The Increasing Challenges of Obsolescence Management to the Subsea Oil and Gas Industry

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Introduction

- The increasing challenges of obsolescence management:
  - What do we mean by the term ‘obsolescence management’.
  - Causes of obsolescence.
  - Challenges of both aging population & new developments.
  - Generic processes.
  - How has BP’s approach changed / developed over the last 10 years.
  - Future challenges.
  - Areas to consider when determining obsolescence management programmes.

Obsolescence, noun, going out of use or fashion, becoming obsolete q.v.

Obsolete, adjective, not used any more (from the Latin obsoletus = worn out)

Ref [1]
What do We Mean by Obsolescence Management?

- **Definitions [from IEC 62402]**
  - **Obsolescence** is 'the transition from availability from the original manufacturer to unavailability'.
  - **Obsolescence Management** is ‘the co-ordinated activities to direct and control an organisation with regard to obsolescence’.

- **Objective of Obsolescence Management** – ensure that obsolescence is managed as an integral part of design, development, production and in-service support in order to minimise the financial and availability impact throughout the product life cycle.

**Obsolescence is inevitable and it cannot be avoided, but forethought and careful planning can minimize its impact and its potential high costs – IEC 62402**
Obsolescence, Cause and Scope

- We consider a product to be obsolete if the supplier is either unable or unwilling to supply it going forward.

- It affects all types of products and the equipment needed to support them, and can occur at any stage of the product cycle.

- Obsolescence:
  - Is a major cost driver for the support of long lifespan systems.
  - Creates vulnerabilities affecting operational availability, maintainability, and supportability.

- Sustainment-dominated systems - systems where the cost of maintaining the equipment will exceed the purchase cost.
Existing Systems

- Procured and designed with limited focus on obsolescence:
  - No assurance that original suppliers had obsolescence processes in place.
  - Likely to contain bespoke design elements and rely on ‘out of support’ software.

- Desire to extend operating beyond originally specified design life, without impacting safety.

- Problems with accessing the original designs:
  - Engineers with in depth knowledge have left the industry.
  - Detailed design documents lost or not accessible.
  - Field Operatorship could have changed.

- Test and inspection standards / procedures out of date.
The New Development Challenge

Consider product life cycles as a series of connected gears:

- In the time it takes to get from concept to delivery for a large mechanical structure, some electronic subsystems components could have gone through 5 generations.

- How do you manage your contractual liabilities with this sort of disconnect between differing system parts?
Obsolescence Management Techniques

Mitigation Strategies:
- Design for Obsolescence
- Supply Chain

Operate:
- Ensure multiple sources for components exist
- Use low obsolescence risk parts – technology road mapping
- Adopt ‘open system architectures’
- Modularity
- Life-Time Buys
- Partnering agreements with suppliers

Resolution Strategies:
- Same Component
- FFF replacement
- Emulation
- Redesign
- Use existing Stock
- Implement ‘last time buy’
- Access authorised aftermarket
- Cannibalization
- Alternate parts
- Equivalent Parts
- Minor
- Major
10 Years Ago

- No acceptance that obsolescence could be a widespread problem.
  - Comparisons made with the ‘Millennium’ Bug.
  - Uncontrolled transition to ‘Component Off The Shelf’ (COTS) parts.
  - Obsolescence not addressed as part of contracting or engineering processes.
  - Suppliers overly prepared to maintain support for discontinued control systems.
  - Minimal industry agreement on open interface standards for subsea electronics.

- Obsolescence focus was limited to subsea electronic packages.
  - Motorola withdrawing from supply of military specification parts.
  - Single sourced power supply sub-system withdrawn by the supplier.

- Implications of new regulations (RoHS, OSPAR) not recognised. Ref [6&7]
Where Are We Today

- **New systems:**
  - Obsolescence processes for subsea now in place, focused on proactive mitigation.
  - Results of **Operator led JIP captured in BP processes.**
  - **Supplier obsolescence management processes checked** as part of vendor audits and reliability assurance work during design.
  - Application of **industry standards** to reduce the number of bespoke systems.

- **Existing systems:**
  - Expectation that most **subsea systems commissioned in the 1999’s will continue to operate until 2030+.**
  - Multiple **examples of obsolescence related issues**, not just with electronics.
  - Suppliers more realistic in relation to **maintaining legacy systems.**
NLGP – Northern Leg Gas Pipeline

• NLGP is a **simple pipeline control system**.
  - Early subsea electronics control system.
  - Operating well beyond original design life.

• Supplier **unable to repair**.
  - Parts not available.
  - No one with detailed NLGP design knowledge is still working.

• A complete **system replacement is not economic**.

• **Power limitations** preclude retro fitting suppliers current controls electronics.
  - A bespoke solution is being looked at.
Future Challenges?

- Cost.
- **Technology** is getting ever more complex.
  - Hardware / software development platforms.
- More aging assets (and people).
- Counterfeiting.
- Test equipment.
- Accessing documents.

![Graph showing obsolescence over time](image)
Areas to Consider

- A **formal process / plan** is important to create structure – even if high level.

- Avoid **short term temptations** to save money on obsolescence – **think holistically**.

- **Long term document storage**

- Consider **test and development equipment** – equipment needs to be powered up regularly or it could become unsafe.

- People – **succession planning** around design knowledge does not work in practice.

- Be proactive – don’t wait for your obsolescence **vulnerability** to become a **production impact**.
References

7. OSPAR - works to identify threats to the marine environment, name comes from the original Oslo and Paris Convention from which the group was formed, http://www.ospar.org

Industry Organisations

• Component Obsolescence Group , admin@cog.org.uk   Tel:+44 (0) 1727 876 029