

NAVAL ARCHITECTURE DIGEST

NEWSLETTER OF THE
NAVAL CONSTRUCTION WING
IIT DELHI
APRIL 2010



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Editorial Team

Faculty:

Capt VK Satyam
LtCdr SK Rao
LtCdr V S Swaminathan

Students:

Lt K Vignesh Kumar
Lt KNVS Ganesh Karthik
SLt Sreejesh Sivan

Crisp introduction of the deployable work force available to Navy and contributions from the students covering different aspects of the life is the core around which the newsletter has been woven.

Music, dance and drama during Commodore Garg Memorial Lecture 2009 inspired students to cross all the time and exam constraints during onset of winter. Spring brought another opportunity of Organizing fun with Get together at the Sultanpur National park.

Capt VK Satyam
Officer-in-Charge

ACTIVITIES AT NCW

MID-CAREER REFRESHER COURSE

Since 2003, a two-week 'Mid-Career Refresher Course' is being conducted every year at NCW in July (during summer vacation of IIT, Delhi) for NA officers. The purpose of the course is to refresh the fundamentals of Naval Architecture, with emphasis on practical application to warship design, and update the officers with latest concepts and developments. The course consists of lectures by NCW faculty, supplemented by guest lectures from DNA and DND.



The seventh such course was conducted from 13 Jul- 25 Jul 09 at NCW. 10 officers (Cdrs and LtCdrs) attended this year's course. The course provided a refreshing capsule of academic fundamentals. The guest lectures stimulated healthy discussions. Case studies were also presented by the participants on various aspects, enriching the overall experience.

MAJOR PROJECTS

The Ship Design Exercise or Major Project in the final semester is the culmination and application of all concepts learnt by the budding warship designers at NCW. The exercise formally commenced in Dec 08 for the present batch, after 6 months time for data collection and literature review.

The projects allocated for design this year were:

- Aircraft Carrier
- Multi-mission Stealth Destroyer
- Landing Helicopter Dock
- Littoral Warfare Surface-Effect Ship
- Air Independent Attack submarine
- Fibre reinforced plastic –Mine Counter Measure Vessel

Four of the design projects mentioned above are briefly described in the succeeding paragraphs.

Multimission stealth destroyer

*Lt M Tripathi, Lt P Adiga,
Lt Gautam*

The multi mission stealth destroyer was designed to accomplish Anti Aircraft, Anti-ship, Anti-submarine warfare and patrolling operations. The vessel is designed with ballistic missile capability.

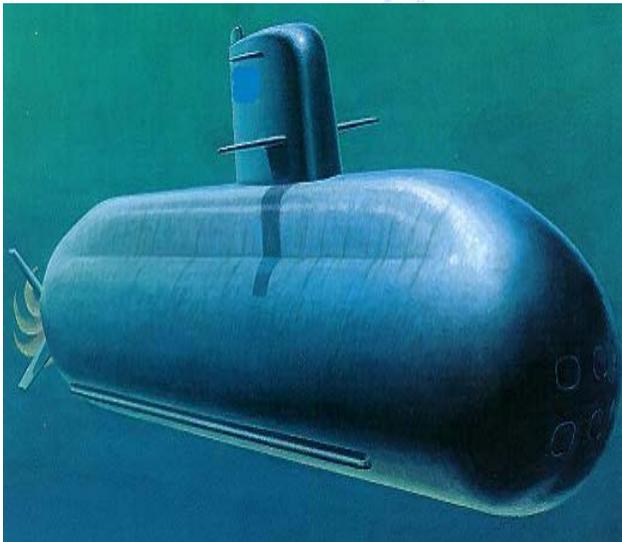
AIP Attack Submarine

Lt P K Shukla, Lt D K Vidhya

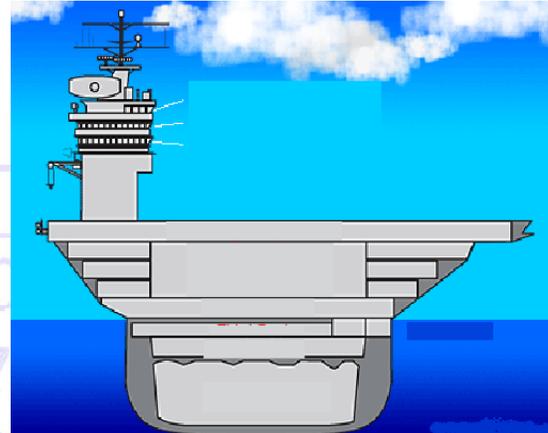
The primary role of the AIP attack submarine is to detect and attack surface/sub surface targets in Indian Ocean region ensuring extremely stealthy operations. The roles extend

to carrying out reconnaissance and intelligence gathering, mine laying, deployment of Special Forces and deployment of mine hunting AUVs.

The propulsion system includes an AIP capsule.



plating for critical areas of the side shell. The vessel is capable of operating even at sea state 6, and can operate various types of aircraft.



MINOR PROJECTS

Landing Helicopter Dock

*Lt Arjun K Nair, Lt Shalini K R,
Lt S Gupto*

The Landing Helicopter Dock is designed as a platform capable of land forces for expeditionary warfare missions and provides helicopters for Air borne support for the troops and carry out Air Attacks.

Aircraft Carrier

Lt P Grover, Lt O Thite, Lt H M Pradeep

Aircraft carrier projects air power over great distances. Sea control, reconnaissance, search and rescue, self defence against air attack, support of amphibious assault and peace-keeping missions are it's few other roles. Special features of the design include armour

In order to have overall understanding of the academic courses taught at IIT, 'MINOR PROJECT' has been introduced. This assignment is graded by faculty of IIT based on the understanding of basic engineering aspects. This enables the budding Warship designers to have an insight into the practical aspects of the various engineering challenges. The various ongoing projects taken up by the officers are briefly explained below.

Helo-Ship Aerodynamic Interface

Lt. KNVS Ganesh Karthik, Lt. E Vishnu

The project deals with the study of aerodynamics and flow around the hangar and helo-deck of ships to reduce turbulent wind envelopes. Various helicopter landing patterns and wind envelopes created while

operations like hovering and recovering are studied. The aerodynamic forces, experienced by helicopter and areas on the helo-deck where vortices and stagnation points occur, are identified. The experiment is carried out on a representative model of a hangar and helo deck (including above water hull form) in 1:100 scale. Turbulent wind conditions through an open circuit centrifugal blower type wind tunnel (with wide angle diffusers) are created. Visualization of flow around the helo deck with various hangar structure modifications are carried out. Optimization of hangar structure and modifications in helo landing areas to reduce turbulent wind envelopes will be the outcome of the project.

Exhaust smoke nuisance onboard naval ships

SLt. Priyank Naithani, SLt V Duggal

Reduction of problems due to smoke nuisance on board Naval ships is the main objective of the project. Various solutions are suggested and tested, verified and validated through model experiments. Model of the ship is made using wood in 1:100 scale. Computational fluid dynamics technique is adopted for the validation of the model test results. Smoke visualization is carried out on the model using smoke generator. The optimum funnel structure and the coordinates of the mast on the top deck of the ship are the results of this experiment based project.

Improved design of solar distiller

SLt V Sinha, SLt S Rao

Solar distillation plant is used for the generation of saturated steam. This steam is further used for producing hot

water for domestic and small scale industrial purposes. The distiller consists of a cylindrical chamber with gratings and filters so that the steam is purified. The output depends on the size of the solar plant employed. The model has a diameter of 15 cm. Seven gratings are used in the system and it is completely insulated with wool.

Underwater Welding & Friction Stir Welding

Lt V Misra, Lt S Dinesh

Hyperbaric welding is the process of welding at elevated pressures, normally underwater. Hyperbaric welding can either take place *wet* in the water itself or *dry* inside a specially constructed positive pressure enclosure and hence a dry environment. It is predominantly referred to as "hyperbaric welding" when used in a dry environment, and "underwater welding" when in a wet environment. The applications of hyperbaric welding are diverse—it is often used to repair ships, offshore oil platforms, and pipelines. Steel is the most common material welded.

Friction-stir welding (FSW) is a solid-state joining process (meaning the metal is not melted during the process) and is used for applications where the original metal characteristics must remain unchanged as far as possible. This process is primarily used on aluminum and most often on large pieces which cannot be easily heat treated post weld to recover temper characteristics. The project aims to study both these procedures and suggest improvements in the current practices.

Study of aluminium foam

Lt Kuldeep, Lt Thiagarajan

This project involves study of foam, which is widely being used in various industries. The scope of project includes different production methods, properties, and uses of aluminum foam. One salient aspect of this project is development of compressive and fatigue tests on aluminum foams.

Impact analysis on composites for marine applications

Lt V Singh, Lt S C Joshi, Lt Y Hemanth Kumar

The project aims at the analysis of composites used for marine applications like hull form and other structural members. The modeling is being done using ABAQUS software for FEM analysis. The project helps in deciding the impact bearing ability of the material before failure. The ship hulls can similarly be made of such composites, which can bear requisite amount of ballistic impact.

Extraction of velocity statistics of turbulent flow

Slt S Sivan, Slt Vinay S, SLt Alexander

The project involves the measurement of velocity characteristics of turbulent flow in wind tunnel using hot wire anemometer. The velocity variation is studied both with respect to time and space. The data obtained from anemometer is analyzed using regression analysis.

Novel Design of Solar Collector

Lt Vignesh, Lt Arun, SLt Tom

The project aims at development and fabrication of a prototype solar collector, using arrays of Fresnel mirrors. The novelty in the design lies in the alignment of the apparatus in the North south orientation rather than the conventional polar axis. The other innovation involves the use of a twin pipe half insulated to receive the reflected sunlight and the setup expects to achieve very high temperatures and steam generation which can be used to feed a boiler for further distillation. This collector can be produced on a larger scale to aid in power generation or distilled water production by this very simple and inexpensive method. The only adjustment that is required is to crank the mirror by 5 degrees every 40 minutes. On a larger scale, a gear arrangement can be timed to give this pulsed crank simultaneously to the entire array.

YARD ATTACHMENT

As part of their annual training the trainee officers of NCW were attached to WOT, GRSE, Kolkata during the month of December 2009 for a period of two weeks. They were familiarized with various departments of the Yard and also undertook various live projects like

- Augmentation of Modular Accommodation in WJ FAC
- Development of Software for Documentation
- Hull Maintenance Visual Training Capsule Development

- Ultrasonic Testing of Materials
- Study of weld defects in ships under construction
- Anchor Chain Handling System Augmentation onboard WJFAC

- Electrical power systems of warships
- Motors & generators used on board warships
- Ancillary plants and system of warships
- Propeller shafting system & Arrangements of warships
- Ship building steels & electrodes used in Indian navy
- Structural maintenance and repairs of warships
- Naval combat tactics
- Submarine operations
- Submarine staff requirements
- Submarine weapon system and Sonars
- Submarine navigation and communication system
- Habitability of submarines

EXTERNAL LECTURES

A unique feature of the DIIT course is the schedule of External Lectures on Wednesday afternoons. Officers from various directorates of IHQ MoD (Navy) are invited to NCW to deliver specialist lectures. These lectures complement the courses in warship design and submarine design, providing invaluable insight into the various aspects of Naval operations, planning, design, production, construction and maintenance.

Since the beginning of the current semester, the following external lectures have been delivered at NCW:

- Naval Planning, Finance and Budgeting
- Gunnery Systems of Warships
- Missile Systems of Warships
- Weapons for Anti-Submarine Warfare
- AIO Systems of Warships
- Acoustic Detection Systems of Warships
- Mines & Mine Counter Measures
- Formulation of staff requirements for surface warship (DSR)
- Mission profiles of ships / submarines (DSR)
- Deck machinery & fittings of warships
- Detailed design and production of warships
- Medium and high speed diesel engines for naval application
- Marine gas turbines

STAFF ACTIVITIES

In addition to instructional duties at IIT, the following activities were undertaken by staff officers posted at NCW:

A paper on 'Smoke Nuisance problem in Naval Ships' as a part of the research programme was presented by Cdr R Vijay Kumar at NCW, IIT Delhi

SPORTS ACTIVITIES

The first year student officers plunged into the inter-hostel sports activities at IIT with the customary zeal.

Lt Hemanth Kumar won the Silver Medal in 4x 100m relay and gold in 100m dash and is also the key player in the IIT Cricket Team.

Lt Padmanabha Adiga represented IIT Delhi in Water Polo at inter-IIT level. SLt Subodh Rao was a part of IIT Delhi Football team.

Lt Thiagarajan, Lt K Vignesh Kumar, Lt KNVS Ganesh Karthik, and Lt Priyank Naithani, were part of their hostel water polo team

SLt Subodh, SLt Sreejesh and SLt Alexander were part of the Inter-hostel Football team.

Lt V Misra, SLt Vinay participated in inter hostel hockey competitions. Lt Kuldeep and Lt Vikram represented hostel cricket team.

Lt Y Hemanth Kumar, SLt Sreejesh Sivan, SLt Subodh, SLt Tom represented their hostel in Institute athletics event.

Lt Vishnu represented Jwalamukhi hostel in badminton

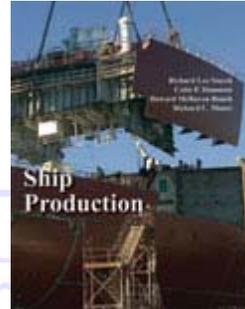
NCW LIBRARY UPDATE

The modest library at NCW has one of the best collections of books, papers, journals and reports on Naval Architecture and Ship Technology. Some recent additions to the NCW library on technical subjects are as follows:

- **Inspection, repair and maintenance of ship structure-** RINA
- **Fatigue analysis of ship structures-** Sergei Petinov
- **Small water plane area ships-** Victor Dubrovsky
- **Fibreglass boat design & construction-** Robert J Scott

Ship Production

Richard Lee Storch, Colin P. Hammon, Howard McRaven Bunch, and Richard C. Moore

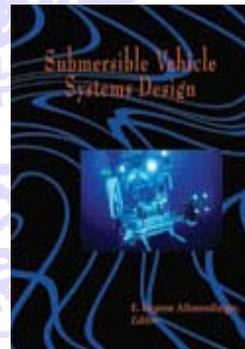


This edition was revised in 1995 to update the contents to be consistent with technological advances made. The focus of this book is state-of-the-art technology and

its application to the principles and practices of shipbuilding employing group technology extensively supported by shipyards in improvement of their conversion and repair operations.

Submersible Vehicle Systems Design

E. Eugene Allmendinger



A comprehensive and cohesive work on the major elements of manned submersible design; useful to those concerned with the construction and classification of

these underwater vehicles and also those involved in the planning or management of ocean systems utilizing them.

STUDENTS' SECTION

I Believe...

Lt Vignesh Kumar

I believe my country was always the greatest civilization.
Since the time of the Indus, when my people grew food,
While men, elsewhere, still roamed as beasts and hunted for hide and hood.
When we had navies, harbors and dry docks.
While men, elsewhere, swam, to survive, faster than crocs .
The Brits got to us and we only got greater after they left.
Learnt their language, spoke it with no cranny nor cleft.
Became the second largest English speakers, more than all their atoll.
Learnt their methods and became the largest Democracy, Republic et al.

I believe there's pride.
In helping Uncle Sam, with our best brains, to grow up to his distinction.
(Until he recently hit a slump, avalanched and took a recess-ion)
To be labelled as a 'developing' country, poverty stricken, to soon swoon.
Yet vie with 'developed 'ones, splitting atoms and sending metal to moon.
To flower, flourish and flaunt IT, the global village, further shrink.
To have become what we are. To have become India Inc.

I believe there's strength.
In keeping paradise, still on earth.
To keep peace, home and away, despite resources glut or dearth.
To have hands strong, yet lent to friends in distress.
In fighting foes and fiery flaming Oberoi and Taj fortress.

I believe there's hope.
In draining brains seeping back.
And Obamas painting the White House black.
I believe that I'll wake up to a better tomorrow.
In a greater India, sans grief sans sorrow.

Davy Jones's Locker

Lt Dinesh S

Navy Jargons and marine lingo. Ever wondered what they mean?

Davy Jones's Locker is an idiom for the bottom of the sea: the resting place of drowned sailors. It is used as a euphemism for death at sea (to be sent to Davy Jones's Locker)

Goat locker: In navy jargon, the goat locker is a lounge, sleeping area and galley on board a naval vessel which is reserved for the exclusive use of Chief Petty Officers. By tradition, all other personnel, including officers and even the Commanding Officer, must request permission to enter the goat locker.

Dog watch: In marine or naval terminology, is a watch, a period of work duty or a work shift, between 1600 and 2000 (4pm and 8pm). It is split into two and compared to a normal watch, each of these dog watches is curtailed (cur-tailed).

The name may have come from the fact that someone tasked with one of these 'half' watches was said to be 'dodging the watch', taking or standing the 'dodge watch'.

Drinking a Toast : This term for drinking to one's health, or in one's honor was coined in early days along the waterfronts, when it was customary to place a small piece of toast in the hot toddy and the mulled wine which was popular with seaman of the day.

Log Book: In the early days of sailing ships, the ship's records were written on shingles cut from logs. These

shingles were hinged and opened like a book. The record was called the "log book." Later on, when paper was readily available and bound into books, the record maintained its name.

Salutes: The hand salute is the military custom you will learn first and use most while in the military. It is centuries old, and probably originated when men in armour raised their helmet visors so they could be identified.

S.O.S.: Contrary to popular notion, the letters S.O.S. do not stand for "Save Our Ship" or "Save Our Souls". They were selected to indicate a distress because, in Morse code, these letters and their combination create an unmistakable sound pattern.

Gun Salutes: In the days of cannon, it took as long as twenty minutes to load and fire a gun. When a ship fired her guns in salute, she rendered herself powerless for the duration. By emptying their guns, the ship's crew showed shore batteries and forts that they were no threat. Over time, this gesture became a show of respect, with both shore and ship gun batteries firing volleys.

Bell Bottom Trousers Commonly believed that the trousers were introduced in 1817 to permit men to roll them above the knee when washing down the decks, and to make it easier to abandon ship or when washed overboard, the trousers may be used as a life preserver by knotting the legs.

Secured network

Slt Alexander.Ngangom

There are continuous efforts all over the world to utilize the maximum potential out of various software applications to get the best possible tool for the new battlefield scenario. In support of this Raytheon has unveiled the first of what it said will be a series of software applications to make iPhones or iPod touch devices into battlefield tools.

The software called One Force Tracker (OFT) takes advantage of features built into wildly popular touch-screen mobile devices to let soldiers track whereabouts of allies and adversaries on maps in real time. OFT capitalizes on iPhone and iPod touch capabilities including global positioning, high-speed internet, and accelerometers that let controls respond to twists, tilts or turns. It's a rapid, low-risk, and affordable solution interoperable system solutions.

The software could also be used by medical personnel, firefighters and other emergency workers responding to disasters. OFT has built in augmented reality and content-centric networking capabilities along with guards against network disruptions or hacks. Soldiers could use iPhones or iPod touch devices, which have wireless internet capabilities, to feed each other updates in real time the same way motorists use smart phones to share feedback regarding traffic.

Thus the need for low-power, simple plug-and-play applications led to the development of a real time situational awareness application using touch technologies.

ON A LIGHTER VEIN..

Lt S Thiagarajan

A Petty Officer Second Class, First Class and a Chief are off the ship together for lunch. While crossing a park they come upon an antique oil lamp. They rub it and a Genie comes out in a puff of smoke.

The Genie says, "I usually only grant three wishes, so I'll give each of you just one."

"Me first!" says the Petty Officer Second Class. "I want to be in the Bahamas, driving a speedboat, a beautiful woman at my side and not a care in the world." Poof! He's gone.

"Me next!" says the First Class. "I want to be in Hawaii, relaxing on the beach with my personal masseuse, an endless supply of pina colodas and a beautiful woman." Poof! He's gone.

"You're next," the Genie says to the Chief.

The Chief says, "I want those two back on the ship right after lunch."

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Having passed the enlistment physical, Jon was asked by the doctor, "Why do you want to join the Navy, son?"

"My father said it'd be a good idea, sir."

"Oh? And what does your father do?"

"He's in the Army, sir."

The grizzled old sea captain was quizzing a young naval student. "What steps would you take if a sudden storm came up on the starboard?"

"I'd throw out an anchor, sir."
 "What would you do if another storm sprang up aft?"
 "I'd throw out another anchor, sir."
 "But what if a third storm sprang up forward?"
 "I'd throw out another anchor, captain."
 "Just a minute, son. Where in the world are you getting all these anchors?"
 "From the same place you're getting all your storms, sir.

++++
 A Navy officer was cutting through the crew's quarters of his ship one day and happened upon a sailor reading a magazine with his feet up on the small table in front of him.
 "Sailor! Do you put your feet up on the furniture at home?" the officer demanded.
 "No, sir, but we don't land airplanes on the roof either."
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PROMOTIONS

The following trainee officers shipped their new stripes in past one year:

- Lt V Doshi
- Lt Dinesh S
- Lt Vikram Singh
- Lt K Vignesh Kumar
- Lt Kuldeep Neralkar
- Lt KNVS Ganesh Karthik
- Lt Thiagarajan
- Lt Vijit Misra
- Lt E Vishnu Vedantan
- Lt Y Hemanth Kumar
- Lt Arun K
- Lt Shrikant C Joshi

GALLERY

This section is a tongue-in-cheek introduction to the to the batch that passed out in Dec 09



Lt P Adiga

Mr.Yogi The computer wizard. The only sole reader of DIGIT magazine.Has been notorious for being found in twisted positions (read YOGA) by casual trespassers in his room. This aquatics champion is also a gifted dancer.



Lt PK Shukla

The soft spoken army product, lethal with rifles and small arms. Knows everything about Bofors and is an expert in wide arm push ups. Contrary to popular belief, still

found time for love.



Lt Mohit Anand

His presence in the course ensured a hassle free life for everyone else but himself. Very famous in NDMB for his adventures and is renowned for introducing tomorrow's gadgets to today's world. Has changed his laptop thrice already...and counting.



Lt Pankaj Grover

Hunk of the course.Cool and carefree. One of the twin towers. Obvious choice of sport:

Basketball. Has reportedly been spotted in various malls in NCR with rosy arm candies.



Lt Arjun Nair

The stealth frigate. Proud owner of a Harley (only he believes so). Gifted artist with special skills of the Titanic Leo kind. The Mallu tanker from Kozhikode. Blood group: C₂H₅OH .

change to camouflage green if possible. Successfully fanned the flames of adventure in many civilians through his Adventure Club.



Lt Manu Tripathi

The most gifted with the mike. The stage is his habitat and does everything from mimicry, stand - up comedy, direction to acting with professional ease. The

other twin tower..



Lt Onkar Thite

Burnt many a dance floors. Used his skills to the optimum and put many birds in his trance. To broaden his scope, picked up percussion instruments also. A true foodie at heart

and was always proud about it. Research underway about his whereabouts after dark.



Lt Pradeep

Famous on four wheels on the road and two legs on the dance floor. Active member of the Tamil mandram in IIT.



Lt KJ Varun

The oldest recorded romantic who managed to stay hale and healthy despite the hostel food. Never took No for an answer and never gave Don't Know as an answer.

Undeterred evening jogger.



Lt Meera Andra

Read her second name like the State and you would see her in fumes. Talented dancer and singer (of the Poth Shilpkar fame). Has the largest telephonic fan base.



Lt Vinit Doshi

A household name in the armed forces fraternity. Has already dived from the sky. Aspiring to dive underwater also. Adrenaline junkie. Noted for his western skin tone which he would gladly



Lt Tarun

Silent. Stealthy. Secret. A man of few words. Any further information about him is classified TOPSEC and is not available for public reference.



Lt S Gupto

The Bengal tiger who made the best use of lectures by multitasking with Bengali books in hand. Watches every IIT football match but never got into the field once.



Dy Comdt Narendra Kumar

The course daddy, as he is affectionately called. His experience and expertise in various fields within and outside the purview of the Services has guided



Lt Shalini Nair

This lively lady from Kerala is also a talented dancer. Discovered her hidden talent in singing during her time at IIT, though others were not very pleased with the discovery.

many a student officer in his batch. The relentless shuttler from Noida who still never missed a single class and was ram rod straight in his principles.

Eternally in love with the Pink City.



Lt K Vidhya

The athletic basketball player who made up for her silence by putting points on the board. The magic of the Taj Mahal didn't spare her either as it remains to be her favourite monument.



Lt K Gautam

Body builder who keeps fit by riding the most famous sport bicycle in the campus. His silent strolls in the night with coke bottle in hand always made one doubt

the contents.

NEWS CLIPPINGS

Source: www.naval-technology.com

Indian Navy inducts MiG-29K aircraft

The Indian Navy has officially inducted the MiG-29K air dominance fighter aircraft into its fleet at INS Hansa, Vasco da Gama, Goa.

Defence Minister AK Anthony said the induction of the MiG-29K fighters into the naval inventory fulfilled a long-standing requirement.



Designed by Mikoyan Gurevich bureau, the MiG-29K is the latest and most potent fighter jet. It will be equipped with anti-aircraft beyond-visual-range missiles, guided anti-ship missiles, smart guided bombs and rockets.

The new MiG-29K is a fifth-generation aircraft that incorporates advanced weapon systems, navigation systems, instrumentation, flight controls and safety systems. The MiG-29Ks are expected to

be deployed on the aircraft carrier INS Vikramaditya, formerly Admiral Gorshkov once it arrives in late 2012 or early 2013. The Indian Navy will induct a total of 45 MiG-29Ks into its fleet, of which four were delivered to INS Hansa in December 2009.

Northrop to Supply Bridge Systems for India's Fleet Tankers

Northrop Grumman will supply integrated bridge systems (IBS) for two new fleet tankers being built in Italy for the Indian Navy, under a contract awarded by Fincantieri.

Under the contract, Northrop's Sperry Marine will equip each of the ships with a complete Sperry Marine VisionMaster FTIBS.



The VisionMaster FT IBS includes radars, electronic chart display and information systems, adaptive self-tuning autopilots, gyrocompasses and repeaters, speed sensors, echo sounders, differential GPS, and other navigation subsystems and sensors. In addition, Sperry Marine will also supply the ships' inertial navigation system and data distribution systems, which will be interfaced with the combat management systems.

The 175m-long fleet tankers being built at Fincantieri's shipyards in Liguria and Palermo are intended for use for marine pollution control and are scheduled for delivery in 2010-11.

Indian Navy aircraft to equip BAE system suite

The Indian Navy's P-8I maritime patrol aircraft will be equipped with a mission computer system suite being developed by BAE Systems.

The mission computer system suite is a flexible and rugged processing platform, which can be configured to meet the general purpose, input and output, video, voice, and graphics processing needs of modern military combat management.

The Boeing-developed P-8I is a multi mission maritime patrol aircraft and is a variant of the US Navy's P-8A Poseidon.

The P-8I can perform a wide range of missions including anti-submarine warfare, search and rescue, and long-range intelligence, surveillance, target acquisition, and reconnaissance over land and water.

A total of eight P-8I aircraft have been ordered by the Indian Government to

replace the existing fleet of Tupolev Tu-142M aircraft.



Indian Navy successfully test fires Dhanush missile

The Indian Navy successfully test-fired a nuclear-capable ballistic missile from INS Shubhadra off its eastern coast on 13 December 2009



Director of the test range SP Dash told Reuters that the surface-to-surface missile had a strike range up to 350 km and a payload of up to a ton. "It has met all the mission objectives. It was a text book launch," he said.

India last tested the Dhanush missile in 2007.

PROFESSIONAL ACTIVITIES

TECHNICAL LECTURES

. The following technical lectures were conducted at NCW in the past one year:

- Estimation of Ocean parameters using genetic algorithms
LtCdr S K Rao
- Commercial Ship Design Industry – Strategy for up gradation An Indian Perspective
Cdr SN Krishnan.
- Benchmarking of Indian ship design projects
Cdr S N Krishnan
- Outsourcing in ship building
Cdr P Jayashankar
- Estimation of Wave forces on costal structures
Lt Cdr V S Swaminathan
- Smoke Nuisance problem in Naval ship research at IIT Delhi
Cdr R VijayKumar
- Concept Design of Multi-mission Stealth Destroyer
Lt Manu Tripathi ,Lt P Adiga & Lt H M Pradeep
- Concept Design of Landing Helicopter Dock
Lt Arjun K Nair, Lt Shalini & Lt S Gupto
- Structural optimisation using Genetic algorithms
Lt Cdr V S Swaminathan

CGML

The 18th Commodore Garg Memorial Lecture was delivered on 24 Oct 2009 by Shri Soli Sorabjee, former Attorney General of India and awardee of Padma Vibhushan. The lecture was on '**JUDICIAL PROTECTION OF HUMAN RIGHTS IN INDIA**'.

The lecture was well received by the audience comprising of professional Naval Architects, academicians, senior officers of the Indian Navy and others. The lecture was followed by lively discussion between the speaker and the audience. The Chief of Naval Staff,

Admiral Nirmal Verma, PVSM, AVSM, ADC was the Chief guest for the event.



The student officers of NCW actively participated in the evening cultural show which received several accolades from the audience. The evening cultural show was followed by a sumptuous dinner arranged with in the campus

. The following awards were given away at the event:

- 'Shri Sam Dotiwala Award' for Best Technical paper was presented to Cdr R Vijayakumar, Prof. V Seshadri, Prof. SN Singh, Cdr (Dr.) PR Kulkarni.
- 'Cmde Thukral Award' for the Best Technical paper presented by a student member was given to Lt K Chakraborty & Lt S K Singh .
- 'Shri Sam Dotiwala Cash Award' for the Best Performance in Ship design projects at IIT Kharagpur was presented to Shri Sourav Bhar
- Cmde VP Garg Award' for Best Outstanding academic Performance in Naval Architecture/ Ocean Engineering at Cochin University was presented to SLt Abhishek Kumar Tiwari

Cash Awards' for Best papers were presented to Cdr S N Krishnan for "Capabilities of Indian Commercial Ship Design Industry: a Strategic Study " and LtCdr S K Rao for "Estimation of Ocean Parameters Using Genetic Algorithm."



Open – house get – together Sultanpur National Park – 21 Feb 2010

The open house get together of Naval Architect officers and families was held on 21 Feb 2010 at the scenic village of Sultanpur. Sultanpur was the center of salt production for use in Delhi and the United Provinces till the late 19th century.

As a bird sanctuary it was the discovery of Peter Jackson, the famous ornithologist, and Honorary Secretary of the Delhi Birdwatching Society.



The area was declared a Bird sanctuary in 1972. It has an area of 1.43 square kilometers. It is a protected area where over 250 species of birds have been sighted.

The get together was attended by NA officers and families including student officers from the Naval Construction wing, IIT Delhi.

A series of fun filled games like Antakshari and dumb-charades were conducted in the bus, snake race,

compatibility test etc kept the participants on their toes during the picnic. Since the theme of the open house get together was birds, the entire participants were divided in to four teams namely Kingfisher, Sandpiper, Robin and Flamingo.

The crown event was the Treasure hunt, which gave people a run for their wits.

The picturesque scenery, wonderful birds and the joyful atmosphere kept everyone in high spirits.



Everyone enjoyed the event to the fullest and as much as we did in organizing it.



The student officers of the NCW played the leading role in making this event fun filled and a grand success.



JOURNAL OF SHIP TECHNOLOGY

The fifth issue of the Journal of Ship Technology (JST), the twice-yearly internationally-refereed publication, was brought out in Jan 2010. Attempts have been made to maintain the international standard of the journal and enhance its readership, subscription and sponsorship. High-quality technical papers on various aspects of marine technology are invited for publication in the Jan 2011 issue of the JST. Details are available on the journal's website: www.jstindia.org.

