

**Conference on
Offshore Inspection, Maintenance & Repair
IBC-Asia**



Project Management Strategies for Shipyard

**Anand V Sharma
Mantrana Maritime Advisory**

Contents - Overview



Shipbuilding & Shiprepair – A Comparison

Complexity - Shiprepair

Project Management

Factors Influencing Shiprepair Project Management

Shiprepair Project Management - Process

Planning & Scheduling at Different Stages – Shiprepair

Responsibilities of Project Manager

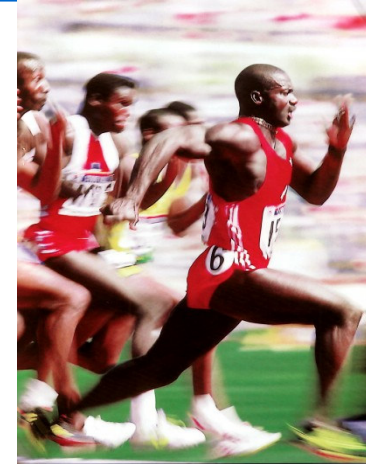
Shipbuilding & Shiprepair – A Comparison



Shipbuilding

- Shipbuilding is Like a Marathon race
- Long Lead Time
- Long Delivery Schedule
- Tasks can be automated, standardized
- Work schedule is planned and deliberate
- Scope of Changes minimal
- Incase of deviation, enough time to implement

Shiprepair



- Shiprepair is like 100 m sprint race
- High turnaround
- Difficult to estimate work content
- Time schedule
- Project budget
- Hidden work emerges during execution
- Has to work with pre defined conditions
- Degree of Specialization is very high
- Work contract ought to change as repair work progresses

Shipbuilding & Shiprepair – A Comparison



Source: Tebma Shipyard, Malpe, India



Constraints of Shiprepair



Types of Shiprepair



- **Voyage Repair** – Its an ongoing activity carried out by ships crew
- **Annual Survey** – It's a floating repair, more like Shave – Shampoo activity carried before annual survey. Its carried out in port of call
- **Dry-docking** – Twice every five year, Its an extensive repair of underwater Hull, Overhauling of Equipments and Machinery. It requires steel renewals, major refits. Its carried out in a Shipyard using Drydock/ Slipways/ Shiplift facility. Requires all faculty of Project Management, involved with several uncertainties
- **Damage Repair**- This is done aftermath of a collision/ grounding/ or any other type of accident. The Shipyard gets to inspect the ship, before bidding for project.

Dry Docking Shiprepair - Tender



Dry-docking Project Starts with Ambiguities

- **Date of Tender** : **November 6th, 2009**
- **Submission of Bid** : **December 2nd, 2009**
- **Type of Ship** : **Crude Carrier (VLCC)**
- **Content of Enquiry: “**Informatively**, the vessel is expected to be released for dry-docking at India/Japan Range around **End December, 2009 / January 2010**. Accordingly, we expect to receive tenders only from our empanelled shipyards located in above mentioned area/route to reduce incidental positioning cost/time and suit our commercial requirements.”**
-the enquiry is followed by tasks to be performed during dry docking
- Document would also have a clause “ all tasks essential but not mentioned above”

Emergency Drydock of Supply Vessel



Emergency Drydock of Supply Vessel – Tender

- Tender Date 18/11/2009
- Last Date of Submission 25/11/2009

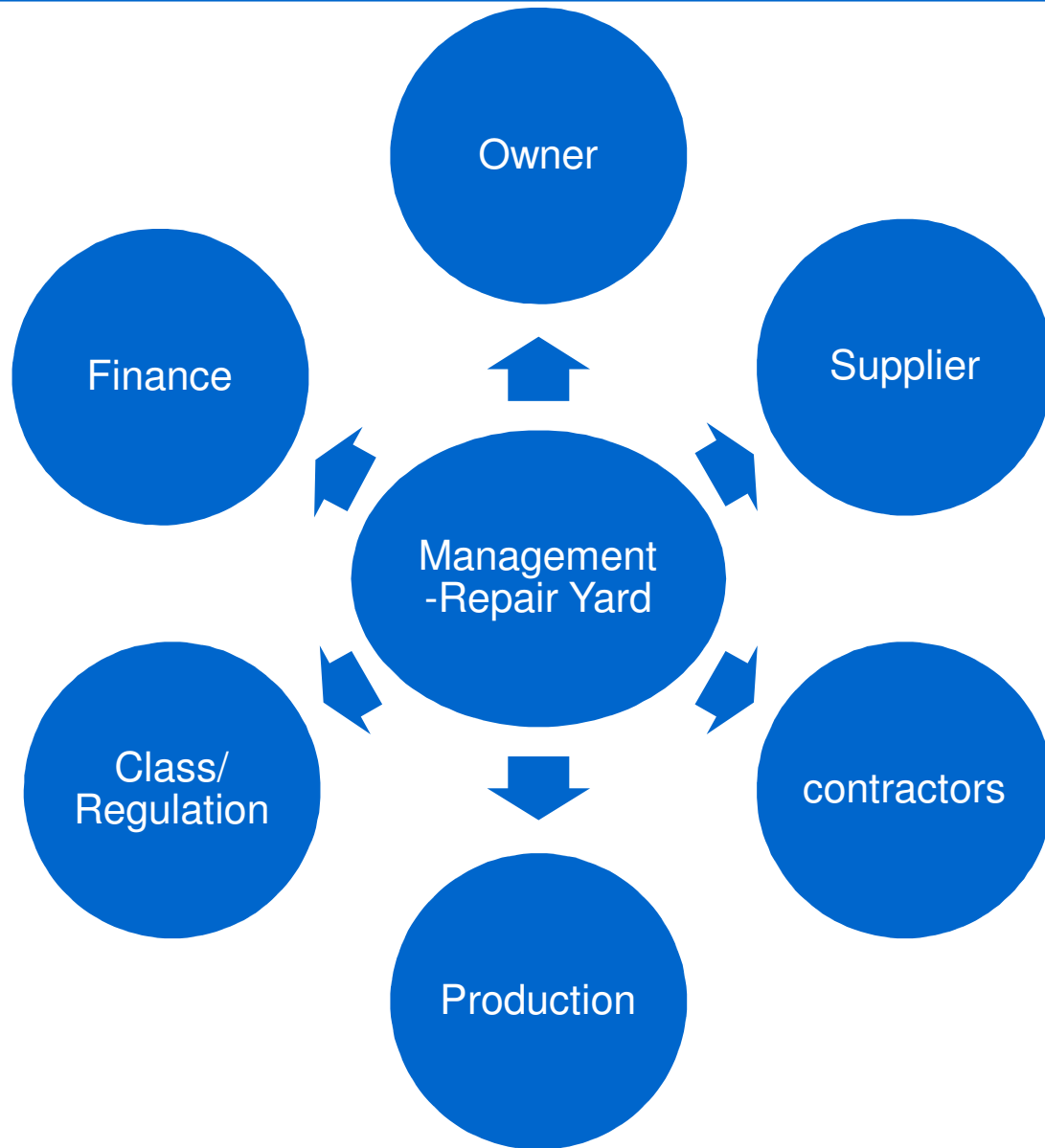
Quotations are invited from MbPT authorised SRU/workshops for total job mentioned in attached defect list, on **turnkey basis with full responsibility of completion of repair in a time bound manner.**

Followed by long list of do's during repair

Constraints are

- Time of commencing not defined
- About 23 yr old ship
- Turnkey Contract

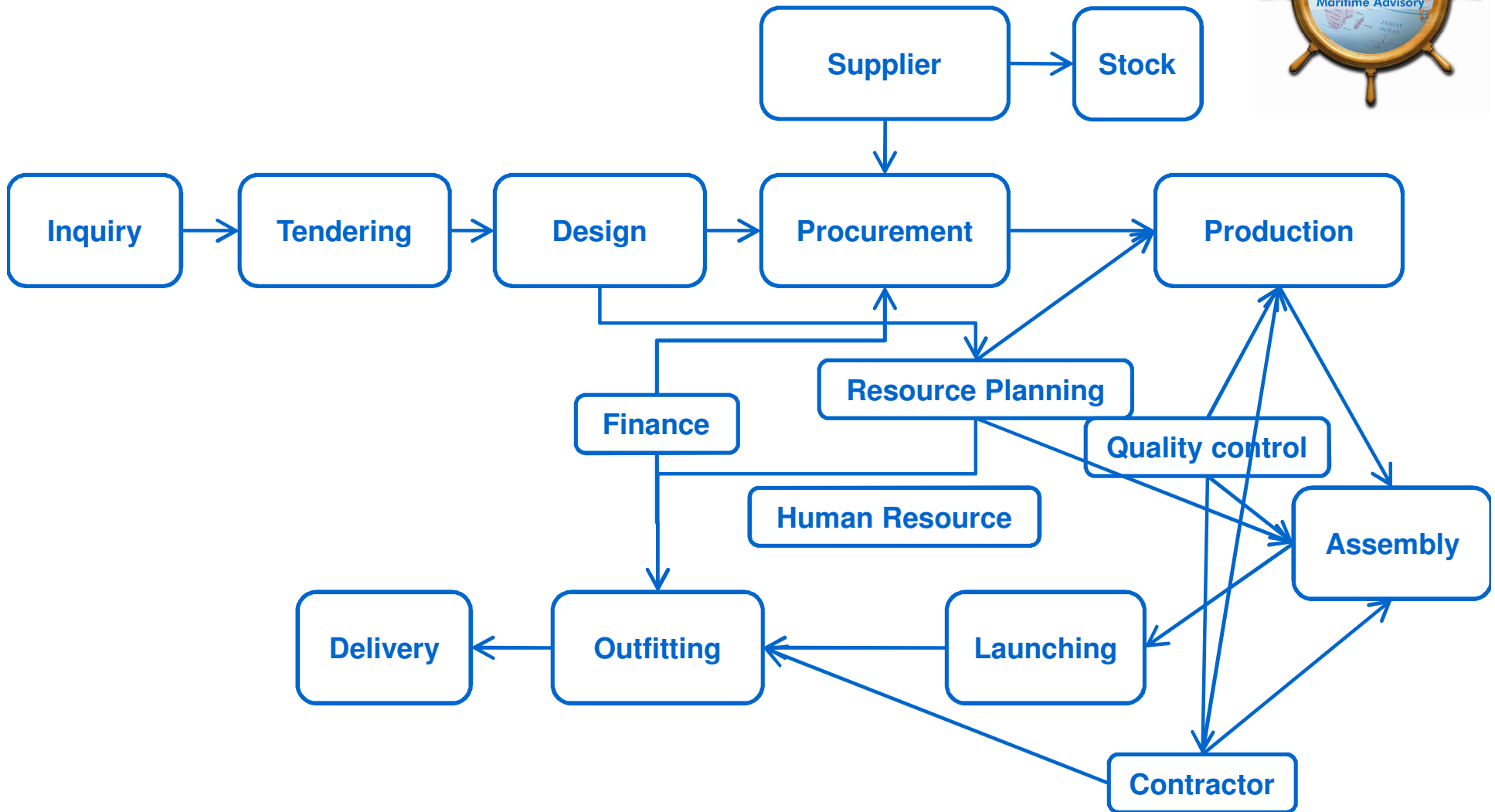
Relationship Complexity - Shiprepair



Biggest Issues

- Coordination
- Monitoring
- Adhering to Timelines
- Cost Control

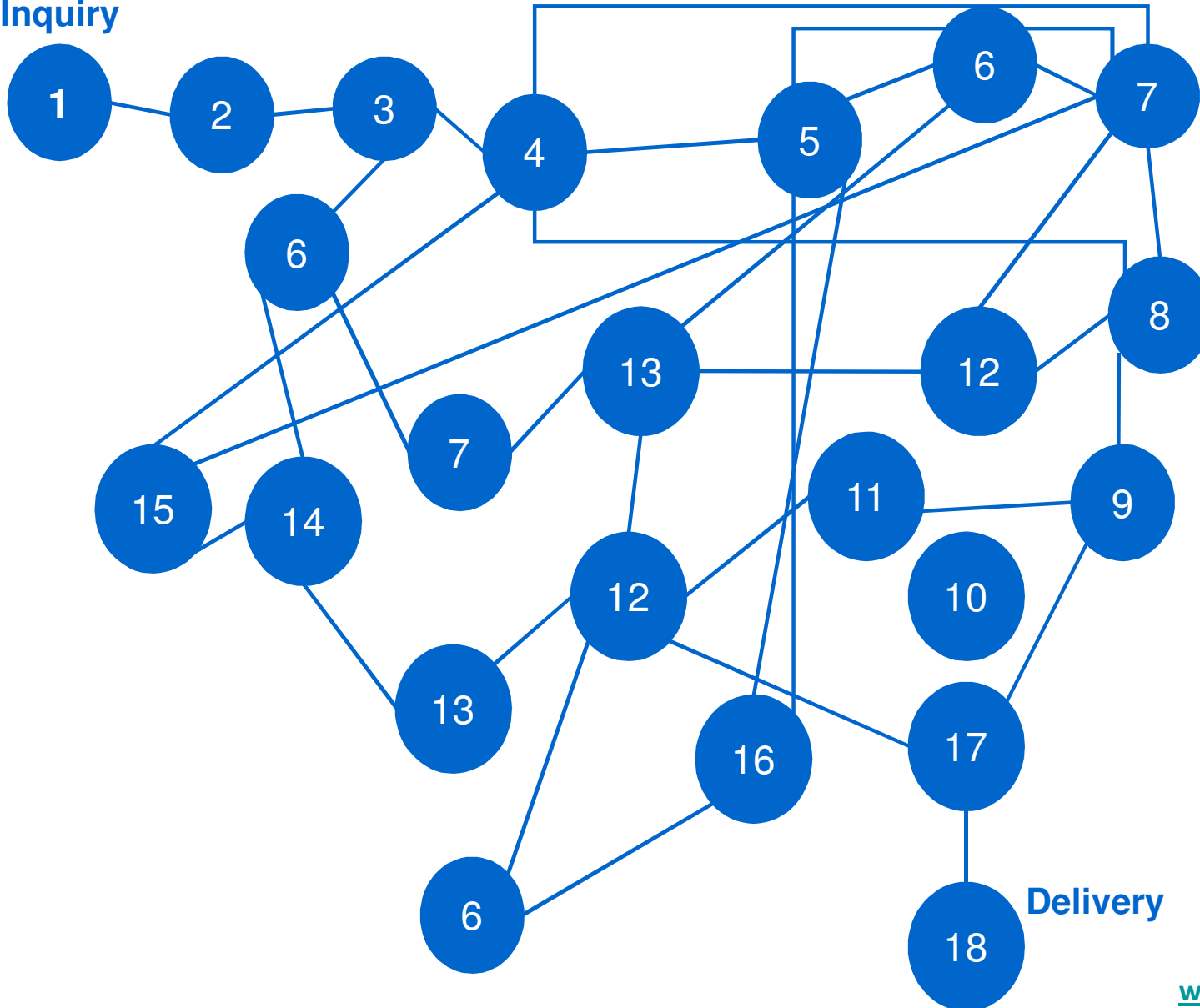
Relationship Complexity - Shipbuilding



Relationship Complexity - Shiprepair



Inquiry



Delivery

Project Management



- **Definition : Planning, directing, and controlling resources to meet the desired objectives, which are in the present case**
 - **Timely Completion**
 - **Meet Quality Standards**
 - **Meet Budgeted Cost**
 - **Avoid wastage of Resources**
- **Divide the Project into Tasks, Subtasks; Work Break Down Structure. i.e.**
 - **Subdivision based on function**
 - **Subdivision based on zones**
- **Identify the Critical Path**
 - **Longest time consuming path**
 - **Alternatively the shortest time to complete a task**
- **Monitor and Review all the tasks, subtasks at periodic intervals**
- **Take Corrective measures, incase of slippage in timelines**

Factors Influencing – Project Management in Shiprepair



- **Skill Set available with**
 - Shipyard
 - Sub Contractors
- **Availability of Ancillary**
 - Local availability of Spares, services helps faster Turnaround
- **Shipyard Infrastructure**
 - Outdated equipment & machinery delays delivery
- **Type of Ship determines the critical path of project management**
 - Cargo Ship
 - Supply Vessels
 - Offshore Drilling Rigs
- **Storage and Retrieval of data is the Most Important of All**

Shiprepair Project Management - Process



Enquiry Stage (Preliminary Scheduling)

- Management of the client base
- Management of Enquiries

Bidding Stage

- Database of Past work
- Materials and Supply Estimates
- Vendors database
- Estimates of Quotes - OEM

Execution Stage

- Planning
- Coordination
- Execution
- Monitoring
- Avoiding conflict of process & Department
- Class & other regulatory approvals

Shiprepair Project Management - Critical



Delivery Stage

- Class & other regulatory approvals
- Test & Trials
- Delivery
- Invoicing

Post Delivery

- Client Follow-up
- Feedback
- Documentation of for Future Project
- Retrieval Management
 - Bidding Team
 - Execution Team

Preliminary Scheduling (Enquiry Stage)- Shiprepair



Core Constraint – Duration of Repair

- Arrival and departure dates required by the ship owner
- Time estimation for Dry-Docking
- Time estimation for Afloat Repair – Quay Time
- Breakdown of Tasks
 - Hull
 - Machinery
 - Equipments
 - Systems
 - Outfitting
- The tasks to be completed, including those requiring sub-contractors

Bidding - Shiprepair Projects



Specification Study

- Critical Issues
- Time Lines
- Liquidate Damage Clauses
- Items likely to be replaced
- Steel renewal
- New addition to the existing system

Work Estimate

- Material
- Labour
- Opportunity cost of Infrastructure
- High end Expertise

Final Bidding

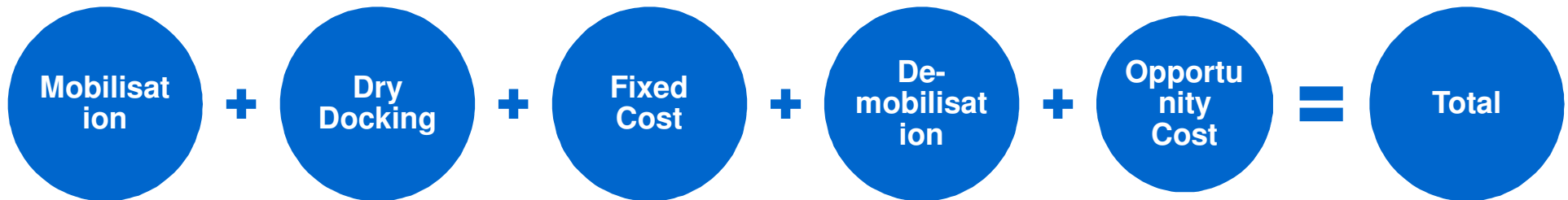
Yard Selection Matrix – Ship-owners Perspective



Technical Capability
Evaluation

Invites Quotes

Prepares Selection
Matrix



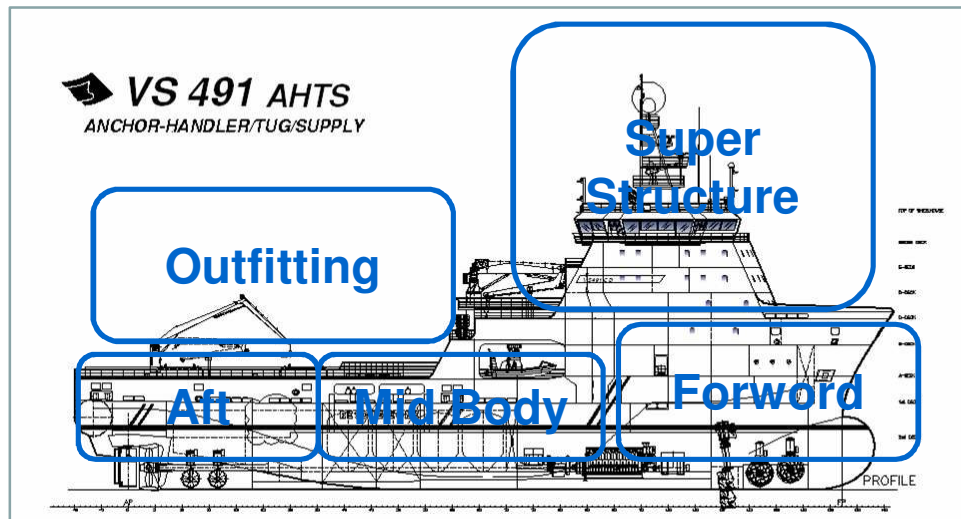
- Matrix Explains, Why Cargo Vessels are repaired in their trade route
- Offshore Supply Vessels, tend to get repaired locally
- Offshore Rigs – travel far off for repair due unavailability of local competence

Shipyard Needs to proactively work on the matrix to evaluate its probability of winning Ship Repair contract

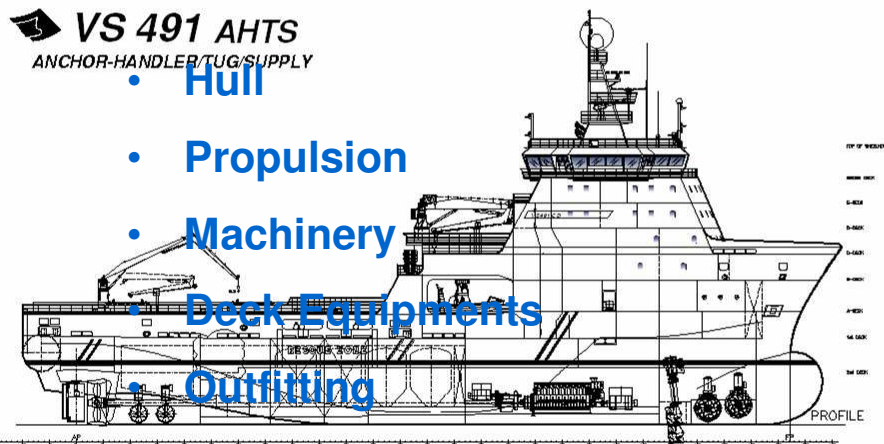
Identification of Critical Path



Subdivision based on zones



Subdivision based on Function



- Theoretically both the methods would provide similar critical path
- Depending upon Ship type, actual result vary
- Subdivision based on Zones is better for Offshore Supply Vessels
- Subdivision based on Function – Better for Cargo Vessels

Profile Source: Vik - Sandvik

Major Work - Shiprepair



- **Cleaning & Painting**
- **Repair and replacement of Underwater fittings**
- **Steel renewal**
- **Machinery Overhauls**
- **Equipment replacement & Installation**
- **Retrofit activities in the engine room, Accommodation or key systems**

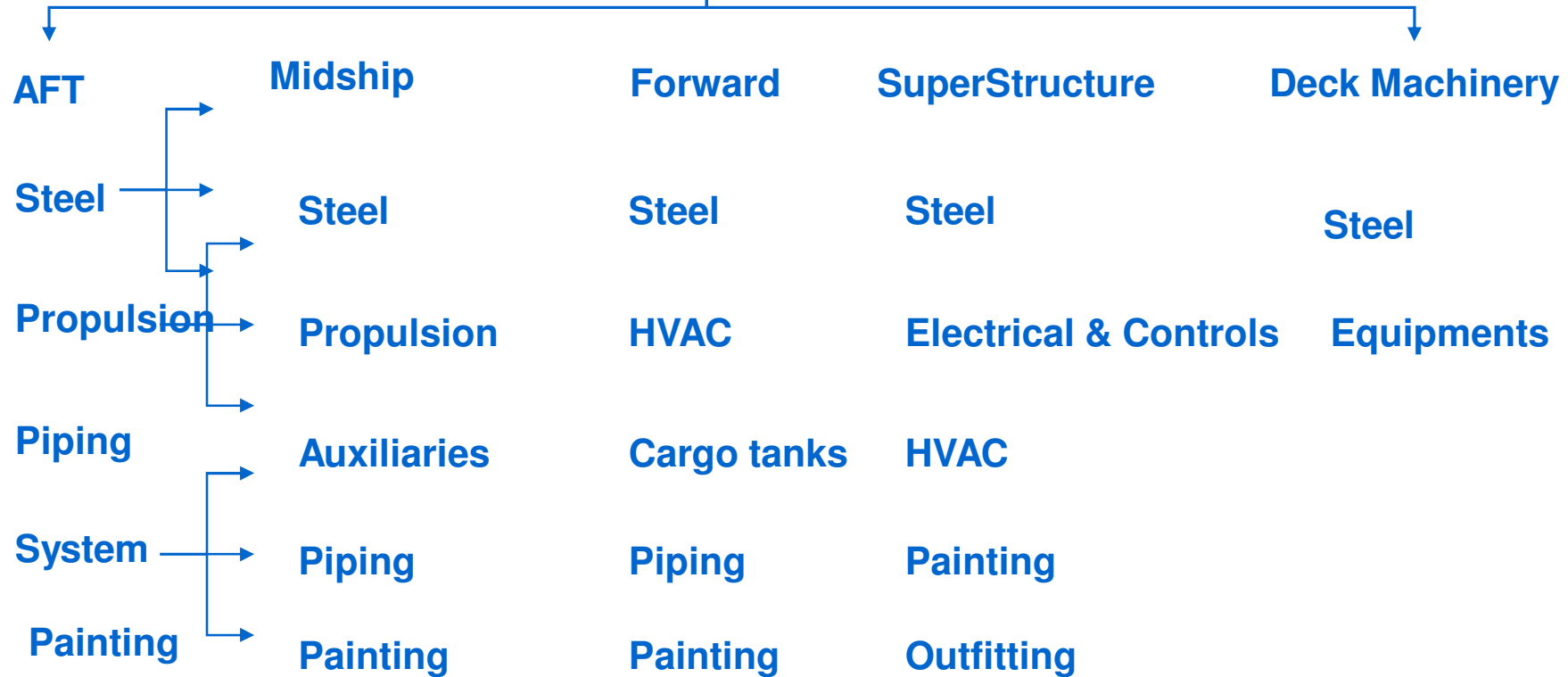
Planning Process

- **Prepare list of all bought-out items to be replaced**
- **Identify the most critical path, based on zone division & work content**
- **Plan to reduce Dry-Dock days – expensive component of repair**
- **Increase afloat repair to an extent possible**

Work Breakdown Structure



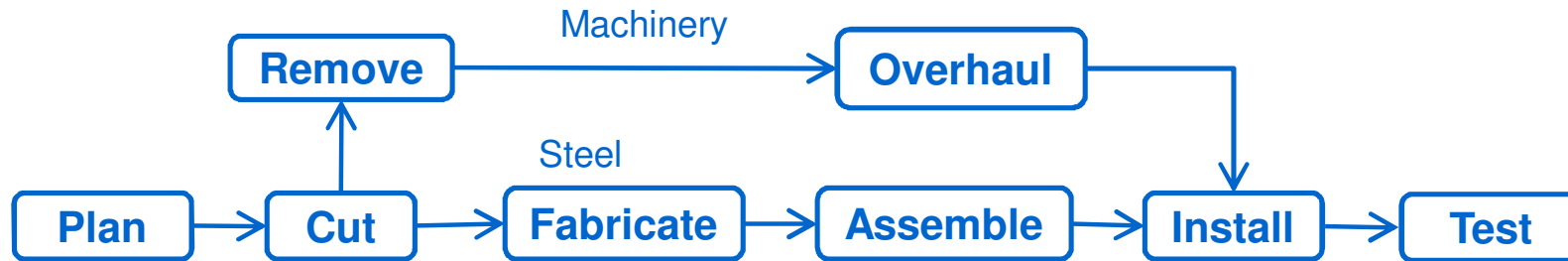
Offshore Supply Vessel



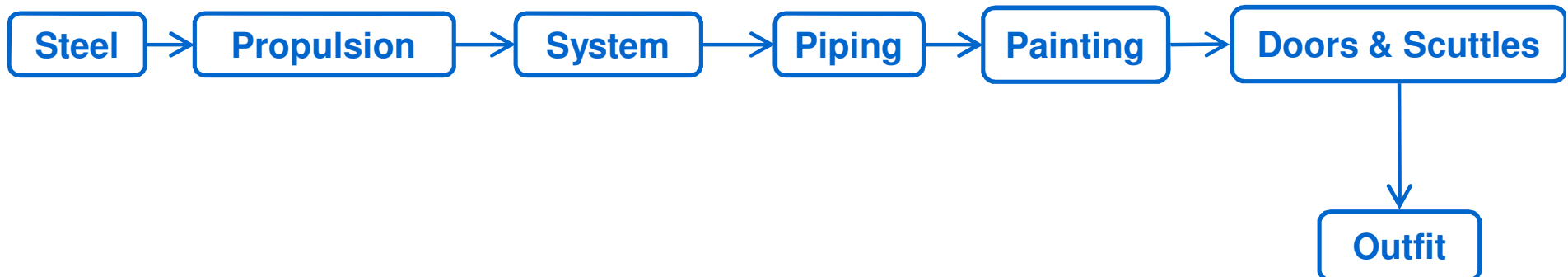
Scheduling of Work – Supply Vessels



Basic Algorithm



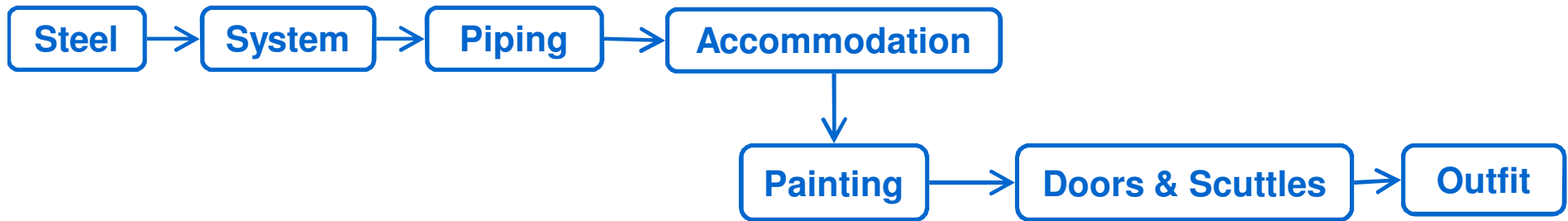
AFT & Midship



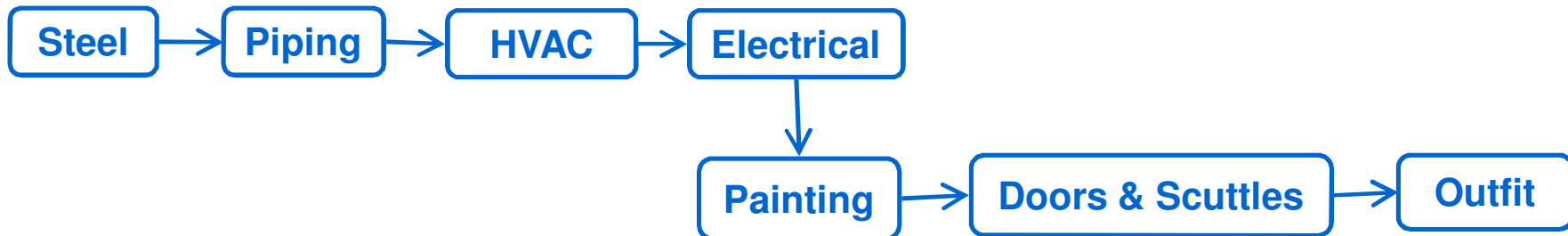
Scheduling of Work – Supply Vessels



Forward



Super Structure



Offshore Supply Vessels – Project Management



- **Regular Monitoring**
- **Resource Support**
- **Critical issues discussed**
 - **Internal Team**
 - **Ship Owner/Manager**
 - **Classification Society**
 - **Accounts Department**
- **Internal Meeting after every milestone**
 - **Document timelines**
 - **Man-hours/ Material**
- **Track the progress against the plan**
 - **Trouble shoot in case of deviation**

Delivery Stage – Project Management



- **Class & other regulatory approvals**
 - Its an ongoing process during repair
- **Test & Trials**
 - Most critical stage of Shiprepair
 - Systems which were working prior to drydocking, fails to function
 - If not handled correctly by Project Manager, it could be a Nightmare for Shipyard
- **Delivery**
 - On Successful Completion of Test & Trial
- **Invoicing**

Post delivery Stage – Project Management



- **Client Follow-up**
- **Feedback**
- **Documentation for Future Project**
- **Retrieval Management**
 - **Bidding Team**
 - **Execution Team**

Implied Responsibility of Project Manager - Shiprepair



- **Plan & Budget for Time & Cost for jobs Mentioned in Contract**
- **Plan & Budget for Time & Cost for jobs Not Mentioned in Contract**
i.e. Implied jobs

If the tender document requires steel renewal in the engine room.

Work content to be budgeted for is

Main Task :- Renew Steel in Engine Room

Implied Task: -

- 1. Insulation in the Engine Room to be removed**
- 2. Cable Trays, Piping in the region to be dismantled if required and refitted**
- 3. Entire Insulation, Cladding and Fitment Panel to be done**
- 4. If steel renewal falls between say engine girders, welding would require additional man-days**

Implied Responsibility of Project Manager - Shiprepair



- **As fitted drawings with structural items may not provide exact fittings on ship**
- **Project Manager is required to carryout extensive survey on arrival of vessel**
- **List down deviation from the bidding scope & actual work found during inspection**
- **Re-work & arrive on reasonable estimate of Man-hour**
 - **Constitutes close to 60% of the cost of repair**
- **Work with owner on the deviation in bid and actual work content**
- **Pursue owner to increase project fee**



Thank you for your Attention

