



To promote, develop and support in the spirit of cooperation, the common interests of its members in all matters concerning the development and quality of maritime education and training.

NEWSLETTER

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TRAIN, TRAIN, RETRAIN, RETAIN!



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Editorial

Consideration of the recent GlobalMET conferences and other activities in India and Malaysia readily brings two statements to mind - 'the future is now online' - which is also in the title of the article by Iman Fiqrie in the last GlobalMET Newsletter - and 'classrooms without walls'. Another to think about in this context, but one not expressed during the recent GlobalMET activities, is 'education is the kindling of a flame, not the filling of a vessel', a statement normally attributed to Socrates.

For over a decade now, those attending GlobalMET organised conferences have heard expressions of serious concern about how so much of the MET delivered falls short of industry needs - and of individual learner needs. 'What is wrong and what to do about it' is the background for much of the discussion. We know what is wrong, but we make only limited progress in doing something about it. Recent activities have focussed more on teacher training needs.

Also frequently mentioned is the need for the current generation of recruits into the industry to learn and become competent. Whatever term is used - 'Gen Y', 'Global Generation', 'Net Generation', 'Millennials' - there is recognition that their learning needs differ from those characteristic of the generations of most of their teachers. The greatest change is due to the development of the internet and the provision of vastly improved communications. Use of a portable hand-held device is very much part of 'Millennials' everyday living and learning.

The need is to bring extensive use of modern educational methodologies into MET. How to overcome boring teacher-centred classroom activities, with students 'switched off' by an uninteresting 'lecturer' reading statements projected on power point? How to overcome dependence on MCQ's for assessing student progress? How to enure teachers who are interesting to the students? How to move the whole scene into the 21st century?

Participants in the GlobalMET activities in India and Malaysia showed clear understanding of these needs. 'Classrooms without walls' indicates a major focus with respect to developing the educational aspects of MET. The training aspect is easier to deal with as it is essentially 'hands on' with trainees more readily involved, acquiring and demonstrating levels of competence.

Steps taken by GlobalMET include a call at an IMO STCW meeting for the formation of a group of experts to review current MET and make recommendations, a call that has not led to action. A more significant initiative was the approach to the Asian Development Bank which resulted in the ADB commissioning consultant Fisher Associates last year to review and report on 'Human Resource Development in the Maritime Sector in Asia and the Pacific'. The resulting Fisher Report recommends four outputs - I) Policy and regulatory environment improved, II) Partnerships strengthened, III) Quality of MET improved, IV) Knowledge sharing strengthened. GlobalMET is currently liaising with the ADB on a concept for a project to achieve these outputs.

Another is the successful application to the TK Foundation for funds to conduct a course on *Bridging the Gaps Between STCW Standards and Course Delivery*. It is a pleasure to advise that the five-day, initial phase of this two phase course is to be hosted by the Maritime Academy for Asia and the Pacific in the Philippines at the end of this month.

And of course there have been many conferences/seminars/workshops, all of which have value in enabling interested parties to describe, propose, question, formulate outcomes and make contacts, but which seldom lead to action other than more similar gatherings.

It is time for action. We in GlobalMET have a responsibility for assisting in ensuring there is action.

Rod Short
Executive Secretary



Torres Strait Maritime Training Program takes out National Award



The Australian Maritime College was awarded the Excellence in Industry Promotion Award at the Transport and Logistic Industry Skills Council's 2014 Awards for Excellence. Pictured (L-R): Award presenter Paul Kahlert (All Purpose Transport), Jarrod Weaving (AMC Vocational Education and Training Manager), Ruth Findlater (AMC maritime trainer), Paul Brown (AMC maritime trainer), Adrian Davidson (Australian Maritime Safety Authority), Koeygab Pabai (trained by AMC) and Robert Adams (TLISC CEO).

An innovative training program designed to develop the seafaring skills of the Torres Strait Islander and Aboriginal people and improve maritime safety in the region has been recognised at a national level.

The Australian Maritime College at the University of Tasmania took out top honours in the "Excellence in Industry Promotion" category at the Transport and Logistic Industry Skills Council's 2014 Awards for Excellence.

The awards offer the opportunity to recognise and celebrate exceptional achievements and contributions made by organisations in training and workforce development in the Industry.

Representatives from the maritime training department joined AMC Board Chairman Dr Michael Vertigan AC to accept the award at a gala event in Melbourne on Thursday, 10 April.

AMC Vocational Education and Training Manager Jarrod Weaving welcomed the accolade, saying it was testament to the dedication of his team.

"We are fortunate to have a group of committed trainers who are focused on providing an outstanding learning experience to all of our students," Mr Weaving said.

"This award is recognition of the team effort that went into planning, developing and delivering the program and helps

reaffirm our mission statement to be Australia's national centre for maritime training, education and research."

AMC was invited to deliver three Coxswain and Marine Engine Driver 3 courses as part of the Torres Strait Marine Safety Program; a partnership between the Australian Maritime Safety Authority, Maritime Safety Queensland, Torres Strait Regional Authority and Queensland Police.

A total of 43 students have completed the program on board the training vessel *Elizabeth II* and are now formally qualified with a nationally-recognised certificate and commercial licence.

"The program provides the Torres Strait Islander and Aboriginal people with the skills and confidence needed to run sustainable maritime and fisheries-related businesses. The students learn about the safe operation and maintenance of vessels, including vessel handling, engineering, navigation and seamanship skills," Mr Weaving said.

"It has played a vital role in the economic development of the region and there are plans to expand the program by offering it across northern Australia, from Cape York in Queensland through to Western Australia's Kimberley region."

By:

University of Tasmania Communications and Media Office

KL Conference



Conference participants

The very successful conference is depicted in the accompany pictures. A major feature of this one-and-a-half day conference and workshops was recognition of the significant MET development occurring in Malaysia.

The GlobalMET in Malaysia Conference '*MET: Closing the Gap between What is Needed and What is Provided*', organised by Capt Lee Ghim Teck and his team at Akademi Laut Malaysia (ALAM) filled the Saloma Theatre in the centre of Kuala Lumpur. Dato' Captain Haji Ahmad bin Othman, Director General, Malaysia Marine Department, delivered the Officiating Address, which was followed by the Keynote Address delivered by GlobalMET Chairman Captain Tim Wilson.

In welcoming the delegates, Malaysian Maritime Academy Chief Executive, David Fredrick, spoke of the need for the delegates who have had long years of industry experience to provide an insight into the current state of affairs in maritime education and training. He also encouraged the delegates to fully utilize the opportunity afforded by the conference to build networks that will work for the greater good of the shipping community as a whole.

Chairman of GlobalMET, Tim Wilson, urged participants to optimize the usage of modern teaching methods to enhance teaching and learning. He also stressed that learners of today are different in terms of the way they study and perceive and it is vital that maritime training institutions engage them using state-of-the-art learning methodologies and facilities.

A feature of the one-and-a-half day conference was the 18 presentations by delegates from Australia, New Zealand, Singapore, Papua New Guinea, Sri Lanka, Philippines, Nigeria and Malaysia, focusing on the theme of the conference, with strict adherence to 20 minute speaking slots.

A highly interactive two-hour workshop led by GlobalMET Director Capt Richard Teo discussed the ways and means forward in the face of many challenges. The sharing of ideas, by representatives of government agencies, port authorities, ship owners, training organisations and classification societies, about educating and training current and future seafarers was a very motivating experience for the conference participants.

The need for student centred maritime teaching empowering students to learn in classrooms without walls was strongly expressed throughout this much appreciated conference.



Dato Capt Hj Ahmad bin Othman, DG, Marine Department, Malaysia and Mr David Fredrick, CEO, Malaysian Maritime College



GlobalMET Director Prof Takahiro Takemoto of Tokyo University of Marine Science & Technology



GlobalMET Chairman Capt Tim Wilson delivering the Keynote Address



Workshop Group with Capt Tim Wilson



Ms Sally Smart, Manager, S E Asia, Cognition Education



Workshop Group – overseen by Capt Lee Ghim Teck (standing in suit), leader of organising group



Mr. Kanagalingam, Marine Officer, Malaysia Marine Department



GobalMET Director Capt Richard Teo with Capt Dabung Kiong, Principal, PNG Maritime College



Relaxed group at conclusion: Capt Lee Ghim Teck (ALAM), Capt Tim Wilson (GlobalMET), Mr David Fredrick (ALAM), Capt Rod Short (GlobalMET), Mr Simon Hoe (Eagle Star, Philippines), Capt Dr Manivanan (ALAM)

GlobalMET in Malaysia Conference

Workshop Session on 'Closing the Gaps'

GlobalMET Director Captain Richard Teo FNI FCILT MAICD



The workshop session was based on the information provided by eminent speakers in their presentations during the first day of the conference. Four diverse groups were required to develop policy, solutions and strategic intervention based on four themes:

1. What are the Gaps: a) STCW vs Industry; b) Praxis vs Knowledge Based;
2. Learning & Assessment Strategies: How CBETA is Implemented Effectively to Close the Gaps;
3. Administration and Policy on Assessment and Issue of CoCs;
4. Andragogy versus Pedagogy.

The Tasks

Each group was tasked to reflect on the day's proceedings and topics presented. Rather than use time to brainstorm and whip a very old horse, the groups were given the opportunity to "brain – swarm" instead. Each group was required to formulate policy and solutions for strategic interventions to resolve the issues and problems they experienced in the work place. Given the short space of time, the groups worked quickly on developing presentations to the subsequent plenary.

Presentations

Each presentation was analysed accordingly.

Topic 1: What are the Gaps?

The group's observations were:

- ◆ Missing competences are not identified clearly, nor where these exist with respect to STCW;
- ◆ methods whereby these missing competences can be resolved in the teaching and learning process are not sufficiently expressed;
- ◆ gaps between STCW and industry are evident and highlight lack of collaboration and connectivity in the environment; viz. administration, industry and MET institutions;
- ◆ model courses are prescriptive and not outcomes based;
- ◆ assessment and examination system is outdated and needs change.

Interesting points were expressed about the poor communicative process between regulators, industry and the training providers. Improvements are required but no strategic solutions offered.

Topic 2: Learning & Assessment Strategies – CBETA

This group identified issues in delivery which appear quite well fleshed out. However it was very apparent that the actual methodology and delivery of CBETA is still in its infancy and not really understood by many. The approach is still generally teacher –centred and not outcome based.

Administration and policy on CoC issues does not appear to be well coordinated through valid, fair, flexible and reliable assessment policies and methodologies.

STCW is closely followed by the regulators, with good working relationships with training providers and industry, however it is unclear as to whether the regulators have the same understanding of delivery of training programmes and assessment of the competencies against performance criteria.

It is also unclear as to whether CBETA is implemented correctly.

Topic 3: Administration and Policy on Assessment and Issue of CoCs

This group had members from the MSA participating. It dwelled on some generalisation and how they would like the gaps to be closed. It was maintained that the STCW code standards served 3 sectors: regulatory, workplace and college/academy.

Regulations and processes are sufficiently in place but it is unclear how well process and procedures are serving the industry and MET, particularly methods of assessment and examination. It was evident that regulators and examiners are untrained in delivery of training assessments and not aware of the rules of evidence for CBETA.

Topic 4: Andragogy versus Pedagogy

A well-presented finding that explained how MISC and associated industry executed the work-place (on site) learning for their HRD. However, there is little evidence of how it is applied in the training providers' domain (off site). It is also unclear how the continuous development of the seafarer is sustained offsite.

It is evident that the general methodology in delivery of training and assessment is still quite traditional with a teacher-centred approach rather than a learner-centred approach. It is also evident that courses are delivered to learning objectives (knowledge and content) and not learning outcomes (performance criteria) based on the competences per the standards.

It was not expressed clearly how both pedagogy (children) and andragogy (adult) were blended in delivery, learning and assessment strategies.

Preliminary Findings

The learning environment is positive and participants are very proactive and enthusiastic.

The mood for change is strong and if the momentum can be encouraged, the change movement should accelerate.

Progressive workshops will assist in the promotion of andragogical methods against traditional pedagogy. This will allow teachers and learners to be participative and collaborative in the learning process and in turn bring about CBETA swiftly, performing to standard criteria for the pertinent standards. Once the gaps in competences are fully and clearly identified between industry and STCW, the expectations of industry may then be satisfied with extra-curricular learning to close the gaps.

The man behind the throttle is the man who drives the ship

A Tribute to the Forgotten Man

The siren shrieks its farewell note, and proudly on her way,
The brand new giant liner moves in grandeur down the bay.
A marvelous creation, her builder's joy and pride,
The great hope of her owners as she floats upon the tide.

The passengers in festive mood, 'mid laughter' jest, and quip,
With keen delight enjoy the great ship's maiden trip.
She's sure to break the record, she'll do thirty knots or more,
Is the hope of all on board her as she leaves her native shore.

Upon the bridge the Captain, a Skipper proud and bold,
Bedecked in gorgeous raiment's, navy blue and gold.
All eyes are fixed upon him and its going to his head,
He stops to drop the Pilot, then rings "Full Speed Ahead".
And "Down Below" the battle starts for the trophy of the seas,
By Engineers, not clad in gold, but greasy dungarees.

On deck the scene is blithe and gay – fair ladies, song, and wine,
But Hell is popping "Down Below", beneath the Plimsol Line.
The Chief raps out his orders to the men on watch below,
The men obey his mandate, and about their tasks they go.

Steam pressure must not fluctuate, the bearings not run hot,
The revs must not be allowed to drop, to make the thirty knots.
At dinner, on the first night out, the Captain proudly boasts;
"We'll surely break the record", as the Gallant Ship he toasts.
But breaking records puts no grey hair upon his head,
His contribution ended when he rung "Full Speed Ahead".

Through weary days and sleepless nights, to consummate this dream,
The Engineers slave ceaselessly till Ambrose Light's abeam.
The record has been broken with thirty one point four-
The Captain wears another stripe, he's now a "Commodore".

And thus he gets the credit for what other men have done:
He boasts to press and radio, the record he has won.
Neglecting e'en to mention, as he swings his ballyhoo,
The men of Brains, and Brawn, and Guts, who shoved the great ship through.

The moral of this poem then is quite conclusively,
That glory seldom goes to those who win the victory.
So keep this simple thought in mind, about a record trip,
The man behind the throttle, is the man who drives the ship.

B.F. Renz, Marine Engineer

I have no right, by anything I do or say, to demean a human being in his own eyes. What matters is not what I think of him; it is what he thinks of himself. To undermine a man's self-respect is a sin.

Antoine de Saint-Exupéry

Putting the Responsibility of Command into Perspective



Vessel Operations in Polar Regions

Requirements of IACS and Torremolinos Protocol of 1993

By

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Overview

By the end of the 19th century, the national ice services of several countries bordering the North and Baltic Seas had introduced routine ice observing and reporting systems. The search for a suitable ice reporting code began very early because a quick and convenient way of transmitting the ice observations to a central body and making them available to users was urgently needed.

Shipping traditionally has a large variety of terms designating the different ice phenomena, taking into account regional differences that are attributable to different natural environments. Although today an essential criterion in the assessment of ice conditions still is the extent to which they hinder navigation, additional features describing the ice extent had to be introduced within the framework of the international exchange of ice information required in the wake of World War I.

Requests for more and better ice information on the part of industry and shipping, efforts within the World Meteorological Organization (WMO) to develop a uniform terminology, the transition to a prolonged shipping season lasting throughout winter in the Polar Regions, Gulfs of Bothnia and Finland, as well as increasing activities in the coastal areas forced the ice services to continually improve the technology and contents of their information exchange.

Guidelines on Voyage Planning for Passenger Ships Operating in Remote Areas

In November 2007 the IMO Assembly adopted, by resolution A.999(25), Guidelines on voyage planning for passenger ships operating in remote areas, to supplement the existing Guidelines for voyage planning (resolution A.893(21)) with additional guidance for passenger ships operating in remote areas. It was acknowledged that the growing popularity of ocean travel and the desire for exotic destinations had led to increasing numbers of passenger ships operating in remote areas and that, when developing a plan for voyages to such areas, special consideration needed to be given to the environmental nature of the area of operation, the limited resources and navigational information.

The Guidelines recommend that, for ships operating in Arctic or Antarctic waters, the usual detailed voyage and passage plan should include additional factors, such as:

- ◆ knowledge of ice and ice formations;
- ◆ current information on the extent and type of ice and icebergs in the vicinity of the intended route;

- ◆ statistical information on ice from former years;
- ◆ operational limitations in ice-covered waters;
- ◆ availability and use of ice navigators;
- ◆ conditions when it is not safe to enter areas containing ice or icebergs because of darkness, swell, fog and pressure ice;
- ◆ safe distance to icebergs;
- ◆ presence of ice and icebergs and safe speed in such areas;
- ◆ existing ice conditions; and measures to be taken before entering waters where ice may be present, e.g., an abandon ship drill and preparation of special equipment.

IACS Requirements for Polar Class ships

IMO's Guidelines for ships operating in polar waters recommend that only those ships with a Polar Class designation, assigned based on the IACS Unified Requirements for Polar Class Ships (UR-I), or a comparable alternative standard of ice-strengthening appropriate to the anticipated ice conditions should operate in polar ice-covered waters. The UR-I are uniformly applied by IACS societies to ships contracted for construction on or after 1 March 2008.

The UR-I contain the following Polar Class notations, intended to guide owners, designers and Administrations in selecting an appropriate Polar Class (PC) to match the requirements for a given ship with its intended voyage or service. The ice description follows the World Meteorological Organization (WMO) Sea Ice Nomenclature:

- ◆ PC 1 Year-round operation in all ice-covered waters.
- ◆ PC 2 Year-round operation in moderate multi-year ice conditions.
- ◆ PC 3 Year-round operation in second-year ice which may include multi-year ice inclusions.
- ◆ PC 4 Year-round operation in thick first-year ice which may include old ice inclusions.
- ◆ PC 5 Year-round operation in medium first-year ice which may include old ice inclusions.
- ◆ PC 6 Summer/autumn operation in medium first-year ice which may include old ice inclusions.
- ◆ PC 7 Summer/autumn operation in thin first-year ice which may include old ice inclusions.

The UR-I consist of three parts, I1 (Polar Class description and application), I2 (Structural requirements for Polar Class ships) and I3 (Machinery requirements for Polar Class ships) and the Polar Class notation is used throughout to convey the differences between classes with respect to operational capability and strength.

It should be noted that ships that are also to receive an "icebreaker" notation may have additional requirements and need special consideration. "Icebreaker" refers to any ship having



an operational profile that includes escort or ice management functions, having powering and dimensions that allow it to undertake aggressive operations in ice-covered waters, and having a class certificate endorsed with this notation.

Requirements for Fishing Vessels Operating in Areas With Ice Accretion

Torremolinos Protocol of 1993 to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977

The 1977 Torremolinos Convention contains safety requirements for the construction and equipment of new decked seagoing fishing vessels of 24 m in length and over, including those vessels also processing their catch. The conditions for entry into force of the Convention were never met and in 1993 the Torremolinos Protocol was adopted which updates, amends and absorbs the parent Convention, taking into account technological evolution in the intervening years and the need to take a pragmatic approach to encourage ratification of the instrument. The Torremolinos Protocol has likewise not yet entered into force.

Chapter III (Stability and associated seaworthiness), regulation 8 (Ice accretion), contains requirements for icing allowances to be made in stability calculations and provides that fishing vessels operating in areas where ice accretion is known to occur should be designed to minimize the accretion of ice and should be equipped with means for removing ice. Recommendation 2 (Guidance related to ice accretion) of the 1993 Torremolinos Conference further sets out the geographical positions of the icing areas to which the above regulation III/8 should apply, including a chart. Recommendation 6 (Guidance for precautions against freezing of fire mains) offers solutions for the problem of freezing of fire mains, including recirculation of water, use of dry systems of fire mains, use of leak-off systems and use of heating systems.

Code of Safety for Fishermen and Fishing Vessels, 2005

The Code of safety for fishermen and fishing vessels, 2005, was developed with a view to promoting the safety and health of crew members on board fishing vessels and consists of two parts, Part A (Safety and health practice), providing information on the safe conduct of fishing operations and Part B (Safety and health requirements for the construction and equipment of fishing vessels), providing information on the design, construction and equipment of fishing vessels. The Code applies to fishing vessels of 24 m in length and above and is not a mandatory instrument.

Part A of the Code advises that the formation of ice on a vessel is dangerous and should be reduced by all practicable means and contains in appendix 10 (Recommendation for skippers of fishing vessels on ensuring a vessel's endurance in conditions of ice formation) information on the causes of ice information and its influence on seaworthiness of the vessel recommendations for skippers on how to deal with ice formation, including lists of equipment and tools for combating ice formation and of additional personal protective clothing.

Part B of the Code contains in chapter III (Stability and associated seaworthiness), section 3.8 (Ice accretion), provisions for icing allowance to be made in stability calculations for fishing vessels operating in areas where ice accretion is likely to occur.

Precautions During Ice Accretion

If the vessel starts to ice up through ice accretion then do the following:

- ◆ Turn the vessel around and head South toward a warmer climate.
- ◆ Minimise the spray coming onto your vessel by slowing your vessel down.
- ◆ If the vessel is listing to starboard, then take the ice off the port side first, you'll give your vessel a bigger list, but the centre of buoyancy will move out also and thus you will have a bigger righting lever.

If a vessel encounters ice accretion that was not mentioned in the shipping forecast, the immediate action must be:

- ◆ Inform all ships in the area
- ◆ Contact the Coastguard

Never ever take chances with ice accretion, this can and will severely affect the vessels' stability, vessels have capsized because of the ANGLE OF LOLL effect that ice accretion has on the vessel, the vessel will become top heavy as the Centre of Gravity nears/meets of goes above the Metacentre. (ie the vessel will become UNSTABLE).

There is a long list of Instructions for dealing with Ice Accretion in the Code for Safety of Fishermen and Fishing Vessels, 2005.

Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels

The Guidelines (ie not mandatory) apply to fishing vessels between 12 m and 24 m in length and contain provisions similar to those in the abovementioned Code regarding ice accretion and the combating of ice formation.



Understanding Global Warming, Green House Gases and Other Interesting Facts

by
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Global Warming (GW), the continual rise and warming of the earth's average temperature due to anthropogenic processes—i.e. due to man. There have been a number of calamities and seemingly weather related events in the news over the past years or so to make one at least consider that GW may indeed really exist and be the root cause of some unusually high temperatures, flooding, draughts and other related phenomena of late; most are believers by now, but there will always be Neigh Sayers.

Anthropogenic (human) processes is a commonly used word in GW and refers to those effects; chemical and biological by products of human activities that would not otherwise occur abundantly and naturally in the environment—e.g., disproportionate Carbon Dioxide, Nitrous Oxide and Methane. My particular interest started while facilitating an Environmental Conservation course several times under the Malaysian Technical Cooperation Program (MTCP) and while creating the eLearning course Ship Energy Efficiency Management Planning (SEEMP) using Moodle. GW and anthropogenic processes are not only global issues, but also one close to the maritime industry—energy efficiency. GW is a rather broad topic and thus may be the subject of several articles; its understanding is necessary to grasping the urgency and context of energy efficiency initiatives, related timelines and required actions.

Observing figure 1., one can clearly see that there has indeed been a large temperature change in the earth's average temperature in recent times in comparison to the last 2000 years or so.

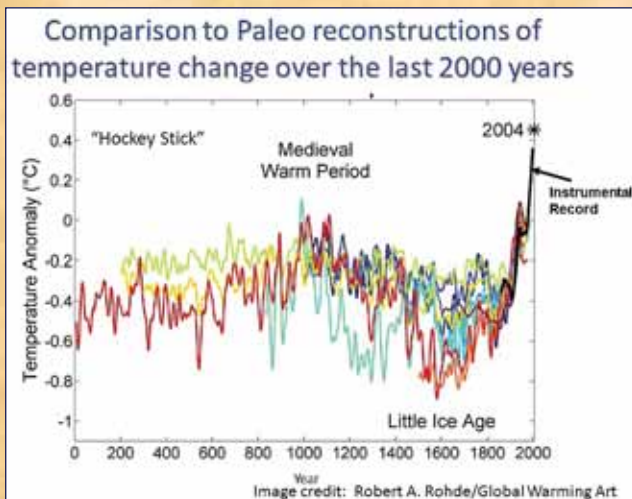


Figure 1 - Temperature Change Last 2000 Years

Figure 2 then tells us where this energy is going—predominately the oceans, ice sheets and land; the upper Ocean is from 0 -700 m and predominately affected. One can also see that a lot of energy is going into the ice sheets and translates rather directly into increases in sea level and potential future problems with ecosystems, food supply and water resources to say the very least. So focusing primarily on surface temperature and the atmosphere may be more than misleading. The amount of ice melt from both the Greenland and Antarctic ice mass in giga tons and corresponding sea level rise in millimetres (mm) is significant. Further, the Global Mean Sea Level (GMSL) has already risen more than some 200 mm since the 20th Century—

not distributed equally at all the same level globally.

But, before we get too deep into Global Warming Science (GWS), let's back out a bit and look at figure 3, and try and understand just what the Greenhouse Effect (GE) really is. Without some GE—the earth's temperature could be something like 255K or below freezing! Let's begin discussing the GE with Solar Radiation from the sun coming into both the earth's atmosphere and earth as short wave radiation— noting that a portion of that radiation is reflected back and doesn't make it to earth, and that making it to earth essentially is mostly absorbed by the surface of the earth (a bit more complicated than that); radiation from the earth's surface is then re-emitted upwards as long wave infrared radiation (LWIR) back into the earth's atmosphere. It is here where the GE can be seen as much of the LWIR is absorbed by the earth's atmosphere causing a global warming effect. Note the conservation of energy does apply here, however, if one adds what comes in and subtracts what goes out—initially it appears as if the law has been broken; not considered, however, are things like convection, the transport of GHGs and formation of clouds, etc., again the subject of future articles. As much, traditionally we hear a lot about CO₂, but there are a number of other well mixed GHGs that contribute to this GE—e.g., Water Vapor, Nitrous Oxide and Methane.

Figure 4., shows what's called Planck Black Body functions; in plain English, temperature emissions of a radiated body, i.e., the sun (solar) and the earth (terrestrial); this is extremely instructive because one can see how much energy both the sun and earth absorb and radiate as well as where all the absorption occurs and the main contributors to the GE; this bears repeating! The left side is short wave radiation and depicts the red curve (solar) and the right side longer infrared radiation and the blue curve (terrestrial). Shown just under that picture is the actual percentage absorption by wave length; and under that the gases that are attributed to that absorption. The numbers on the top curve represent temperature ranges of that absorption, e.g., 210-310K (Kelvin) for the solid blue curve—the black curve representing 210K and the purple curve representing 310K; on the left and solid red curve, 5525K for solar radiation. Note that the absorption (or Planck functions) has no overlap and can therefore be talked about as two entirely different streams of discussion with reference to radiation, i.e., solar and terrestrial. The red curve and notches represents the actual amount of radiation received at the earth's surface and by analysing the notches and the pictures below them—get an idea of where the solar radiation not being absorbed by the earth is being absorbed—e.g., on the left one can see that Oxygen, Ozone and Rayleigh Scattering (responsible for blue skies as sunlight is scattered) account for some of the Solar Radiation being absorbed; the absorption of UV radiation is a good thing as it protects us from being radiated by UV rays! Instructive are the graphics on the right showing water vapour and CO₂ as big absorbers. The blue curve represents how much radiation is emitted from the surface of the earth to the atmosphere, as one can see, only about 15-30% of that radiation makes it out to the atmosphere and the other portion represents the GE—this is essentially the problem; meaning not much of the energy leaving the earth makes it out to space! One should note that there must be a conservation of energy, but how?

It has been suggested it's probably no accident that our eyes have evolved to see or operate in the portion of the curve in



figure 4 where very little light is absorbed (visible wave length). And finally, in the terrestrial portion (blue) of the diagram, one can see Water Vapor has significant absorption and some in the solar portion of the diagram as well.

So as one can see, GWS has a lot to contribute to our understanding of what's called Anthropogenic processes or the human impact on global warming. What's covered here only scratches the surface of GWS and our understanding of the earth we live on and our impact on it—as we now gluttonously consume more than the equivalent of 1½ times the earth's resources; this is non-sustainable!

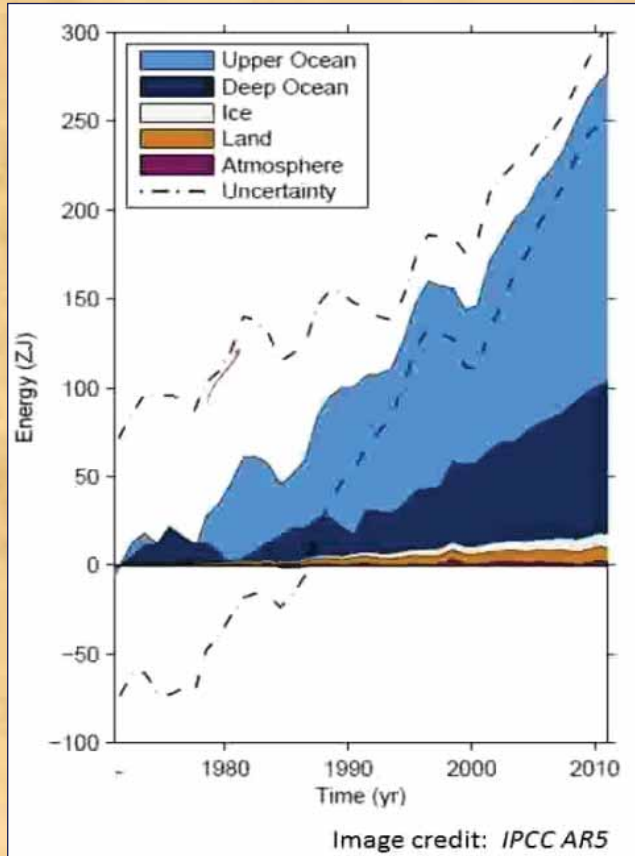
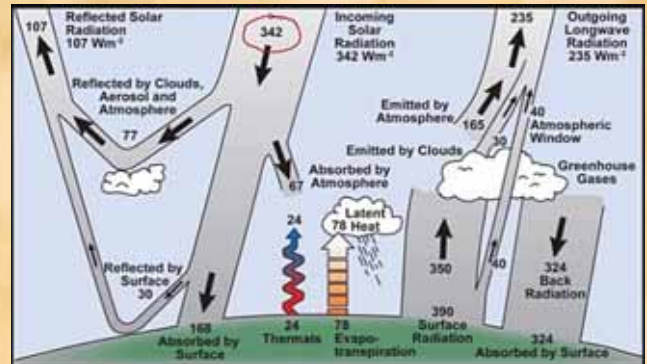


Figure 2 - Energy Absorbed from Global Warming

Many consumption and GW scenarios (SRES) forecasting our probable destiny and future have been calculated and foretold as actual versus expected human behaviour and charts that future and destiny; our children and children's children future depends on us getting these scenarios and actions right! The year 2050 being quite instructive! There are temperature charts going back millions of years that suggest that our course is inevitable! Be that as it may, Maritime programs like the Ship

Energy Efficiency Management Planning (SEEMP) are designed to help the maritime industry do their part to help curtail Global Warming and perhaps forestall the "inevitable." The 1500 plus page Intergovernmental Panel on Climate Change (IPCC), 5th Assessment Report (AR5) is more than a good start for one to fully understand the scope of the problem and way ahead—I suggest one get a hold of it, begin to understand it, create dialog and make the required changes we all have to make before it's too late! Look forward to more articles and discussions on GW.

Elements of the Greenhouse Effect



from IPCC AR4

Figure 3 - Greenhouse Effect

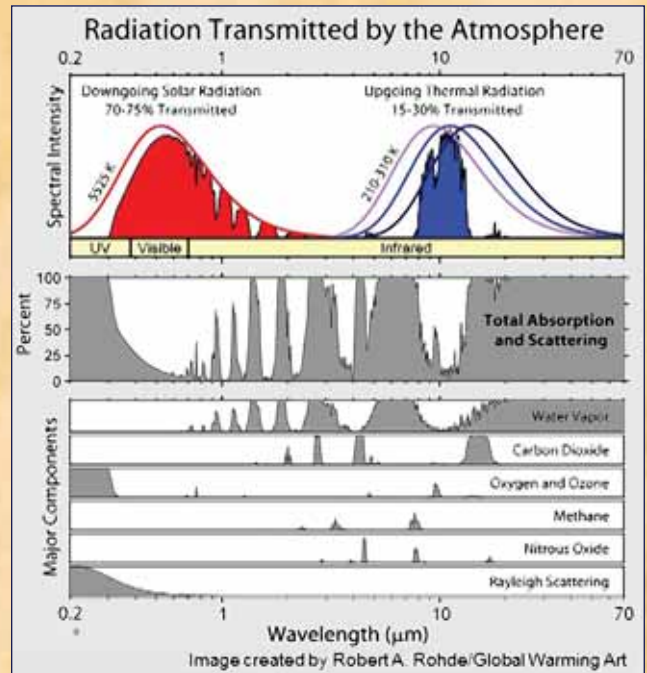


Figure 4 - Radiation Transmitted to the Atmosphere

eLearning Vignette or Highlight
Oculus Rift: What if, Virtual 3D Maritime Education?

We all dream about what might be, some of us maybe a little too much. But would you believe that for about 300USD, it's possible to get an Oculus Rift Development Kit and begin the process of creating your own virtual experiences; there are camera and a few other costs—but imagine what this could mean for learning, teaching in the classrooms and simulators?

Those who have already experienced it say there's nothing like it! The experience can be brought right to your living room with the look and feel of actually being there; the bridge,



engine room and possibly firefighting and other training could be done in this venue—imagine the possibilities!

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