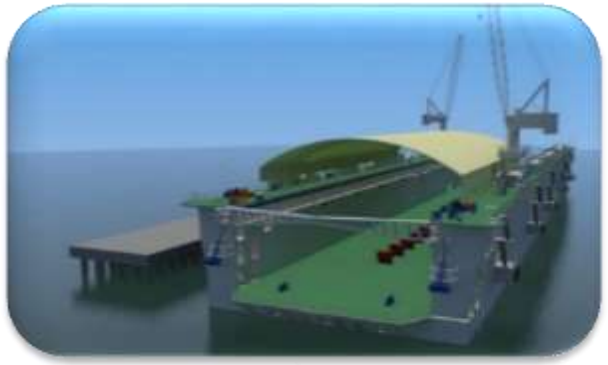
SHIP BUILDING AND SHIP REPAIR IN MARITIME INDUSTRY

"Atmanirbhar" in Indian Maritime Industry : Fuelling the Growth of Indian Economy

CHALLENGES IN SHIP BUILDING



21-08-2020

Cdr S Navaneetha Krishnan (Retd)
L&T Shipbuilding

Presentation Outline

- Overview: Shipbuilding and Ship Repair
- Impact on Economy
- **Atmanirbhar**: Need of the hour
- Ship Building and Ship Design: Best Practices
- Conclusions

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MOTHER INDUSTRY –MANUFACTURING SECTOR (WITH DOWN STREAM INDUSTRY)

Raw Material

-Steel /aluminum
-Wood
-Paint

Infrastructure

SHIPS

-Yard (Dry dock & slip way)
-Machinery
-Inventory Mgmt
-Material Movement
-System for work/Info flow
-Finance (WC)

Labour

Equipments

-Engine/Gear /Prop Sys
-Motor/pump
-Deck fittings
-Outfitting Equip-pipe, cable
-Nav & Comm system
-Weapon & Sensor

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The "Shipbuilding Industry" has been identified to have the highest investment and employment multiplier effect amongst the Manufacturing Industry

KPMG Report 2007

-The "**Manufacturing Industry**" is the biggest force multiplier for the economy

-This sector will be the vehicle for creating **employment** and **wealth** for the country

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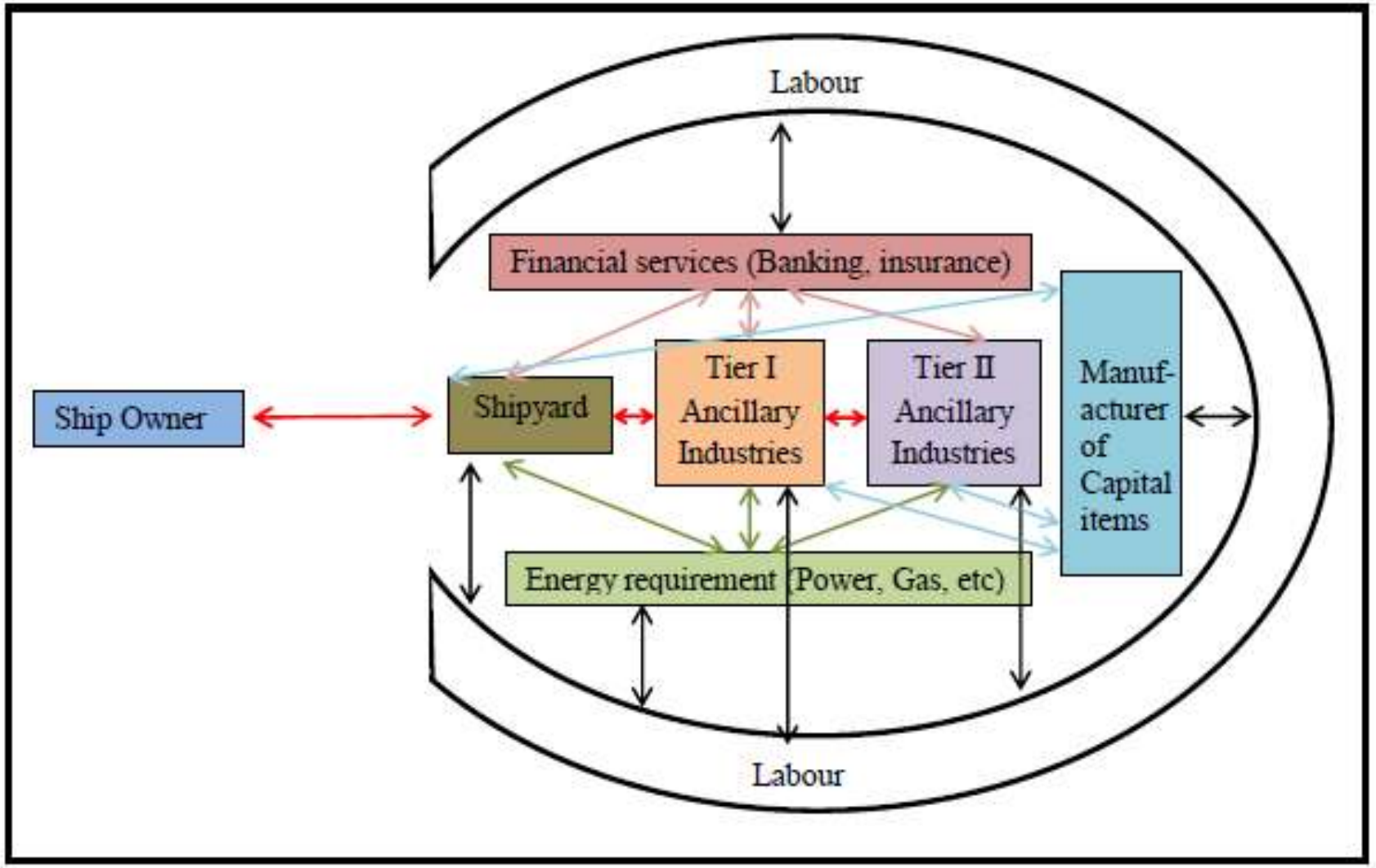
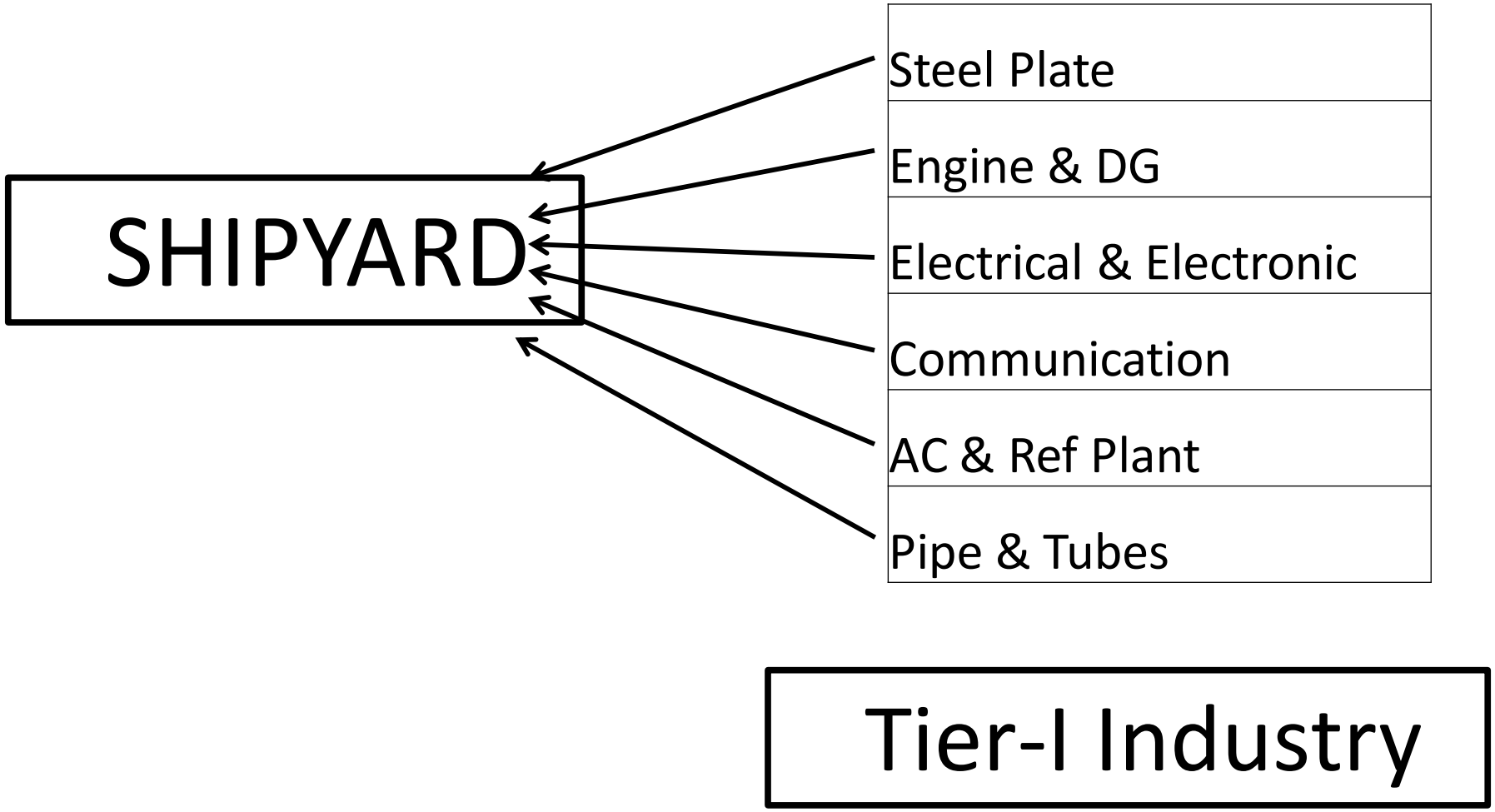
SHIPBUILDING: ECONOMIC ECOSYSTEM



INDUSTRIAL RELATIONSHIP

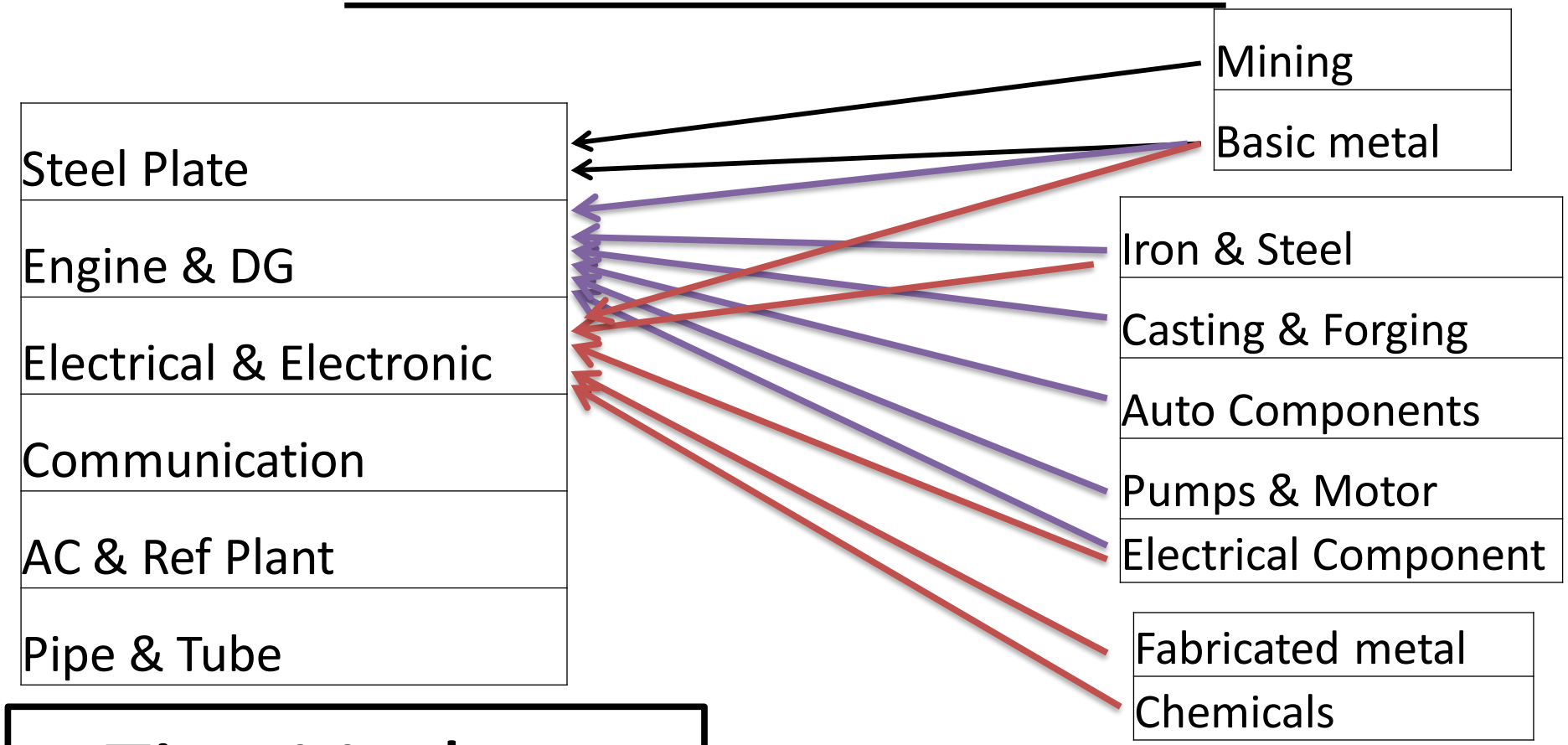


SHIPBUILDING: ECONOMIC ECOSYSTEM

Sr. No	Tier-I Industry	Percentage of total cost of input material
a	*b*	*c*
1	Steel	20.00
2	Anchor, Windlass, Shipping Machinery	8.65
3	Fabricated metal products	5.48
4	Cranes & Gangways	2.20
5	Life Saving Equipment	1.51
6	Fire Fighting system & Chemicals	2.25
7	Electrical, Electronics &Communication systems	17.85
8	Air Conditioning & Refrigeration systems	5.47
9	Deck covering, Insulation & Paints	6.15
10	Engine, DG Set & Related Machinery	15.43
11	Pump, Motor, Propulsion systems	4.00
12	Pipes and tubes	8.01
13	Industrial Valves	3.00
	Total	100.00

(Source: Report on shipbuilding sector. "*Economic benefits and benchmarking Government support across countries*". (KPMG Final report, 2007), pp. 128-129.)

INDUSTRIAL RELATIONSHIP



SHIPBUILDING: ECONOMIC BENEFIT

Sr No:	Tier-II Industry	Percentage share of the total cost of the ship (%)	Actual cash flow for a 19,000 DWT Cement carrier ship (Lakhs)	Cash flow for unit DWT (Rs)	Rank
a	b	c	d	e	f
1	Iron & Steel	10.99	1174.9	6183	2
2	Basic Metal	6.63	708.3	3729	5
3	Fabricated metal	4.39	469.4	2471	7
4	Chemicals	5.76	615.3	3238	6
5	Oil	0.37	39.8	210	12
6	Paint	0.32	33.7	178	13
7	Packaging	0.29	31.2	164	14
8	Pipes & Tubes	1.15	123.1	648	9
9	Castings & Forgings	7.78	831.6	4377	4
10	Auto Components	11.08	1184.4	6234	1
11	Electrical components	0.61	64.9	341	10
12	Pumps & Motors	0.44	47.2	248	11
13	Mining	8.40	898.0	4727	3
14	Fuel	1.80	192.4	1013	8
	Total	60 %	6414.5 lakhs		

Source: S Navaneetha Krishnan (2013) *Prosperous Nation building through shipbuilding*, KW Publisher, India

SHIPBUILDING ANCILLARY INDUSTRY

1. Indian Ancillary industry support
   a) **Hull and Hull outfits**: Adequate support is available in India.
   b) **Engineering**: Poor support is available.
   c) **Electrical items**: Moderate support it available.
   d) **Weapon & Sensors**: Very limited support is available.

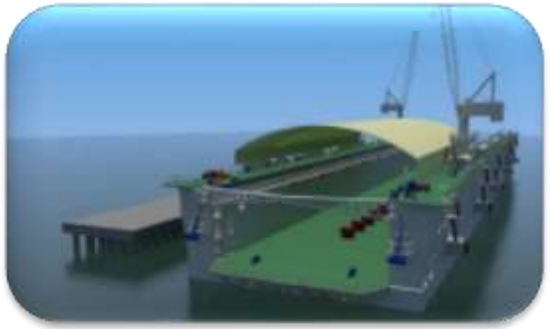
2. Shipbuilding industrial cluster is the need of the hour.

Atmanirbhar: Efforts required

What needs to be done?

1. Have more order on Indian Shipyards
2. Have maximum supporting industry within India: **Atmanirbhar efforts**
    a) SMEs
    b) Start-ups
    c) Cluster formation
3. SHIPYARDS: To have advanced shipbuilding process, so as to ensure timely delivery of ships.

Proof of timely delivery at L&T Shipbuilding



FDN-2 for the Indian Navy
Build meeting all technical requirements of Indian Navy
Delivered on schedule to Customer

OPV (7 ships) for the Indian Coast Guard
Build meeting all technical requirements of Customer
FIVE ships delivered ahead of schedule (Including first of the class)
5th ship completed all sea acceptance trails (SATs) in one sea sortie.

Interceptor Boats (54 Boats) for the Indian Coast Guard
Build meeting all technical requirements of Customer
Vessels being delivered ahead of schedule

Refits & Repairs: Completing all major refits, ahead of time

Good Shipbuilding Practices

1. Ship Design: Virtually building the ship in 3 D before physically constructing the ship:
   a) Interference checks: Minimize rework
   b) Extraction of BOM
   c) Direct feed to production

2. Material Management
   a) BOM from 3-D design to be used to procure material.
   b) Warehouse and Inventory management using ERP and various dashboards

Good Shipbuilding Practices

3. Planning in digital mode:
   a) Plans made in MS Project and dynamically controlled
   b) Actual work progress monitored in dashboard

4. Production Automation
   a) Track production process for accomplishment of milestones
   b) Workforce management using digital tools (RFID, skillset tracking)

5. Quality Management
   a) All inspection and reporting using online system
   b) Defect analysis shared with all stakeholders.

Good Shipbuilding Practices

6) Project Management
   a) Automatic Tracking of all cash inflow and outflow
   b) Intelligent estimation of cost to complete the project

7. Decisions support system
   a) Dashboard : Consolidation of vital information
   b) Informed decision taken at all level, which is known to relevant stakeholders.

Trend towards Shipbuilding 4.0 Standards

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Conclusions

1. Shipbuilding has a high investment, but also a very high **employment multiplier effect**.
2. Ensure timely delivery of ships, by way of adopting good shipbuilding practices.
3. Growth of supporting ancillary industry essential.
   - **Atmanirbhar**: Need of the hour

"To do the same old thing the same old way and to expect some new outcome…..That is madness"

…..Einstein

Thanks

"If you find a path with no obstacle,
it probably doesn't lead you anywhere"

Cdr S Navaneetha Krishnan (Retd)

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