Samundra Spirit

QUARTERLY IN-HOUSE MAGAZINE FOR SAMUNDRA INSTITUTE OF MARITIME STUDIES (SIMS), MUMBAI & LONAVALA

JUL 2010 . ISSUE 10


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JOIN the MERCHANT NAVY!

SAMUNDRA INSTITUTE OF MARITIME STUDIES (SIMS)

A Training Commitment of Executive Ship Management Pte Ltd (ESM), Singapore
(Certified by leading maritime classification society, Det Norske Veritas, Norway for ISO 9001:2008)

INVITES APPLICATION FOR -

- **DECK CADETS (DNS) - FEB 2011 BATCH**
  Approved under Indian Maritime University (IMU), Directorate General of Shipping Govt. of India & Maritime Port Authority (MPA), Singapore
- **4-YEAR B. TECH. (MARINE ENGINEERING) - AUG 2010 BATCH**
  Under in principle approval from Indian Maritime University (IMU) and Letter of intent by Directorate General of Shipping Government of India
- **1-YEAR GRADUATE MARINE ENGINEERING (GME) - MAR 2011 BATCH**
  Approved under Directorate General of Shipping Govt. of India & Maritime Port Authority (MPA), Singapore

DECK CADETS (DNS)

- One year Diploma in Nautical Science at SIMS, Lonavala.
- Minimum 18 months of practical shipboard training before 2nd Mate's examination.

4-YEAR B. TECH. (MARINE ENGINEERING)

- Four years Marine Engineering course at SIMS, Lonavala.
- Followed by 6 months shipboard training before appearing for Class IV examination.

GRADUATE MARINE ENGINEERS (GME)

- One year training in Marine Engineering at SIMS, Lonavala which includes 6 months hands-on practical training in the **Ship-in-Campus**.
- 6 months shipboard training before appearing for Class IV examination.

Eligibility	DNS	B. Tech. (Marine Engineering)	GME
Age & Marital Status	• Not more than 20 years for **10+2** candidates, 22 years for **B.Sc** candidates, 25 years for **B.E/ B.Tech** candidates as on date of joining • Unmarried	• Not more than 20 years as on date of joining • Unmarried	• Not more than 25 years as on date of joining • Unmarried
Academic (Results must be obtained at 1st attempt)	**All Board (Class XII):** Minimum Av Score - 60%, PCM Minimum - 60% **OR** **B.Sc** - Physics / Chemistry / Maths / Electronics with min of 55% in final year along with min of 55% in PCM during Class XII **OR** **B.E/B.Tech** - Any stream from an **AICTE/UGC** approved institute	Passed in 10+2 or equivalent exam with Physics, Chemistry, Mathematics and English as separate subjects with PCM average of not less than 60%	Degree in **B.E/B.Tech (Mechanical / Naval Architecture)** from an **AICTE** approved institute, **Deemed University** with min marks of 55% in final year
Language	English shall be one of the subjects with min marks scored of 50% in Class X or XII	English shall be one of the subjects with min marks scored of 50% in Class X or XII	English shall be one of the subjects with min marks scored of 50% in Class X or XII
Eyesight	6/6 vision, no colour blindness, no use of corrective lenses allowed	No colour blindness, use of corrective lenses permitted	No colour blindness, use of corrective lenses permitted

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Background of cover picture -
Taken on SIMS, Lonavala campus by photographer:
CDT Vijinth Kannan, GME-08, SIMS, Lonavala

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SAMUNDRA SPIRIT is a quarterly in-house magazine produced by Samundra Institute of Maritime Studies (SIMS) for private circulation.

Our Editorial Team wants to hear from you!

If you wish to submit any feedbacks and/or contributions, feel free to write to the Editor at: samundraspirit@samundra.com

**Please note we reserve the right to publish your letters/articles or an edited version of it in all print & electronic media.*

EDITORIAL NOTE

Yet another issue of Samundra Spirit has been prepared to hit the website by 15th July and this will be celebrating our 10th issue of the magazine.

A hearty congratulations to all those who have given their heart and soul for its success with a never-say-die attitude during the short lifetime of this in-house publication. As such, two and half months is not a big time in the life of an institute of SIMS magnitude. However, it has been our sincere endeavour to capture and record anything that makes an impact to the life and psyche of the campus and those in the campus - the cadets, the faculty members and the staff alike.

The single most important story that has unfolded in the two and half months has to be the launching of the 4-year BE marine engineering course in the Lonavala campus. We have included a short write up on this important event. July deluges a seasonal gift which Mumbai cringes before its arrival – Lonavala rejoices and welcomes with open arms and extra buckets to fill in the campus lake. It's the reservoir that stores water for the dry season starting from March to April - the lifeline for the hundreds living in the campus. Besides, the rain ensures we are having enough water in the lake to boat drill, free fall life boat training and such other important and crucial trainings conducted by the institute. That connects us with the environment story we have included in this issue on the ocean and the over fishing - a story of irresponsibility and selfishness of the mankind resulting in wreckage and disruption in our environment. The story of the blast encountered by a tanker during the Iran-Iraq war 25 years back is an episode of merchant navy challenges and the professional hazards beyond control. But, it is also a story of overcoming the challenge and prevailing over it.

On the other hand, we collected an interesting piece of real life story of a 9th century replica Arab dhow which sailed into Singapore in the beginning of the month of July. The tiny boat traced the route taken by similar dhows to do trade in the Far East including Singapore and beyond. It depicts the tenacity and courage of the sailors of years gone by together with their ingenuity and skillful navigation and architecture in building such boat.

Underlying thoughts and beliefs in the pages of this issue is the indomitable spirit of the sailors as well as the love and affection of the mankind for the sea and the ocean. After all, the sea has been always a giver and it's time we think about reciprocating and ensuring that the sea could continue to give to our next and the next generations – much after we all leave this world.

Behold the Sea
The opaline, the plentiful and strong,
Yet beautiful as is the rose in June,
Fresh as the trickling rainbow of July;
Sea full of food, the nourisher of kinds,
Purger of earth, and medicine of men,
Creating a sweet climate by my breath,
Washing out harms and griefs from memory,
And, in my mathematic ebb and flow,
Giving a hint of that which changes not.

Ralph Waldo Emerson, Sea shore

With this beautiful thought from the famous American philosopher and poet, I do hope this issue will continue to draw interests from our readers on various maritime topics for meaningful conversation and discussion.

Happy reading and safe sailing!

Sikha Singh

The Right Attitude for Success at Sea

An open letter to the cadets stepping out of SIMS

Dear Cadet,

It'll be a big leap forward, after you've finished your course at SIMS and are impatiently getting ready to join the ship as an apprentice. You may have already been dreaming of how the ship and the life on board is going to be. You are all excited, pumped up and at the same time, super confident of your success in this wonderful vocation. Some of you may even harbour a strong feeling that you know it all after having spent quality time in this state-of-the-art institute and there is nothing more to learn.

When decades ago, after passing out of the Training Ship Dufferin, when I had joined the first sailing ship – even my friends and I had suffered from some wrong notions. We had spent two long years on a venerable training ship, which had produced admirals and famous master mariners. We had learnt all about sailing, rowing, rope work, navigation and even the subjects which were required only for Master's exams. However, after joining the ship, the realisation soon dawned upon us (my other friends and I) that among the officers, we were at the lowest rung. We also ruefully realised that our bookish knowledge could help us pass the tests with flying colours - but they were grossly inadequate and limited for the life at sea. We had miles to go – indeed we were just the trainees, i.e. the cadets.

The demands of a practical life on a running ship carrying cargo for its survival were totally different and each person on the ship had a duty and responsibility to perform his job sincerely and efficiently. The first months on the ship were a humbling experience for us, but with the right attitude to learn and cope with new challenges, all of us survived the storms, enjoyed our sea legs and learnt new things as we went along. I too may recall Chief Officers, tough as sledge hammers, insisting we fulfill job expectations and deck work but nevertheless, at the same time, patient and fair while teaching us and training us to climb up the knowledge ladder in our career. I have no qualms in dedicating my career growth to them and I bet, all of you would go the same route provided you learn to accept the drill and drudgery of this learning piece.

Learning is for Life

The structured life which you've spent in SIMS, learning many things in the workshop, classrooms and Ship in Campus was so very well organised, but on board a real running ship, there will be many things happening – some fairly routine but some totally unexpected. You may encounter issues and problems, where your learned skills and investigational capabilities will be tested and definitely hold you in good stead.

There is famous saying by Newton D. Baker, which says "The man who graduates today and stops learning tomorrow is uneducated the day after." So always keep an open mind and don't shut yourself off from new learning experiences. On board a ship, even an experienced ordinary seaman or a wiper can teach you a thing or two, which will benefit you lifelong. Hence, respect and humility towards all your fellow sailors will be an added quality that you must carry along wherever you go from here.

HSSE Culture

The word "culture" by definition indicates a combined system of values, knowledge, belief and even attitude that shape and influence our perceptions and behaviours. As you may well know, HSSE stands for Health, Safety, Security and Environment. Good HSSE performance is possible only when it becomes part of our culture and existence both on board or ashore. In other words, you could achieve a good HSSE performance by:

- Being aware that safety of shipmates depends on your actions as well as the actions of the rest on board.
- Being responsible to identify areas which might provide a potential safety hazard and ensure that corrective actions are taken.
- By reducing waste, emissions and discharges and using energy efficiently.

Behaviour and Attitude

As a part of our training at various levels of jobs, we have studied the shipboard machines so well and have learned how to deal with them sufficiently well. However, it doesn't take reminders to know that humans are much more complex beings than machinery and they will either do well or injure themselves simply by their wrong behaviour in spite of well engineered ships and well laid out Safety Management Systems. Finally, your training will be all meaningless unless you ensure the right behaivour and attitude towards your job and towards the environment and the people around us.

Take note of that and I am sure, everything else will be safe and smooth sailing with the training that you already received at SIMS.

Bon voyage and safe sailing!

Capt. Arun Sundaram
General Manager
ESM, Singapore

Cold Temperature Fracturing of Ships

Capt. Olaf Olsen
Advisory Consultant
SIMS, Lonavala

In the field of ship designs, it is only within the gas carriers that we normally see demands for cold temperature tough steels. Some specialist trades including ice class do have more demanding specifications. However, the following two stories can give room for thought in 'normal ship' operations.

The first account is of a small cargo ro-ro ship when in winter lay up in the Great Lakes and a second tale takes place in a 40,000 dwt high speed container ship on North Atlantic service.

The concerned ro-ro was a commercial endeavour to short cut road truck distances by introducing a cross sea ferry transit on Lake Ontario between the Canadian town of Oshawa and the town of Oswego on the US, southern side of the Lake. The winter freeze did however interrupt that trade and the ship was thereby laid up pending the warmer spring climate.

After a few winter months, all personnel repatriated and the ship was closed down and left in the care of a local Oshawa agency. On one of those days, I received a telephone call in Glasgow, Scotland, telling me as a ship manager, I had better get someone over to the ship in a hurry as a five metre jagged crack had appeared on the upper superstructure of the ro-ro. Thankfully, it was above the waterline and actually in way of the truck hold.

As a regulatory practice in Canada, the Coast Guard had taken command of the ship in its alarmed condition and their representative met up with our technical management a day after the phone call.

The resulting five metre zigzag, mainly vertical, crack was diagnosed as an effect of sub zero temperatures with a strong wind chill blowing on the surface of the 10mm mild steel superstructure plating. Arrangements were made to move the ship to a repair berth, remove the damaged section and renew the plate, with small samples of the crystallised fractured metal being taken for analysis and desk souvenirs.

Unfortunately or fortunately for the ship, the Lake Ontario venture failed and in the following spring, the ship no doubt breathed a sigh of relief in being reflagged and then employed in deep sea warmer waters elsewhere.

The second story in this context took place near Christmas time in a high speed liner service container ship; one of four and all capable of thirty plus knots. The market demand at the time expected such ships to depart Greenock Scotland and berth at Weehawken, New Jersey in no more than five days berth to berth time.

It was in such circumstances that these four ships called at ten ports in every twenty eight day four week round voyage, namely: Greenock, Weehawken, occasionally Baltimore, Norfolk Virginia, Wilmington North Carolina, Charleston South Carolina and return to Weehawken before running East to Le Havre, Rotterdam and Bremerhaven, then back to Greenock and off once more. This meant that two of the ships would meet up in Weehawken each week, one westbound and the other heading east – a very convenient circumstance when following this story.

Being close to Christmas, the particular voyage was full of JIT (just in time) freight and, North Atlantic weather dependent, the Master was expected to make most haste. Not only did this mean full speed, but included great circle tracking north of Ireland, across to the south of Newfoundland, then past Cape Breton Island, Nova Scotia, Long Island and on to the Ambrose Light, under the Verrazano Bridge and into the Port of New York with Weehawken on the New Jersey shoreline.

As a manager in Glasgow, the story commenced on a weekend with me receiving a call from the Master reporting that the ship was in strong and cold N'Wly heavy seas, that the starboard anchor had sheared half way up the shank, in the hawse pipe, and that the anchor crown and flukes had gone! This meant that I had to activate a floating crane and classification representative in Weehawken to disconnect the sheared anchor shank and fit the ship's spare anchor.

One day later; guess what?! The ship called a second time saying the port anchor had similarly sheared and a second spare would be required! Apart from wondering whether this was a joke, there was a long ship / shore conference call double-checking all weather details, ship speeds, sea conditions and whether the anchors had been slamming prior to loss.

Much activity in transatlantic communications later, the east bound ship arriving at Weehawken was instructed to have its spare anchor ready as with the victim ship. That done, the floating crane and classification arrangements were carried out and replacements made.

On completion of the replacements, the two sheared anchor shanks, as the remains of eleven tonne, class approved and certificated quality, forged and assembled in Germany, admiralty style anchors, were loaded into a container and express transported back to Scotland on the eastbound ship.

On arrival in Greenock, with arrangements in place, specialist metallurgy experts from a renowned university examined the anchor shanks and promptly pronounced '**cold temperature fracturing**' to the approximately 350mm by 450mm cross section steel shanks. The severely cold air temperatures blowing down from the Labrador coastline, over the Grand Banks off Newfoundland, combined with water wet steel suffering wind chill had caused the events.

This resulted in much repeated effort to examine anchor hawse housing, winter weather voyage planning and downright sensible seamanship to prevent a similar event ever happening again. A lesson probably worth delivering to the future officers from SIMS and the general readers of Samundra Spirit!

Increasing the Reliability and Life Span of Heat Exchangers

Heat exchangers are as important as the machinery they are connected to for their proper operation. Shipboard staff must not ignore these static equipments just because they don't make noise! By following simple guidelines, these equipments can be maintained as good as new even on aged ships. As the age old saying goes, 'a stitch in time saves nine'. Hence, a lot of time, money and manpower required to maintain these silent warriors in the engine room can be saved by just following these simple guidelines.

S.Viswanathan
Principal
SIMS, Lonavala

Working Principle:

If a medium has to be cooled, we must have another medium, which must satisfy the following criteria for its selection as a cooling medium:

- it must be available at a lower temperature than the cooled medium (Second Law of Thermodynamics)
- it must be available plentiful or sufficient
- it must be cheap

In ships, by virtue of their environment, sea water is best suited to work as a cooling medium, despite its ills, such as excessive salts, corrosivity, aquatic life etc.

Both mediums must be brought together to make thermal contact for sufficient time to allow heat to be extracted from cooled medium by the cooling medium. This can be achieved by direct contact with sea water (such as in Scrubber tower of Inert Gas System) or through a heat exchanger of plate type, tube and shell type or hull coolers.

For making the heat exchanger efficient, pumps are usually employed to force both the mediums through the heat exchangers.

Fresh Water Generator having tube type heat

Assessing the Heat Exchanger Functioning:

The efficiency of the heat exchanger can be assessed quickly by checking the inlet and outlet temperatures of both mediums. In fact, on board the ships, this is carried out every 4 hours and logged. Any deviation from the designed parameters is investigated and fault found is rectified by symptomatic maintenance.

Ways to Prevent Deterioration in Performance:

1. Ensure the fluid space is filled completely all the time for both fluids, by purging out air and other gases through the vent lines. This prevents overheating of the parts in the empty space and prevents fouling with salt deposits and marine growth.
2. Never throttle inlet valves on the heat exchangers for flow control. This ensures the heat exchanger is always full of fluid.
3. The first to open and the last to shut is the cooling medium valves. The cooling medium is to be shut off at least 10 minutes after the cooled medium is shut off during overhauls.
4. If expansion arrangements are provided for tube stack and shell, they must be free to move. Greasing may have to done.
5. Heat exchangers are always provided in pairs, each one must be used on alternate months.
6. When coolers are not to be used for long periods of time, say more than 3 to 6 months, they must isolated, fluids drained from all chambers and kept in a dry condition.
7. Do not operate the heat exchanger beyond the designed parameter limits.
8. While cleaning the tubes, take care not to damage the tube walls by using non-standard bristles, for e.g. metallic wires. Use only nylon bristles. Use adequate water with a jet while cleaning the tube. Fresh water is a good cleaning, washing and lubricating liquid.
9. While fitting sacrificial anodes, take note that the anodes have positive electrical contact with the cover, lest anodes will be saved from corrosion and the cover would have been corroded.
10. Check that the partition plate serves its function and does not bypass the fluid.
11. Swirler tubes (short plastic pipes), which aids turbulence (if fitted), must be at fluid entry side and not at the exit side of the tubes.
12. Never exceed the pressure limit, or in other words velocity limit as the tubes are designed only up to certain velocity of fluid to prevent erosion.
13. Cooling medium must be filtered adequately before admitting into heat exchangers. (especially in river passages and close ports).
14. If the Marine Growth Prevention System is fitted, it must be working effectively.

JCW Plate Type Heat Exchanger

Prevention is better than cure. If the heat exchanger is cared for as mentioned above, one may be able to use it beyond its expected life.

Bimetallic Corrosion

Sunil Gaikwad
Senior Marine Instructor
SIMS, Lonavala

What's common among the Statue of Liberty in USA, Eiffel Tower in France and the ships trading across the seas and oceans all over the world? Well, apart from the fact that the first two were built by Gustav Eiffel, they all do share the same trait and response towards corrosion and reaction to water or similar elements.

That a vast majority of metal or metallic objects tend to succumb to weather over a period of time, is common place knowledge even to a child. However, the phenomenon and the impact of the process in terms of much wider implication beyond dollars and cents is an area of huge concern for those in the field involved in keeping these humongous structures free from damage and destruction through a process called "Galvanic or Bimettalic corrosion".

Needless to say, galvanic corrosion is of crucial importance for the marine industry - the environment full of iron, steel and such other metals. One common concern for all mariners is un-insulated stainless steel heating coils causing deep pits in the cast steel of cargo tanks due to electrolytic action set up during alternate carriage of ballast water after cargo. The remedy is always to take the following preventive actions:

1. Electrically insulating both metals from each other to prevent a galvanic cell being set up.
2. Coating with epoxy paint, the metal which is more noble (i.e. having more electrolytic potential or anodic), such as mild steel.
3. Keeping dissimilar metals dry or shielded from electrolytic materials (such as salt solutions, acids or alkalis).

Bimetallic corrosion can cause far more serious problems than other forms of corrosion on individual metals and alloys. It tends to be localised, leading to pitting, and in pipe system can lead to rapid perforation and failure. Different alloys/metals in closed proximity are used due to various design constraints like aluminium superstructure on steel deck, aluminium/ brass fittings/ pipes attached to steel structures, etc. Unless two dissimilar metals and alloys are well insulated at the joint, bimetallic corrosion will occur in marine applications.

Bimetallic Connection:

Whenever two dissimilar metals and alloys are connected to each other through a good conductor in marine environment, bimetallic corrosion takes place, resulting in pitting and rapid failure. It is inevitable that different alloys will be used in ship, it should however, be ensured that their connections are made carefully to avoid this problem. The environment encourages that bimettalic corrosion and hence to be avoided is:

a. Presence of an electrolyte
b. Electrical connection between the metals.
c. Difference in potential between the two metals.
d. A sustained cathodic reaction on the more noble of the two metals.

Presence of Electrolyte:

Electrolyte, as we know is a medium or surface that conducts electricity and it plays an important role in bimetallic corrosion. Atmosphere where condensed film arising from rain water, dew etc., present is also conducive to bimetallic corrosion. Salt deposit on the surface in marine environment acts as an effective electrolyte. In fact any damp material in contact with metallic components can provide suitable condition for bimetallic corrosion e.g., damp cloth, lagging etc. Since conductivity of seawater is 50 times that of fresh water, bimetallic corrosion is far more severe in marine environment. It is therefore necessary that bimetallic joints to be kept clean, dry and free from salt deposition.

Difference in Potential Between Two Metals/Alloys:

For any corrosion cell to operate, there must be potential difference between the electrodes. The intensity of corrosion is directly proportional to the distance between the alloys in the table. For example, the intensity of corrosion will be very high if titanium is connected with magnesium, whereas it will be much lesser if titanium is connected with austenitic stainless steel. Temperature can influence the relative position of alloys in the galvanic series. Velocity and aeration can also affect the potential difference between two alloys, which are generally known as a couple. It is therefore necessary to consider all these factors while determining the potential difference between two alloys, since prevailing service conditions can significantly alter the potential difference between a couple.

A ship's environment uses a wide series of galvanic metals and alloys and metals right from steel (carbon, chromium and austenitic), iron, copper, nickel, cadmium, zinc to aluminium and titanium which are highly susceptible to bimetallic corrosion and hence needs attention and preventive action from the ship staff for their regular maintenance.

Some Practical Ways to Minimise Bimetallic Corrosion:

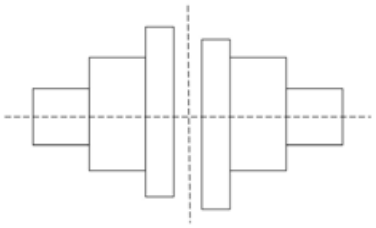
a. Construct equipment and structures for marine service from one material.
b. Where (a) is not possible, select combinations of alloys those are close together in the galvanic series.
c. Avoid small anode - large cathode situations and ensure that critical components are more noble.
d. If necessary, add extra thickness to less noble component and increase the anodic area.
e. Insulate dissimilar alloys. When insulating bolted joints ensure that the shank of bolt is insulated by a nonconductive sleeve. Check that the components are effectively insulated.
f. Protect the bimetallic couple with suitable resistant coatings.
g. Design should be such that anodic component could be replaced easily.
h. Monitor structures during their service lives to ensure that preventive measures to combat bimetallic corrosion remain effective. Any modifications during service life should be checked for possible bimetallic effects.
i. Where appropriate, cathodic protection can be used.
j. Ensure that absorbent materials like lagging are prevented from coming into contact with the alloys in the structure.
k. Exclude electrolyte from around the bimetallic junction. e.g. painting.
l. If electrical insulation is used to minimise the risk, then test for the insulation quality as part of PMS.

Alignment

Alignment of machines has been performed for ages; the reasons have always been obvious. In the modern world, the necessity of alignment with today's optimised machinery performance is a vital part in the daily maintenance work. Machines need to be on-line continuously with minimum interruptions. A machine breakdown causes devastating loss of production. Statistics attribute nearly 50% of all machine breakdowns to misalignment.

Definition of Misalignment

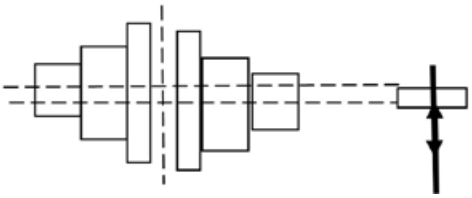
1. Misalignment is the deviation of the relative shaft position from collinear axis of rotation when the equipment is running at normal operating condition.



Alignment is the process of positioning two (or more) machines that are coupled, so that centerlines of rotating shafts form a single line when the machines are working at normal operating condition.

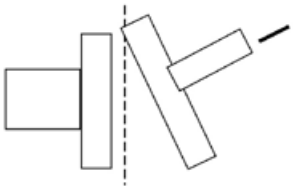
Types of Misalignment

1. Parallel or Off-Set



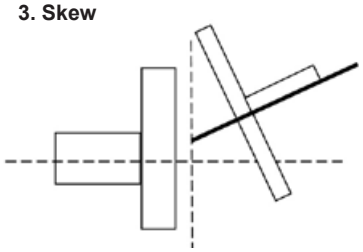
It occurs when the shaft centerlines are parallel but displaced from one another.
Parallel misalignment consumes more power than angular misalignment.

2. Angular



It occurs when two shafts are joined to make an angle at coupling centre.

3. Skew



Combination of offset & angular misalignment is the most common type of misalignment.

Reasons for Misalignment

1. Poor workmanship during alignment.
2. Improper foundation or larger holes of holding down bolts.
3. Improper grouting or shrinkage after grouting.
4. Thermal expansion due to process heating. Most machines are aligned cold & when operated, heat up causing thermal expansion which may cause misalignment.
5. Forces transmitted to the machine by piping and support members.
6. Soft foot.

Effect of Misalignment

1. Most experts agree that 50% of machinery problems are caused by misalignment.
2. Misalignment usually causes the bearing to carry higher load, in turn causes bearing failure due to fatigue. Fatigue is the result of stresses applied immediately below the load carrying surfaces. The result of excessive load will increase the power consumption of electric motor.
3. Misalignment vibration, which destroys the critical parts of the machine such as bearings, seals, gears, couplings etc. These failures are sometimes not identified and analysed as normal wear and tear.
4. Misalignments break the lubricant film inside the bearing and increase friction between rotating or moving parts.
5. Misalignment increases the power consumption by 2-17%.
6. Misalignment will increase the operating temperature of the machine.
7. Misalignment generates heat in the coupling.

Scientific Diagnosis of Misalignment

1. By vibration spectrum analysis.

a. There is high energy, low frequency radial & axial vibration amplitudes.
b. Pure angular misalignment causes axial vibration at the running speed frequency (1X).
c. Pure parallel misalignment produces radial vibration at twice or three times the running speed frequency (2x or 3x).
d. With severe misalignment, the spectrum may contain harmonics from 3x to 10x. In fact, hardly any faults other then misalignment produce excessive 3x vibration.
e. Higher than normal 1x/2x/3x amplitudes occur in both axial & radial positions the 2x amplitude is not always present. But if it is a higher than normal 2x amplitude, it can vary from 30% of 1x to 100 % of 1x. Measurements with 2x amplitude < 50% of 1x are usually acceptable and often operate for a long period of time. When the vibration amplitude at 2x is 50% to 150% that of 1x, it is probable that coupling damage will occur. A machine whose vibration at 2x running speed is above 150% has severe misalignment. The problem should be corrected as soon as possible.

Recognising Misalignment

There are several symptoms indicating misalignment. In general, misalignment results in the following symptoms

1. Excessive radial and axial vibration.
2. Premature bearing, seal, shaft and coupling failure.
3. High casing temperature at or near the bearing or high discharge oil temperature.
4. Repetitive failure of seals and excessive amount of oil leakage.
5. The coupling is hot while running and soon after the shut down.
6. Premature failure of coupling element.
7. Loose coupling elements.
8. Loose foundation bolts.
9. Excessive amount of greases inside the coupling guard.
10. Similar pieces of equipment are vibrating less or seem to have longer operating life.

Rough Alignment Methods

- Straight edge method
- Twin wire method
- Face gap method

Precision Alignment Methods

- Face peripheral dial indicator method
- Reverse indicator method
- Laser alignment method

Sanjay Pardeshi
Senior Marine Instructor
SIMS, Lonavala

Blast from Past

Braving Missile Attack by Iraqi Warplanes

Capt. Arun Sundaram

This is a story from over a quarter century ago and to put it on paper needed recalling events from half my lifetime ago. It was truly a trip down memory lane, which was clogged fully with worn out memory cells and hence it took a long time to navigate through the tortuous passage.

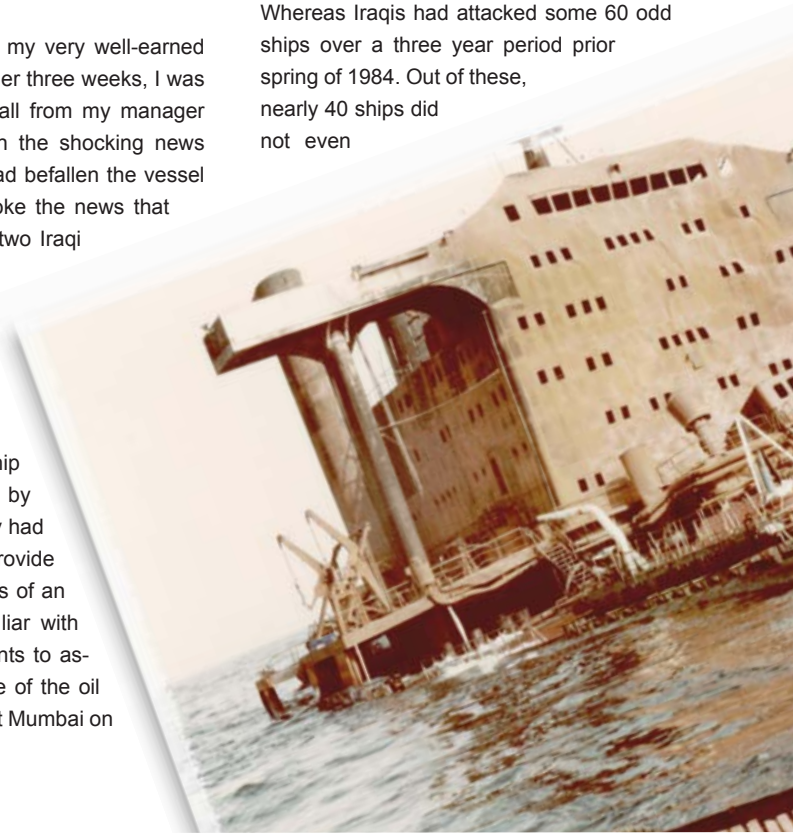
I had sailed on the 117,710 Ton Saudi flagged oil tanker Al Ahood as Master for a continuous period of 11 months 17 days (i.e. from April 1983 to April 1984). Our current crop of tanker officers may scoff now, at even harbouring a passing thought of spending such a long period on a tanker in a senior position. Even in that era, when oil majors were not breathing down our necks and vetting guidelines were some distance away, life was not easy. This lady was rather old and was on a demanding run of Arabian Gulf to Europe/ Mediterranean Sea through Suez Canal, where every transit was a testing period for engineers in view of exhaust temperatures going up on increasing speed, pilots threatening to get down on any pretext and asking the Master to do what he wanted. It was also a constant battle to fix pipelines and leakages on an aged ship, encountering sandstorms with zero visibility and memorable experiences of trying to anchor the ballasted ship in the bitter lake in conditions of zero visibility and gusting winds (but that would then be matter for another story!).

This was the peak of the Iran Iraq War activity. Fresh in memory are the days of navigation in total blackout (navigation lights off as well!) through this treacherous waterway and the regular drill of loading at Kharg Island and proceeding to Italian ports, mainly Genoa to discharge the Iranian Crude oil cargo. After discharging, we would return back in ballast to the Gulf again (which was referred to by different names, depending on which port the ship was bound for - whether Arabian or Iranian). At times the discharge port would be Rotterdam, but mostly, the vessel plied to Italian ports for discharging. I finally signed off at Venice after completion of discharging on 15th April 1984 and went back home on a well deserved vacation. The vessel was bound for Kharg Island once again under a new command to load nearly 114, 000 tonnes of Iranian Crude oil.

While I was enjoying my very well-earned vacation, in just another three weeks, I was jostled by a phone call from my manager from Hong Kong with the shocking news of the disaster that had befallen the vessel and the crew. He broke the news that Al Ahood was hit by two Iraqi Exocet missiles after sailing out from Kharg Island on the fateful day of 7th May 1984.

I was told that the ship had been salvaged by SEMCO and that they had asked owners to provide them with the services of an expert who was familiar with the ship's arrangements to assist them in discharge of the oil from cargo tanks. I left Mumbai on 24th May and arrived in Bahrain the same day, where I was taken to Gulf Hotel. This was to be our HQ for shuttling back and forth from the stricken ship. A superintendent from Owner's managers V Ships was already there and we made the first trip in a small tug boat, which was to also act as our home alongside Al Ahood.

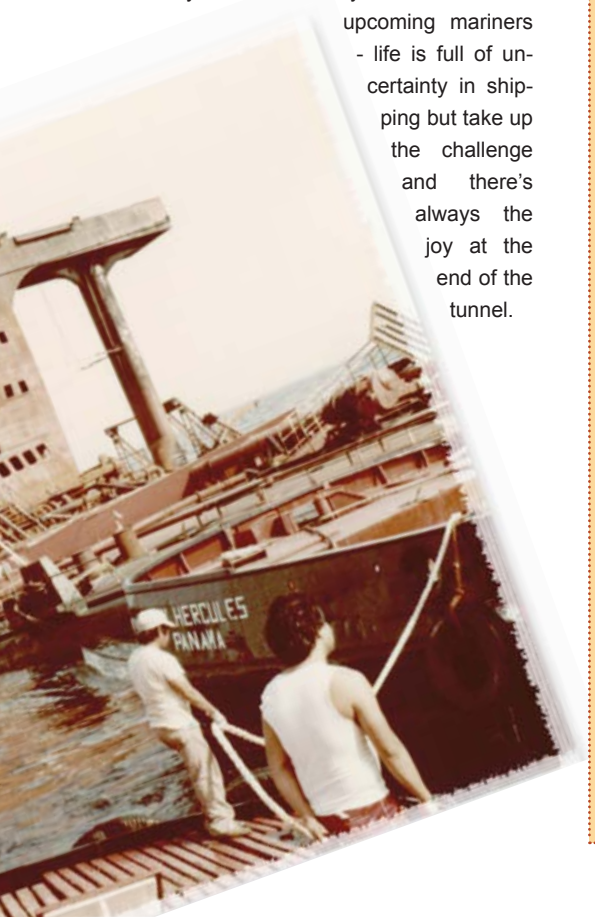
Just to put things in perspective for you, Iran had launched a massive offensive against Iraq in February 1984 and seized parts of the artificial islands of Majnoon inside Iraqi marshes north of Basrah. The island could be effectively used as a base for launching further attacks against Baghdad – Basrah strategic highway some 6 miles distant. Whereas Iraqis had attacked some 60 odd ships over a three year period prior spring of 1984. Out of these, nearly 40 ships did not even



belong to the warring countries. Then Iraqis started using their new toys – French made Super Etenard planes, instead of normally used helicopters, to fire the heat seeking exocet missiles at oil tankers.

The ship was anchored about 75 miles away from Bahrain. For a small tug boat, the seas seemed rather choppy and during the entire trip, which may have taken eternity or 10 hours, was very uncomfortable. The tug-boat rolled, pitched, slewed, corkscrewed and we all were feeling very queasy. I prided myself as an excellent sailor, who never felt seasick from day one on the ship. But during this trip, I came closest to feeling seasick and could really appreciate the torture others had to go through during this process. Fortunately I did not throw up, but that was little comfort in this arduous journey. Both of us tried to lie down, but that was of little help. In short, these were 10 hellish hours in the tug boat.

When I arrived, what I saw, what I heard and what I did, are going to be the fodder of the next part of my story. Needless to say, this was an experience of a lifetime for a master mariner like me. However, harrowing and challenging were the next … days of my association with the ship where I spent over a year to command her under testing situations, they taught me many lessons not exactly related to shipping but life in general and moulded me to be part of what I am today. My advice to all the upcoming mariners - life is full of uncertainty in shipping but take up the challenge and there's always the joy at the end of the tunnel.



Damage caused by Iraqi Exocet missile

Cadet's Morning Bridge Watch

Groggily I get up at quarter to four,
Splashing cold water on my eyes galore.
Rush quickly to bridge I go,
For keeping watch to eight from four.

Wheelhouse is eerily dark and quiet,
Small lamps winking red light.
Slowly mingling into the darkness around
Allowed my sleeping bones to be awakened and bold.

Hearing the winds gushing and howling at bridge wing,
Realise the agony that the Siberian winds in winter bring.
Even though wrapped in heavy woolen
Biting winds make my poor nose reddened.

Ensure my eyes remain alert and wide
To keep lookout with all senses of mine.
Early must I spot the approaching ships' light,
And quickly report to the officer of the night.

Then, I must find the compass error,
By taking azimuth of stars up yonder.
Then I need to search the stars for sight,
Before they start to fade away in twilight.

How I love to hear the ship hums in the night,
Piching 'n' rolling but moving like a sprite!
Watch the dark night retreat in a fright,
Pitch dark 'fore but now turns so bright.

After the star sight is plotted and done,
Work for bridge cleaning then begun.
Bit by bit the sun glows brighter
Day-workers now waking up from slumber.

Oft I heard that for a seasoned sailor,
Sunrise is but a boring mundane matter.
Tho' find watching rising sun so refreshing,
Believe me, my morning watch is really very pleasing!

Capt. Arun Sundaram

SIMS Cadets Join as ESM Officers During the Last Quarter Ending 15th July, 2010


3/O Krishna Kumar


3/O Agnel James


3/O Ajay Kumar


3/O Ankul Prasad Gautam


3/O Arun Baiju


3/O Rohit Saran


3/O Dilpreet Singh


3/O Shikhar Singh


3/O Anand Kumar V


4/E Sooraj K M


4/E Mathew Jince


4/E Gagandeep Singh Marwah


4/E Jithin Payyanat Vijayan


4/E Kuldeep Singh


4/E Lijo George Mundakathil


4/E Mayank Singh Rawat


4/E Praveen Raj V.B.S


4/E Abhilash Chandran


4/E Birinder Singh Chauchan


4/E Gurpreet Singh


4/E Shekhar Singhal

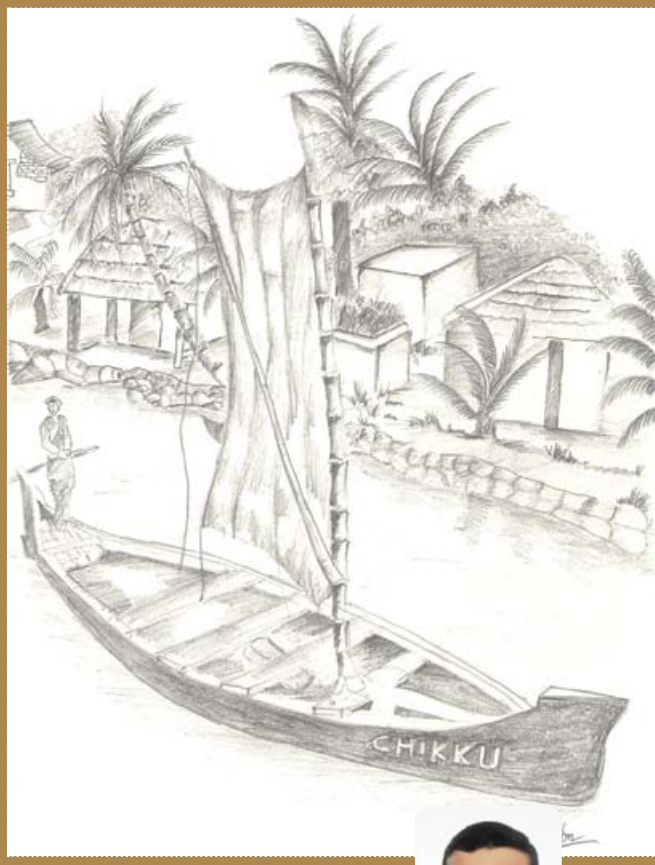

4/E Navdeep Bedi


4/E Dham Bhavya


4/E Prakash Chandran


4/E Chinmoy Das


4/E Dhanil Koottakkil



Artist:
CDT Bibin Varghese
DNS-09
SIMS, Lonavala

Artist:
CDT Robin Sunny
DNS-09
SIMS, Lonavala

Emergency Anchoring of a Loaded VLCC off One Fathom Bank

Handling a VLCC, especially when loaded, is a skill that is in many ways unique and easily differentiated with the handling of the smaller vessels. This is indeed an art acquired from years of learning the ropes from seniors on board and hours of observing how the VLCC responds to helm, speed and the topography around the vessel. Not that the vessels are in any way different in construction as compared to other tankers. It is simply the size of the ship and weight of the cargo that make her extra challenging and equally exciting for a navigator.

This is the story of Capt. Vimal Chand, who has spent close to 20 years of his sailing career on VLCCs, six (6) of which have been in command of these super tankers plying on the high seas. He has about 80 loaded transits of the Malacca-Singapore Straits under his belt and undoubtedly knows more than a fair share about the intricacies of handling these leviathans in the narrow confines of one of the world's busiest waterways.

On this occasion, Capt. Vimal Chand was in command of a 15-year old Single Hull VLCC, one of the last few of her generation on her final months of active service, loaded and drawing 18.70 mtrs draught. The vessel was on an East bound transit to Taiwan after having loaded in the Persian Gulf. Capt. Vimal Chand was well aware that as a navigator, he had to be ahead of the game whilst manoeuvring in the Malacca Straits. Years of time expended in contingency planning and emergency preparedness had given him enough insight into how a bridge team would react in an emergency but little did he anticipate that he would need to draw on all his acquired knowledge and skills to deal with the unexpected turn of events in this particular transit.

The vessel entered the deep water section of the One fathom Bank TSS Eastbound early in the morning around 0500 hrs with the Bridge and Engine room fully manned. The surrounding environment was still to be awakenened by the day light. The Bridge team comprised of the Master, the 2nd officer, a Helmsman, a Lookout and a cadet. Going by his experience and exercising prudent seamanship, the anchor lashings had been removed well ahead and anchor chains adjusted such that the stopper was not bearing its weight in case an emergency 'letting go' was necessary.

Leaving the shallows about a mile and a half on either side, the vessel was proceeding at about 12 Knots, parallel indexing on the Batu Mandi beacon to starboard. Capt. Chand issued the helm orders, lining up the vessel to squeeze through the barely 1 mile room between the two cardinal beacons which marked the shallows. The officer of the watch monitored and plotted the vessel's position continuously and reported to the VTS at the designated locations. For this transit, there were no other vessels in close range of own vessel.

Though Capt. Chand had executed this very manoeuvre on numerous occasions in more trying circumstances in the past, there was no let up in the quality of passage planning, execution and monitoring. He knew very well that a 15 year old single hull VLCC warrants every bit of care and contingency possible and the bridge team had been well briefed on this by the Master.

At 0528 hrs just as the Master had rung Half ahead on the engines to reduce speed with the cardinal buoys about 6 miles ahead, the Chief Engineer called the Bridge to inform that the ME had to be stopped immediately and that there was a likelihood of a black-out.

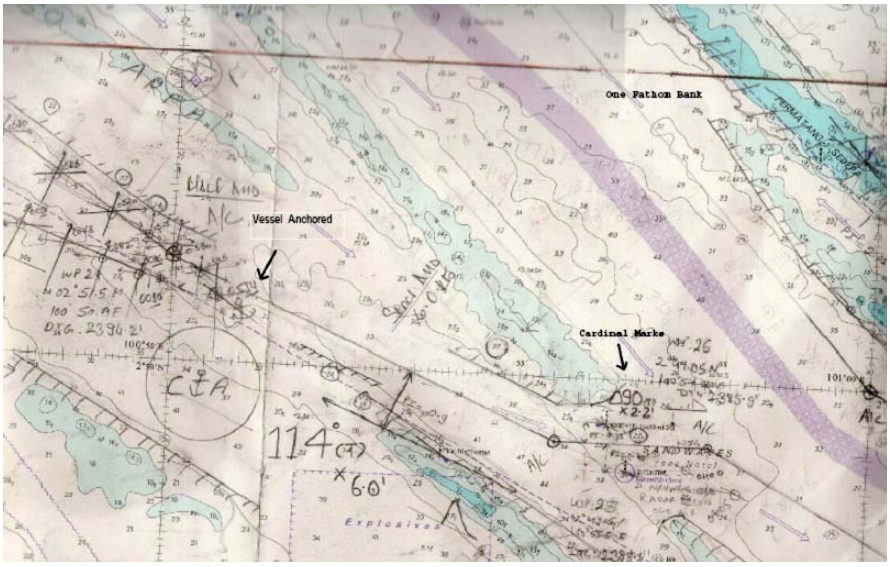
No matter how prepared a bridge team is and irrespective of the planning that has been conducted, information of that nature from the engine room of a loaded VLCC in a confined waterway littered with shallows can catch the best of bridge teams off guard.

That was a bombshell even an experienced master of his calibre could not duck from and what he did thereafter is the story below:

Shaking off the initial numbness and keeping the conversation with the Engine Room relevant and brief, emergency anchor stations were called on the PA system within seconds and anchoring team informed to rush forward and prepare for anchoring. VTS Klang was informed on VHF of vessel's intention to anchor within the southern limits of the TSS as this was the safest option available under the circumstances of a possible loss of power.

The Master instructed the engines to stop at 0536 hrs and employed rudder cycling to dampen the speed. The wheel was put hard to starboard and then checked to commence a starboard swing. A "Securite" message was broadcasted on VHF, NUC lights were immediately displayed and astern Engine orders were then rung in quick succession to stop the vessel and assist the swing to starboard .

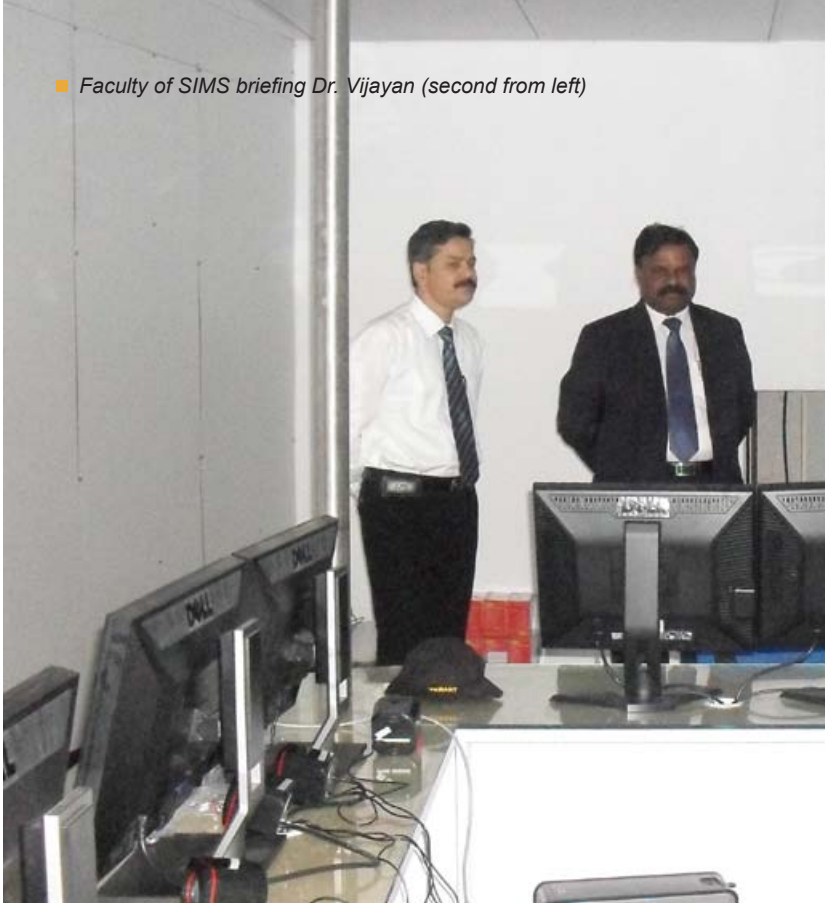
Continued on page 18



Nautical chart, showing the route taken

Dr. Vijayan, VC, IMU, being welcomed to SIMS

Dr. Vijayan visiting the Engine Control Room



Faculty of SIMS briefing Dr. Vijayan (second from left)

Dr. Vijayan in a meeting with SIMS faculty

Dr. Vijayan listening to another interesting briefing

Vice Chancellor, Indian Maritime University Lauds SIMS

The Vice Chancellor of IMU, Dr. P. Vijayan also lauds SIMS, Lonavala for its "green environment" and for producing quality manpower for the industry during his visit to the campus on 21st May, Friday. He stressed that this green environment is indeed congenial for the well-being of the cadets trained by the institute.

Dr. Vijayan, who had earlier visited the SIMS, Lonavala campus about a year back, toured the campus and showed keen interest, particularly in a large number of new state- of-the-art equipments and facilities added to the campus for the learning benefit of the young cadets.

The vice chancellor was warmly received on arrival by Capt. Anil Mehta, acting dean of DNS and Mr. Soman from the Engineering Faculty. After a customary safety briefing by Capt. Krishnan, he was accompanied to the various facilities like the Inert Gas Tanker Simulator (IGTS), Engine Room Simulator (ERS) and the Officer of the Watch Ship Maneuvering Simulator (OOW-SMS), which are unique facilities and first of its kind in India and in the industry as such.

Dr. Vijayan commended SIMS for its contribution in producing quality manpower for the industry and added that a dedicated faculty and workforce is the strength to produce and nurture disciplined seafarers – the quality to be given top priority in the industry. He mentioned that SIMS is setting the benchmark for quality maritime training in India. While Dr. Vijayan made special note of the green environment, he was also briefed about various recycling and environmental friendly measures undertaken in this much awarded campus designed by MIT trained American architect, Christopher Charles Benninger. The 300 feet photovoltaic solar wall of the SIMS building, Asia's longest and producing 90KW of energy daily, is one feature of this 'green environment'.

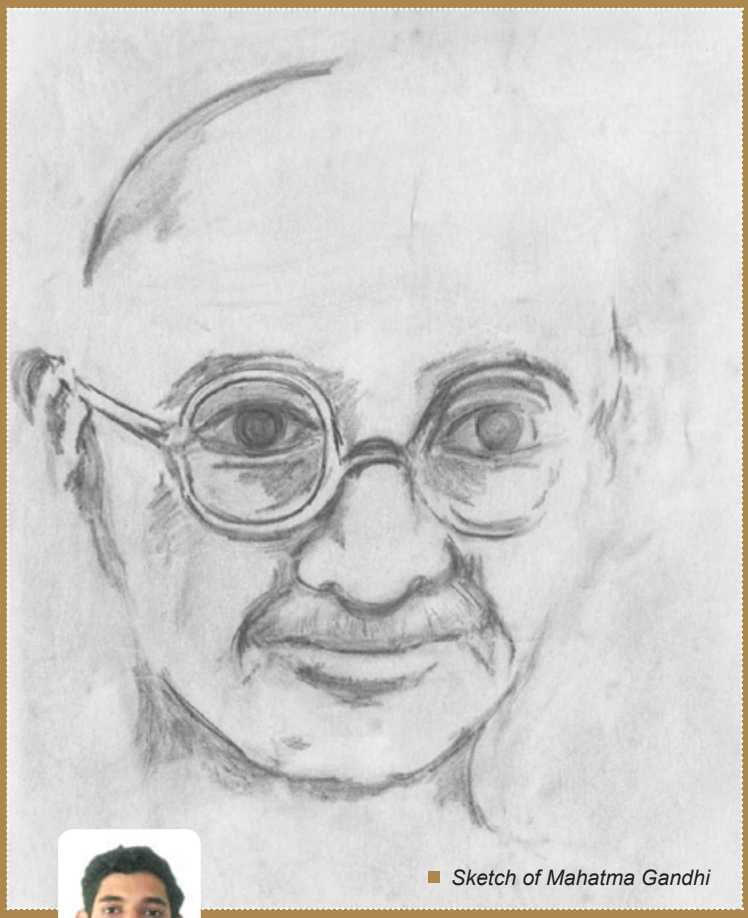
Earlier, in an interaction with the faculty members in the conference room, the vice chancellor advised them on efforts by IMU in introducing a new Learning Management System for the future cadets. The faculty members pointed out that similar e-learning programme

Dr. Vijayan writing in the SIMS guests' comments log book

for Navigation was in fact, already introduced to the cadets in SIMS and some of the modules are in the testing ground with the institute's cadets.

Emphasizing the role of the university in ensuring good standard and quality of cadets, he mentioned that IMU was planning to make it mandatory for the cadet to pass his Diploma exams before he obtains his Certificate of competency (COC). Additionally, the Diploma certificate that IMU will issue to the cadets will be a biometric certificate. This would prevent any forgery and ensure foolproof certification.

After his tour around the campus, Dr. Vijayan commented in the visitor's log book, "Dedicated faculty and workforce is an added strength to produce disciplined seafarers for the industry. SIMS has been able to contribute quality manpower through their upgraded facilities. Discipline is considered to be given top most priority which facilitates a green environment which is congenial for the students' well being. I wish all good luck in the years to come and prosper well to contribute for the betterment of the industry."



Sketch of Mahatma Gandhi

Artist: CDT Manmohan
GME-08
SIMS, Lonavala

SIMS to Launch 4 - Year B. Tech Marine Engineering Course

In addition to the existing one year Diploma in Nautical Sciences and one year post Graduate Marine Engineering courses (GME), SIMS is set to start the 4-year B. Tech Marine Engineering course this summer. The successful cadets at the end of the course will receive a BE degree from Indian Maritime University (IMU) and a Certificate of Competency (COC) from Directorate of Shipping, Govt. of India.

The news has received a lot of enthusiasm from the maritime fraternity and prospective candidates in view of the superior infra-structure and teaching capability of SIMS, not only in India but abroad. As per Mr. S. Viswanathan, Principal of SIMS, Lonavala, the first batch will have an intake of only 40 candidates selected through an all India level entrance test. As of the end of June, the course seemed oversubscribed, with a total of 128 applications coming in from 7 cities in India. In line with how the entrance test is conducted for the rest of the courses, the test will comprise of three levels of screening including a written test, interview and finally a psychometric profiling test, in addition to the regular medical fitness and eye test. The selection will be strictly based on criteria set and announced on the institute's website (www.samundra.com).

ESM will be the sole sponsor of all the cadets and thereby provide sailing berth to them at the end of their full course at SIMS. The admission test is scheduled for 04th July, along with the GME admission test and will be conducted in seven (7) centres spread across the country. All interested candidates can apply online, free of cost.

Foul Anchor

The subject vessel, an oil/ chemical tanker was awaiting orders at anchor outside port limits off Singapore (OPL). She had already been at anchor for about four days. Vessel was riding to her stbd. anchor, maintaining her anchor position. The nearest vessel was at a distance of about 4 cables. At around 1630 LT on the day five, while Master was taking his deck rounds, he noticed that the closest vessel was at the stern of own vessel and appeared to be much closer than before.

The master immediately went on Bridge and discovered that the nearest vessel at the stern of was only 2.2 cables off. The main engine was prepared immediately and anchor stations were called, suspecting that own vessel was dragging anchor. Lots of strain was observed on the anchor chain while picking up anchor. Frequent engine movements had to be given to ease the tension from anchor chain to facilitate picking up of anchor chain. At about 1700 LT upon weighing off the starboard

Safely rigging the 'hanging-off' arrangement

anchor, it was found fouled with some other anchor chain, which was lying on the sea bed (probably lost anchor chain of a vessel). At that moment, the current was about 3.5 kts and wind speed about 20 kts.

Since the other anchored vessels were rather close to own vessel, frequent engine movements were given to maintain the vessel's position safely away from them. The master also immediately decided to get clear the chain fouling the ship's anchor. All the concerned parties were informed.

Anchor Team was formed under the leadership of Chief Officer to clear the fouled anchor. Chief Engineer was made responsible for safety and Risk assessment as it was a very critical operation involving crew to go over side for clearing the chain fouling the anchor.

After repeated trials and errors over 2-3 times, ship's crew managed to clear the foul anchor at about 2030 LT and vessel re-anchored at about 2100 LT.

Capt. Biswajit Shukla
Nautical Faculty
SIMS, Lonavala

1. **What kind of emergency preparedness and vigilance is necessary whilst in a congested anchorage?**
2. **What are the tell tale signs of a fouled anchor and what actions are required to handle such a situation?**
3. **What procedures, permits and notifications would a Master have to consider prior to allowing the ship's crew to carry out the clearing of the fouled anchor?**

* We invite responses from our learned readers as to the causes and lessons learnt through this case study. Please send your responses to samundraspirit@samundra.com.

Responses for - Steam Burns to Motorman: Issue 09 (Apr 2010)

We have received an overwhelming number of feedbacks and comments from our enthusiastic readers on the previous case study - **Steam Burns to Motorman**. Here is a compilation of the responses received...

Causes:

1. The 2/E had too many things going on under his charge. He was distracted and not sufficiently attentive. He did not appreciate the hazards of opening steam on the deck with the hot well manhole open and with a person working in the vicinity; hence he did not caution the Motorman.
2. Inadequate identification of hazards involved: while keeping the hot well inspection cover open, the hazards involved were not identified hence correct preventive action not taken. Had the 2/E identified the hazards involved in opening steam to the deck with the hot well manhole open and a motorman working in the vicinity, he surely would have cautioned the motorman to stay clear before opening the steam on the deck or would have had the hot well manhole cover boxed back in place before the steam on deck was opened.
3. Improper procedures followed/short cuts taken: leaving the manhole open was the wrong practice being carried out without being aware of the consequences of such an action. Also proper procedure of opening steam (draining the water from drains) was not followed.

Lessons learnt:

1. Many times, accidents occur when we do not carry out good planning for the job.
2. Hence all persons must be involved and understand the plan and its sequence. Supervisor must ensure that all personnel in the engine room are aware of the various jobs going around in the engine room and all are warned regarding he hazards involved.
3. Tool box meeting/safety meetings at the beginning of the day and after lunch of before starting any job are an excellent tool to raise everybody's awareness.
4. Keeping such inspection covers/ hot well manholes open should be avoided as far as possible. Sight glasses, etc (if available) should be used. Just to reduce duty officers' work, cover was kept open but this poses danger to engine room personnel. Taking shortcuts may make the job simple for the first few times but in the long run it always proves to be dangerous for personnel.
5. If opening of such inspection covers is required (after discussion/meeting by engine room team) a risk assessment is to be carried out (formal or informal) and in view of the hazards identified, necessary precautions are to be taken. These may include cordoning off the area near the hot well using caution tape or posting a warning sign so that people working in the vicinity are warned.
6. Steam lines to be drained well before opening the steam on deck. Proper procedures with regards to draining steam lines on deck and opening steam must be followed (again, no short cuts to be taken).
7. The engine room team must ensure that all steam traps on condensate return lines are maintained in good working conditions by a timely maintenance schedule.

Parametric Roll in Longitudinal Sea

Sajal Sengupta
R & D Department
SIMS, Lonavala

Continuing from the last article discussed about parametric roll behaviour in longitudinal seas, it is worth discussing about the effects of the GZ curve on roll amplitude, influence of ahead speed, the threshold parameters and controlling aspects for the safe sailing of a ship.

Amplitude of Parametric Roll

The shape of the GZ curve is one of the most important factors determining the amplitude of parametric roll. This can be understood by following relationship,

GM = f (roll angle , shape of the GZ curve)

since, $T = \frac{2\pi k}{\sqrt{gGM}}$

where, GM: metacentric height
GZ: righting arm
T : natural period of roll
k : radius of gyration
g : gravitational acceration

For small heel angle say up to 10- 12 degree, the GZ curve is usually linear (shown in fig-1), so GM does not change & thus the natural period of roll and frequency remains constant.

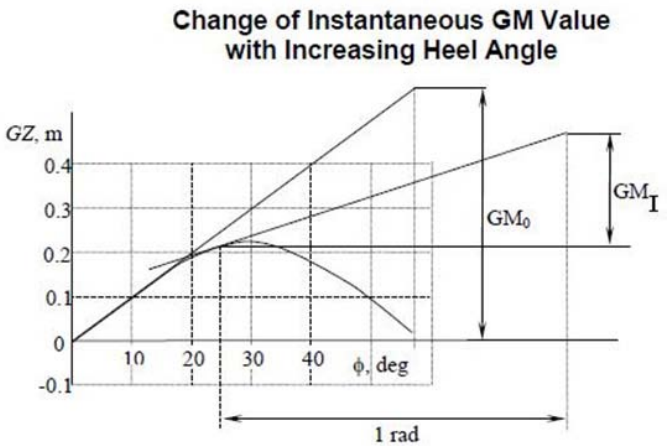


Fig.1

Once the roll angle increases beyond the linear portion of the GZ curve, the instantaneous GM (GMI) value changes as the GZ curve bends shown in Fig-1. This causes the natural roll period and natural roll frequency to change as well. Since the wave encounter frequency remains the same, the roll natural frequency may no longer be close to twice the encounter frequency. As a result, parametric resonance conditions no longer exist and roll motions no longer receive additional energy at each cycle. This causes the parametric roll to stop increasing and a certain amplitude of roll is established.

Influence of Ahead Speed and Wave Direction

Longitudinal waves (head and following) cause the most change in a ship's intact stability and, therefore, create maximum parametric excitation. A ship moving through the waves encounters them with a different frequency than a ship that is not moving. This frequency is called "frequency of encounter" or "encounter frequency". It is smaller for following seas (ship speed is subtracted from wave celerity) and larger for head seas (wave celerity is added to ship ahead speed).

The encounter period (wave period corresponding to the wave frequency of encounter) is the time that passes while a ship encounters two adjacent wave crests or two adjacent wave troughs. It is also a frequency of change of a ship's stability. Parametric roll resonance develops when the frequency of stability change is nearly twice that of natural roll frequency or when the frequency of encounter is nearly twice that of natural roll frequency. The value of natural roll frequency mostly depends on GM value (transversal distribution of weight also may have an influence). Therefore, whether parametric roll resonance may occur in following or head seas depends mostly on current GM value. Wave length also has an influence because it is related to the wave frequency on which the frequency of encounter is dependent.

From the research studies carried out so far, the following have been observed:

- Parametric roll occurs when natural roll period is between 1.8 to 2.1 times the encounter period (normally associated with the pitching period).
- There is a range of encounter wave frequencies that is capable of causing parametric roll resonance.
- The larger the flare, the more likely is the parametric roll angle and wider is the range of resonance.
- The wave damping is below a certain threshold level.
- The wave height is above a certain threshold level.

Controlling Aspects

First stay calm. When detecting the short roll period close to the pitching period, it is a warning of the parametric roll inception. Change heading to beam seas is the fastest way of getting rid of it. Then slowly come back to the original heading if necessary.

Nature has its way of taking care of things. For a ship's loading condition with high GM, i.e. shorter natural roll period, say around 10 second, the waves that could cause the pitching period around 5 seconds are usually not very high and therefore unlikely to initiate parametric rolling in head/stern seas. However, the synchronous roll may occur in beam seas. So the way to reduce the roll is by heading into the sea.

The Parametric Roll screen serves as a warning system for monitoring parametric resonance as well as to alarm the officer on watch by displaying roll and pitch of the vessel in a 3-dimentional picture. There are known examples of an increase in rolling angles from 150 to 600 in less than 6 minutes. One instrument named **DimMax 2.0** by Max Control BV, Netherlands, as shown in Fig 2 below, was recently developed as a warning system for monitoring parametric resonance.

It is hoped that future R&D will be able to correlate the parametric roll with predictive events such as large relative bow motions and bow submergence (indicating flare immersion), thereby alerting the master in the route planning stage or change loading conditions (GM) before departure.

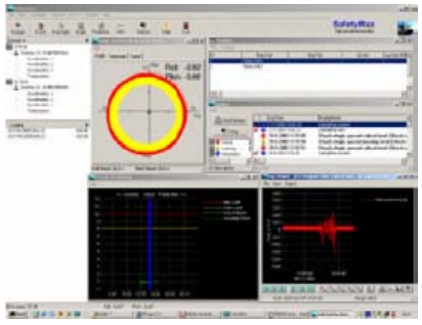
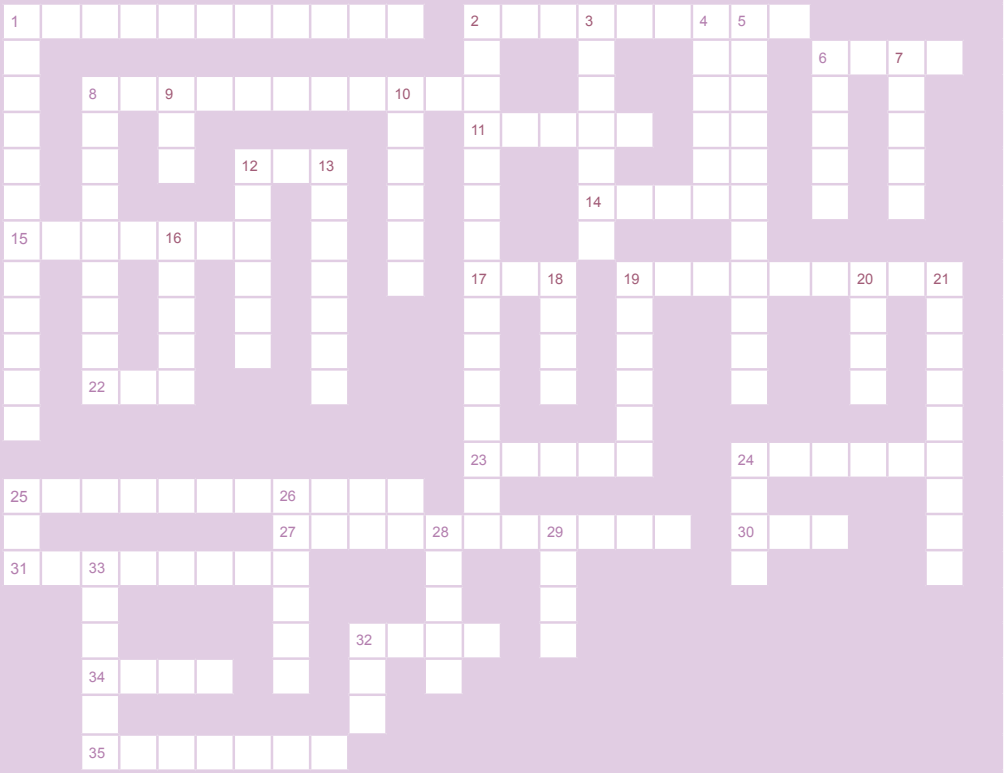


Fig.2 Program DimMax 2.0 showing inception of parametric roll

Crossword Puzzle

CDT Deepak Gupta &
CDT Pritesh Shetty
GME-08
SIMS, Lonavala



Across

1. _____ if engaged with the fly wheel the engine wont start.
2. _____ bacteria are not preferred in STP.
6. The secondary movement of piston is referred to as _____.
8. The space which separates the combustion space and crankcase.
11. _____ gases are produced from scrubbers using exhaust gases.
12. A breaker having low current rating.
14. _____ flash is the rapid release of energy due to an arcing fault between a phase bus bar and another phase bus bar, neutral or ground.
15. Another name for floating lever.
17. The _____ value of an alternating voltage is the equivalent DC voltage that can deliver the same amount of energy to the resistor as the AC does over one cycle.
19. When the frequency of vibration matches with the natural frequency _____ is said to occur.
22. Course which covers the mandatory min requirements of familiarization on basic training in first aid as per the STCW 95 convention.
23. Unit of flux.
24. An alloy of copper and Zinc.
25. Device used for burning sludge and oily rags.
27. Device used in the paralleling of two generators.
30. Washing system using crude oil on tanker.
31. _____ temp is the temp at which the air can no longer hold its water vapours.
32. Ramp is fitted on _____ type of vessels.
33. _____ alarm is to be activated prior alone entry to engine room on UMS class ships.
34. _____ ring is another name for gravity discs.
35. _____ alloy is used as a material in latest exhaust valves.

Down

1. Waste energy of exhaust gases is utilized in this type of supercharger.
2. Device used to provide scavange air to the system during starting in a two stroke engine.
3. Quantitative measure of disorder in a system.
4. Device used in the generation of steam in large quantities on board ships.
5. In air compressor after compression the air passes through?
6. _____ generator produces power from the main engine.
7. _____ arc welding an inert gas is used.
8. The hole in the hull structure for accommodating the propeller shaft to the outside of the hull.
9. A class of vessels.
10. Material used in journal bearing.
12. Device used to check Insulation Resistance.
13. Common type of pressure gauge.
16. I in phonetics.
18. In these areas the Sox emissions will be reduced to 1% from 1st july 2010.
19. Device which changes the direction of ship.
20. _____ available should be greater than _____ required to avoid cavitations in pumps.
21. _____ valve controls the flow of refrigerants in refrigeration.
24. _____ wash filter is used in lub oil systems.
25. During blow through of engine it should remain open.
26. The propeller can rotate in ahead and _____ direction.
28. Unit of Inductance.
29. _____ blowing is used in economisers.
32. _____ down time is calculated for turbochargers.
33. Air operated diaphragm pump.

Answers:

Across: 1.Turninggear 2.anaerobic 6.Slap 8.stuffingbox 11.inert 12.MCB 14.PSSR 15.Hunting 17.RMS 19.resonance 22.EFA 23.weber 24.Brass 25.incenerator 27.synchroscope 30.COW 31.Dewpoint 32.RORO 33.Deadmans 34.DAM 35.Nimonic

Down: 1.Turbocharger 2.Auxiliaryblower 3.Entropy 4.Boiler 5.Intercooler 6.Shaft 7.Argon 8.Sterntube 9.UMS 10.Babbit 12.Megger 13.Bourdon 16.India 18.SECA 19.Rudder 20.NPSH 21.Expansion 24.Back 25.Indicatorcock 26.Astern 28.Henry 29.Soot 32.Run 33.Weldon

Mind Crackers

1. MAN / BOARD

2. YOUJUSTME

3. STAND / MIS

4. ECNALG

5. W | R | I | T | I | N | G

6. DEATH/LIFE

7. O_ER_T_O_

8. 0
B.Sc
B.E
B.Com

9. R
O
R O A D S
D
S

10. SGEG

11. PIT

12. TUNNELLIGHT

Answers:

1. MANOVERBOARD.
2. JUST BETWEEN YOU AND ME.
3. MISUNDERSTAND.
4. BACKWARD GLANCE.
5. WRITING BETWEEN LINES.
6. LIFE AFTER DEATH.
7. PAINLESS OPERATION.
8. THREE DEGREE BELOW ZERO.
9. CROSS ROADS.
10. SCAMBLED EGGS.
11. BOTTOMLESS.
12. LIGHT AT THE END OF TUNNEL.

Compiled by:

CDT Roopesh N K
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Contiuned from page 12

(Emergency Anchoring Of a Loaded VLCC off One Fathom Bank)

The vessel was brought to dead stop by 0548 hrs and the starboard anchor was walked back into the water at waters of 30 metre depth. The vessel was finally brought up to its anchor at a position about 2 miles from the shoals. A report was made to the VTS and a security broadcast made to warn all approaching vessels using the deep draft TSS.

In the 20 minutes it took from the time the Engine room informed the bridge to 'Stop' to the time the vessel anchored, a series of actions were initiated to brake the vessel and manoeuvre it to a position of safety. After ensuring that the vessel was safely at anchor, the Master carried out the necessary notification to all parties. In consultation with the office and after a thorough risk assessment, it was decided to allow the vessel to remain at anchor for nearly 18 hours to effect repairs to a leaking ME seawater cooling pipe which was found to be the reason for the unplanned stoppage. Throughout the time at anchor, the Bridge was manned continuously by an officer and a look out; the anchor position was monitored and all approaching vessels were cautioned at regular intervals on the VHF.

During this time, the Master reviewed the position of the vessel and drew up a plan to restore the vessel to its original track once the repairs were completed. For a loaded VLCC, this is not as simple as it sounds, the vessel was anchored only about 5 miles off the deep water Cardinal beacons marking the shoals. From a dead stop, the vessel would not gather enough momentum to ensure sufficient steerage speed to retain directional control and pass between the beacons. It was therefore decided that the vessel would have to be swung to the west keeping to the deeper waters south of the lane until speed could be increased to allow the engine tests to be carried out. With that taken care off, the vessel could be swung to the starboard to make her approach once again in the East bound Deep draft lane of the TSS.

After seeking approval from the VTS, the manoeuvre was executed successfully as per plan and the vessel proceeded on her passage through the straits. The vessel completed a safe transit through the Singapore Straits to the discharge port of Mailiao, Taiwan.

Whilst the vessel and its crew came out unscathed from the incident, Capt. Vimal Chand reminisces on the events with mixed feelings. Full credit will go to the master for not only utilizing his knowledge but also for applying his mental strength and experience to be totally focused and ride over the crisis. Any delay on this count could have resulted in the vessel drifting to the shallows and with a single skin loaded VLCC, this had the potential to be catastrophic.

On the other hand, on a positive note, had the vessel suffered a blackout or had there been heavy traffic or poor visibility, the events could have played out differently.

Finally, what Capt. Vimal Chand could prove is that without the years of experience, the task would have been quite daunting for a newcomer or a lesser experienced master. Although the benefits of planning, emergency preparedness and contingency measures cannot be undermined, the manner in which the Master and the bridge team sized up the situation and executed the contingency measures eventually averted an unpleasant outcome to say the least. There is enough to be done in terms of ascertaining the root causes and arriving at the corrective action but regardless of the loss of time, there was no casualty, pollution, damage or grounding. This, as we all know remains the most crucial aspect.

This is indeed a great lesson for many upcoming young officers who push for rapid promotions as soon as they get their certificate of competency in their hands. An inexperienced master would definitely be more anxious and stressed and would buckle soon enough instead of taking full command of the situation and lead the team on board.

Move Smart to Prevent Back Injuries

All of us take our backs for granted. During our numerous travels, we tend to pick up heavy bags from the floor level without bending our legs but fully bending our backs. We pick up our well fed children (they are heavy, God bless them!) and carry them for long hours. We push heavy Godrej cupboards or newly bought 42" television sets and carry heavy loads in our arms, while climbing up the stairs on board a ship – well, the list can just go on and on.

The truth is that whether at work ashore or on board ships, a large percentage of personal injury incidents can be easily linked to poor manual handling or overexertion, which can badly strain our backs. Manual handling is the transportation or supporting of a load by lifting, lowering, pulling, pushing, carrying, dropping or throwing.

Common Causes of Back Injuries:

1. Twisting at the waist while lifting or holding a heavy load. This frequently happens when using a shovel.
2. Stretching, reaching and lifting over your head, across a table, or out the back of a car.
3. Lifting or carrying objects with awkward or odd shapes.
4. Working in awkward and uncomfortable positions.
5. Sitting or standing too long in one position. Sitting and working for long hours, focusing on a computer screen can be very hard on the lower back.
6. It is also possible to injure your back slipping on an oily, slipper deck or ice.
7. Finally, using poor lifting techniques - for instance, stooping, overexertion, twisting, sudden movements and poor grip can lead to injury.

How to Prevent Back Injuries:

1. Avoid lifting and bending whenever you can.
2. Place objects up off the floor.
3. Use carts and trolleys.
4. Use cranes, hoists, tackles, and other lift-assist devices whenever you can.
5. Get help if something is too heavy for you to lift it alone.
6. Use proper lift procedures. Follow these steps when lifting:
   - Take a balanced stance, feet shoulder-width apart
   - Squat down to lift, get as close as you can.
   - Get a secure grip, hug the load.
   - Lift gradually using your legs, keep load close to you, keep back and neck straight.
   - Once standing, change directions by pointing your feet and turn your whole body. Avoid twisting at your waist.
   - To put load down, use these guidelines in reverse.

Preparation is Key to Safe Lifting:

- Assess any manual handling operations which involve a risk of injury and cannot be avoided. Conduct a risk assessment mentally (Take 5 or use a risk assessment form to guide you).
- Examine the load – determine the weight of a load and check if it is stable, equally distributed and there are no sharp edges.
- Plan the job – plan the route before lifting, identifying doors, hatches and tripping hazards along the way. Where possible, secure these open or gain assistance to prevent having to put loads down or manoeuvre awkwardly.
- Take a firm grip – a common cause of injury when handling objects is an insecure hold. Decide in advance how to grip the load, deciding if protective equipment, such as gloves are required.
- When picking up the load, stand close to the object, with feet shoulder width apart and one foot slightly in front of the other. Letting your legs do the work, carefully push the body upwards.

Additionally, minimise problems with your back by doing regular exercises that tone the muscles in your back, hips and thighs. If you are not fit or are overweight before beginning any exercise program, you should check with your doctor.

Exercises to Decrease the Strain on Your Back:

- Lie on back, knees bent, feet flat on floor. Raise knees toward chest. Place hands under knees and pull knees to chest. Do not raise head. Do not straighten legs as you lower them. Start with 5 repetitions, several times a day.
- Lie on stomach, hands under shoulders, elbows bent and push up. Raise top half of body as high as possible. Keep hips and legs on floor. Hold for one or two seconds. Repeat 10 times, several times a day.
- Stand with feet apart. Place hands in small of back. Keep knees straight. Bend backwards at waist as far as possible and hold for one or two seconds. Repeat as needed.

Remember, take care of your back and it will take care of you.

Source: www.worksafety.act.gov.au

Safe lifting procedures

Overfishing

A Threat That Grows


Source: www.nipic.com

Do you know that the global fishing fleet is now 2.5 times larger than what the oceans can continue to support? The world fish consumption has leapt from 45 million tonnes in 1973 to 110 million tonnes in 2006. A study of catch data published in the journal, Science, predicted that if fishing rates were to continue at this pace, all the world's fisheries will be collapsed by the year 2048.

The Law of the Sea

In December 1992, The United Nations Convention on the Law of the Sea (UNCLOS) was signed to counter the rising threat of over fishing. The Law of the Sea covered issues of territory, research, protection of the maritime environment, claims to resources, navigation rights, and uses of the high seas. The treaty determined an international set of fishing policies to attempt to restore the balance of the oceans and the marine biodiversity that has become increasingly threatened in the last 100 years. It has also established important marine boundaries between nations. Up till today, the UNCLOS treaty is still active and has been signed by over a hundred nations.

The Magnuson-Stevens Act

Another law that was established in 1976 and reauthorized in October 1996 is The Magnuson-Stevens Fishery Conservation and Management Act. The act is reviewed and updated by the United States congress every few years. It balances a support of the fishing industry and conservation of marine resources through established quotas and fisheries management. The Act sets the 200 nautical miles Exclusive Economic Zone (EEZ) that established American control over all fisheries and resources within the EEZ zone.

Fishes that are widely consumed such as the Atlantic cod, herring and California's sardines were also fished to the brink of extinction. The Chinese River Dolphin, one of the three known species of freshwater dolphins, is now extinct due to over fishing. It would be the first extinction of a large vertebrate in the last 50 years. Other than that, the Atlantic Blue fin Tuna has decreased in stocks of the fish in the eastern Atlantic and Mediterranean and a sharper decline in the western Atlantic could drive it to extinction.

What Had Been Done

In 1995, 50 of the world's resources ministers called for urgent action to address the crisis of over fishing in the oceans. They supported global efforts to rebuild fish stocks, protect and restore the marine environment. A year later, Australia requested for all major fishing nations to reduce their fishing fleets. It has already scaled down its tuna fishing fleet from 134 boats to 80. Over the past 12 years, tuna catch quotas for Australian, Japanese and New Zealand fleets have also been reduced by two-thirds.

To protect the Blue fin Tuna species, a special conservation commission was being set up by Australia, New Zealand and Japan under the Law of the Sea convention to set quotas on tuna catches. However, countries such as Taiwan, Indonesia and Korea refused to join the commission and they continue to fish the Blue fin. Japanese officials have pointed out that they will put pressure on Indonesia and South Korea to join the commission and accept the limits on catch sizes. Also, Japan has reduced the number of factory boats and scaled down the size of its commercial fishing fleet by a quarter.

Action Needed

A combined effort and agreement at international level is needed to stop indiscrimate and irrational over fishing. Though there are some good news of cooperation at certain level, we have a long way to go to restoring the balance of fish stock in our oceans and thereby, to ensure world's richest source of protein without imbalacing the natural marine biodiversity in the oceans.


Source: www.nipic.com

Ship Quotes

No captain can do very wrong if he places his ship alongside that of the enemy.
- Horatio Nelson

No one would have crossed the ocean if he could have gotten off the ship in the storm.
- Charles Kettering

One ship drives east and other drives West by the same wind that blows. It's the set of the sails and not the gales that determines the way they go.
- Ella Wheeler Wilox

Set your course by the stars, not by the lights of every passing ship.
- Omar N Bradly

It is not the ship so much as the skillful sailing that assures the prosperous voyage.
- George William Curtis

It is a ship with a great deal of sail but a very shallow keel.
- Robert Bork

If the highest aim of a captain were to preserve his ship, he would keep it in port forever.
- Saint Thomas Aquinas

If my ship sails from sight, it doesn't mean my journey ends, it simply means the river bends.
- J Enech Powell

He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may cast.
- Leonardo da Vinci

Hence a ship is said to head the sea when her course is opposed to the setting or direction of the surges.
- William Falconer

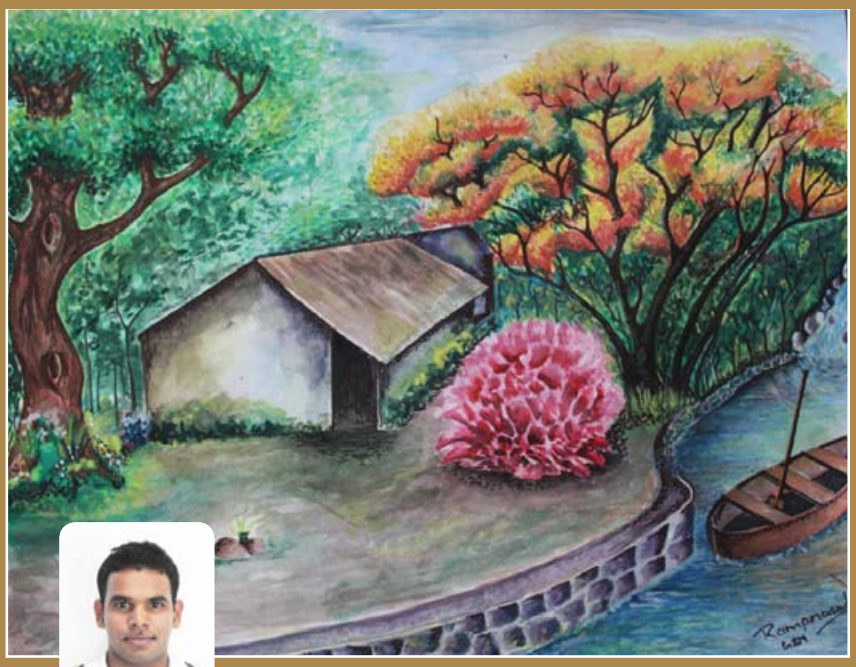
I am not afraid of storms for I am learning how to sail my ship.
- Louisa May Alcott

I must go down to the sea again, to the lonely sea and the sky and all I ask is a tall ship and a star to steer her by.
- John Mose Field

A ship in port is safe but that's not what ships are made for.
- Grace Hopper

A small leak can sink a great ship.
- Benjamin Franklin

CDT Mano Micheal Raj
DNS-09
SIMS, Lonavala



Artist: CDT Ram Prasad, GME-09, SIMS, Lonavala

Ship-in-campus, SIMS Lonavala

A full bloom flower to welcome 'visitors' at SIMS, Lonavala campus

Photographer: CDT Vijinth Kannan, GME-08, SIMS, Lonavala

Samundra Manthan

There may not be much to debate about but to just implement and ensure that all necessary and appropriate measures are being taken for the protection of environment. The workshop, rightly entitled "Samundra Manthan" (Churning of the ocean as in the great Indian epic story Mahabharata) drew the young cadets of SIMS, Lonavala to explore and learn about the various aspects related to burning environmental protection issues.

Aiming for safer seas and cleaner oceans

A workshop on 'Environment Protection' (EP), entitled "Samundra Manthan", held at the campus on 16th June 2010, drew a huge enthusiasm from the entire force of DNS cadets, who along with their mentors, faculty members and instructors, discussed threadbare the pertinent topics from MARPOL, including discharge criteria of garbage and sewage to ballast water management and anti-fouling paints.

The participants were divided into teams comprising of four members each and each group had a separate subject to present, which was again left to the rest of the audience to discuss and comment.

There was healthy interaction and cross-questioning all around by the audience, as each topic was debated after its presentation. Faculties in attendance and the three judges moderated the whole event with their knowledge and true shipboard experiences. It was a lively workshop with not a single moment of boredom in the entire 180 minutes.

Some of the interesting questions put forward by the participants were:

- What is different in engine room bilge discharge for special areas and areas outside special areas, as the regulations seem to be same?
- All other annexes talk about pollution prevention but this one talks about control of pollution. Why is this so?
- If the ship is fitted with a sewage treatment plant, can treated sewage (grey water) be pumped out in port? What are latest regulations regarding SOx and NOx emissions?

Referring to the first question, the faculty members – most of them seasoned seafarers, were prompt to point out that in special areas, the oily mixture is processed through an oil filtering equipment meeting the requirement of reg. 14.7 of this Annex – which states, "... In addition it shall be provided with alarm arrangements to indicate when this level cannot be maintained. The system shall also be provided with arrangements to ensure that any discharge of oily mixtures is automatically stopped when the oil content of the effluent exceeds 15 ppm. "

Refering to the second question on pollution control, it was pointed out that Annex II is categorized under different pollution categories by IMO, which have different discharge criteria. In cases of 'X' and 'Y' (solidifying & viscous) a pre-wash is required while 'Z' and 'OS' can be discharged into sea without a pre-wash, as long as they comply with the discharge standards listed in Reg. 13.2. of MARPOL Annex II.

Referring to the third question, it was a relief for the cadets to know that if the vessel has an IMO approved Sewage Treatment Plant and the local regulations do not prohibit, the vessel can discharge the treated sewage from its STP (grey water) even while in port. Taking a lesson on the latest regulations on Sox and Nox emissions, the cadets got to know that the main changes to MARPOL Annex VI will see a progressive reduction in sulphur oxide (SOx) emissions from ships, with the global sulphur cap reduced initially to 3.50% (from the current 4.50%), effective from 1st January 2012; then progressively to 0.50 %, effective from 1st January 2020, subject to a feasibility review to be completed no later than 2018.

It was emphasised that the limits applicable in Sulphur Emission Control Areas (SECAs) will be reduced to 1.00%, beginning on 1st July 2010 (from the current 1.50 %) which will further reduced to 0.10 %, with effect from 1st January 2015.

Progressive reductions in nitrogen oxide (NOx) emissions from marine engines were also discussed, with reference to the most stringent controls on so-called "Tier III" engines, i.e. those installed on ships constructed on or after 1st January 2016, operating in Emission Control Areas.

The revised Annex VI will allow for an Emission Control Area to be designated for SOx and particulate matter, or NOx, or all three types of emissions from ships, subject to a proposal from a Party or Parties to the Annex, which would be considered for adoption by the Organization, if supported by a demonstrated need to prevent, reduce and control one or all three of those emissions from ships.

This workshop, in fact, served to shine a new light on the Environment Protection (EP) subject, which helped to clear cadets' doubts and difficulties and clarify aspects from a practical point of view. A large section of the faculty members from both the nautical and engineering side along with the IT support group joined the discussion and encouraged the cadets to take full advantage of the combined knowledge of the group.

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Multistage Turbocharging System

CDT Shishir Mishra
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Shipping is still by far, the most economical means of transportation and means of moving cargo across the world. One of the key factors which keeps it economical, is that a huge bulk of cargo can be shipped at a competitive cost compared to any other means of transportation. In other words, the more the cargo carried, the cheaper the freight per ton. Undoubtedly, this is one of the most compelling reasons which in turn requires ship designers to optimise their cargo capacity. This results in the cargo area becoming larger and the other areas, especially the engine room and more so the engine have to be of relatively smaller sizes.

All said and done a sleeker engine will demand more in view of the fact that the engine will need to deliver the power to drive the same quantity of freight, which would have probably been done by a bulkier engine. This calls for the engine to be made "smarter" which essentially means more power to weight ratio. Literally, the engine has to be more compact but also, more powerful.

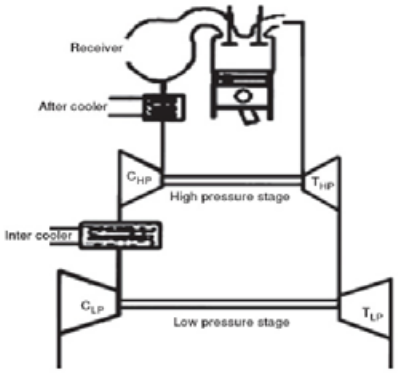
While there are several aspects in making this happen, the aspect we discuss here is what is known as Multi-Stage Turbocharging.

In this system, the atmospheric air is compressed in stages up to 3 to 4 bar, by means of an exhaust gas driven turbine, which taps the main engine exhaust gas in stages; as opposed to a single stage of turbocharging system, which naturally will achieve lesser pressure. In effect, this translates directly into larger mass of air entering into the system, which is essential for burning more fuel in the same cylinder. By doing so, almost twice the amount of power is achievable. On the contrary, a normal engine working on single turbo charging system can achieve a pressure of 1.8 to 2 bar only.

Construction

(1) Two centrifugal compressors
(2) Two Axial flow turbines
(3) Two Intercoolers

In this turbocharging system, two turbo chargers are connected in series: one on the high pressure side and the other on the low pressure side. The inter-coolers are arranged one between the low pressure compressor outlet and high pressure compressor inlet and the other between the high pressure compressor side and scavenge receiver manifold. The compressor blades are made of titanium.



Two-stage turbocharging with single-stage turbochargers

Working

The two turbo chargers are connected in series. The low pressure unit is driven by the exhaust gas energy of exhaust gases leaving the high pressure unit. The high pressure one is driven directly tapping the energy from the main engine exhaust.

1. Air enters the low pressure compressor and once compressed, it comes out at a higher temperature and pressure than inlet.
2. This compressed air passes through the inter cooler in order to reduce its temperature only and make it denser.
3. This cooled air enters the high pressure compressor inlet where it gets further pressed up and also results in the temperature rising again.
4. Finally, this air passes through the second inter cooler and the temperature is reduced prior entering the scavenge air receiver.

Why Titanium Lead is Used in Compressor

1. Corrosion resistant.
2. Better strength to weight ratio.
3. Titanium is as strong as some steels but 45% lighter.
4. Quite ductile in oxygen free environment.
5. It is non-magnetic and poor conductor of heat.
6. Melting point 1649 degree centigrade.

Advantages of Two Stage Turbocharger

1. Bearing life increases due to lower loads on each compressor.
2. Reduced noise levels.
3. Rotational speed is much lower than high pressure ratio single stage turbine.
4. The remaining energy in a normal single stage turbocharging gets utilised.
5. More efficient scavenging takes place due to higher pressures, due to which better combustion takes place.
6. Brake fuel consumption efficiency improves.

To Be or Not to Be

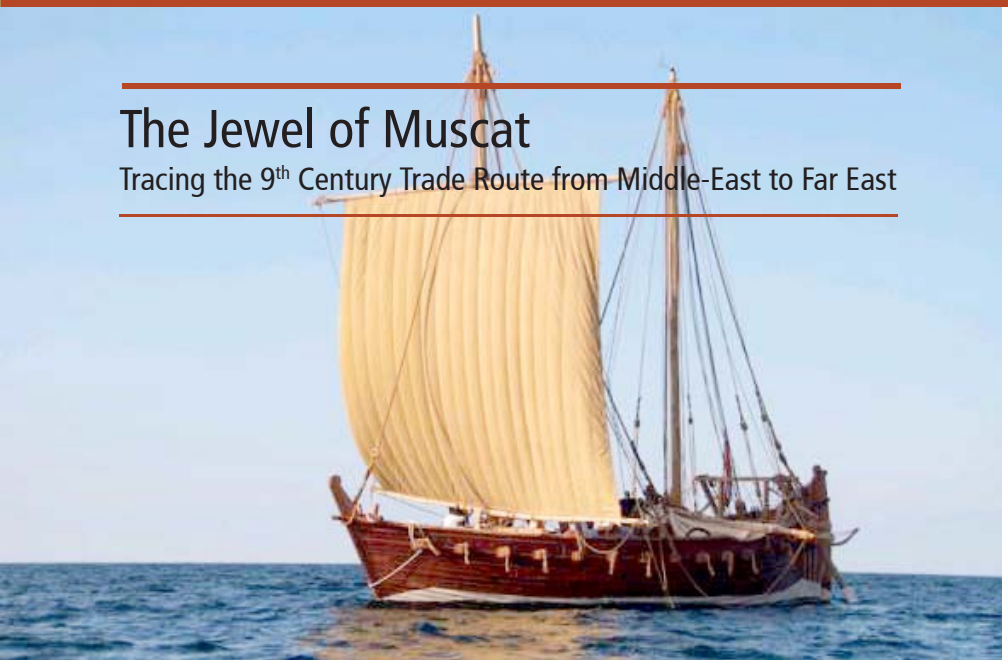
Higher overall turbocharger efficiencies can be reached with two stages as it is possible to have intercooling between the two stages thereby reducing the compression work needed in the second turbocharger stage. Clearly, there are benefits of keeping within the strength limits of known materials, and allowing the operating fields of compressors and turbines to be optimised for a wide load range.

However, there are always two sides to a coin. The low-load efficiency of two stages of today's turbochargers is worse than is obtained with single-stage operation. The major drawback of two-stage turbocharging is the complex arrangement of air and exhaust ducts (six ducts per turbocharging unit). It requires much more space which is, in any case, restricted in ships' engine rooms. Even the space required by today's single-stage systems is becoming critical.

It must also not be forgotten that two-stage turbocharging can result in less heat, or poorer quality heat owing to lower temperatures, being available from the scavenge air coolers for hot water for onboard use.

There is thus always the preference to remain with the simplest arrangement – single-stage turbocharging. Yet to keep up with the requirements of future engine developments, it requires higher technology turbochargers operating at the known limits of material strength and vibrations.

In this era of energy conservation and environmental protection, this is indeed one of the endeavours at tapping more energy before it goes to the thermodynamic SINK!



The Jewel of Muscat

Tracing the 9th Century Trade Route from Middle-East to Far East

Front view of Jewel of Muscat

When on 2nd July this year, 18-metre long Arab ship, The Jewel of Muscat pulled into the Keppel Bay Marina of Singapore, a huge enthusiastic crowd headed by the President of Singapore and the High Commissioner of Muscat cheered and welcomed her at the culmination of her historic five month voyage retracing the route of similar Arab vessels trading between the Middle-East, East and Far East over centuries back.

The boat is the replica of a wreck found at Belitung, Indonesia in 1998 carrying cargo of 60,000 ceramic pots and plates of the Tang Dynasty (an imperial dynasty in China from the year 618 to 907) to Malaysia and India. While the archeologists marvel at the engineering ingenuity of the boat, it caught attention of many in the modern maritime industry for the navigational skill and technique of those gritty and tenacious sailors who braved such torturous over 3000 miles of journey to trade in those far flung regions. The story is indeed a tribute to those predecessors of the present day merchant navy sailors and depicts a lesson or two from their ancient wisdom.

History and architecture

A joint project between Singapore and Muscat completed the construction of the replica of about 1000-year-old vessel with the technique and materials used in that era within two years at Oman. A model constructed at the beginning in UK determined the hydrodynamics of such vessel. The hull is made from 40 tonnes of Afzelia Africana wood from Ghana while the two masts needed the largest and straightest Poona tree from the forests in South India around Cochin which was again a port enroute the vessel's voyage to South East Asia and China. Imitating the historical data, the ship was built without a single nail and the wooden planks were sewn together by coconut fibre protected and toughened by goat fat mixed with lime.

Voyage and the route

A team of 17 sailors from eight nationalities including Omanese, Indian, British, Italian, Singaporean and Malaysian and headed by Omanese skipper set on the voyage on the ancient trade route from Port Sultan, Qaboos, Muscat in mid February in Oman with multiple stops in India, Sri Lanka and Malaysia before reaching her final destination, Singapore, where she was gifted to the people of Singapore by the Sultanate of Oman and to be kept in the Sentosa maritime museum for display. It first touched base at Kochi in south of India, then made several stops at Sri Lanka and Malaysia before successfully ending its nearly five-month journey in Singapore on 3rd July 2010.

Speed and navigation

The crew closely followed the ancient route but also the 9th-century navigation skills and techniques, available to Arab seamen of that century, plotting the course for the ship with a 'kamal' (a small block of wood connected to a piece of string that calculates latitude), the stars and the sun. The observations of the sky and the sea colour, marine and bird life, wind and direction were also used as aids in navigation. Modern instruments were only used to check the ancient navigation techniques.

Depending on the wind and the weather, the vessel managed speed up to 8 knots while dropping down to a single knot during the course of the entire voyage. She entered into dry dock in Cochin at the end of March to recover from the damage that she suffered on her way to India due to rough weather.

Nevertheless, the crew did not lose their stamina and spirit and continued on their journey, as did their predecessors a thousand years ago. The arrival of the Jewel of Muscat in Singapore was greeted with a spectacular ceremony of dancing and singing by Omani dancers and cheers and salutes from the onlookers and the surrounding fireboats at the Singapore anchorage. Indeed a true homage to the crew of the Jewel of Muscat but also to those ancient sailors who made the trade and commerce between regions possible with their indomitable spirit of adventure and professionalism.

(Information compiled from various sources; Pictures source: www.jewelofmuscat.tv).

No nails used to secure any part of the ship

Sails made from palm leaves

Incognito face painting

Imitating Edward Scissorhands' hair style

United Sparks of Mettle (Roadies Competition)

United Sparks Of Mettle

METTLE 2010

A SIMS contingent of 55 creative talents showcased their impressive repertoire in the annual cultural festival, METTLE 2010 of Tolani Maritime Institute, the fourth so far, held in April and walked away with many prizes and certificates, apart from regaling the audience with their fine talents. Out of all the competitions held, 15 of the SIMS cadets won 1st prizes, 11 won 2nd prizes and 6 won 3rd prizes.

A total of about 500 cadets from nine colleges in Pune, Mumbai and rest of the country participated in the festival. Some of the noteworthy participants were Symbiosis, Pune, AMET and other non-maritime Arts and Science colleges of Pune. The events were spread over three days and SIMS won a number of the competitions, ranging from creative competitions like face painting, poster painting to gaming competitions to live music performances.

The team prepared under the Officer in Charge (Cultural), Capt. Prabhat Nigam and a core team of four co-coordinators namely, Cdt. Pritesh Shetty, Cdt. Aditya Gupta, Cdt. Vipul Verma and Cdt. Animesh Joshi who ensured smooth and efficient participation of the team in all events.

On Day 1, cadets from SIMS participated in the Antakshari and Gaming events and walked away with the first and second prizes respectively. On Day 2, SIMS showed maximum participation in all the creative events such as Impressions, Edwards Scissorrhands, Incognito, Directors Cut as well as outdoor events such as Futsal Mundial, United Sparks of Mettle and Lan Gaming. SIMS was awarded many prizes and in some cases, multiple prizes in the same event, which was truly exceptional. The evening was truly a treat for all the participants from SIMS, as they also got the opportunity to witness some amazing performances by other colleges such as fashion shows and rock concert style shows.

The festival ended in a grand fashion on the third day, with the top dance performances in the Tandem and Junkyard Beat events. The entire audience swayed with the beat and enjoyed the day thoroughly – a pleasant change from the earlier two days of daily routine for the participants. The evening was again lined up with music and photography competitions in which students from SIMS also took part in. This was finally followed by the prize distribution and the closing ceremony for METTLE 2010.

The team returned from the three day extravaganza not only with a bagful of prizes but also with memorable and enriching experiences of participating with equally good or better competitors and above all learning and sharing from peers from various other institutions and groups.

A hearty congratulations to the team along with their mentors, Capt Prabhat Nigam, warden Mr. P.S. Mehra and not forgetting Principal Mr. Vishwanathan, for supporting the team at every stage of the process!

Impressions

United Sparks Of Mettle

Incognito face painting

SIMS participants

Visitors' Comments - Second Quarter, 2010

Dedicated faculty and workforce is an added strength to produce disciplined seafarers for the industry. SIMS has been able to contribute a quality manpower through their upgraded facilities. Discipline is considered to be given top most priority which facilitates green environment which is congenial for the students' well-being. I wish all good luck in the years to come and prosper well to contribute for the betterment of the industry.

- Dr. P. Vijayan, Vice Chancellor, Indian Maritime University, Chennai

Very good hospitality by the entire team. Wonderful infrastructure, well-maintained campus and fully equipped with Ship-in-Campus and other training facilities. State-of-the-art technology starting from solar systems, to Wifi and video conference take the training infrastructure to a modern level. Wishing all the success.

- Samuel Darse, Deputy Director of General, Shipping

This reminds me of my days at IIT Madras. The ambiance, the architecture, the landscape, together provide the right combination for a life-time learning experience. There is no doubt the people behind it have put their heart, soul and everything into making this campus an out-of-the world learning centre.

- Deepesh Salyea, CEO & Director, Grand View Estates Pvt. Ltd

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▲ A part view of SIMS, Lonavala pre-sea campus

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