



Elcome Integrated Systems

1-Mar-17

Elcome Integrated Systems (P) Ltd, Navi Mumbai, India

AIM

To present Elcome as Technical and Service Partner

Corporate Office

ELCOME



**Great Eastern Summit – A, 11th Floor, Plot no 56, Sector 15,
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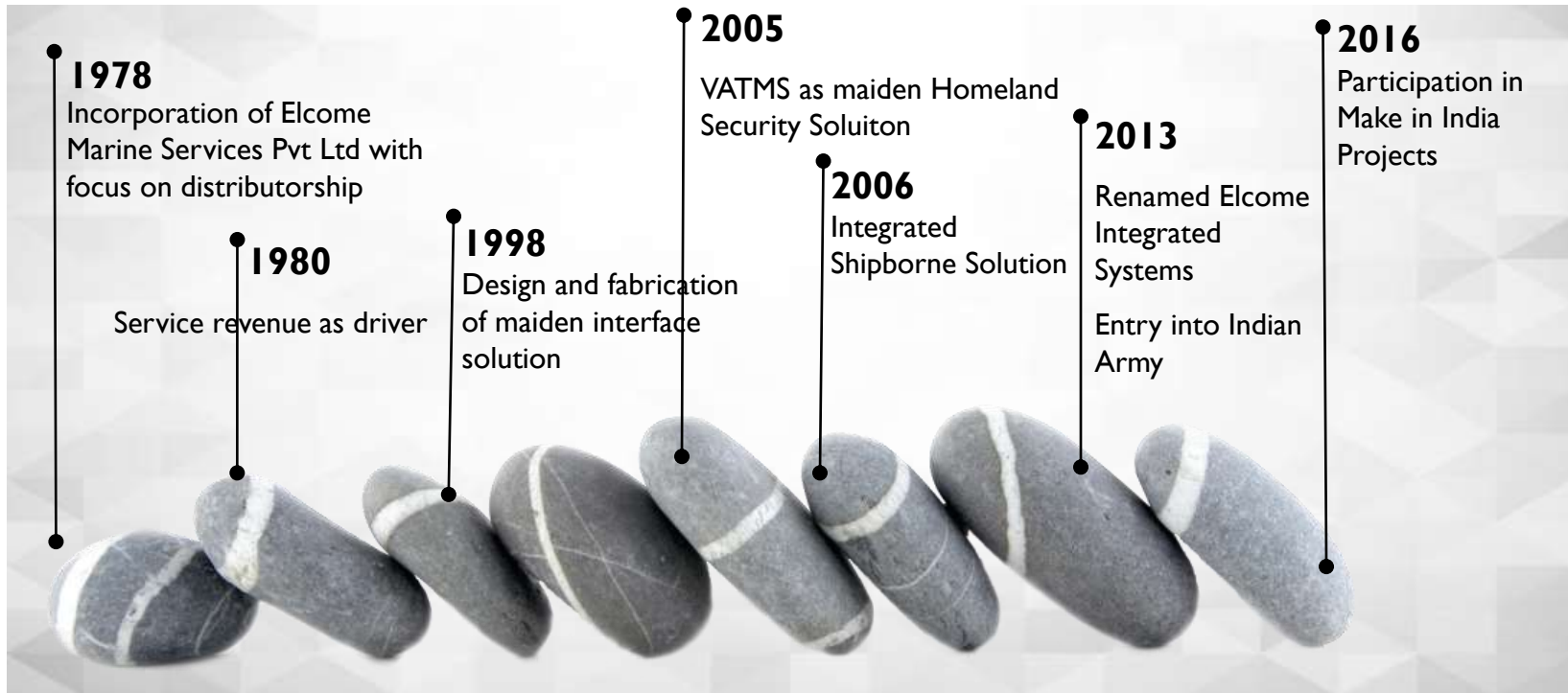
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Glimpses of New Premises

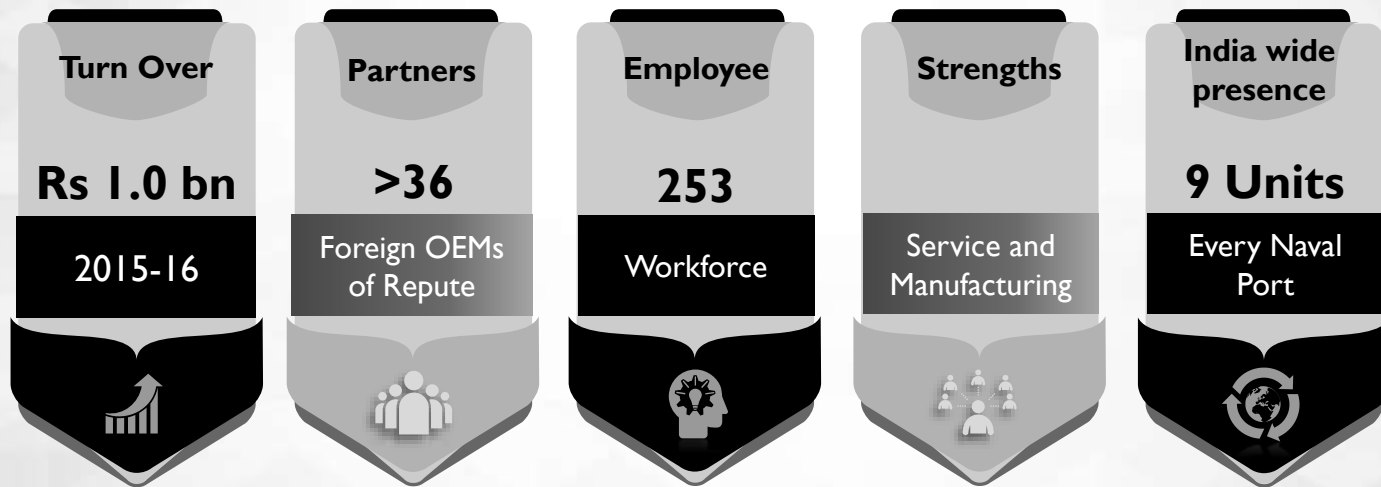


An effort to aggregate Elcome facilities in Mumbai

Journey so far



Elcome Today



*Figures based on Q2 results 2015-16 for Global IT Services business

Awarded CII Innovation Award 2015

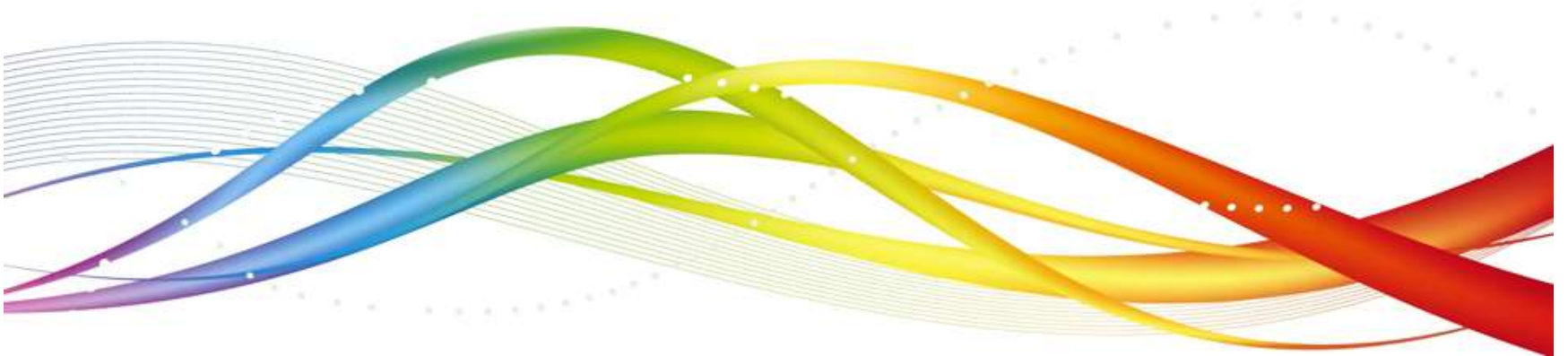
Rated SE I A by CRISIL/NSIC for High Performance

Agenda



- ❑ Corporate Overview
- ❑ Elcome Partners and Customers
- ❑ Elcome Portfolio
- ❑ Elcome Skill set
 - System Integration Expertise
 - Simulator Projects
 - Homeland Security
 - Projects with Indian Army
- ❑ Manufacturing Capability
- ❑ Elcome Service Credentials
- ❑ Make in India initiative
- ❑ Summary

Corporate Overview



Corporate Overview



Company Profile in 1978

- ❑ Delivery, Repair and Service of Marine Navigation & Communication Equipment.

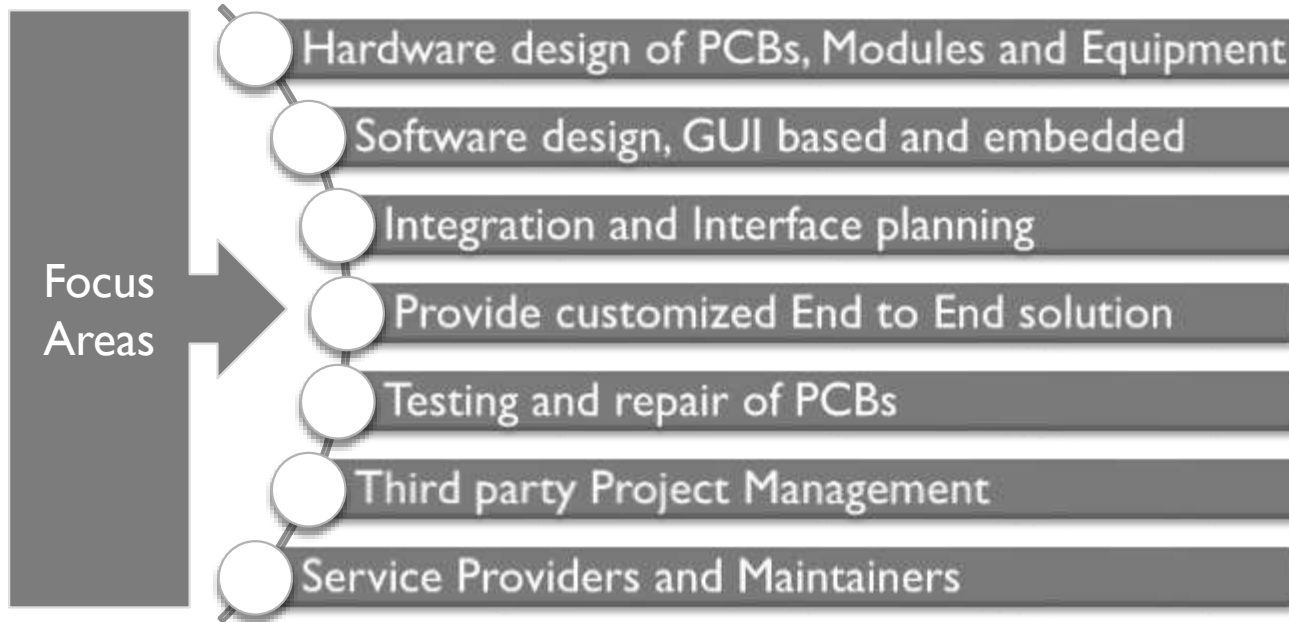
Strategic Vision

- ❑ Sought after service credentials
- ❑ Indigenous Product Development
- ❑ Innovative Solutions
- ❑ Make in India initiative

Corporate Overview



Elcome Integrated Systems, an Electronics Company in the MSME sector established in 1978.



Excellent waterfront support with branches in all Naval Ports

Corporate Overview



- ❑ Date of incorporation 8th Aug 1978
- ❑ Corporate Headquarters in Navi Mumbai
- ❑ ISO 9001:2008
- ❑ 62,000 sq ft of production facilities
- ❑ Branches at every Naval port
- ❑ Waterfront support units:
 - Mumbai (since 1978)
 - Kolkata (since 1980)
 - Vizag (since 1981)
 - Chennai (since 1986)
 - Port Blair (since 1988)
 - Kochi (since 1995)
 - Goa (since 1999)
 - Jamnagar (since 2003)



Corporate Overview



Recipient of CII Innovation Award 2015

Corporate Overview



NSIC-CRISIL rating SE-1A for Highest Performance Capability
and High Financial Strength

Corporate Overview

TRACE Certificate for due diligence

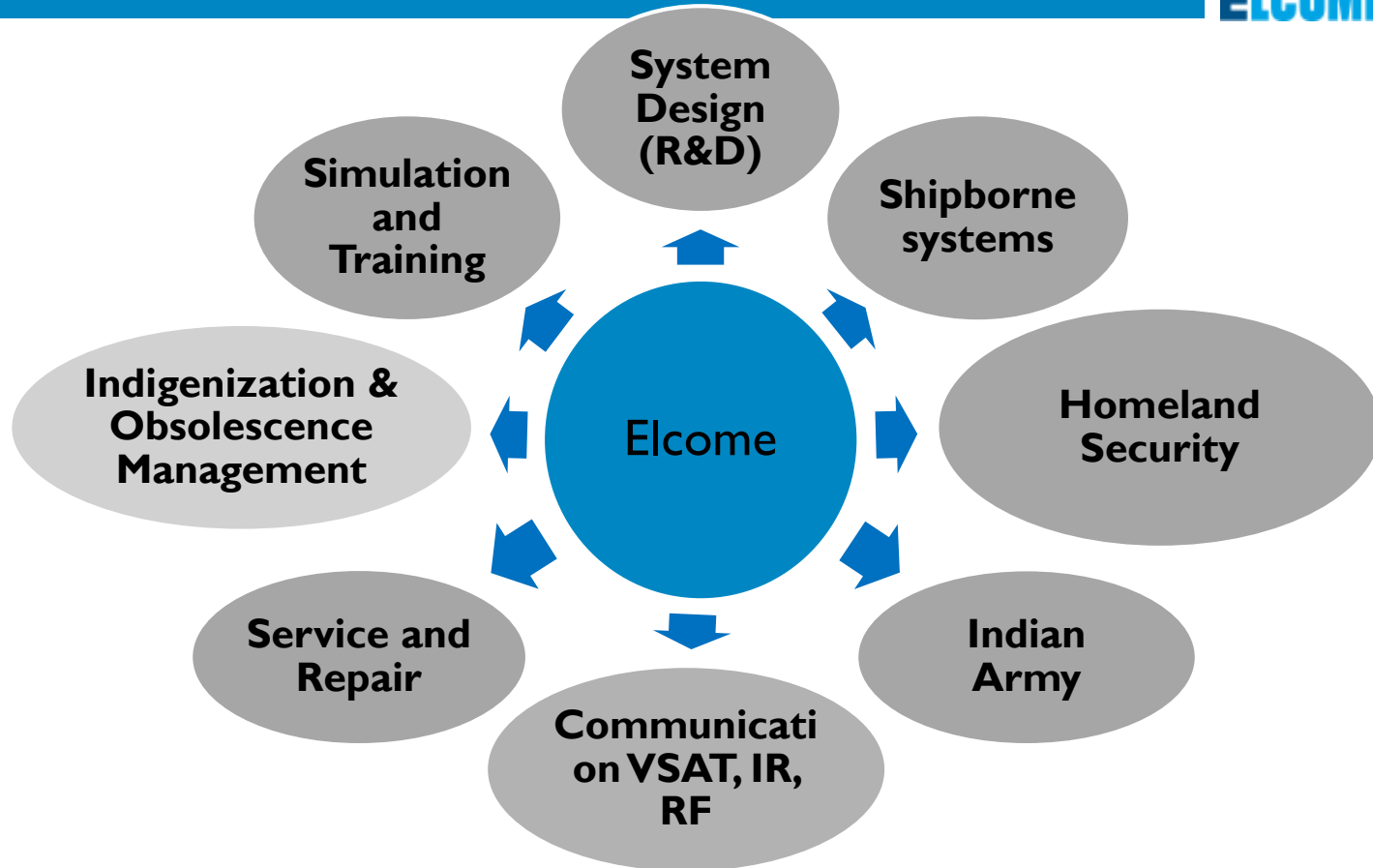


Elcome – Resource

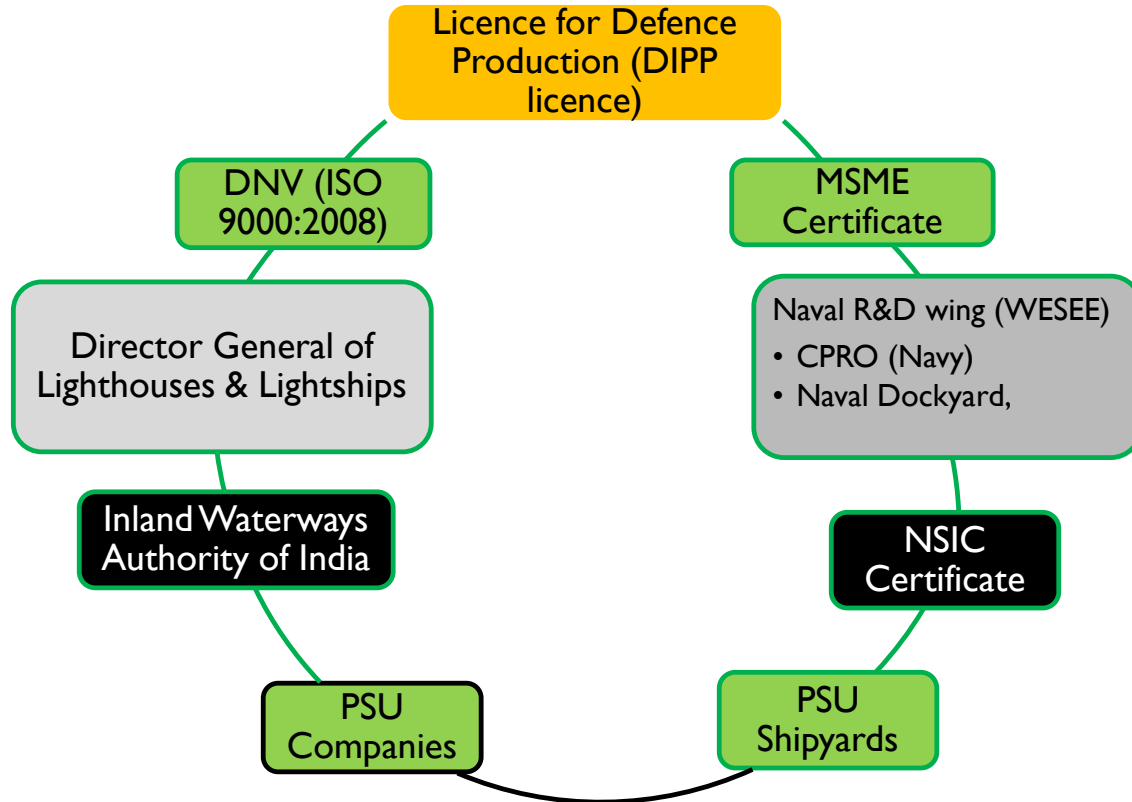


- ❑ Headquarters at Mumbai located at Belapur, Navi Mumbai which comprises of
 - 17,000 sq ft at Belapur
 - 60,000 sq ft of at Mahape
- ❑ Mumbai waterfront support facility of 2,000 ft² located at Masjid Bunder adjacent to Naval Dockyard
- ❑ 30000 sq ft at New Delhi and Technical Support branches in 8 locations to cover every Naval Port
- ❑ Elcome employs 280 people countrywide;
 - Around 140 have engineering background;
 - Over 70 ex naval personnel;
 - Indian Ownership;
 - ISO Certified;

Areas of operation



Accreditations



Our Partners

ELCOME

Raytheon Anschütz



Thrane & Thrane



TRANSAS

SKIPPER
SKIPPER Electronics AS

COOPER | Gitiessse



KODEN



ORBIT
TECHNOLOGY GROUP



John Lilley & Gillie, UK



Data well, BV



ZÖLLNER

Since 1911, we have been there.



navico



Israel Aerospace Industries Ltd.
Systems Maritime & Space Group, TAMAM Division

Our Customers : Govt

ELCOM



Indian Navy



Indian Army



Indian Coastguard



ISRO



National Institute of
Ocean Technology



Director General
Light House



National Hydrographic
office



Defence Research
and Development



Dredging Corporation of India



Bharat Electronics

Our Customers : Shipyards/Industry

ELCOME



ABG
ABG Shipyard Limited



PIPAUVAU
SHIPYARD

RELIANCE

ESSAR

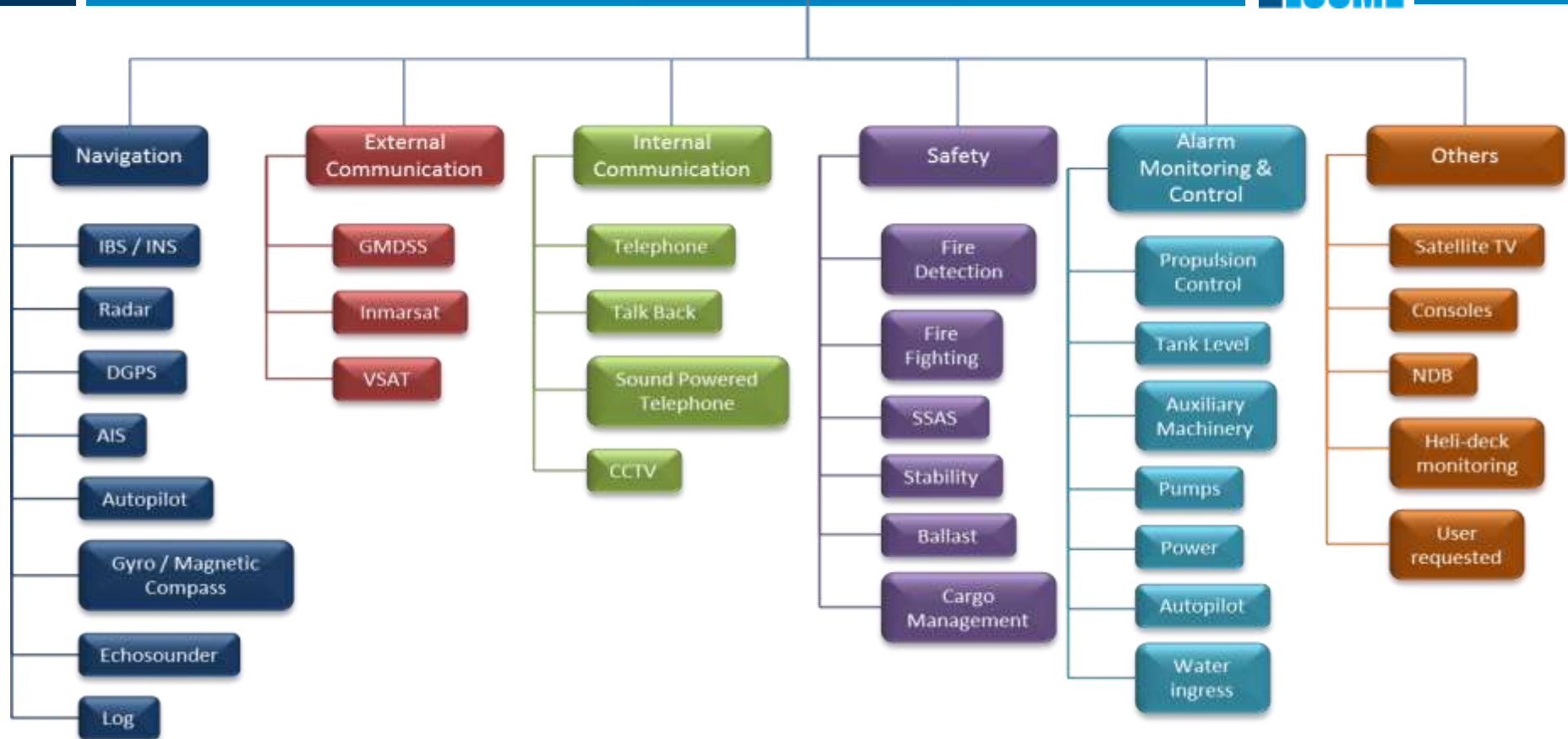


Elcome Product Portfolio

- Marine
- Landbased
- Homeland Security



Product Portfolio: Marine



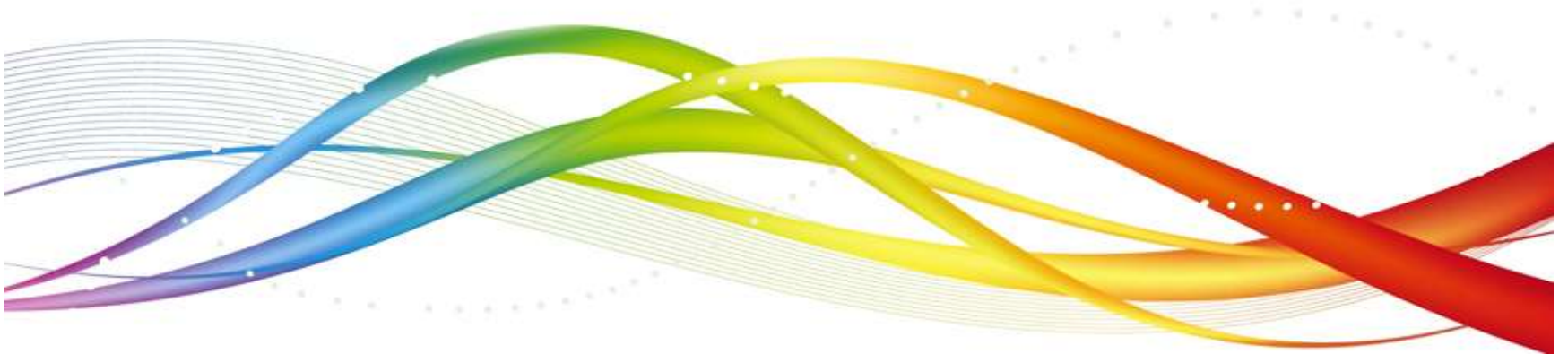
Product Portfolio : Land Based



- ❑ Land Based System
 - Long Range surveillance cameras, IR camera, II Tube Camera
 - Integrated surveillance with remote monitoring
 - Surveillance Receiver
- ❑ Homeland Security
 - Radar with small target detection
 - Diver Detection sonar
 - Surveillance cameras
 - Integrated system with Radar, Camera, AIS etc

Elcome Skill Set

- ☐ Design Capability
- ☐ Service Capability



Design Capability



User Requirement Conceptualization

- Convert cryptic user requirement into detailed system requirement
- Preparation of initial design and BOM
- Presentation of acceptance trials

Full capability for Turnkey System Design

- Hardware and software design and implementation
- Design of PCBs, Modules, Full Equipment and Test Jigs
- Console design and fabrication

Design to meet MIL STD/Aviation grade/COTS

Design to combat obsolescence

Offset Compliance

Service Capability



Services

- Installation and commissioning
- Annual maintenance contract
- Documentation

Obsolescence Management

- Ab initio design to form-fit and function
- Reengineering based on I/O data

System Integration

- Design of interface hardware and software
- System networking and connectivity
- Simulators and interface acceptance

Waterfront service

- Pool of multi-skilled manpower
- Countrywide maintenance network

An Innovative Enterprise

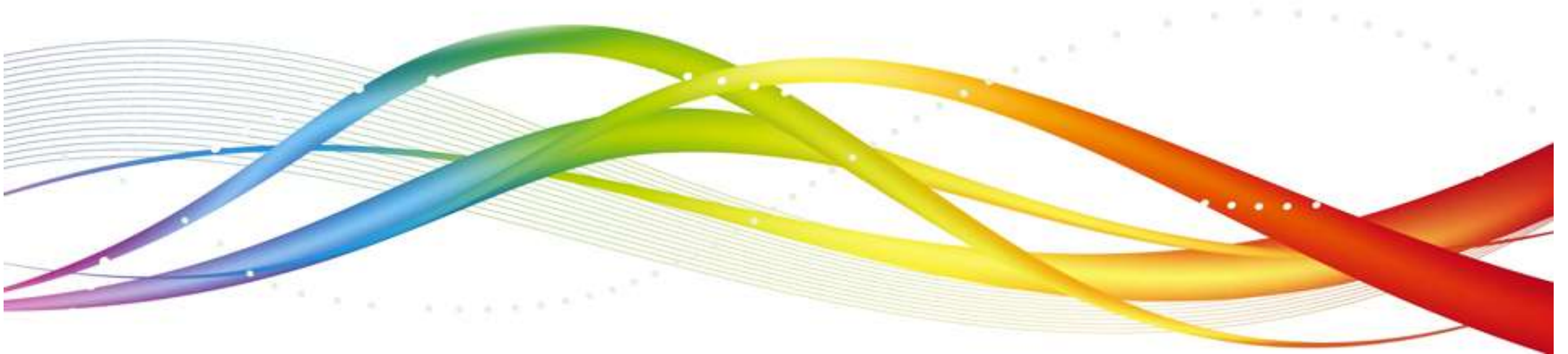


- ❑ Indigenisation and Innovation is not new to Elcome
 - It started off as development of the missing pieces in the jigsaw puzzle of providing system solution to our oversea partners.
 - With growth in complexity of systems, it was not always possible to use off the shelf items.
 - Therefore indigenous interface solutions (hardware and software) became order of the day
 - System integration was yet another activity which fuelled our desire to develop new products
 - Obsolescence management was another factor that pushed our indigenisation/innovation efforts.
 - Above all unwavering will and support of the management has been a catalyst

You will see some examples of our innovation and integration expertise

System Integration

- You will see examples of
 - ✓ Our design
 - ✓ Fabrication



Integrated Bridge System (IBS)....



- ❑ Integrated Bridge System is an ergonomic compilation of Navigational Data for safe ship navigation
- ❑ Implemented in collaboration with M/S Raytheon, Germany
 - IBS software from Raytheon, Germany
 - Balance software and complete hardware from Elcome
- ❑ Integrated with CMS, MDA, VDR, IPMS, CCTV etc
- ❑ Gigabit Ethernet backbone
- ❑ Onboard Training System
- ❑ Extensive diagnostic and BITE
- ❑ IETM

Integrated Bridge System (IBS)

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An example of Elcome Design Capability

Integrated Platform Management System



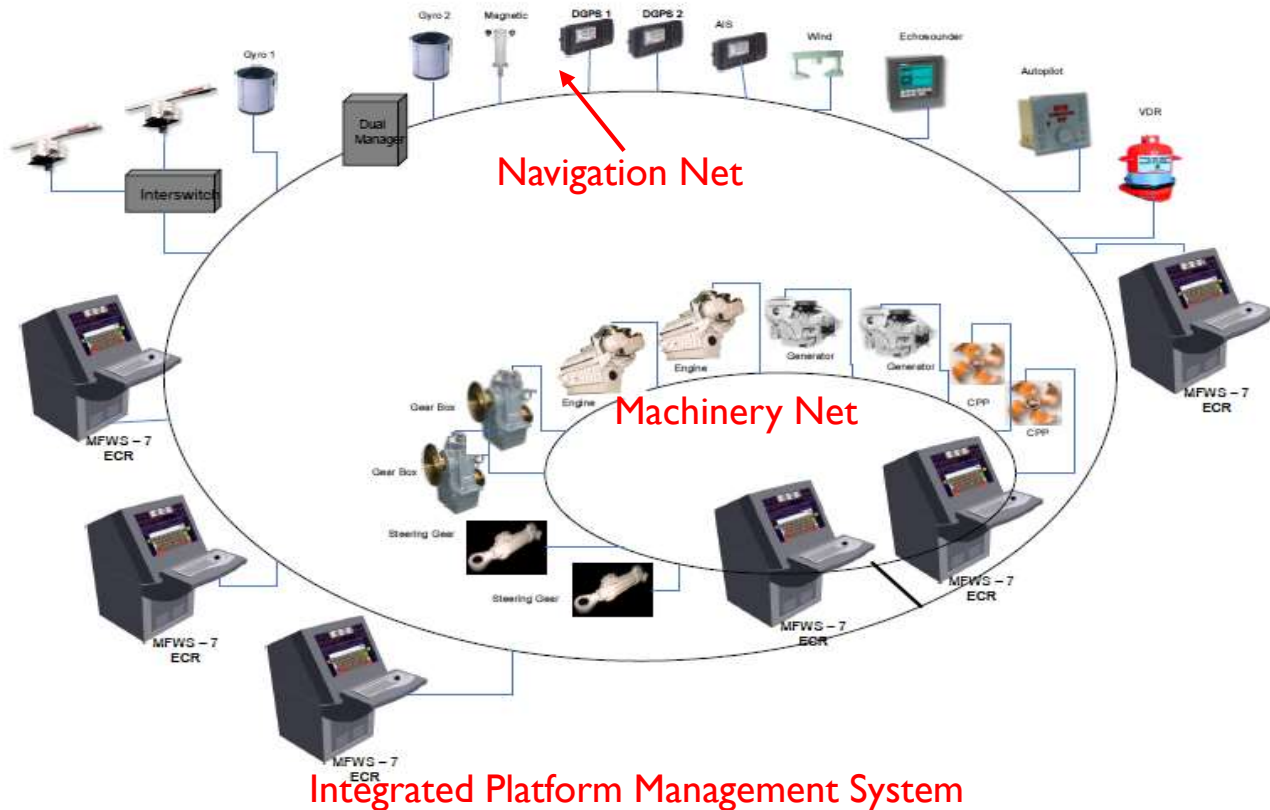
- ❑ Integrated Platform Management System (IPMS) comprises of
 - Integrated Bridge System (IBS) and
 - Integrated Machinery Control System (IMCS)
- ❑ In collaboration with Raytheon, Germany and Noris, Germany
- ❑ Delivered for Indian Coastguard AOPV (2007)
- ❑ Total 11 sets of IPMS
- ❑ Elcome scope
 - Bridge, ECR & DCHQ console design and approval;
 - Installation, commissioning, acceptance and maintenance support;
 - Project management, configuration management;
 - Interface with shipyard, ICG, other equipment suppliers to ensure seamless integration;

IBS & IMCS for ICG ...

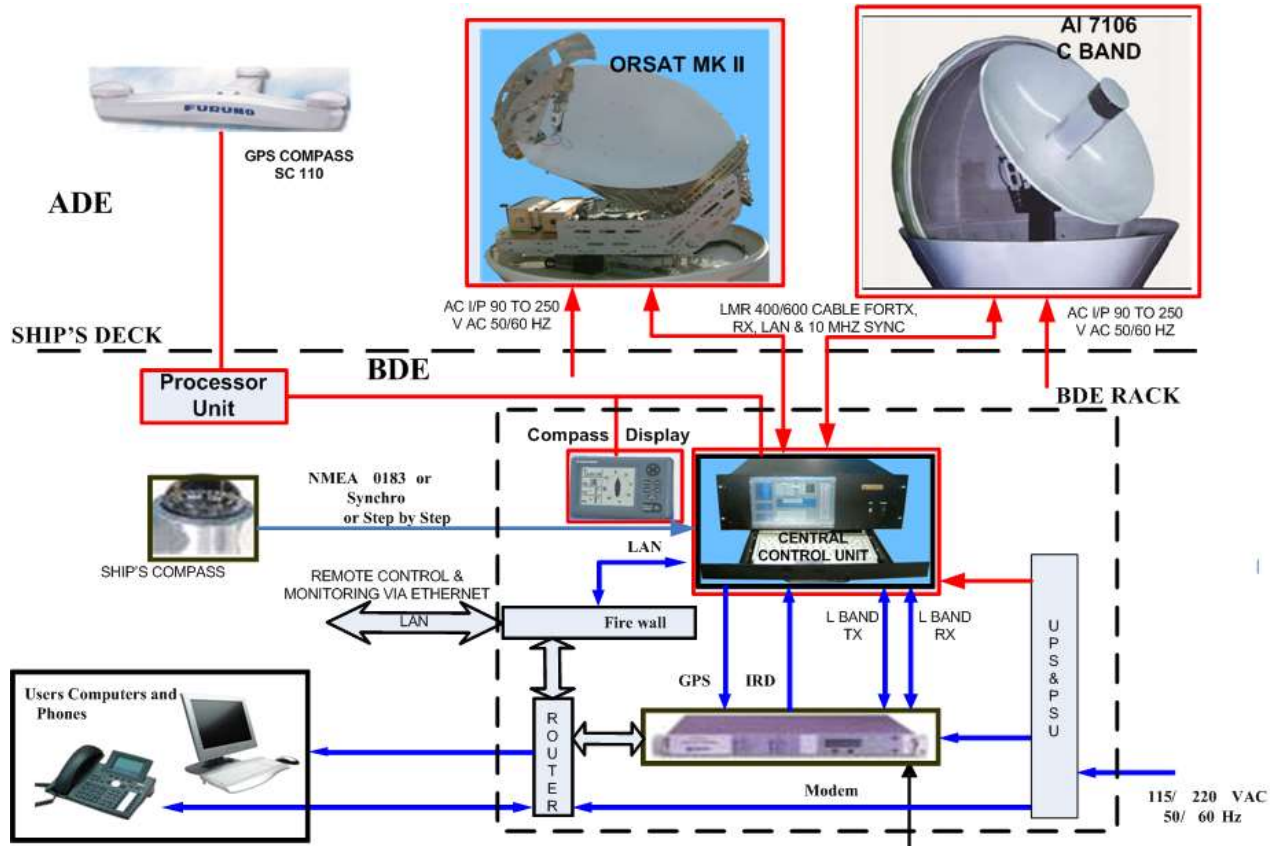


Elcome was the first to deliver IPMS in India (Indian Coastguard OPV in 2007)

IBS & IMCS for ICG ...

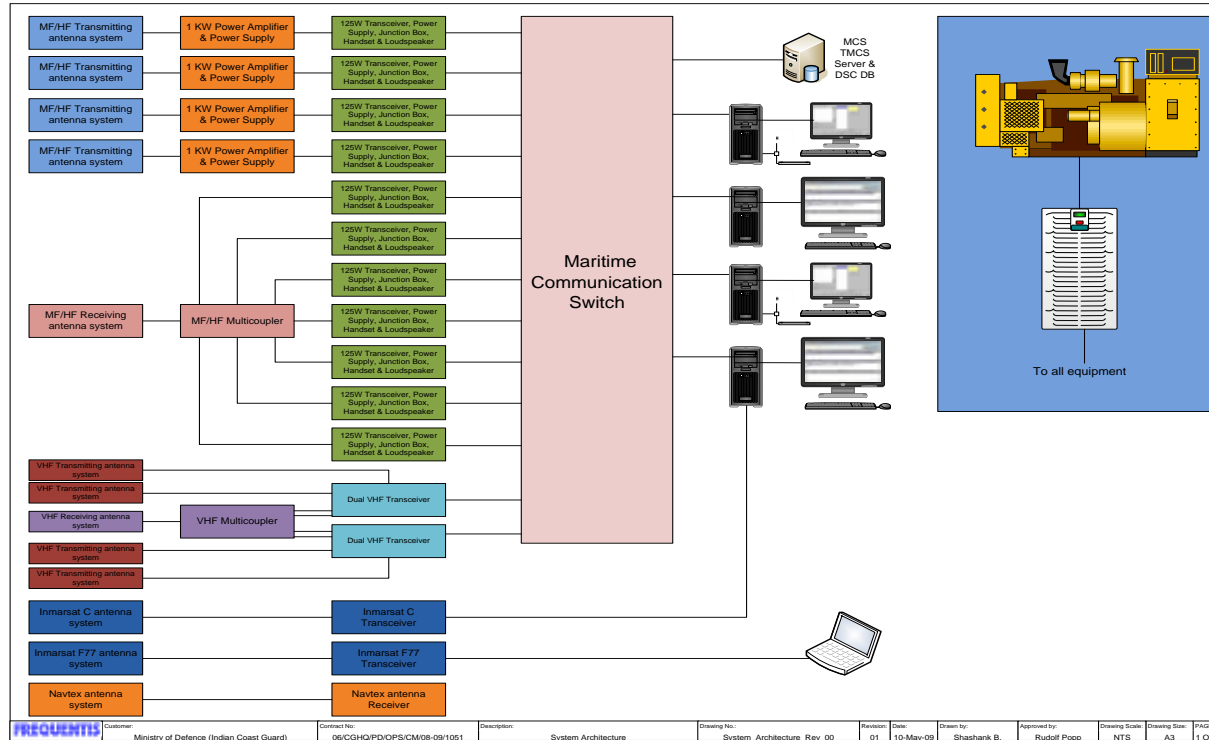


VSAT Project of Indian Navy



- ❑ 15 Analog Radios
 - 4 VHF Tx/Rx with whip antenna
 - 4 MF/HF transmitter with whip antenna
 - 4 MF/HF receivers
 - 8 MF/HF receiving antenna
 - Multi coupler
- ❑ Inmarsat and F77 terminal and antenna
- ❑ NAVTEX terminal and antenna
- ❑ PSTN connectivity for telephone
- ❑ 100% power back up

Maritime Rescue & Coordination Centre



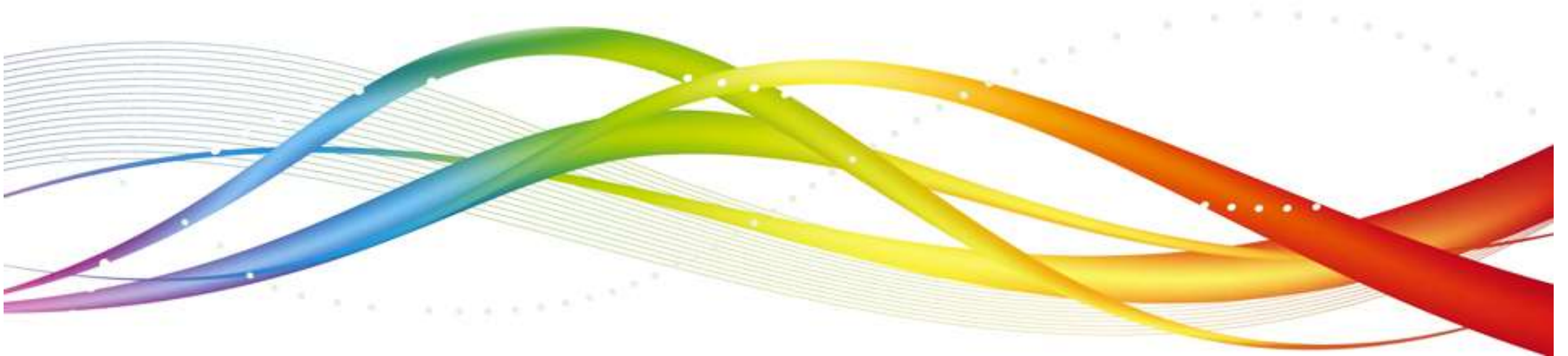
DGPS Beacon system for DGLL



- ❑ 22 stations installed over last 12 years;
- ❑ Reference Stations, Integrity Monitors, Control & Monitoring from MX Marine (erstwhile Leica);
- ❑ Non Direction Beacon Transmitters:
 - Used existing transmitters at some stations;
 - Used Southern Avionics at some stations;
 - Used Nautel at some stations;
- ❑ Since commissioning, system under All Inclusive Annual Maintenance Contract;

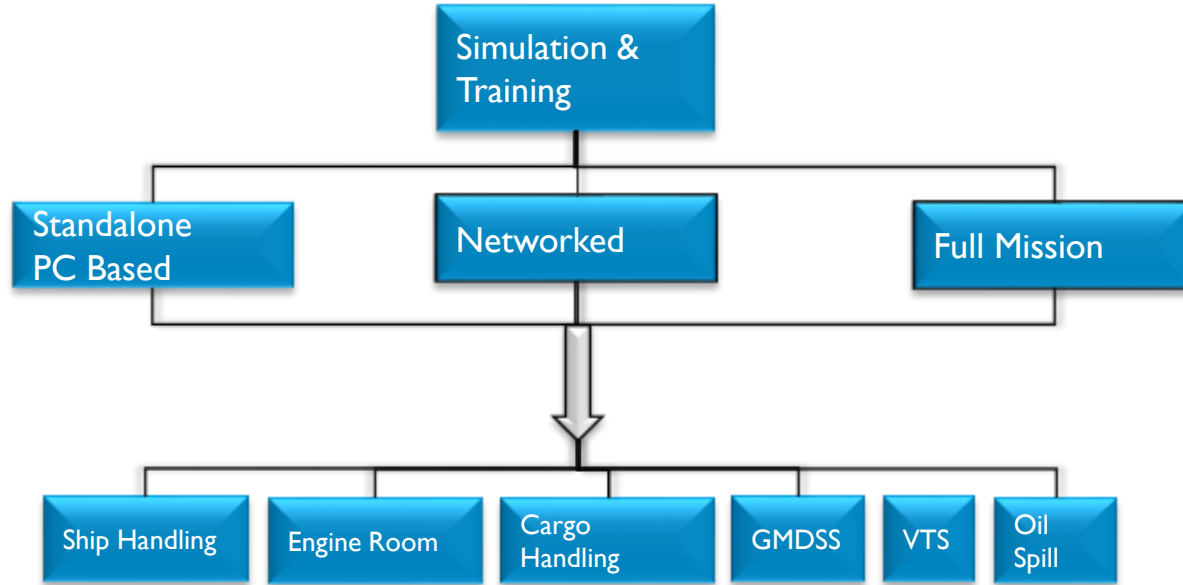
Simulator Projects

- Integration of I/Os
- Console Fabrication



- ❑ Elcome partners with reputed developers for simulation as technology partners namely Transas, VMT etc :
 - Technology Partner scope:
 - Application software;
 - Elcome scope:
 - All computer and network hardware;
 - Design and deliver Projection system (including circular screens);
 - Design & deliver Consoles;
 - Interface of consoles with application software's mathematical model;
 - Acceptance trial presentation

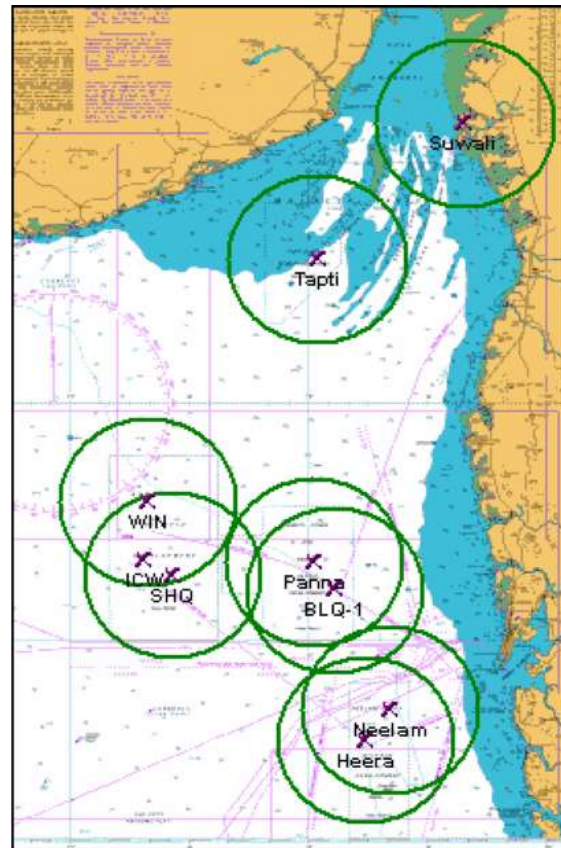
Simulators



60 Simulators installed in India over last 15 years

VATMS Project

- Remote Sensor Sites:
 - 7 Platforms at sea;
 - 1 Ashore;
- Monitoring Sites
 - Countrywide networking
 - Total 21 sites
 - 5 civilian sites ashore
 - 8 platforms
 - 8 military sites



VATMS Project ...

3.2.9 Remote Sensor Site Tapti

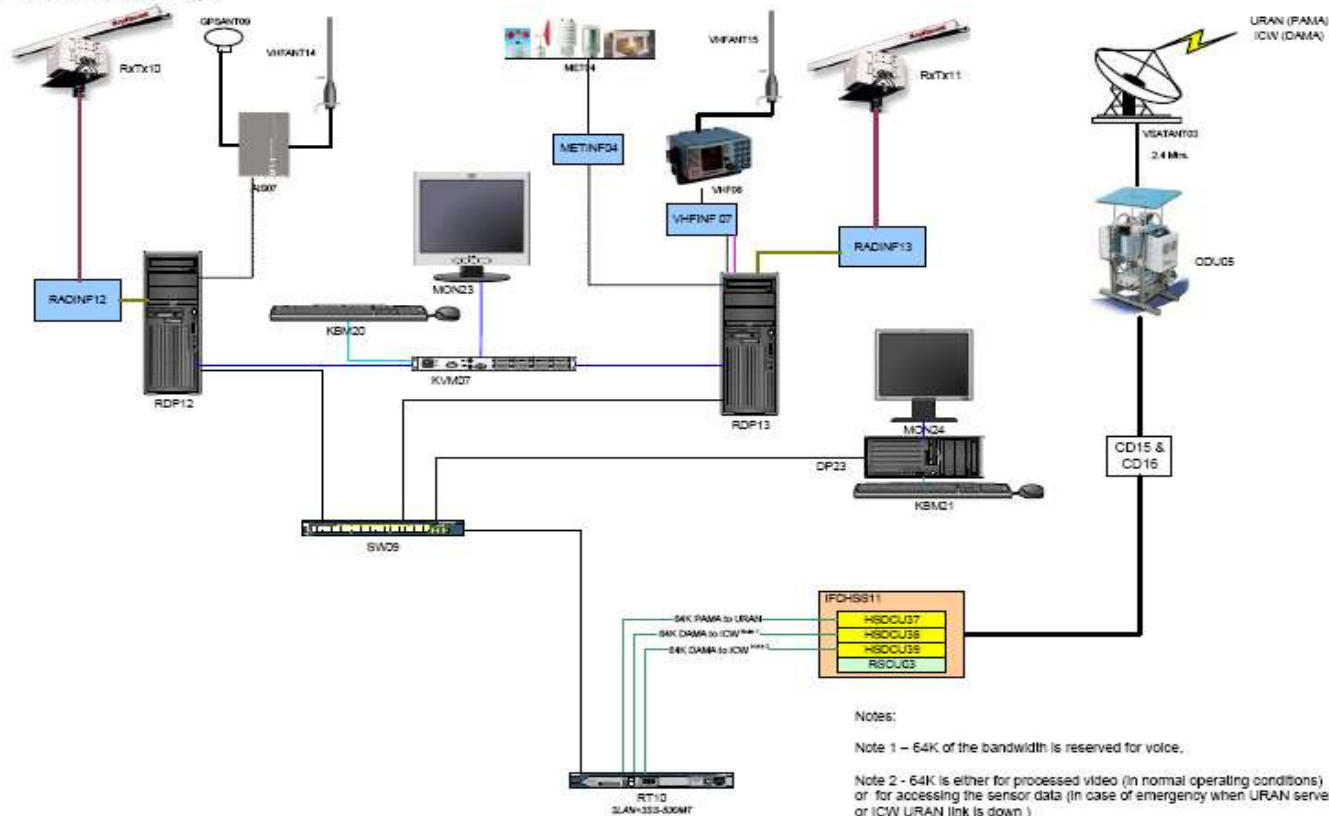


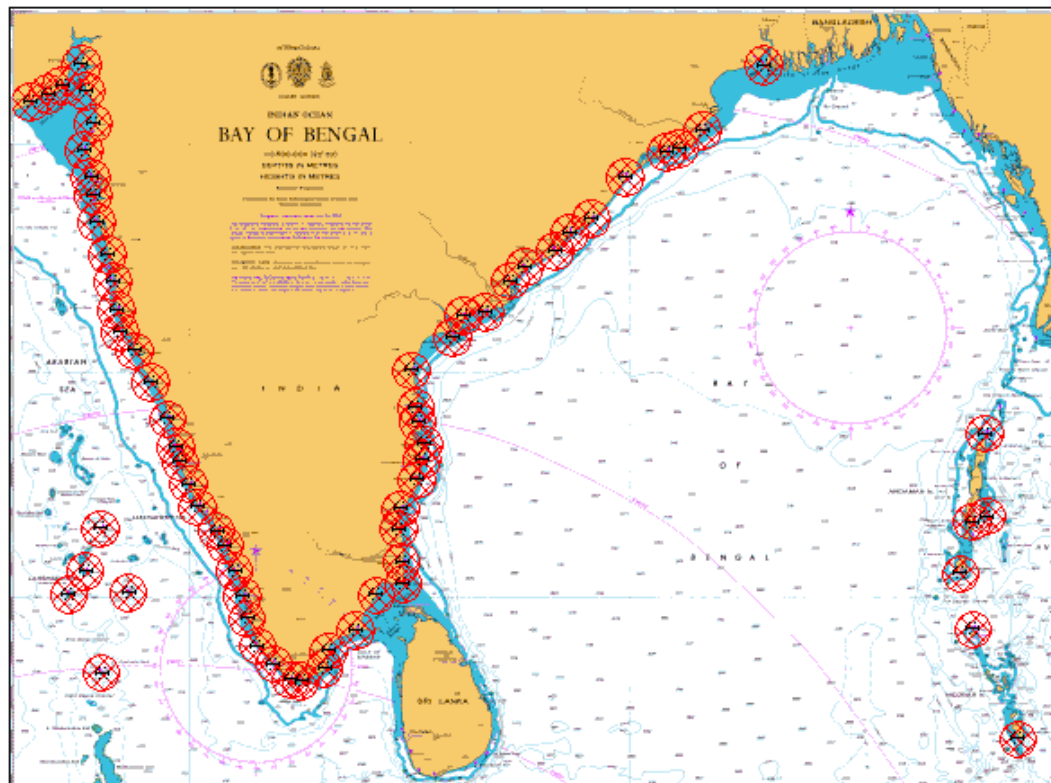
Figure 28 Tapti Remote Sensor Site

National AIS ...

- ❑ Phase 1 commissioned in Aug 2012 and Phase 2 in Dec 2014
- ❑ Installation of dual redundant AIS base stations at 87 lighthouses;
- ❑ Wide Area Network comprising of
 - 8 Regional Centres (RCC)
 - 2 Central Control Stations (CCC)
 - Data Distributed countrywide
 - Media used VSAT, Leased lines, Fibre optic cables etc;
- ❑ Integration with 3rd party Coastal Radar and CCTV system;
- ❑ Annual Maintenance to cover 10 years;

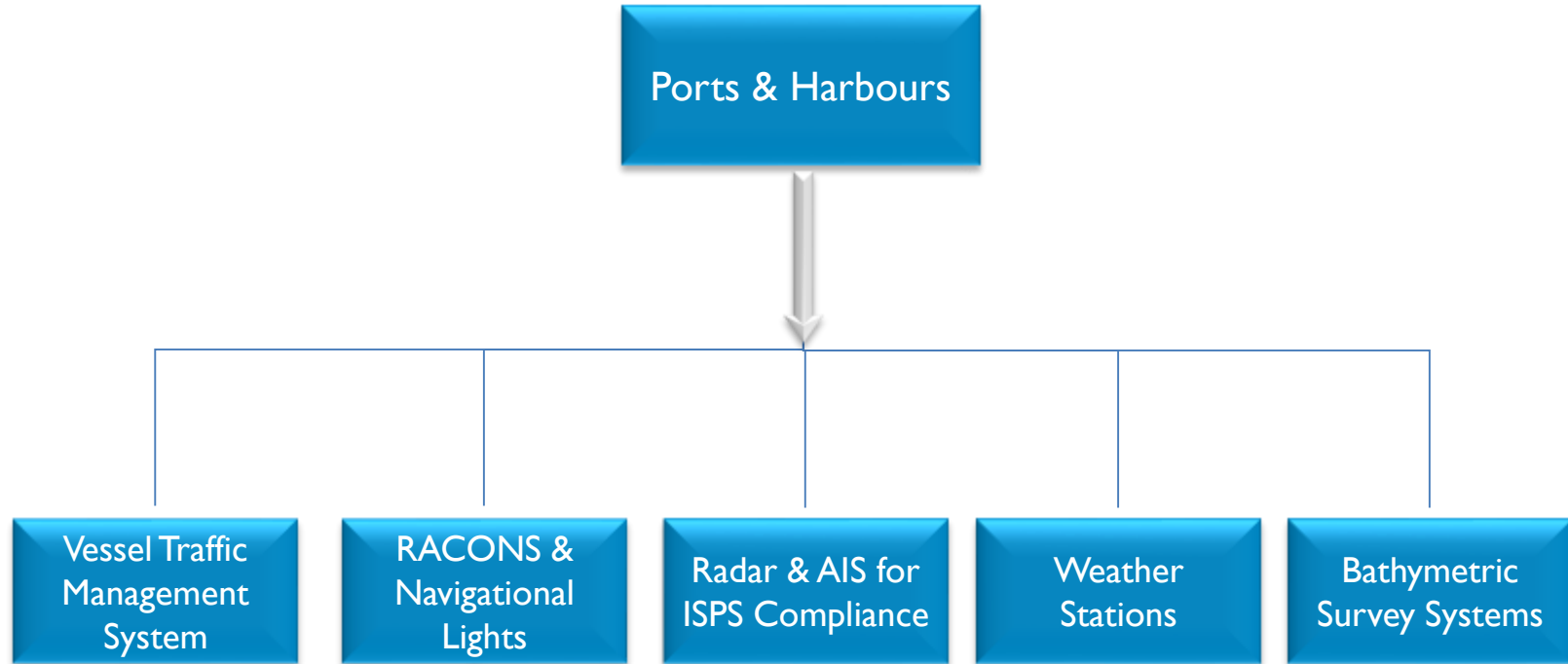
National AIS Project

- **Sensor site**
 - 87 locations;
 - 174 SAAB AIS Base stations operating in dual redundant mode;
- **Networking:**
 - 65 nos. 64 Kbps VSAT links;
 - 20 nos. 64 Kbps Leased line links;
 - 2 nos. 1 Mbps VSAT links;
 - 1 no. Fibre optic link;
 - 14 nos. 2 Mbps Leased line links;
 - 10 nos. 4 Mbps Leased line links;
 - 2 nos. 4 Mbps internet leased line;
 - 40 CISCO routers;
 - 107 CISCO switches;
 - 10 CISCO firewalls;
- **Processing**
 - 68 Servers operating in dual redundant mode;
 - 50 workstations;



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Ports and Harbours

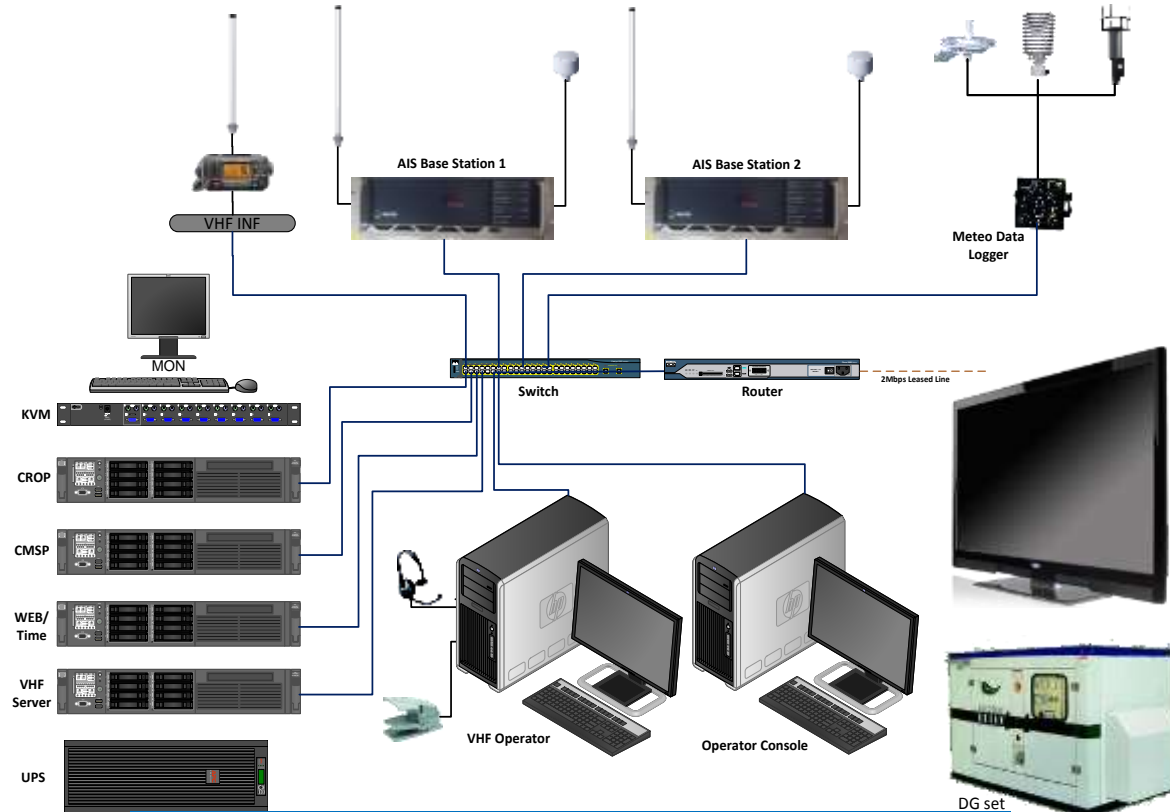


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River Information System

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River Navigation onboard equipment suite

Projects for Indian Army



Projects for Indian Army



- ❑ L1 for 33 nos High Grade Surveillance Receivers
 - Order Received
- ❑ Awaiting price bid opening for 78 more Receivers
- ❑ L1 for Border Surveillance Management System (TI Camera based)
 - Project cancelled due inadequate funds
- ❑ Indigenization (DOI). Order received for following items of 155 mm gun
 - Induction Receiver
 - Control Box

Projects for Indian Army



- ❑ Mobile Satellite Terminal
 - Elcome has been accepted as a bidder
 - Includes HUB
 - Interface to legacy voice VHF terminals
 - Awaiting issue of RFP
- ❑ Small Man Portable Satellite Systems
 - Bid in collaboration with GD and Hughes
 - Adjudged L2

Submarine Specific Projects

- Innovation
- Domain knowledge

SSK Submarine experience



- U209 submarines (4 nos):
- Installation and upgrade of
 - Steering Stand;
 - Data Distribution Unit (DDU);
 - Standard 22 Gyro Compass
 - MINS 2000 (INS);
- Integration of above equipment with following on-board systems;
 - Fire Control System from Atlas;
 - ISS of Atlas;
 - Optronic Periscope from Carl Zeiss;
 - Steering Hydraulic system;

Kilo Class Submarine experience ...



- ❑ Navigation Radar to replace obsolete radar
- ❑ Installation of WAAS, Italy make C-303 Chaff Launcher;
- ❑ 10 KVA Dual Static Frequency Converter
 - MIL STD. 8 in number in service
- ❑ Installation of ECDIS and integration with Nav Sensors

Scorpene Submarine experience ...



- ❑ Delivery of navigation radar
- ❑ Integration with Sagem
Navigation Complex
 - ICD jointly prepared and
signed with SAFRAN
- ❑ Delivery of ECDIS
- ❑ integration with Navigation
bus

Indigenous Submarine experience ...



- ❑ For Classified Project
 - Delivery of Automatic Fire Detection System
 - Order received. Delivery in Nov 11
 - Delivery of ECDIS and integration with MIL 1553 bus
 - Delivery of Radar and integration with sensors

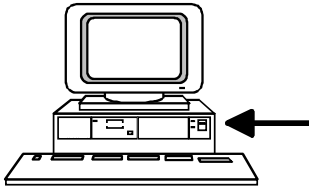
Steering Stand of U209 during FAT



Submarine Steering Console
S51 MOD 1

Simulation System S51

PC / Note Book
with Software
Service Tool



Simulation Rudder and Planes

SIMON,
operating and monitoring
of the simulation (MMI)

SIOUX,
simulation processor

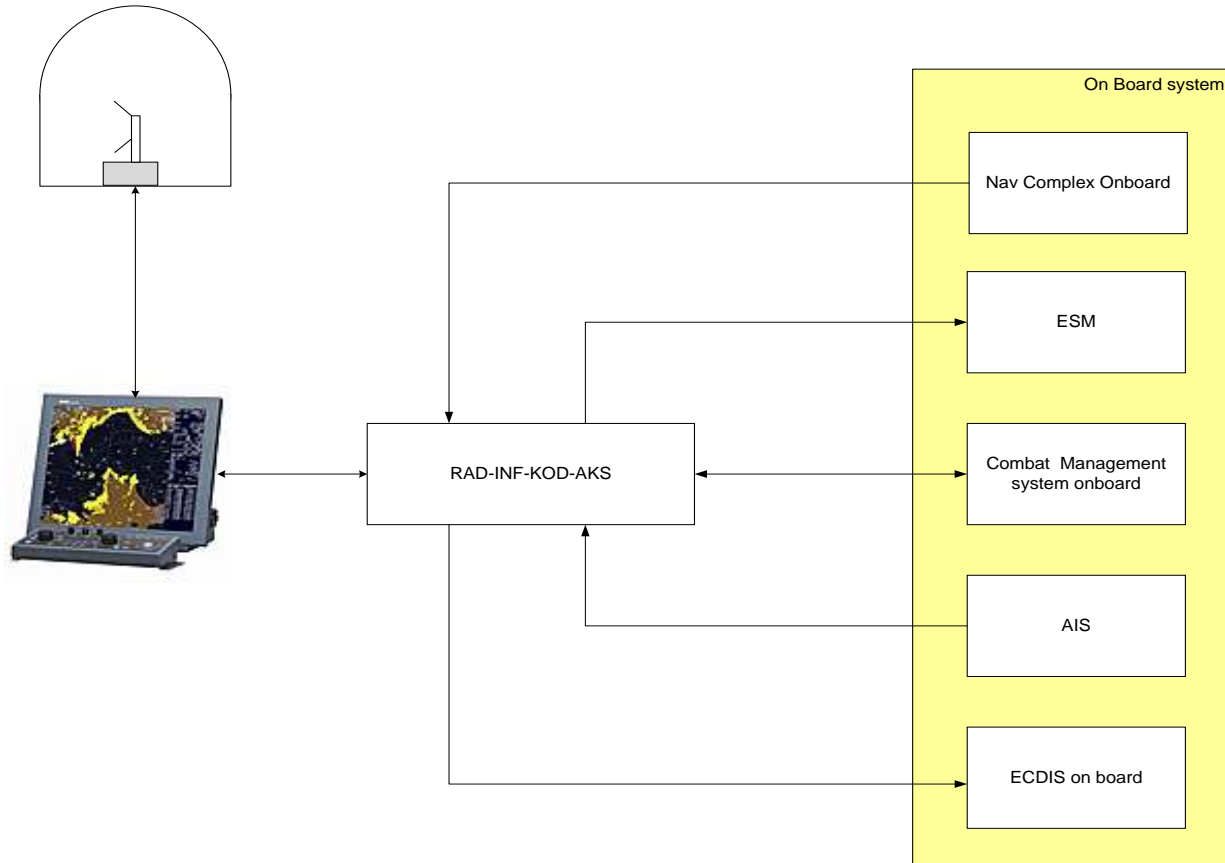
BDS, dynamic data
of the Submarine

Radar for Kilo Class Submarine



- ❑ Supply of COTS Navigational Radar;
- ❑ Design, manufacturing and integration of pressure tight (45 bars), RF transparent radome;
- ❑ Integration with following on board systems:
 - Nav Complex (GPS, Gyro, Log);
 - Elcome developed the converter for Nav Complex which provided a MIL 1553 bus;
 - AIS;
 - ESM;
 - ECDIS;
 - Combat Management System (CMS);

Submarine Radar Integration



Static Frequency Converter

- ❑ 10 KVA Dual SFC for hot standby
- ❑ In service on Kilo Class Submarine
- ❑ Compliant to MIL STD



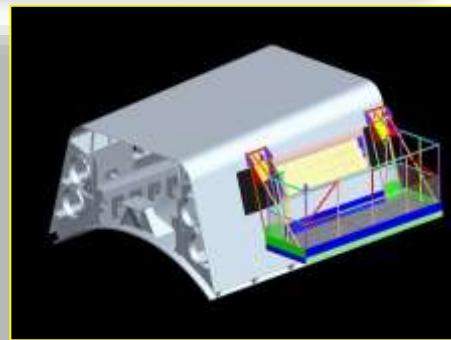
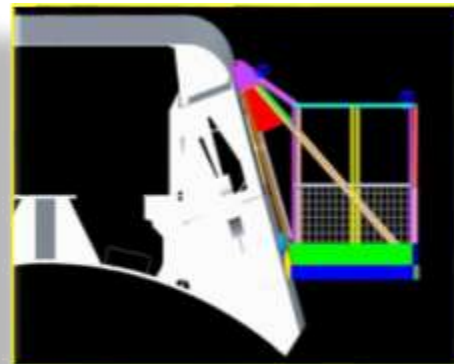
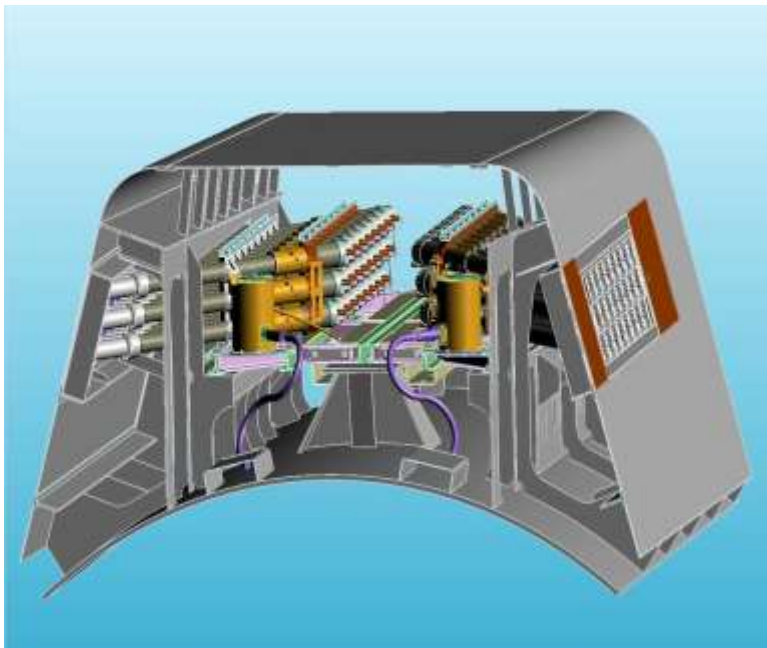
Torpedo Decoy for Kilo Class



- ❑ Launcher Capacity
 - Each multiple launcher B521/24 consists of
 - 24 launch tubes
 - Configured into 3 rows of 8 tubes each
 - Installed outside the pressure hull on port and starboard side
- ❑ Elcome scope
 - Turnkey solution
 - Mustering of items
 - Installation planning
 - Fitment of side support
 - Loading/Unloading of launchers
 - Installation of hydraulics, control system etc
 - Commissioning and presenting system for acceptance trials

Torpedo Decoy for Kilo Class

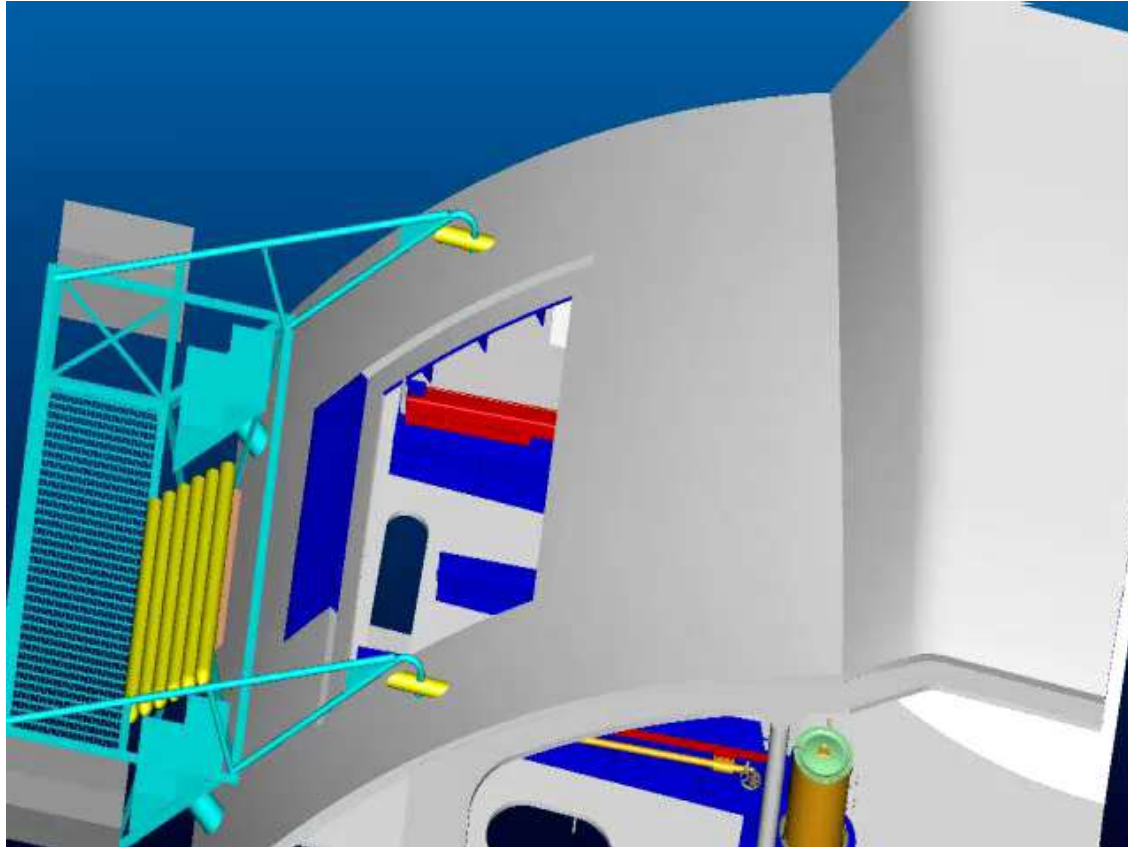
ELCOME



Shipping in and Installation Planning, Hydraulics and Electrical Interface

Installation Planning for Decoy

ELCOM[®]



Submarine Indicator Buoy

ELCOMÉ



Submarine Indicator Buoy

- ❑ Scope of work
 - To modify existing Submarine Indicator Buoy to make it GMDSS compliant by integrating EPIRB



Submarine EIB Project

- Introduction.
- Scope of Project.
- Major Stages of Project.
- Delivery Schedule
- Time lines of project
- HATs & SATS.
- Invoicing.
- Warranty support.



Manufacturing Capability

- Design Conceptualisation
- Manufacturing knowhow
- Indigenous Products



Manufacturing Objectives



- ❑ Elcome undertakes need based business driven manufacturing.
- ❑ Manufacturing objective is to meet
 - Customised solutions required for system integration
 - Manufacturing against firm order
 - Solutions for obsolescence management
 - Indigenous product where
 - Imported support not available
 - Reliable support not available

Indigenous Products



- ❑ Customised Solution
 - Universal Navigation Interface
 - Radar Remote Control unit
- ❑ Obsolescence Solution
 - SSK Memory card
 - Mission Program Loader for Sea Harriers
- ❑ Manufacturing against firm order
 - Static Frequency Converter
- ❑ Indigenous Products
 - Radar Interface Unit
 - Plotting Table
 - Self Powered Telephone
 - Weather Station and Anemometer
 - Universal Radar display
 - Addressable Flood Alarm System

Universal Navigation Interface



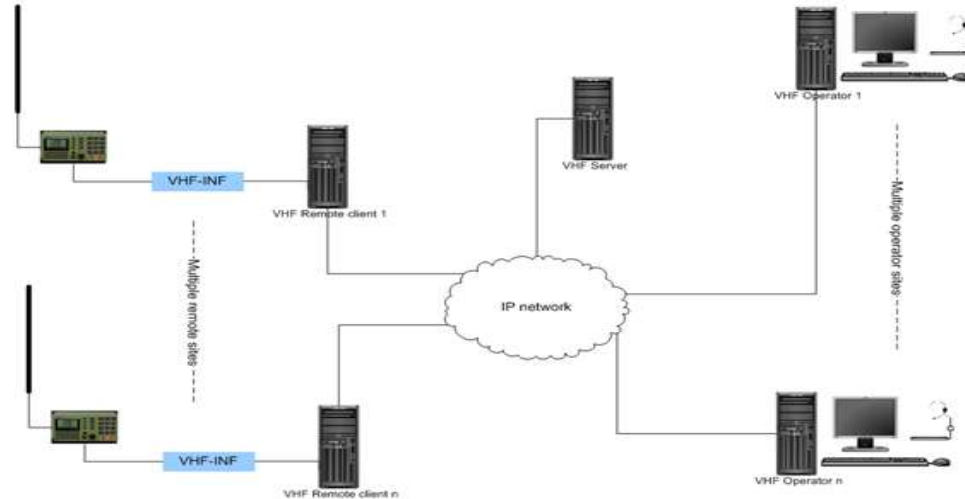
- ❑ Designed for Indian Naval Ships
- ❑ Fitted on all ships of Indian Navy
- ❑ Interfaces with all types of
 - Gyro,
 - Log
 - Echo-Sounder
- ❑ Varied electrical interface eg pulse, synchro, resolver,
- ❑ Output in NMEA format
- ❑ Field programmable
- ❑ Compliant to IEC 60945



VHF over VOIP

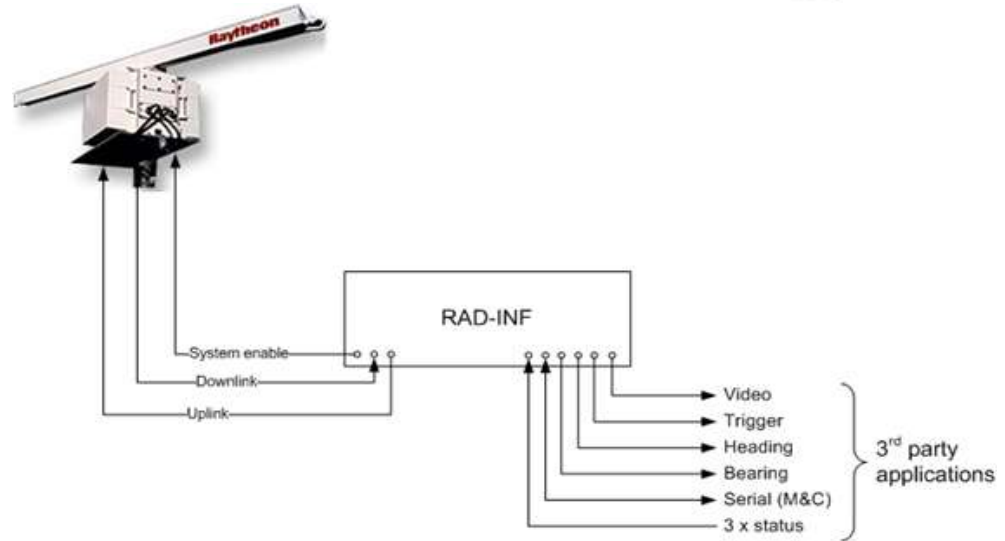
□ Elcome design

- 4 nos. Aanderaa Meteo sensor remote control interface;
- 10 nos. Sailor VHF Remote Control interface unit;
- Voice over IP and remote control for sailor radio;



Radar Remote Control Unit

- ❑ Elcome design
 - Radar remote control interface
 - Signal conditioning
 - Converts digital data into conventional radar control signals



Radar Interface Unit (RIU)..

- ❑ Signal Conditioning Unit for
 - Two long range military radars
 - Three short range radars
 - Includes Russian Make Radars
- ❑ Radar Integrator board for
 - D/A conversion
 - Image processing
 - Video on ethernet
- ❑ Compliant to MIL STD for
 - Shock and vibration
 - EMI/EMC



Obsolescence Solutions

- ❑ Mass Memory Unit Replacement of Torpedo fire Control System SSK Submarines
 - Equipment Manufactured by M/S Singer Librascope, USA
 - MMU comprised of magnetic core
 - Replaced by new FPGA based design
 - Designed to form, fit and function
 - No support from OEM



Printed Circuit Board Design Capability

Obsolescence Solutions

❑ Mission Program Cassette and Program Loader for Sea Harrier

- The mission program of Sea Harriers is loaded in a cassette and loaded using a cassette player
- The cassette as well as loader was rendered defective
- No support from OEM
- Flash disk designed which can now be loaded into a device as shown
- Aviation worthy design



MIL Grade UPS



- **Online UPS 2/3KVA**
 - Proven design
 - MIL STD 461E EMI/EMC
 - Delivered for LCU project

Indigenous Product : Plotting Table

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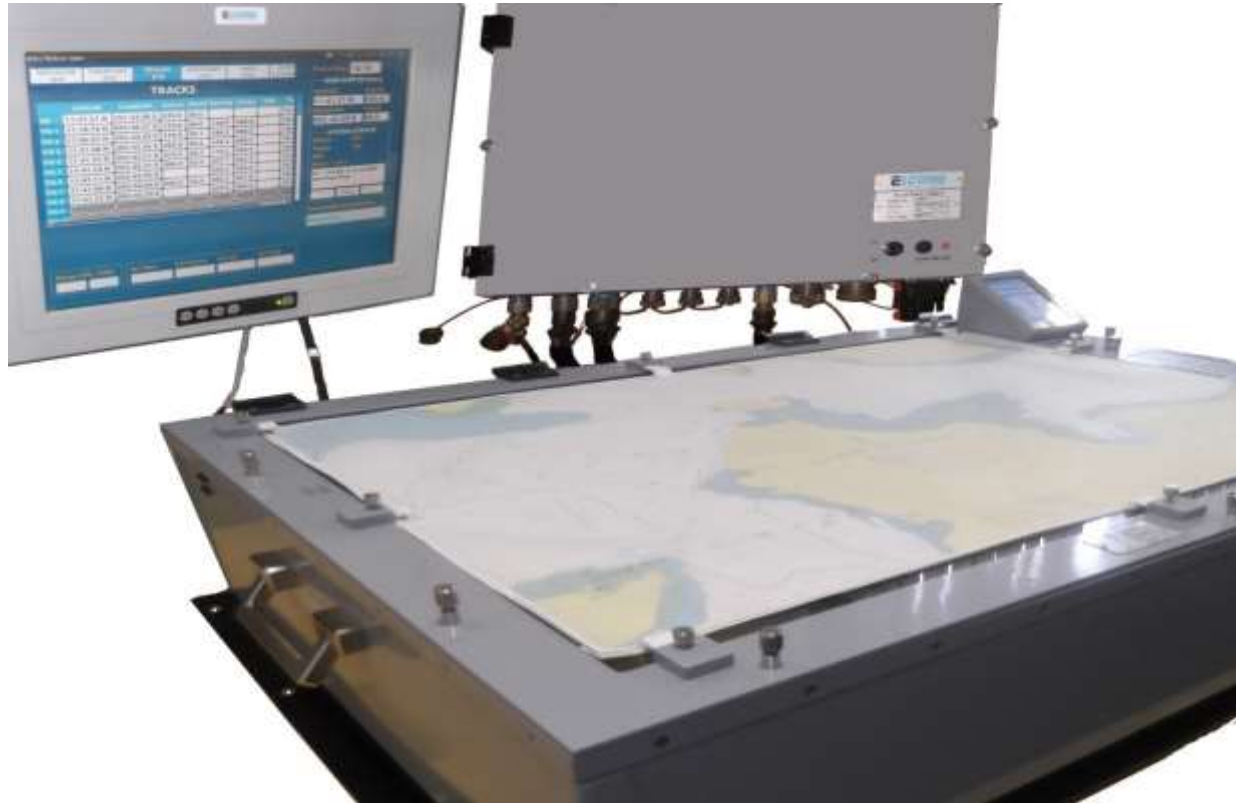


- ☐ 100% Indigenous design of Hardware and Software
- ☐ Compliant to Naval requirement
- ☐ MIL STD design

Prototype Plotting Table

Indigenous Product : Plotting Table

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Accepted by Indian Navy post rigorous static and dynamic test

Indigenous Product : Self Powered Telephone



❑ Elcome design

- Developed for Indian Navy
- Certified to IEC 60945 for EMI/EMC and Environmental specs
- Intrinsic safe
- Supplied for Indian Aircraft Carrier



Delivered > 1500 units

Indigenous Product : Weather Station Display

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- ❑ Control and ruggedized LED & LCD display system designed in-house
- ❑ Sensors procured from reputed manufacturers namely Vaisala, RM Young
- ❑ Compatible with all contemporary sensors available worldwide
- ❑ Compliant to IEC 60945
- ❑ In use in Indian Navy and Coastguard

Universal Radar Display



- Collaborator scope:
 - Scan Converter board;
 - Radar Display application software;
 - Radar keyboard;
- Elcome Scope
 - CPU and Console;
 - IEC 60945 approved monitor;
 - Interface box to adapt RAWL MK 2 signals to that expected by scan converter board;
 - IP based scan converter



Indigenous Product : Flood Alarm System

- Elcome design
 - Developed for Indian Navy against DEE tender
 - To be certified to MIL STD for EMI/EMC and Environmental specs
 - Accepted post trials



Static Frequency Converter

- ❑ 10 KVA Dual SFC for hot standby
- ❑ In service on Kilo Class Submarine
- ❑ Compliant to MIL STD



Indigenous Product : Equipment



STATIC FREQ CONVERTER



DISPLAY CONSOLE



Indigenous Product : Modules



**RADAR
INTERFACE**



**GYRO
CONVERTER**



UNIVERSAL ECDIS INTERFACE

Indigenous Product : PCBs



EUWAC LOADER



ARINC INTERFACE



SSK MEMORY CARD



EUWAC MEMORY

Elcome Manufacturing Capability



- ❑ Elcome has the capability to design PCBs, Modules as well as whole Equipment and Systems
- ❑ We have inhouse R&D to undertake need based customised hardware and embedded/GUI based software design
- ❑ We are equipped with all the necessary design tools
- ❑ We possess domain knowledge to facilitate system design
- ❑ We have experience of various physical electrical interfaces as well as data protocols required for system integration
- ❑ We are aware of the design requirement to meet specifications like IEC 60945, MIL STDs

Elcome Service Credentials

- Domain Knowledge
- Trained and skilled manpower
- Reliability



Waterfront Support

- ❑ Established in 1978
- ❑ Corporate headquarters in Navi M
- ❑ Own waterfront support
 - Mumbai (since 1978)
 - Kolkata (since 1980)
 - Vizag (since 1981)
 - Chennai (since 1986)
 - Port Blair (since 1988)
 - Kochi (since 1995)
 - Goa (since 1999)
 - Jamnagar (since 2003)



Life Cycle Management



- ❑ Deputation of engineers to principal's premises for training
- ❑ Train the trainer concept and inhouse training
- ❑ Cross training of engineers
- ❑ Maintenance of reference systems
- ❑ Stocking of spares for discharging AIAMC obligation
- ❑ Back to back arrangement with OEM
- ❑ Inhouse capability for obsolescence management

Equipment Under Maintenance



- ❑ Elcome has provided the following equipment/system which are in use in the Indian Navy and Indian Coastguard
 - Electronic Chart Display System (ECDIS) in collaboration with Transas, Sweden,
 - Fitted on every ship of Indian Navy
 - The Universal Interface Unit designed by Elcome integrates the ECDIS to ship's sensors on all these ships
 - 3D VSAT communication in collaboration with BEL and Orbit, Israel,
 - Fitted on every ship of Indian Navy
 - Elcome's role is to install, integrate and present HAT/SAT
 - Gyro STD 22 M from Raytheon Anschutz
 - Fitted on majority of ships of Navy and Coastguard
 - Radars for submarines from Koden
 - Fitted on all Kilo Class submarines as replacement
 - To be fitted on indigenous submarines also
 - Elcome role is to provide the pressure proof radome and integrate to ship systems including MIL 1553 bus

Equipment Under Maintenance.....



- ❑ St Stand, DDU, MINS and Gyro from Raytheon
 - Fitted on all SSK submarines as modernisation package
 - Elcome role is to provide installation, STW, commissioning and present system for HAT/SAT
- ❑ Radars from Raytheon
 - ❑ 24 radars fitted on Indian Coastguard ships
- ❑ IBS and IPMS from Raytheon and Norris
 - ❑ Fitted on AOPV of Indian Coastguard

Maintenance of Phalanx CIWS

- ❑ Phalanx is a Close In Weapon System (CIWS) from Raytheon Missile Systems
- ❑ Fitted on INS Jalashwa
- ❑ High rate of fire 4500 rounds per minute
- ❑ Shell size 20 mm
- ❑ Comprises of
 - Integrated Radar
 - Acquisition as well as tracking radar
 - EOS
- ❑ System maintained by Elcome under AMC from Indian Navy



Equipment Under AMC



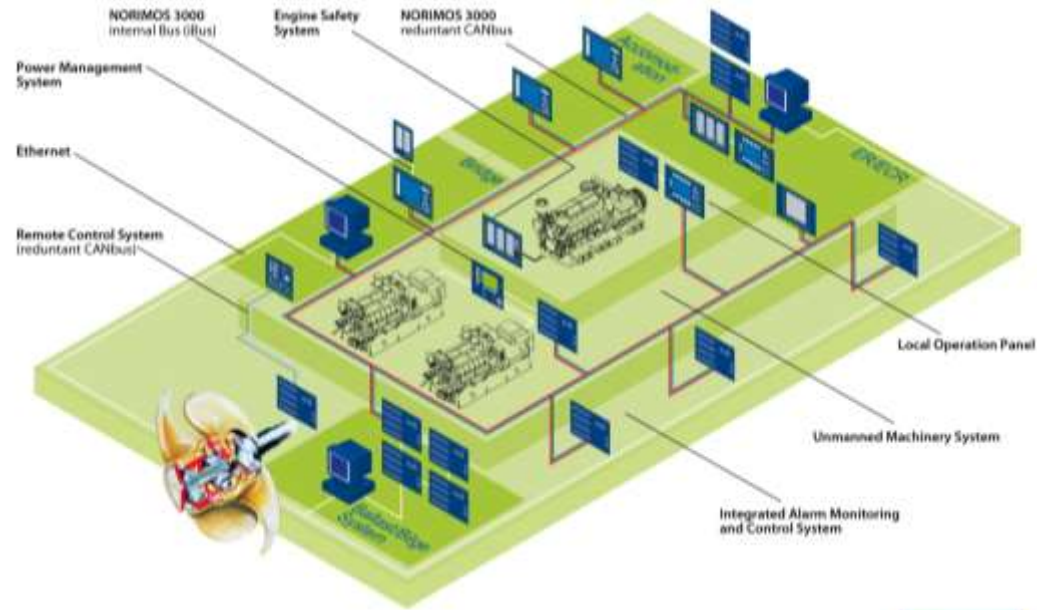
Besides delivery of equipment and installation, commissioning, Elcome has been entrusted with a large number of AMCs

- 9 years AMC for ECDIS for Naval ships
- 5 years extended warranty for VSAT network of Naval Ships
- 5 years AMC for Mumbai High Surveillance Network
- 24 Radars of Indian Coastguard
- AMC for AOPV of ICG for IBS/IMCS and other eqpt
- 7 years AMC of the National AIS project of DGLL
- 9 years AMC for MRCC for ICG

Continuation of AMC for the past 10 years for 22 DGPS beacon station on Indian shoreline for DGLL

- ❑ The scope of IPMS delivered by Elcome includes
 - Propulsion Machinery control panel
 - Engine Control System
 - Steering Gear Control System
 - Power Management System
 - Alarm Monitoring and Control System
 - Stability and Damage Control System
 - Fire Detection System
 - Automatic Door Closing System
 - Flood Warning System
 - Bilge Level Warning System
 - Tank Level Measurement System
 - Kill cards

IMCS Functional Blocks



Visualisation PC



Alarm Group Indication



Power Management System



Duty Alarm System



Dialogue Unit



Engine Safety System



Signal Unit

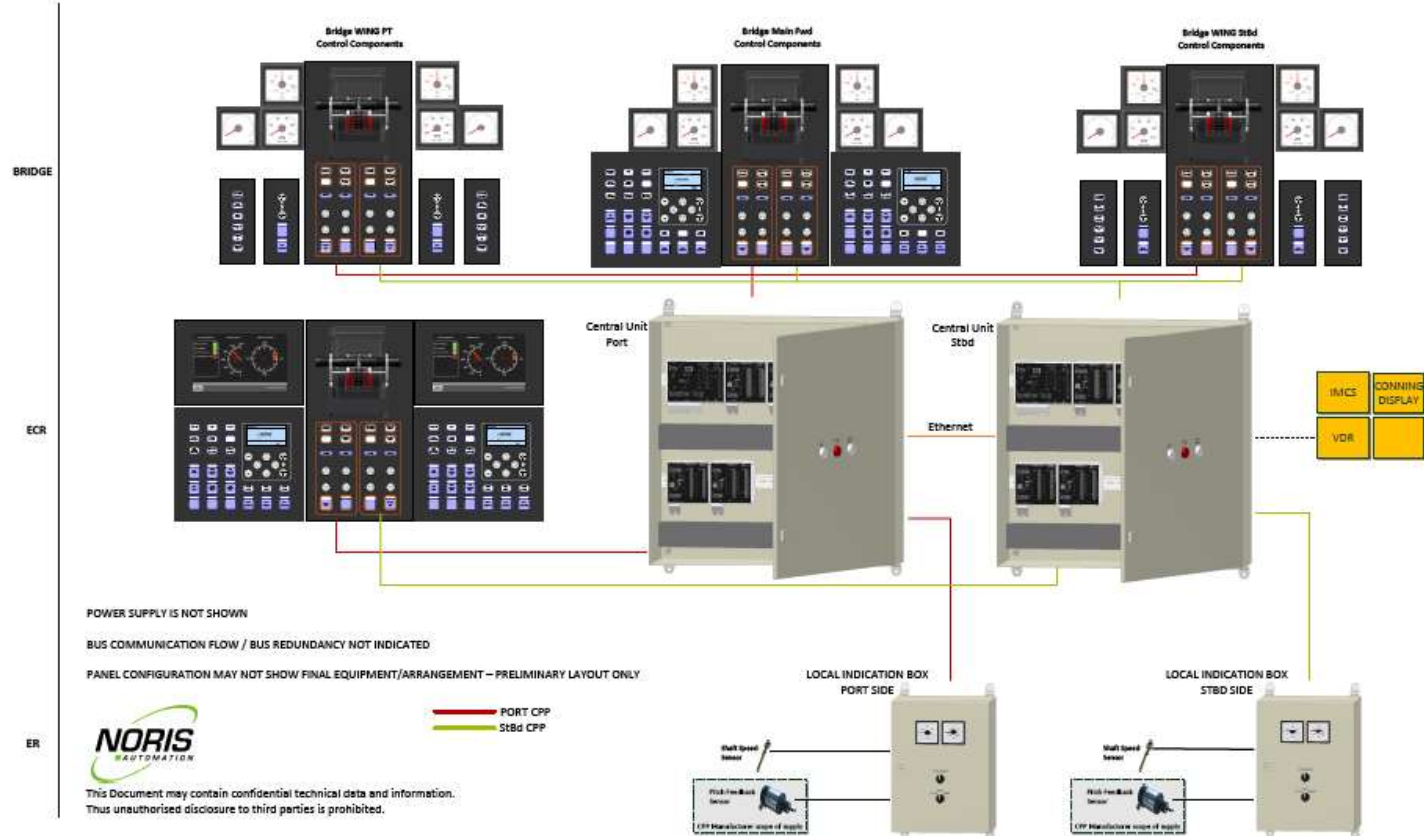


Remote Control



I/O-Box

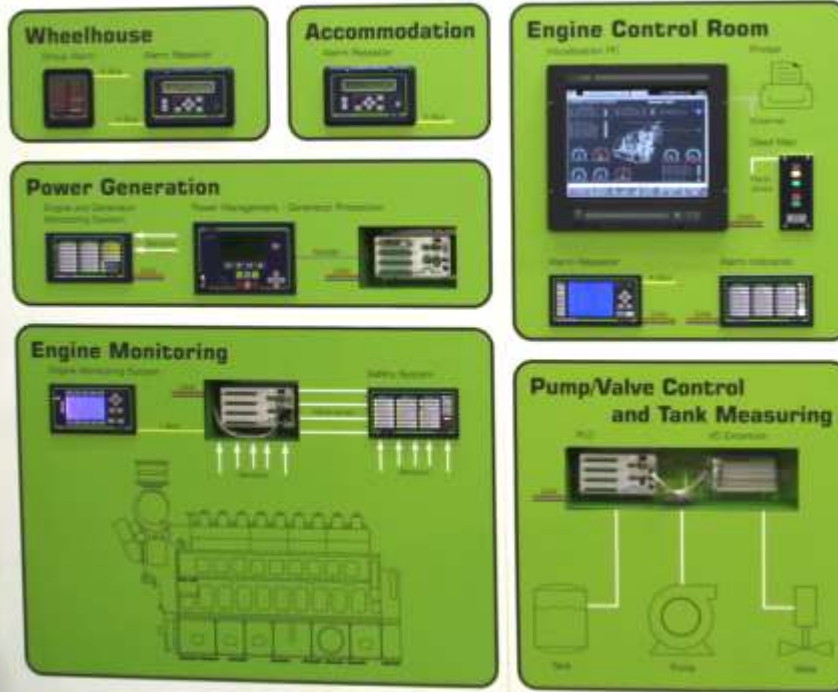
IMCS Schematic



IMCS Building Blocks

❑ Control Units and Systems

Integrated Alarm, Monitoring and Control System



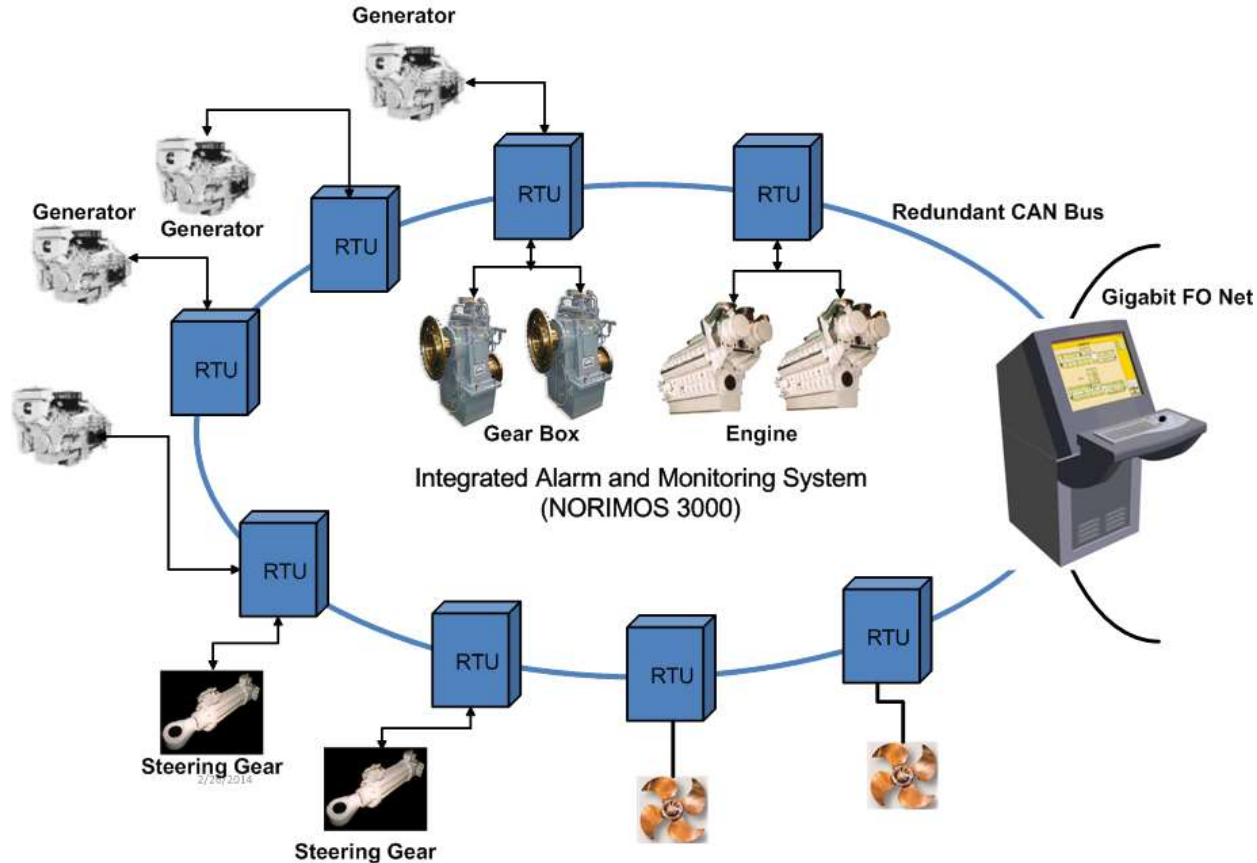
I Retrofit Solutions



Features of NORIS Retrofit Systems

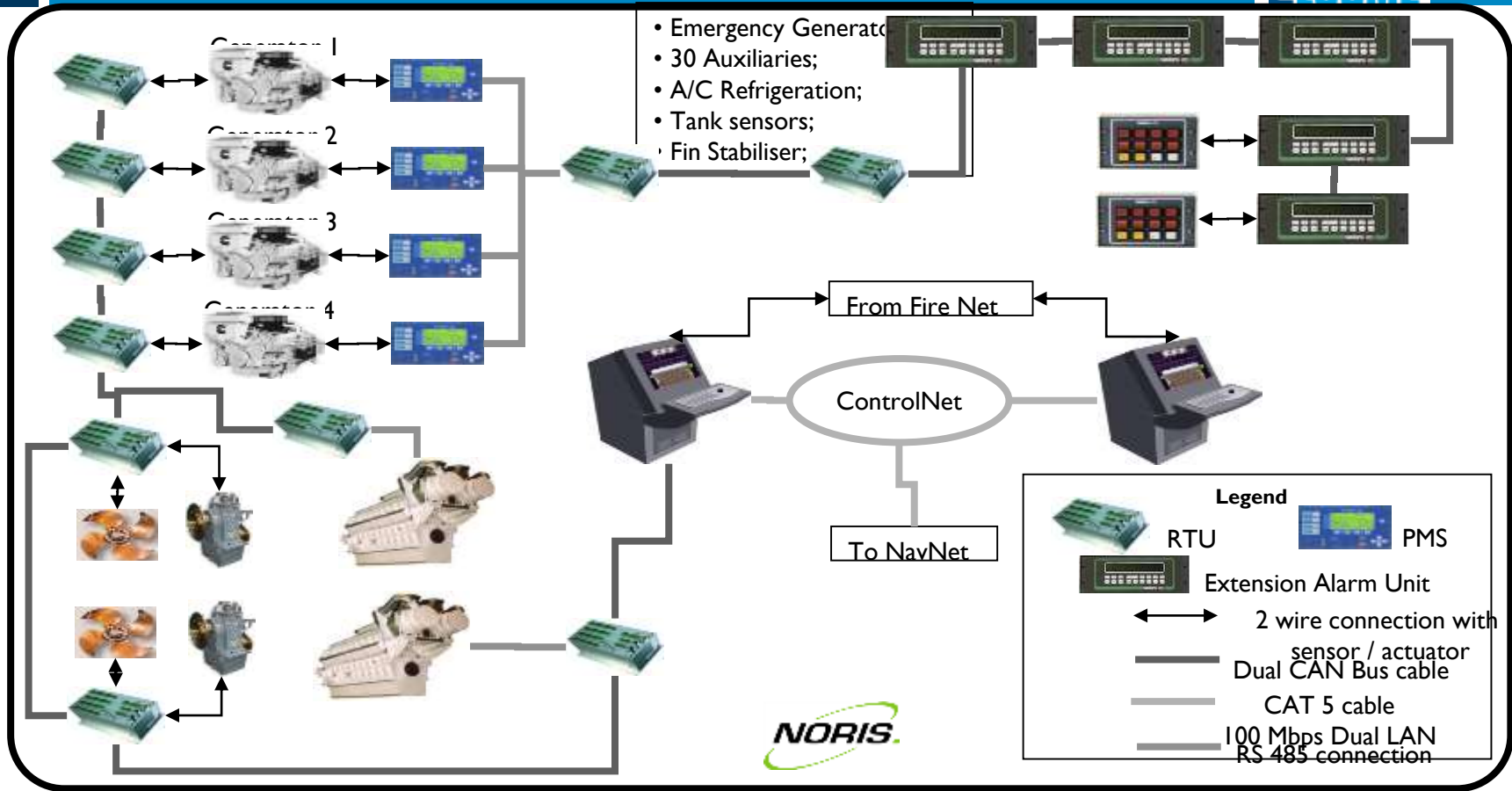
- One-to-One Replacement of Old NORIS Systems
- Substitution of Third-party Systems
- Advanced Technology and Functionality
- Ruggedised and Fail-safe Design
- Operation Reliability for the Next Decades

Alarm and Monitoring System



IMCS Control Net Schematic

ELCOM



IMCS Building Blocks

❑ Automation Systems



❑ Visualisation Units



IMCS Building Blocks

□ Signal Processing Units



Limit-value switches



Measuring transducers



Multi functional devices



I/O boxes

□ Sensors



Speed sensors



Speed pick-ups



Temperature sensors



Rotation angle pick-ups



Tachogenerators



Pressure transducers



Radiosondes

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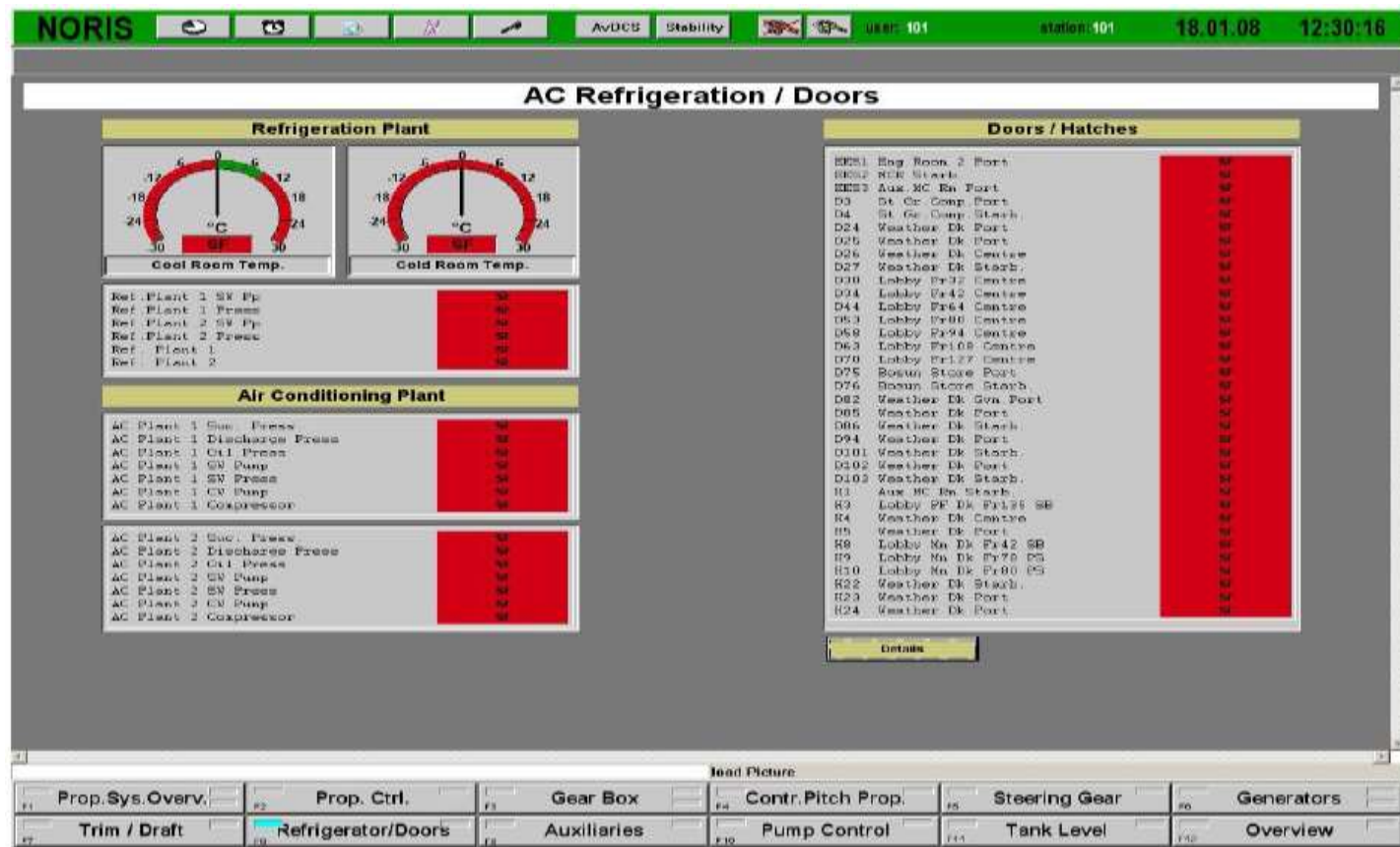
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IMCS I/O Details

Project: 05W32 Goa		Drawing-No. 063.022.30 (AS FITTED) Date 05.05.2008										
List of mesuaring points												
	Channel	Terminal	Description	Remark	Norimos	ID	Visu-Side	Range Start	Range End	Setpoint	Sensor	Unit
65	A01_3_11	X10:1/2	PME Main Bear.Temp.H		A01	0310	A3			NO	MOD-BUS	DI
66	A01_3_12	X10:3/4	PME Main Bear.Temp.VH		A01	0311	A3			NO	MOD-BUS	DI
67	A01_3_13	X10:5/6	PME TCA LO-Temp. Out.	HIGH/OK	A01	0312	A4	0	150	100	MOD-BUS	°C
68	A01_3_14	X10:7/8	PME TCB LO-Temp. Out.	HIGH/OK	A01	0313	A4	0	150	100	MOD-BUS	°C
69	A01_3_15	X10:9/10	PME Prim.LO-Pp	ON/OFF	A01	0314	A4			NO	MOD-BUS	DI
70	A01_3_16	X10:11/12	PME PreLub.	FAIL/OK	A01	0315	A4			NO	MOD-BUS	DI
71	A01_3_17	X10:13/14	PME PreLub. In Progr.		A01	0316	A4			NO	MOD-BUS	DI
72	A01_3_18	X10:15/16	PME LO Temp.Inlet		A01	0317	A4			NO	MOD-BUS	DI
73	A01_3_21	X20:1/2	PME Oil Mist Det.Safety		A01	0318	A4			NO	MOD-BUS	DI
74	A01_3_22	X20:3/4	PME Oil Mist Det.	FAIL/OK	A01	0319	A4			NO	MOD-BUS	DI
75	A01_3_23	X20:5/6	PME Oil Mist Det.AL		A01	031A	A4			NO	MOD-BUS	DI
76	A01_3_24	X20:7/8	PME ConRod Bear.T. 01		A01	031B	A3	0	150		MOD-BUS	°C
77	A01_3_25	X20:9/10	PME ConRod Bear.T. 02		A01	031C	A3	0	150		MOD-BUS	°C
78	A01_3_26	X20:11/12	PME ConRod Bear.T. 03		A01	031D	A3	0	150		MOD-BUS	°C
79	A01_3_27	X20:13/14	PME ConRod Bear.T. 04		A01	031E	A3	0	150		MOD-BUS	°C
80	A01_3_28	X20:15/16	PME ConRod Bear.T. 05		A01	031F	A3	0	150		MOD-BUS	°C
81	A01_3_31	X30:1/2	PME ConRod Bear.T. 06		A01	0320	A3	0	150		MOD-BUS	°C
82	A01_3_32	X30:3/4	PME ConRod Bear.T. 07		A01	0321	A3	0	150		MOD-BUS	°C
83	A01_3_33	X30:5/6	PME ConRod Bear.T. 08		A01	0322	A3	0	150		MOD-BUS	°C
84	A01_3_34	X30:7/8	PME ConRod Bear.T. 09		A01	0323	A3	0	150		MOD-BUS	°C
85	A01_3_35	X30:9/10	PME ConRod Bear.T. 10		A01	0324	A3	0	150		MOD-BUS	°C
86	A01_3_36	X30:11/12	PME ConRod Bear.T.H		A01	0325	A3			NO	MOD-BUS	DI
87	A01_3_37	X30:13/14	PME ConRod Bear.T.VH		A01	0326	A3			NO	MOD-BUS	DI
88	A01_3_38	X30:15/16	PME Con Rod Brg Device	FAIL/OK	A01	0327	A3			NO	MOD-BUS	DI
89	A01_3_41	X40:1/2	PME FW.Inlet Temp.	HIGH/OK	A01	0328	A4	0	150	92	MOD-BUS	°C
90	A01_3_42	X40:3/4	PME FW Press.	LOW/OK	A01	0329	A4	0	10	5	MOD-BUS	BAR
91	A01_3_43	X40:5/6	PME FW Outlet Temp.	HIGH/OK	A01	032A	A4	0	150	85	MOD-BUS	°C
92	A01_3_44	X40:7/8	PME FW.Exp.Tk L		A01	032B	A4			NO	MOD-BUS	DI
93	A01_3_45	X40:9/10	PME FW.Exp.Tk VL		A01	032C	A4			NO	MOD-BUS	DI
94	A01_3_46	X40:11/12	PME FW.Exp.Tk H		A01	032D	A4			NO	MOD-BUS	DI
95	A01_3_47	X40:13/14	PME Start Air Press.	LOW/OK	A01	032E				NO	MOD-BUS	DI
96	A01_3_48	X40:15/16	PME TC Seal.Press.		A01	032F	A4	0	10000	100	MOD-BUS	mBAR

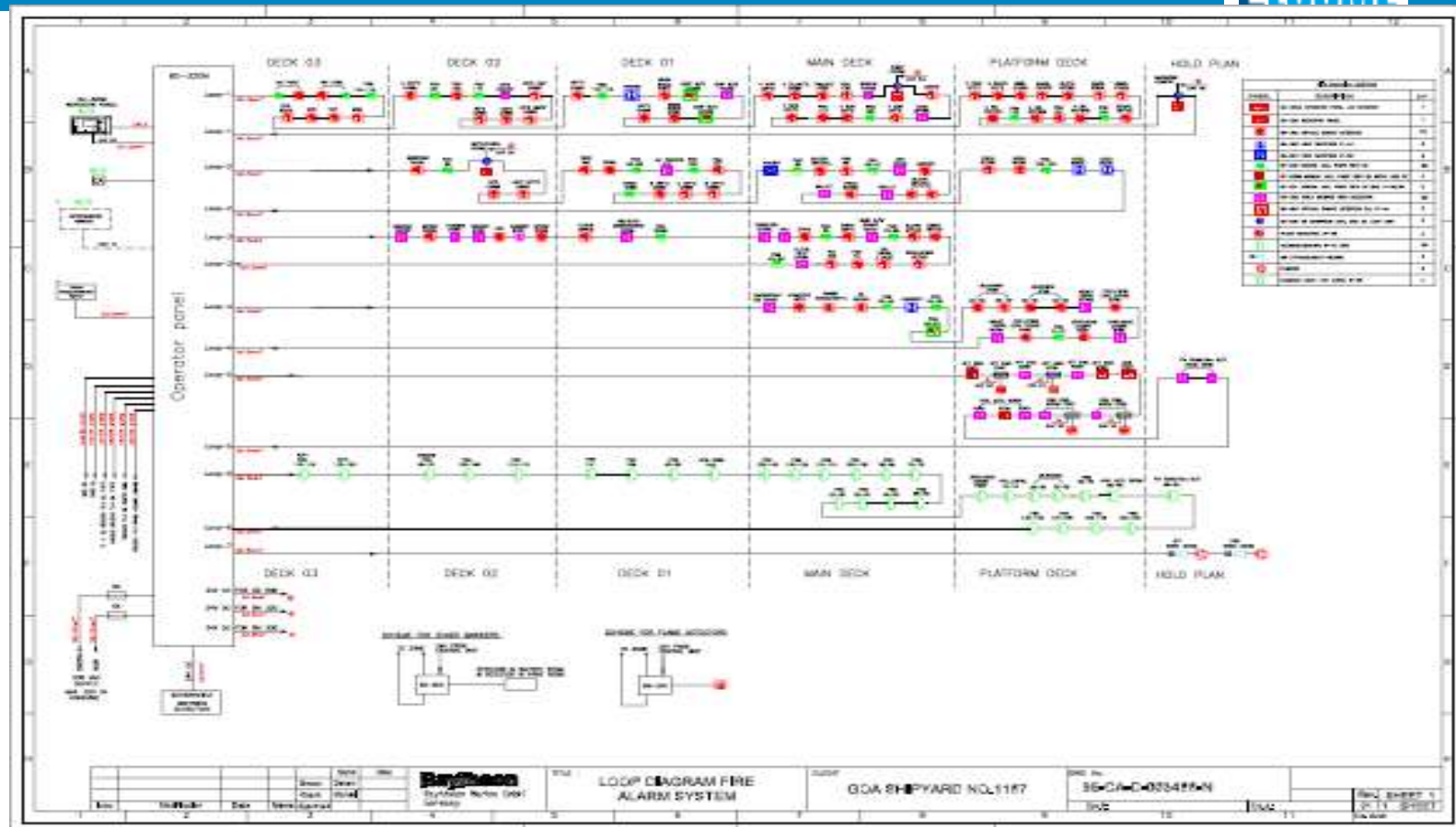
IMCS Mimic Display



WELCOME



Fire Sensor Disposition



ELCOMÉ

What Elcome brings to the table



- ❑ Domain knowledge of electronic equipment and systems
- ❑ Excellent System Integration expertise
- ❑ Inhouse R&D capability
- ❑ Proven experience of having executed complex projects requiring domain as well technical knowledge
- ❑ Established waterfront support capabilities to provide countrywide service support;
- ❑ Elcome has manufacturing and production setup to undertake production under TOT

Quality turn key solution and field service assurance

In Conclusion



- ❑ Elcome has capability to undertake hardware and software based design and fabrication
- ❑ Elcome is open to augment facilities / resources to meet production need, if required
- ❑ Elcome can offer its services in fields covering
 - System conceptualisation and design
 - Hardware fabrication and software development
 - Manufacturing under ToT
 - System Integration,
 - STW, Commissioning and maintenance support;

Technical collaboration is what we look for