

MAINTENANCE

&

REPAIRS

POLICY & CONCEPT



Counterfeit parts

- ◆ Let us begin with some facts & figures:
- ◆ Fake transistors in space shuttle, fake fire detectors on Boeing 737, fake parts in NATO military helicopters have been the cause of some serious incidents/accidents.
- ◆ Automotive parts supply in the Gulf is worth US\$ 11 billion. Counterfeit products command 30% of the trade.
- ◆ Marine Industry spare parts counterfeit products control 40% of the trade.

Counterfeit parts & shipping

- The counterfeiting of industrial parts is an expensive & dangerous international problem.
- With ever increasing awareness and public pressure on marine industry for the protection of environment, ship owners and operators have to take a more proactive & responsible approach.
- In shipping, maintenance cost averages only 10% of the vessel's operating cost. *Is it really worth the risk? We, as ship owners, do not believe so;*

Machinery Maintenance.

- We need not emphasize the importance of a reliable, efficient and effective maintenance of machinery. The ultimate OBJECTIVE is to operate ships
 - “SAFELY, EFFICIENTLY & ECONOMICALLY”.
- Reliability and Efficiency is achieved by adopting a consistent and far sighted approach towards maintenance and repair policies?
- Short term benefits or low initial expenditures have never provided sound foundation for sustained economic benefits.

How Reliability & Efficiency is ensured?

- By promoting maintenance systems using GENUINE spare parts and manufacturer's service engineers/technicians.
- Ensuring the above mentioned plans are strictly adhered to and remains consistent.
- KOTC manages a policy of maintaining all major/critical machinery such as Main Engine, Turbo chargers, navigation equipment, etc using only genuine spare parts and maker's service engineer.
- In this presentation, as an example, we have covered Main Engine & Turbo-chargers of two sister vessels.

Case study- 2 LPG ships-13 years

- Since new, 100% of spare parts used, for both M/E & T/Chrs were only from original manufacturers.
- All major repairs/maintenance (including DD) were supervised by maker's service Engineers.
Outcome of this:
- M/E running at 98% rpm and 90% power of MCR, through out. In other words, performance has been exemplary.
- Downtime /Off hire due to engine failures - virtually zero.

Case Study – LPG ships -----contd.

- From our records of last 3 years, a period of highest expenditure, average cost of spare parts & service engineers amounted to US\$ 177,000 / year/vessel.
- By using non genuine parts a saving of 40% of the above, say, \$70,000/ year could have been possible.
- One breakdown, due to poor workmanship or pirated parts would evaporate abovementioned savings.
- Not to mention, jeopardizing safety of the vessel and company's image in the eyes of Charterers.

M/E Turbo Chargers (Fleet experience)

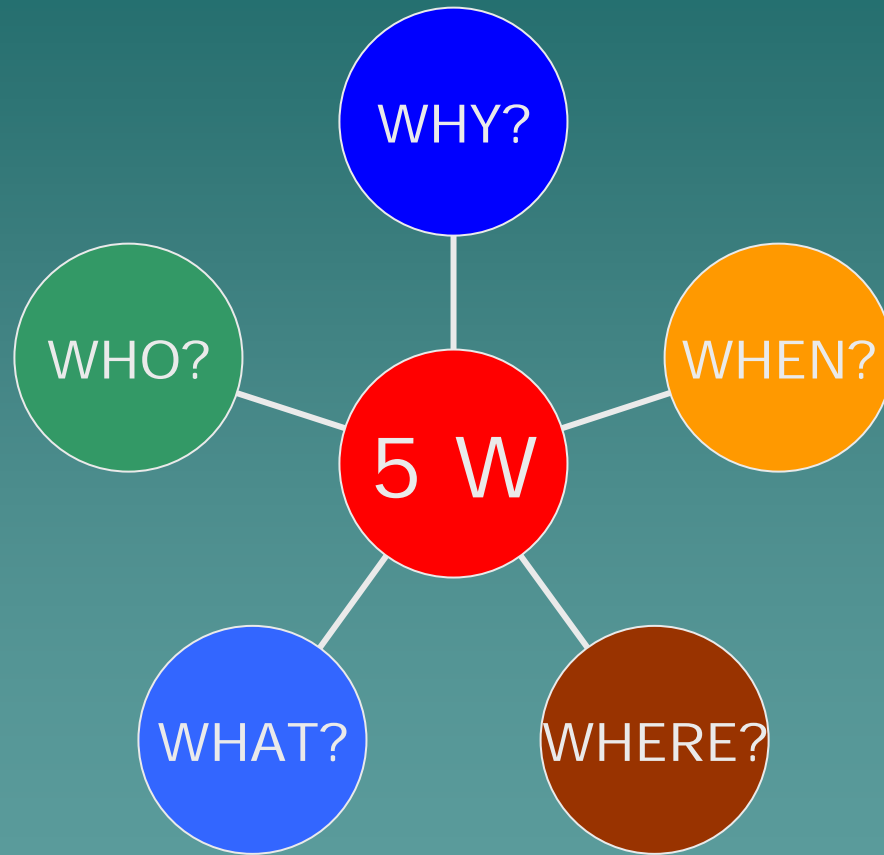


- ◆ In early & mid 1990s, our policy of using genuine parts was inconsistent which led to numerous machinery breakdowns.
- ◆ This resulted in significantly high financial losses in the form of unplanned / emergency repairs, additional new parts and depleted revenues.
- ◆ In late 90s KOTC started using only original machinery manufacturers for repairs & service of M/E T/chargers.
- ◆ Situation has reversed since then, we have fewer problems and negligible breakdowns.

Makers Service Engineer's

- ◆ Large proportion of machinery damages occurs after routine overhaul. This is primarily due to job being done by ship staff.
- ◆ The two LPG carriers in the previous example had several damages to A/Eng turbo-chargers, due to human error.
- ◆ We spend nearly \$78,000 per year per vessel on the maintenance of 3 A/Eng Turbo-chargers due to frequent and untimely failures.

MAINTENANCE CONCEPT OF 5 Ws.



Concepts of 5 W

- ◆ We would like to introduce our concept of five Ws. A successful maintenance system revolves round these 5 Ws, namely:
- ◆ WHY,WHEN,WHERE,WHO & WHAT. Let us briefly explain these.
- ◆ WHY? Mandatory, makers, condition, or right opportunity?
- ◆ WHEN? Dry-docking, PMS, CBM, failure or the time is right?
- ◆ WHERE? At sea, shore facility, dry-dock, waiting area?
- ◆ WHAT? Mechanism, tools, spares, supports?
- ◆ WHO? Ship staff, maker's engineer, riding squad?
- ◆ Right choice of each 'W' smoothens the path for a successful and effective maintenance plan.

Genuine parts & people

Benefits: (Our experience).

- Though initially expensive, over the extended life time of a vessel, it is certainly economical to use genuine parts.
- 100% guarantee of quality & material. Reliable & timely completion of repairs, which improves the image of vessel/company.
- No loss of revenue due to breakdown.
- In compliance with Marpol Annex VI (exhaust emission) for engines built after January 2000.

Consistency in the policy.

Added advantage of this approach:

- History & records of repairs readily available.
- Easy traceability. One source of all spares and service.
- Technical feed back/support on R&D. Tailor made training and seminars for ship staff.
- Easier handling of insurance claim in the event of a major damage.

CONCLUSION

- ◆ Based on what has been detailed in the preceding slides:
- ◆ We reiterate that the final goal to operate ships safely, efficiently & economically can be best achieved by encouraging the use

'genuine parts & people'

- ◆ *Thank you.*