Matching the coating process to shipyard needs

ISST Symposium
September 2007
Osaka – Japan
Raouf Kattan
www.safinah.co.uk
Before I begin on this subject, I shall give a few necessary cautions which ought to be minded in fitting and preparing the parts that are designed to be painted, Otherwise your paint (Which undeniably is a very good Preservative, if rightly applied) will be of little use in service..

Of Painting Ship work by Sutherland 1717
Coatings development

- Historically the “poor man” of production
  - Least investment
  - Least thinking
  - Least predictable

- Now under pressure
  - Environmental
  - Shipyard productivity concerns
  - Ship owner concerns
  - Regulatory

- Need to treat it as an engineering system
World Class Production

- Short innovation cycle
- Short time to market (build cycles)
- Zero defects
- Zero stocks
- Economic order quantities of 1

- Requires predictability
- Coating process not so predictable - unstable
Process control

预测能力

- 标准化
- 专业化
- 简化

难以在涂层中实现——四个主要因素

- 天气
- 整合
- 检查标准
- 化学过程，例如干燥时间
Process engineering

- The process has largely remained the same for many years
  - Pre-treatment lines
  - Secondary surface preparation
  - Coating application
  - Inspection, repair and touch up
  - Post event inspection – corrective action not preventative
- Largely recognisable to the process of 30 years ago.
Challenges to the current process

- Regulatory issues
  - IMO
  - Class
  - Environmental (Ballast water treatment)

- Owner requirements
  - Chartering – two markets
  - Safety – structural integrity
  - Competitive edge – fuel, heating etc.

- Builder requirements
  - Predictability
  - Compliance
  - Compatibility
Coating Strategy

- Legislation Regulation And Reporting
- Production methods
- Product Mix
- Coating suppliers
- Customers
- Class
- Sub-contractors
Sources of problems

- Conflicting needs on the coating
  - Shipyards/paint contractor needs
  - Ship owner needs
  - Product capability
  - Paint company needs
  - Regulatory needs

- Evidence by failure in the field
The Customer Dilemma at New build

Shipyard is customer

Workability
Process compatible
Inspection
Packaging
VOC
Drying
Regulatory compliance
Technical support
SH&E
etc

Ship-owner
Long life
Performance
Compliance
Availability
Support
M&R
IDI
Cosmetics
A closer look at claims – major cause
Inadequacies

Resources

Work Content

Time
Make up of inadequacies

Resources

Work Content
Design
Coating Selection
Production Tech.
Management Sys.
Human issues

Time
Process improvement

Technology improvement

Resources

Work Content

Design

Coating Selection

Production Tech.

Management Sys.

Human issues

Process Improvement

Time
Process improvement - Design

- Ship design
  - Material selection
  - Shadow analysis
  - Edge analysis
  - Access
  - Area assessment
  - NOBS – No Ballast Ships

- Facility design
  - Capacity
  - Infrastructure
  - Vessel size
Process improvement – Coating selection

- Traditional
  - Generic
- Contemporary
  - Functional
- Shop primer and universal primers
Process improvement – Production technology

- Has remained the same
  - Small sector
  - Need for solutions
    - Laser surface preparation
    - Improved transfer rates for paint
    - Coating technology
    - Reduced heat input
  - But regulatory constraints
Process improvement - Management systems

- Reporting – increasing demand
  - VOC
  - PSPC – CTF
- Quality
  - Re-work man-hours
  - Production man-hours
- Training and education
  - Frosio/NACE or equivalents
- Inspection
  - Move to objective techniques
- Computer based tools
  - VOC manager
  - CTF Manager
  - Coating calculator
Process improvement – Human issues

- Retention
  - Workers
  - Inspectors

- Motivation
  - Dirty, dangerous, poorly paid
Technology improvements

- Surface preparation
  - Improving productivity
  - Meeting Environmental needs

- Coating application
  - Transfer efficiency
  - Overspray

- Coating technology
  - Better match to yard/owner needs
  - Functionality such as ease of inspection, drying time etc.

- Reporting needs
  - Reduce manpower needs by computerisation
Conclusions

-The problem will get worse in the short term.

-In the short term need for
  - Management systems is urgent
  - Better design – ship and facilities
  - Better product selection - function
  - Better integration – better strategy and planning and better tools.
Conclusion

Medium to long term

- Improved technology - automation
- Automation to reduce man-power demand
- Improved management tools – from the simplest to the more complex.
- Improved inspection method – objective not subjective.
- Improved products to match process needs.
Thank you very much