



INTEGRATED FULL ELECTRIC PROPULSION

FOR INDIAN NAVY

EXPECTATIONS FROM DEFENCE INDUSTRY



Content

1. Introduction

2. Need for Electric Propulsion

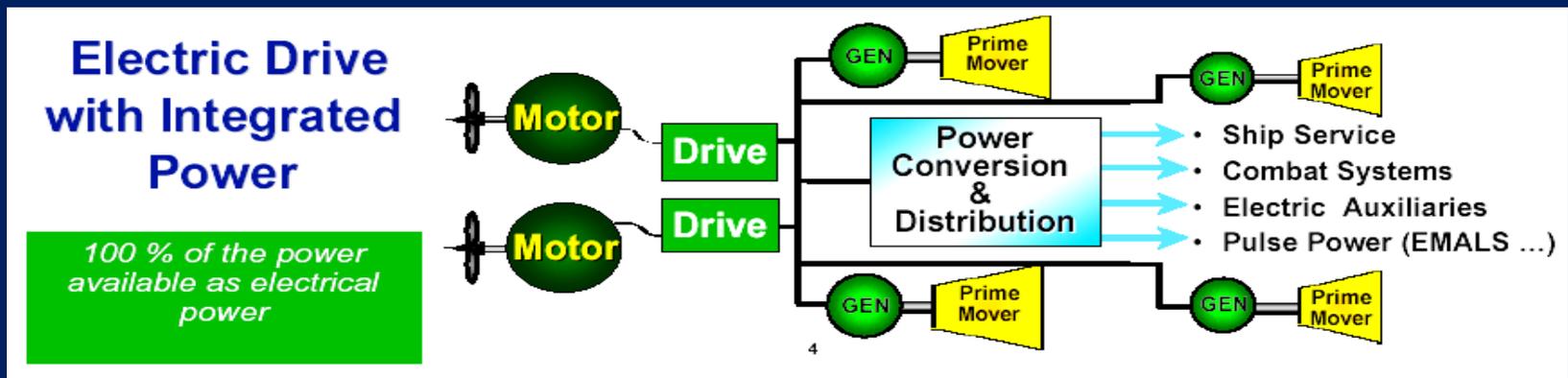
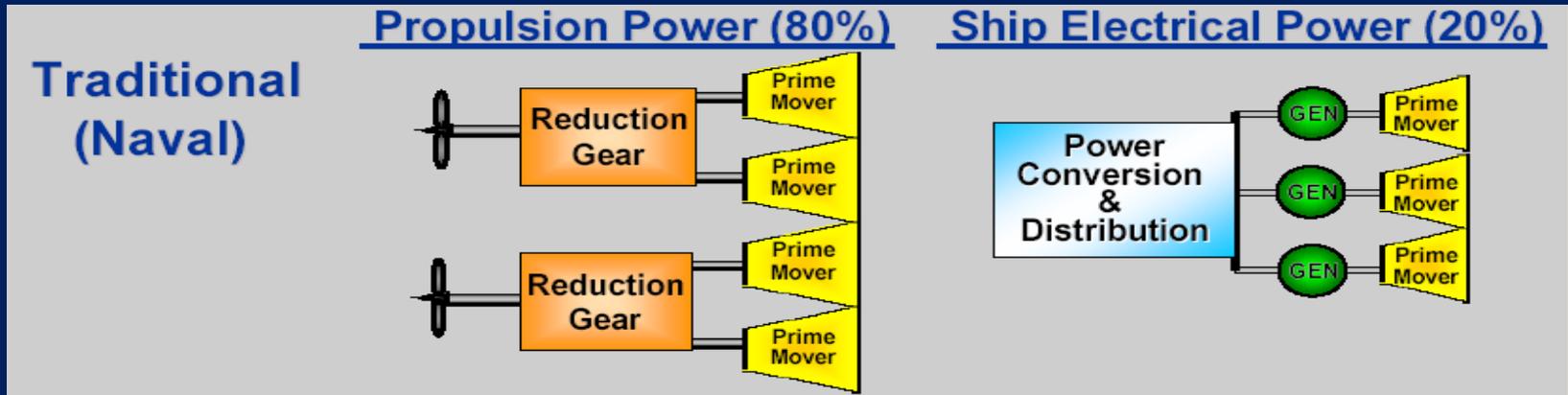
3. Adoption of IFEP by Other Navies

4. Indian Navy's Multi Role Support Vessel

5. Expectations from Industry



Conventional Vs Electric Propulsion

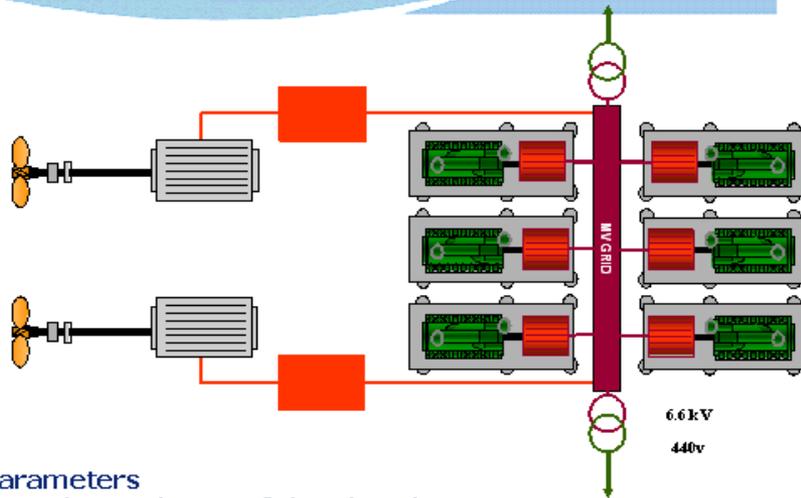


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All Electric Propulsion Arrangements

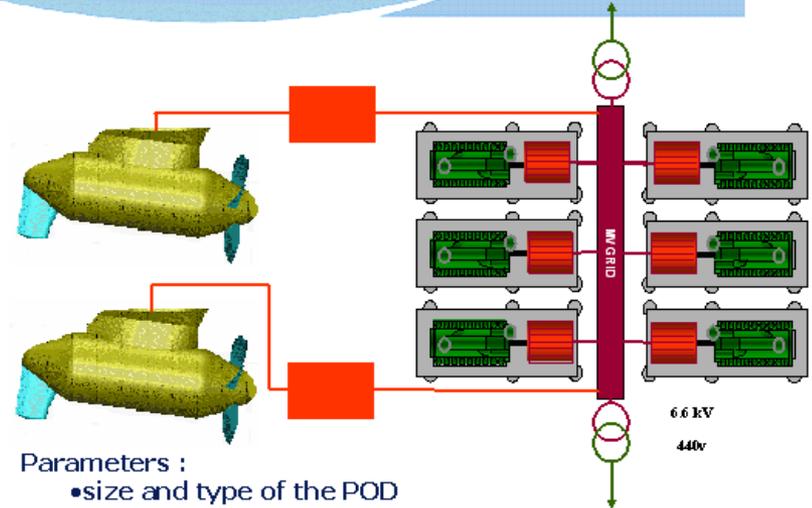
ALL ELECTRIC



Parameters

- size and type of the electric motors
- size and number of DG
- use of GTG instead of DG

ALL ELECTRIC with POD



Parameters :

- size and type of the POD
- size and number of DG

Typical All Electric Propulsion Arrangements



Governing Factors for Electric Propulsion

- Operating Profile of the Vessels
- Advancement in Naval Weapon systems – Increase in power Requirements
- Requirement to reduce Life Cycle Costing & achieve better operational superiority
- Provision to accommodate weapon systems upgrades and associated increases in required power



Integrated Full Electric Propulsion

Benefits

- Reduced ship life-cycle costs
- Better stealth features & Increased payload & Increased survivability
- Power available for non-propulsion uses
- Simplified Controls/ Increased automation
- Reduced manning & Improved flexibility for upgrades over life



Integrated Full Electric Propulsion

Challenges / Disadvantages

- Higher initial costs
- Complexities in Power Management
- High Voltage Systems
- Not suitable for smaller platforms



Electric Propulsion in Foreign Navies

Albion Class LPD (18000 Ton), UK

- 02 x 12.5 MW; 02 x 3.1 MW DG
- 02 x 06 MW Motors; HV System

Type 45 Destroyer (7500 Ton), UK

- 02 x 25 MW GTG; 02x 2 MW DGs
- 02 x 20 MW AIM ; HV System

Queen Elizabeth A/ Carrier(65500 Ton)

- 02 x 36 MW GTG; 04 DGs 9-11 MW
- 04 - 20MW AIM



Electric Propulsion in Foreign Navies

Zumwalt Class Destroyer, (15600 ton), US

- 02 x 36 MW; 02 x 3.9 MW RR GTG
- 02 x 34.6 MW AIMs



T-AKE Class Cargo Ships, US

- 04 MAN B&W DGs; Total 35.7 MW
- 02 x 11.2 MW AIM ; HV System



Mistral LHDs (22000 Ton), France

- 02 x 12.5 MW; 02 x 3.1 MW DG
- 02 x 7MW – Podded Propulsion



Indian Navy's Landing Platform Dock Programme



IHQ MoD (N)

Directorate of Marine Engineering

Landing Platform Docks

- Four Landing Platform Docks (LPDs)
- Buy & Make Indian - Two – Selected Indian Private Shipyard
 - (i) Larsen & Toubro (L&T)
 - (ii) Reliance Def & Engineering Ltd
 - (iii) ABG Shipyard
- Two - M/s HSL, Vizag
- Broad Specs
 - : Length - 215 Mtrs
 - : Draught - 8 Mtrs
 - : Speed - 20 Kts
- Full Electric Propulsion



Source Ref : <https://en.wikipedia.org/wiki>

IFEP – Expectations from Industry

- Development and production of different types of advanced propulsion motors.
- Development & Production of HV power generation equipments.
- Development and production of HV power distribution equipments.
- Development and setting up simulators for testing and training.



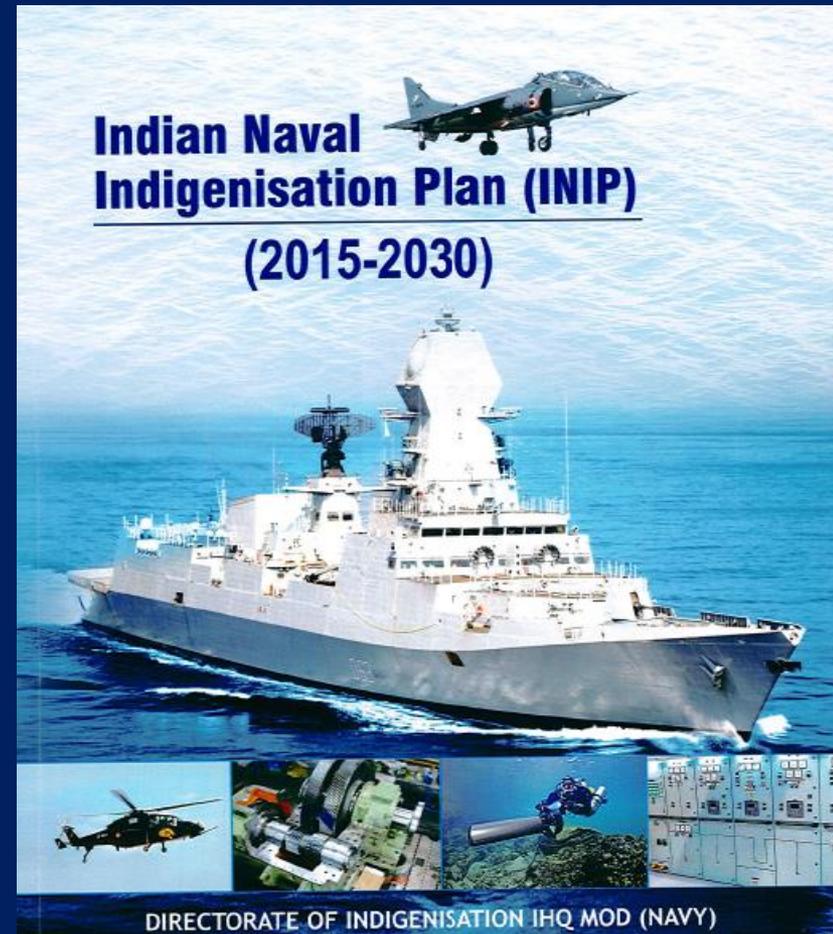
IFEP – Expectations from Industry

- Development of Propulsion control system and Automated power management systems.
- Development of advanced fire fighting systems for HV/ MV Compartments.
- Development of 'Stored Energy Concept' for IFEP ships.
- Development of expertise in the field of Propulsion system integration for IFEP & Design optimization.



Indian Navy Indigenisation Plan (INIP) -15

“ Indigenous production and high capacity power electronics/ HV/ MV systems design capabilities are planned to be developed through ToT route ”.



Conclusion/ Way Ahead

- Development of Defence Industry
- *IN* Blueprint - Indigenisation and Self Reliance





MARINE ENGINEERING

