultation with unions and industry, which would for example:

- i. require every employer of a marine engineering certificate of competency to pay a per-person levy to be accumulated in a central fund to pay for the training of new entrant Marine Engineers.
- ii. the companies who employ only a few Marine Engineers only pay in proportion
- iii. but the companies who strip the most Engineers out of the existing industry would then pay for a commensurate number of new entrant Marine Engineers
- iv. the Levy from the Bluewater, Dredging, Towage, FPSO and Offshore Oil & Gas sectors could pay to sponsor Cadet Engineers or Trainee Engineers in the merchant fleet sector using the accumulated Levy funds.
- v. The Levy [perhaps at a higher rate?] should also apply to each engineering position filled by someone on a S.457 Visa.
- vi. if there is a levy imposed on small harbours & rivers vessels [perhaps at a different rate?] it could pay to sponsor Marine Engine Drivers and Class 3 Engineers.

- vii. accumulated Levy funds held in trust in a transparent fashion, to be allocated as determine by a National Maritime Industry Training Committee.

We should not sit idly by and watch the de-skilling of Australia's youth; companies that do train [like ASPSM, Farstad and Teekay] are flooded with qualified applicants when there is a preparedness to pay for their training and something along these lines would address the countries social/educational aspirations whilst contributing to an improvement in the nation's deficit in trade-in-services.

Marine Engineers in Australia are currently trained to World's Best Standard and are eminently employable anywhere in the world. If the above solution was matched with a variation in the Taxation Act to allow Australian seafarers engaged in international-shipping the same tax-concessions as enjoyed by other OECD nations then we would have the makings of a new cash-positive export-in-maritime-services that could in time make the same contributions to our domestic economy as occurs in the U.K. or Norway.

The last thing you would do would be to destroy the potential for these things by proposing any reduction in Engineer Entry Standards or safety Training/Certification.

5. Why it Costs to Train; background on Qualifications & STCW95

Why does new entrant marine engineer training only occur if paid/sponsored by a maritime employer?

The short answer is because:

- i. the training necessarily involves sea-service by a Cadet Engineer [HSC passes in English, Mathematics & Science required] or Trainee Engineer [qualified engineering Tradesperson] on a company's ships initially being trained by shipboard engineers but as they learn they increasingly perform work:
 - o for which they must have an employer willing to accept liability for the consequences of any error they make; and
 - o for which they must have workers compensation in case they are injured; and
 - o for which they must be paid proportionate to the value of their work.
 - o In the case of a Trainee Engineer [i.e. already a qualified engineering Tradesperson often with a family and a mortgage to support] the value of this work is substantial yet the rates paid are probably half the typical market rate for such skills ashore.

However other related considerations are:

- ii. The Cadet Engineer course was originally designed to be at Degree level with a major employer [with Training Officers on staff] taking responsibility for integrating all the disparate elements in a meaningful comprehensive cadetship; it properly requires sponsorship by a competent employer committed to providing this.

- iii. As no company can afford to employ extra Engineers expressly as Trainers it necessary that a large proportion of this training/work can not be constantly supervised and therefore cannot be characterized as merely 'training'.
- iv. In the case of Trainee Engineers it is necessary to pay at a rate that will attract experienced tradespersons from industry ashore.
- v. The industry is agreed that a mix of sponsored Trainee Engineers and Cadet Engineers must continue else the school-leaver Cadets will in time have no Trade-trained Engineers to support the Cadet's acquisition of manual maintenance skills.
- vi. The standard of all maritime training must be no less than the *minimum* set down in the STCW95³ Convention & Code, to which Australia is a signatory.
- vii. Australia's maritime safety/certification standards have always been higher than this minima and it is in no one's interests to lower them.
- viii. State-issued certificates commence at the entry-level of Marine Engine Driver 3 and allow progression [via sea-service on *small* vessels, college courses and Safety-Authority test] to Marine Engine Driver 2, Marine Engine Driver 1, and peak at Marine Engineer Class 3.
- ix. AMSA-issued certificates commence at the entry-level of Marine Engine Watchkeeper and allow progression [via sea-service on *large* vessels, college courses and AMSA test] to Marine Engineer Class 2 and peak at Marine Engineer Class 1.

There are four ways for a person to work as a marine engineer in Australia:

- Small vessel State-issued certificates as per viii above, with no prerequisites.
- STCW95-standard AMSA-issued certificates as per ix above, with prerequisites of HSC capability. Note also that AMSA and AIMPE have agreed that work needs to be done to better redefine the Engineer Cadetship.
- STCW95-standard AMSA-issued certificates as per ix above, with possession of a suitable engineering Trade. Note also that AMSA and AIMPE are developing a methodology to assess the suitability of a Trade and expand the assessment to post-Trade engineering work where substantiated.
- STCW95-standard Certificate issued in another nation; subject to a verbal safety-test by AMSA an Australian Certificate of Recognition is issued which will permit the use of the foreign Certificate in Australia.

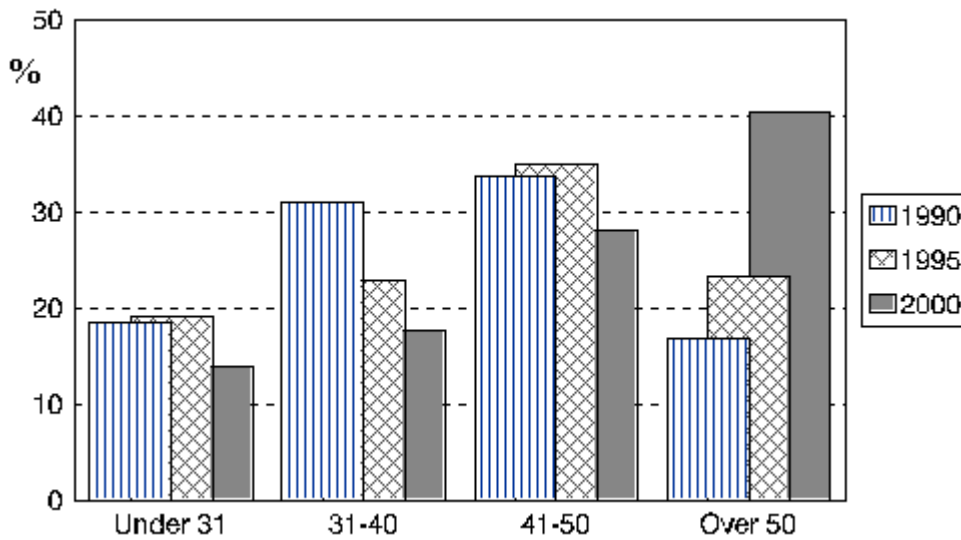
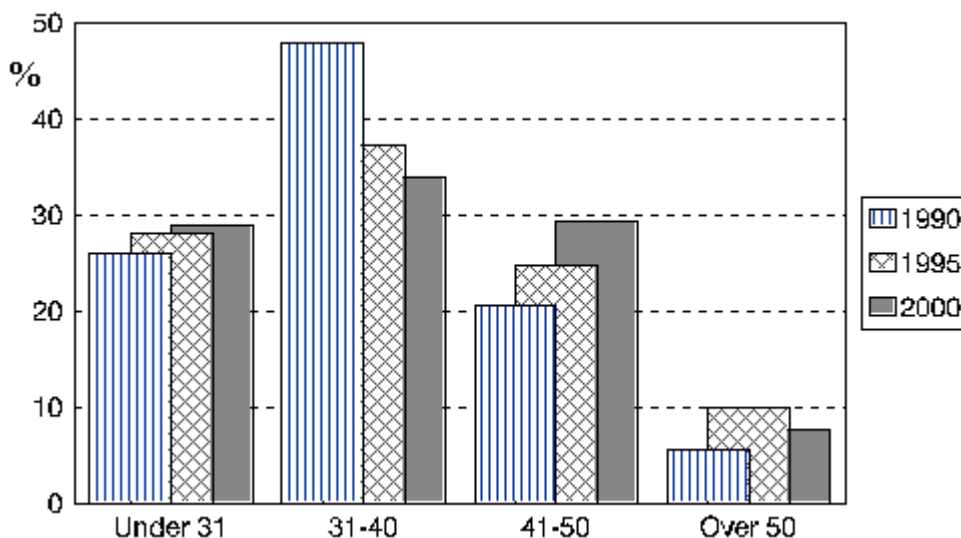
Henning Christiansen
 FEDERAL SECRETARY
 10 May 2008

[attached: Appendix A]

³ STCW95 is the United Nations[IMO] convention on Standards of Training Certification & Watchkeeping 1978 as amended in 1995 & the related Code.

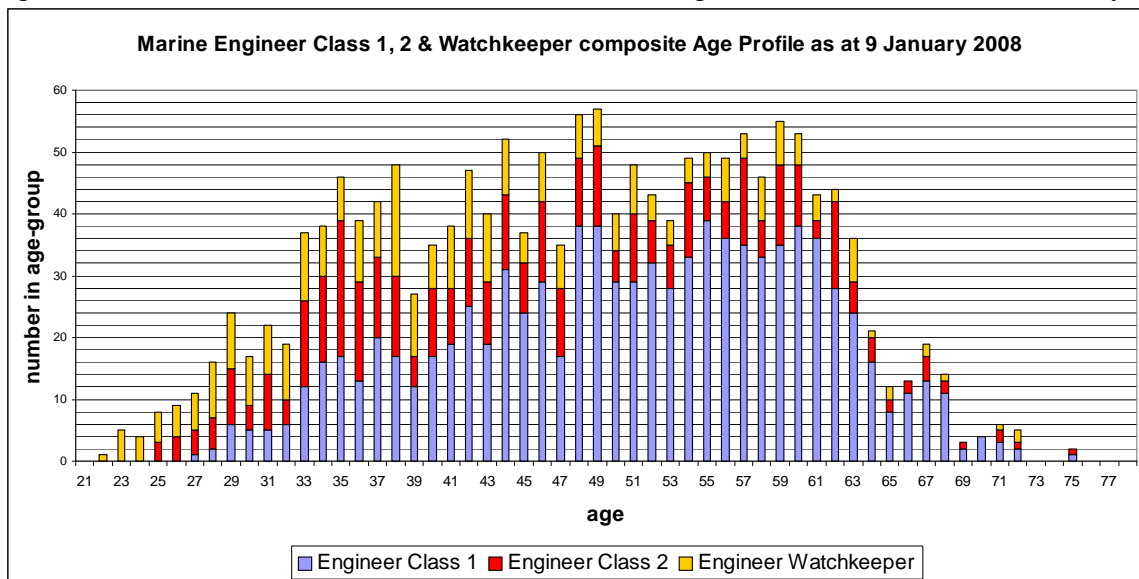
WORLD SHORTAGE OF OFFICERS: Extracts from ISF/BIMCO world-wide Survey 2000

“...The BIMCO/ISF “2000 Manpower Update” reveals that the world-wide supply of 823,000 Ratings is some 224,000 more than required, yet the 404,000 Deck and Engineer Officers is 16,000 less than required.... Despite the warnings of the last BIMCO/ISF survey in 1995 that shipowners needed to increase the number of Trainee Deck and Engineer (junior) Officers the evidence is that it was substantially reduced in 1999, particularly in the OECD countries... As a result the OECD seafarers have reduced from 31.5% of the workforce in 1995 to 27.5% in 2000 with the impending retirement of large numbers of OECD officers clearly to worsen this trend in the next few years.

AGEING PROFILE OF O.E.C.D. OFFICERS 1990-1995-2000**AGE PROFILE OF FAR EAST OFFICERS 1990-1995-2000**

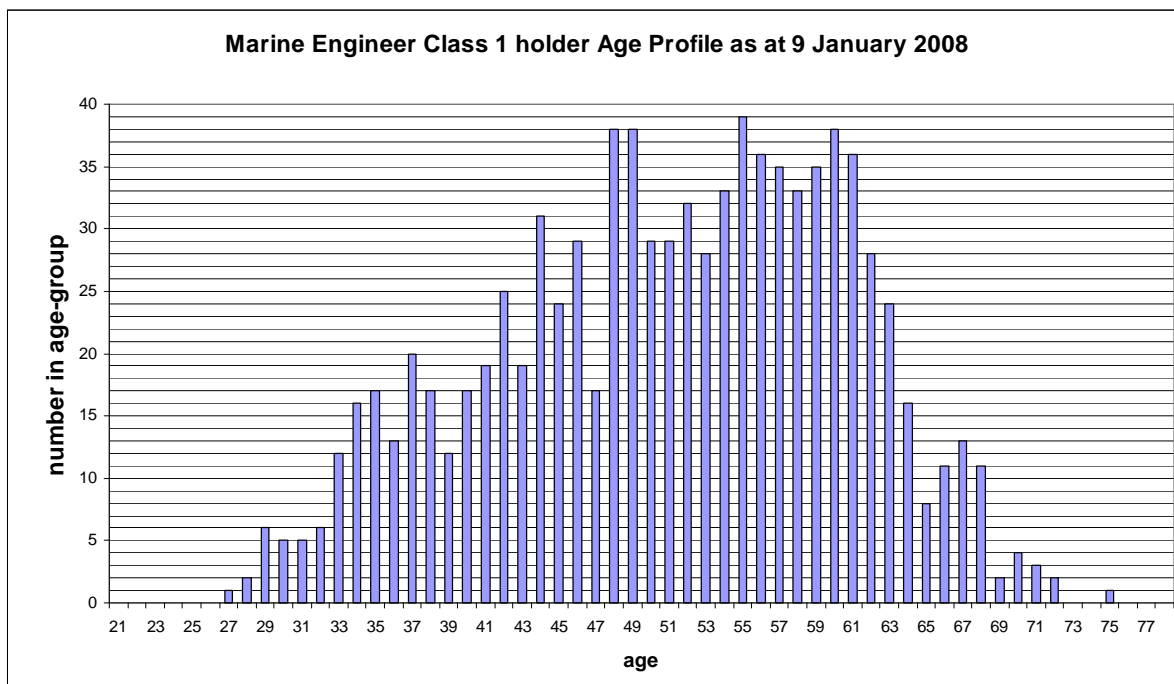
“...The data...suggests that unlike seafarers from OECD countries, relatively few officers from the Far East or the Indian sub-continent choose to remain at sea after the age of 50.....analysis of the evolution of age profiles over the last 10 years suggest that in Asia the trend has remained remarkably consistent. If substantial numbers of officers continue to retire at or around the age of 50 this may challenge the assumption that officers from these nations will automatically replace retiring senior officers from OECD countries...”

Age Profile of Holders of AMSA-validated Marine Engineer Certificates as at 9 January 2008



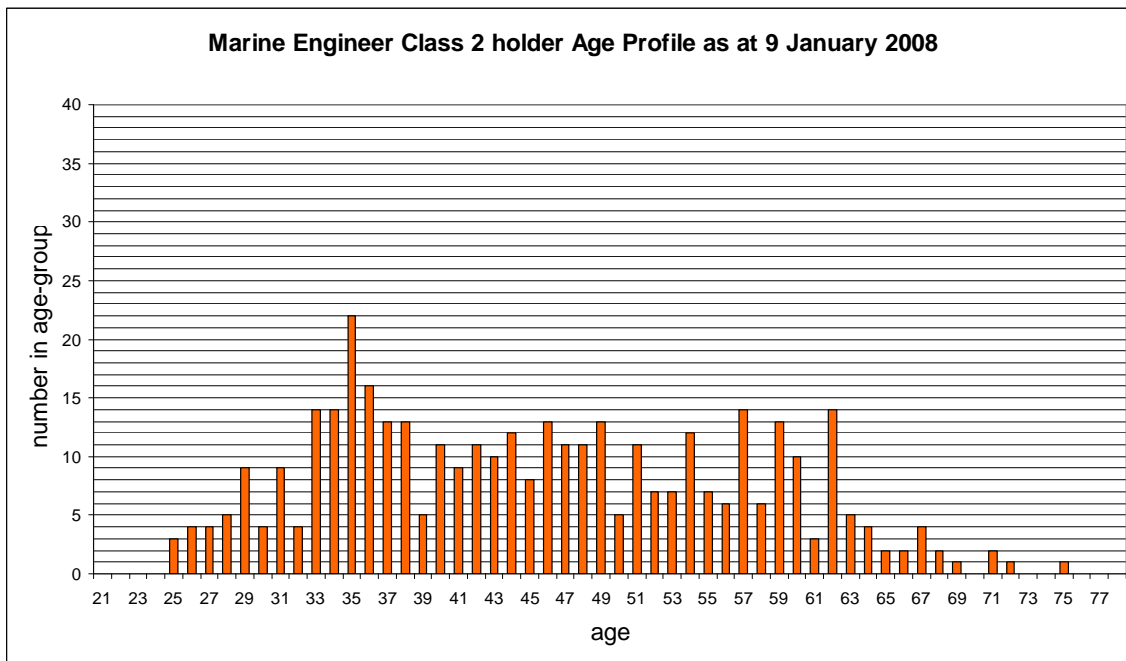
AIMPE calculates from the 1607 holders of valid qualifications as Engineer Class 1, 2 & Watchkeeper that:

- **AVERAGE:** The average age of all Engineer Class 1, 2 & Watchkeeper holders is 48
- **MEDIAN:** 804 of the 1607 Engineer Class 1, 2 & Watchkeeper holders [50%] are aged 49 years or more
- 747 of the 1607 Engineer Class 1, 2 & Watchkeeper holders [46.5%] are aged 50 years or more
- 528 of the 1607 Engineer Class 1, 2 & Watchkeeper holders [33%] are aged 55 years or more
- 275 of the 1607 Engineer Class 1, 2 & Watchkeeper holders [17%] are aged 60 years or more
- 78 of the 1607 Engineer Class 1, 2 & Watchkeeper holders [5%] are aged 65 years or more



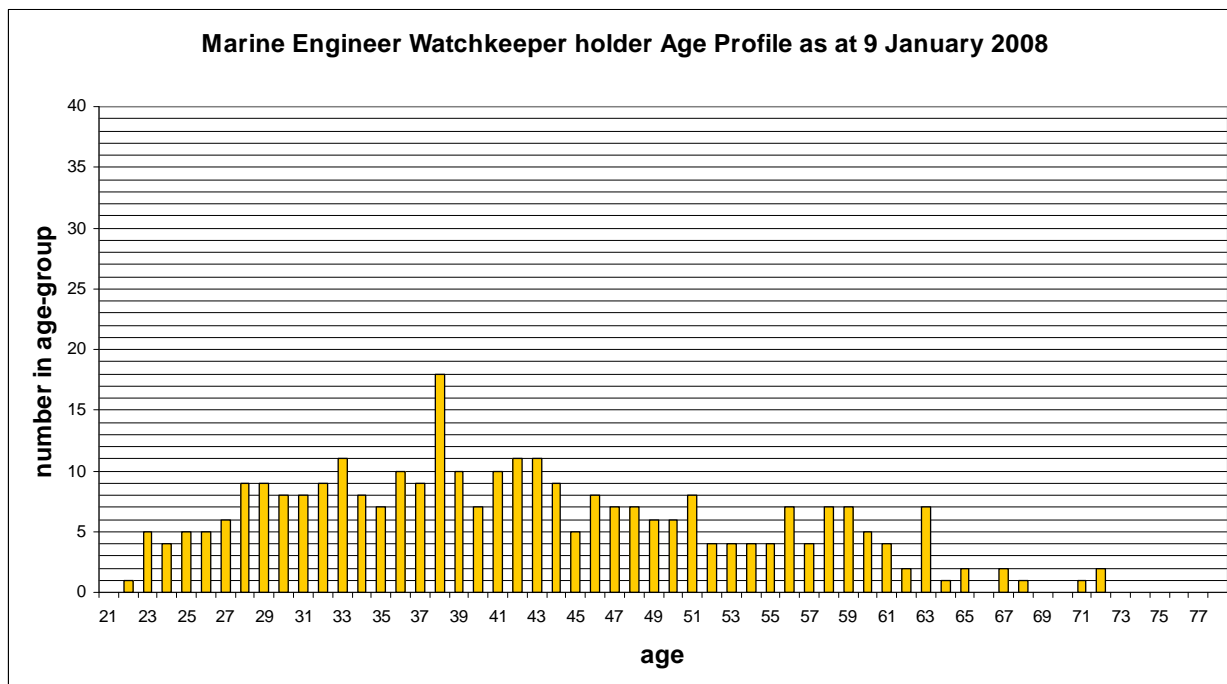
AIMPE calculates from the 915 holders of valid qualifications as Engineer Class 1 that:

- **AVERAGE:** The average age of all Engineer Class 1 holders is 51
- **MEDIAN:** 468 of the 915 Engineer Class 1 holders [51%] are aged 52 years or more
- 526 of the 915 Engineer Class 1 holders [57.5%] are aged 50 years or more
- 375 of the 915 Engineer Class 1 holders [41%] are aged 55 years or more
- 197 of the 915 Engineer Class 1 holders [21.5%] are aged 60 years or more
- 55 of the 915 Engineer Class 1 holders [6%] are aged 65 years or more



AIMPE calculates from the 387 holders of valid qualifications as Engineer Class 2 that:

- **AVERAGE:** The average age of all Engineer Class 2 holders is 45.5
- **MEDIAN:** 195 of the 387 Engineer Class 2 holders [50%] are aged 45 years or more
- 139 of the 387 Engineer Class 2 holders [36%] are aged 50 years or more
- 97 of the 387 Engineer Class 2 holders [25%] are aged 55 years or more
- 51 of the 387 Engineer Class 2 holders [13%] are aged 60 years or more
- 15 of the 387 Engineer Class 2 holders [4%] are aged 65 years or more



AIMPE calculates from the 305 holders of valid qualifications as Engineer Watchkeeper that:

- **AVERAGE:** The average age of all Engineer Watchkeeper holders is 42
- **MEDIAN:** 191 of the 305 Engineer Watchkeeper holders [49.5%] are aged 38 years or more
- 82 of the 305 Engineer Watchkeeper holders [21%] are aged 50 years or more
- 56 of the 305 Engineer Watchkeeper holders [14.5%] are aged 55 years or more
- 27 of the 305 Engineer Watchkeeper holders [7%] are aged 60 years or more
- 8 of the 305 Engineer Watchkeeper holders [2%] are aged 65 years or more