

Submarine Safety Symposium

9 -10 October 2013 - Dock Museum, Barrow-in-Furness



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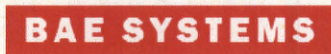
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Learning from Experience (LfE)


Chief Technologist – Propulsion Systems



Agenda

Introduction

LfE Areas:

Source & Method Change

Complex Processes

Infrastructure

Breakout Intent

Breakout Sessions



Introduction

- Feedback from the last symposium indicated LfE as an area where the Enterprise could improve.
- LfE forums exist, but are limited & predominantly focused on 'operational feedback'.
- We ultimately learn from our mistakes, but sharing LfE from positive outcomes is equally important.
- Key is identifying, recording, sharing root causes of issues/events & good practice.



Introduction

There is only one thing more painful than learning
from experience and that is not learning from experience.

(Laurence J. Peter)

- Aim is to present a number of examples of LfE covering a range of experiences.
- Then its your turn to identify & record LfE, which will then be distributed across the Symposium attendees.



LfE – Source and Method Change

Overview:

- To ensure effective risk and management control when changing the source of supply or manufacturing method.
- Required to ensure that there is no loss of product integrity, quality or supply when making such a change.

Scope:

- All changes of source or method for any component, component package or sub assembly.
- The introduction of an alternative source of supply for a product(s).
- The implementation of change to the method of manufacture.
- Supplier requested source change.



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LfE – Source and Method Change

[REDACTED]

[REDACTED]

[REDACTED]

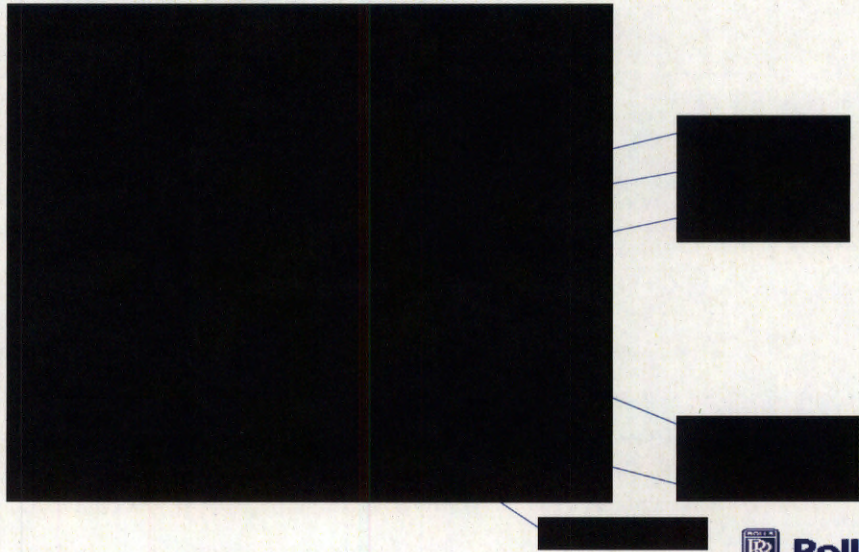
[REDACTED]

[REDACTED]

LfE – Source and Method Change

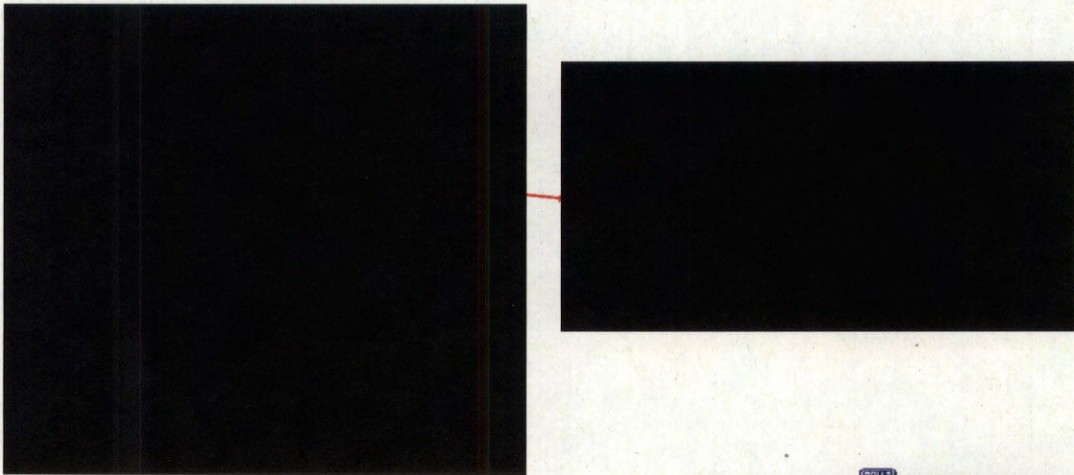
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LfE – Source and Method Change



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LfE – Source and Method Change
How do we make a Propulsor duct?



LfE – Source and Method Change



Astute B4 Duct Inner Skin Showing Typical Porosity and Dry Laminate Areas

Note: Propulsor views have been declassified for purposes of this presentation



LfE – Source and Method Change

What have we done about it?

Three main issues to address:

- [REDACTED]

- [REDACTED]

- [REDACTED]



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LfE – Complex Processes

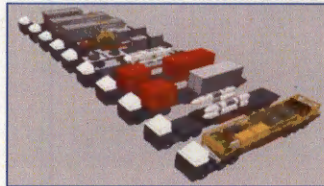
• NSRS

The four main components of NSRS are:

- Submarine Rescue Vehicle (SRV)
- Portable Launch and Recovery System (PLARS)
- Transfer Under Pressure System (TUP)
- Remote Operating Vehicle (ROV) (unmanned submersible – 1st intervention)

Key capabilities:

- Ready to deploy – anywhere in the world – 1st Rescue within 72 hours
- Transportable by air
- The world's first diver-less recovery system
- 5m wave height capability
- 600m rescue depth
- 60 Degree Angled Mate
- And by the way;
- To anybody's Submarine!



Transport

- 240 tonnes ~ 23 Trailers
- 7 Large Aircraft –eg AN124, C17



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LfE – Complex Processes

Issues:

- Most complex Ship/Sea interface in MoDs scope (Difficult Analysis)
- Human interface - Artisan
- Worse things happen at sea...
- Can do attitudes are great, but....
- A Few Good Men
- Experience from ops - Hazards
- Tiredness

Solutions:

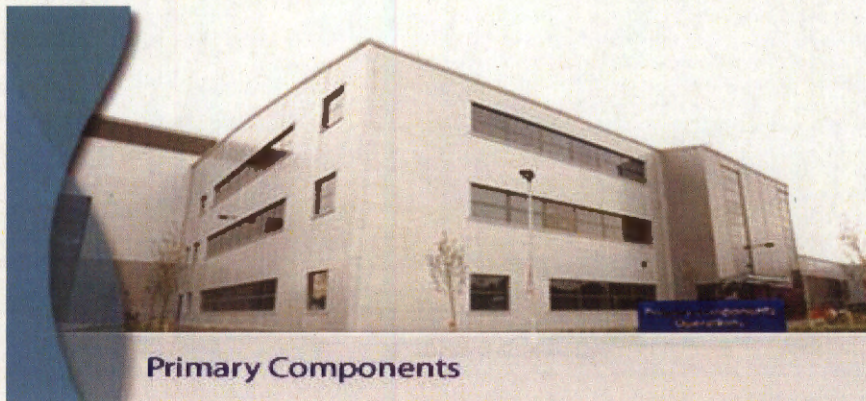
- Redesign
- Introduce procedures

Remaining Challenges:

- Remain Safe
- Remain Rescue Ready - and keep focus on improving
- land based Launch and recovery simulator — reduces cost
- Continued Training

LfE - Infrastructure

- Significant changes have occurred at the Raynesway site over the past 5 years. Primary Component Operations being a major new manufacturing capability.



LfE - Infrastructure

- Key learning aspects:

[REDACTED]

- Who does what during all stages is fundamental. Transparent accountabilities, roles & responsibilities need to be defined.
- Awareness of the different rules around new facilities, e.g. racking & parts management.
- Account for time from contractor 'handover' to availability of Operational Capability.
- Plan for snagging issues – e.g. machines pass handover test but problems encountered when used in anger.

[REDACTED]

- Last Article/First Article Inspection Report.



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Aims of Breakout Session

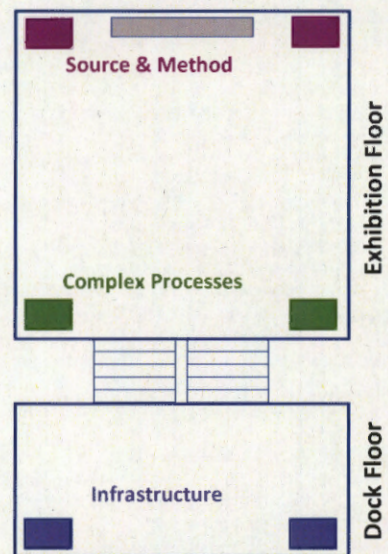
- From the 3 areas presented:

- Identify specific instances across the Submarines Enterprise where 'good practice' has been displayed.
- Note organisation/individual identifying LfE opportunity.
- Discuss where this good practice 'is' or 'could be' exploited, e.g. extant meeting group or new learning/ exploitation forum.
- Note who could benefit from this LfE.

LfE Area of Good Practice	Raised By (Name)	Raised By (Organisation)	How could this be shared? To Whom?

Breakout Session – 15 minutes

- 6 areas located around the Exhibition Hall:
 - 2 x Source and Method
 - 2 x Complex Processes
 - 2 x Infrastructure
- Convene at a flip chart where you are best able to contribute to an LfE discussion.
- Aim is to have ~15 individuals at each chart.
- Allocate a 'scribe' to record output.



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