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]

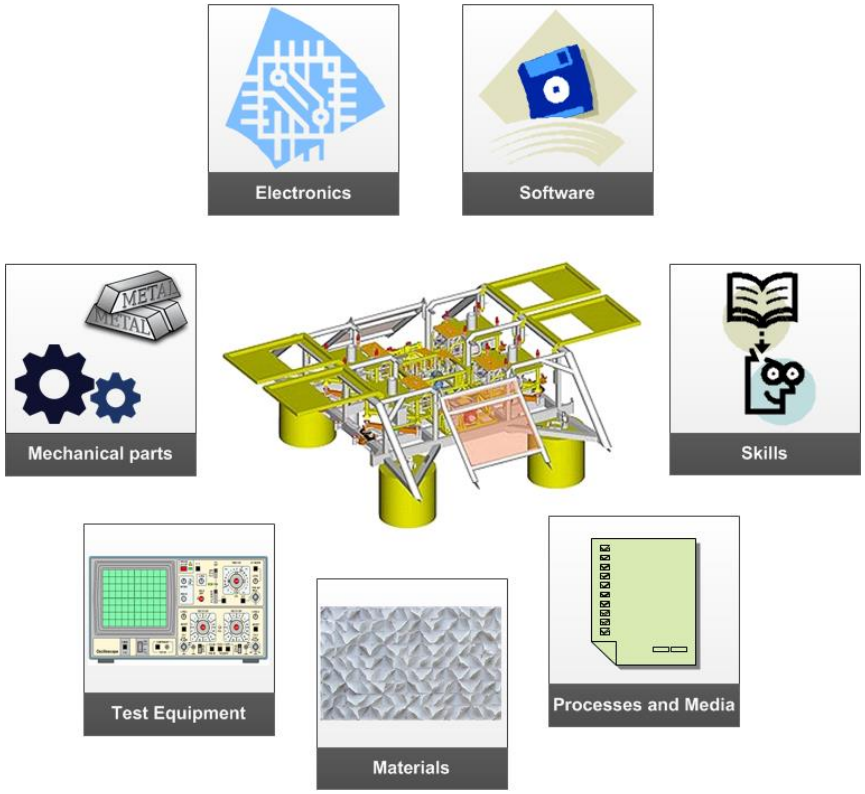
What do We Mean by Obsolescence Management?

- 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

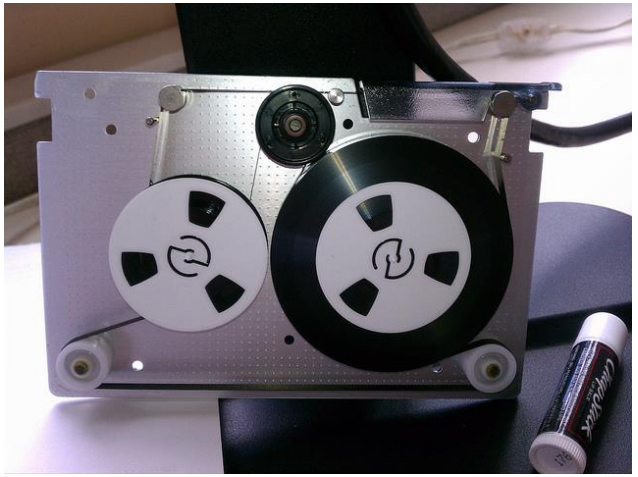
- We **consider a product to be obsolete if the supplier is either unable or unwilling to supply it going forward**.
- It affects all types of products and the equipment needed to support them, and can occur any stage of the product cycle.
- Obsolescence:
  - Is a **major cost driver** for the support 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.



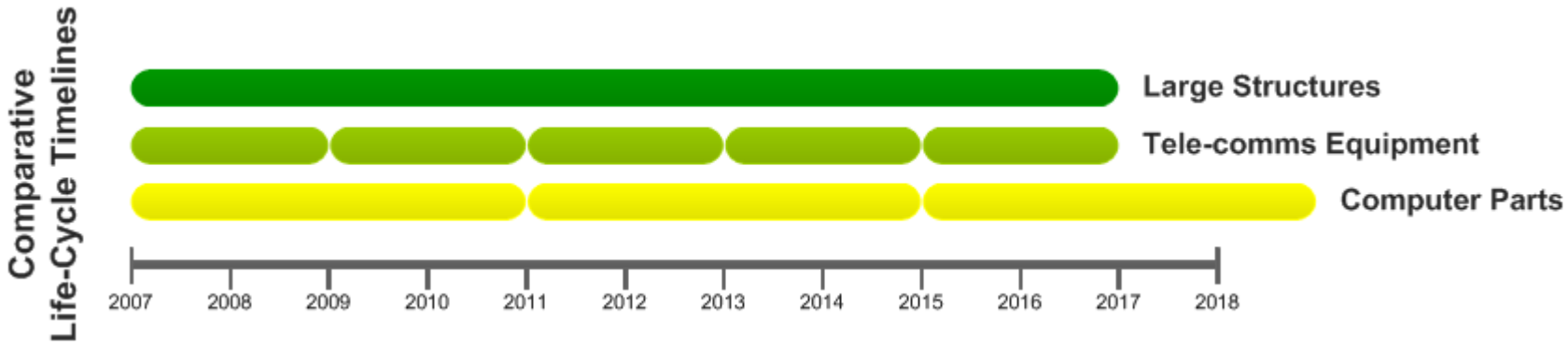
Ref [2]

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**.



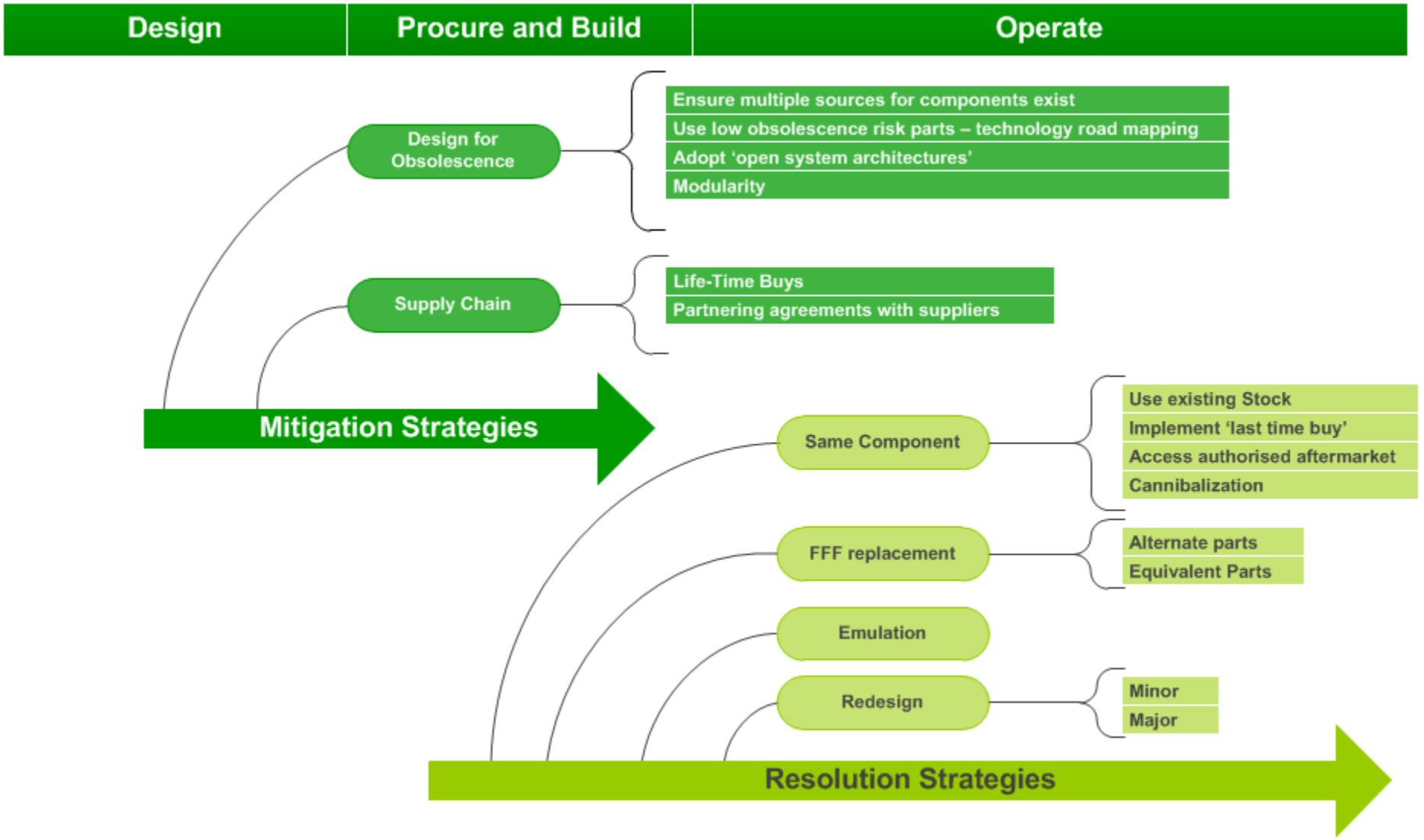
The New Development Challenge



- **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 ?

Ref [4]

Obsolescence Management Techniques



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.

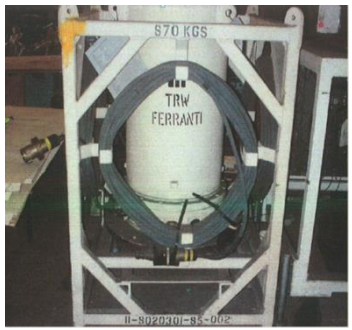
- **Implications of new regulations (RoHS, OSPAR) not recognised.** Ref [6&7]

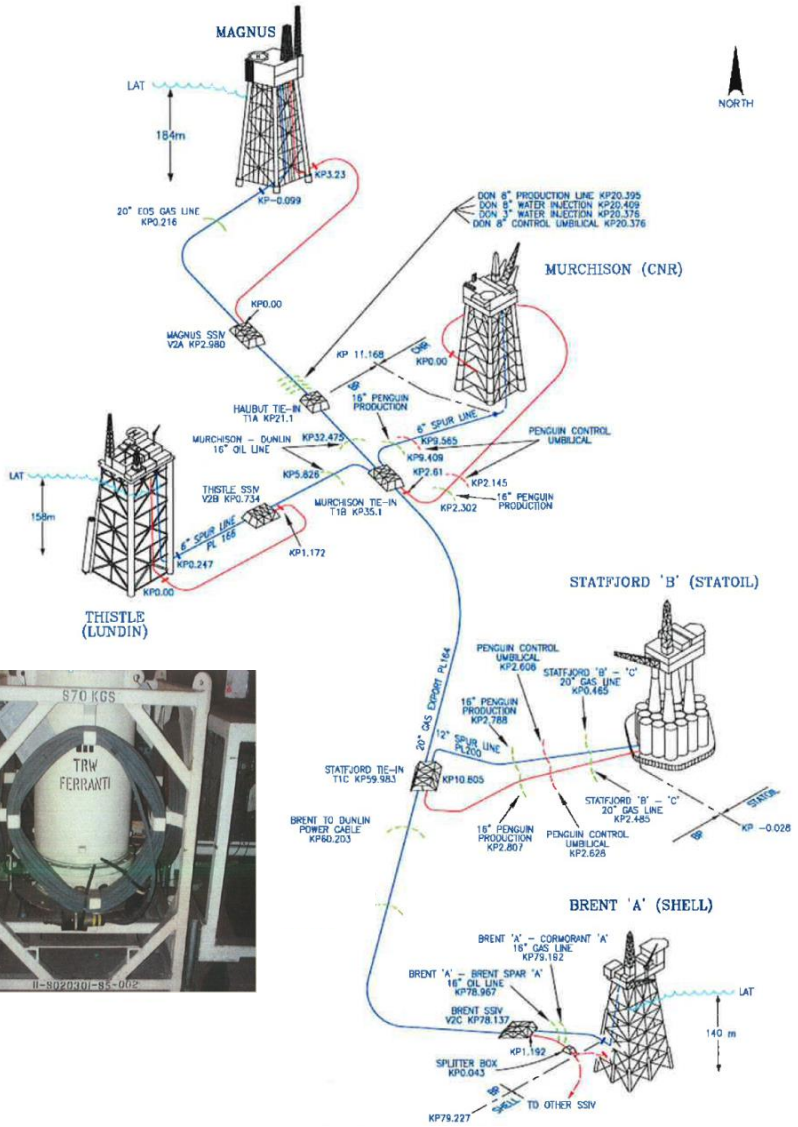
Where Are We Today

- 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 a 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

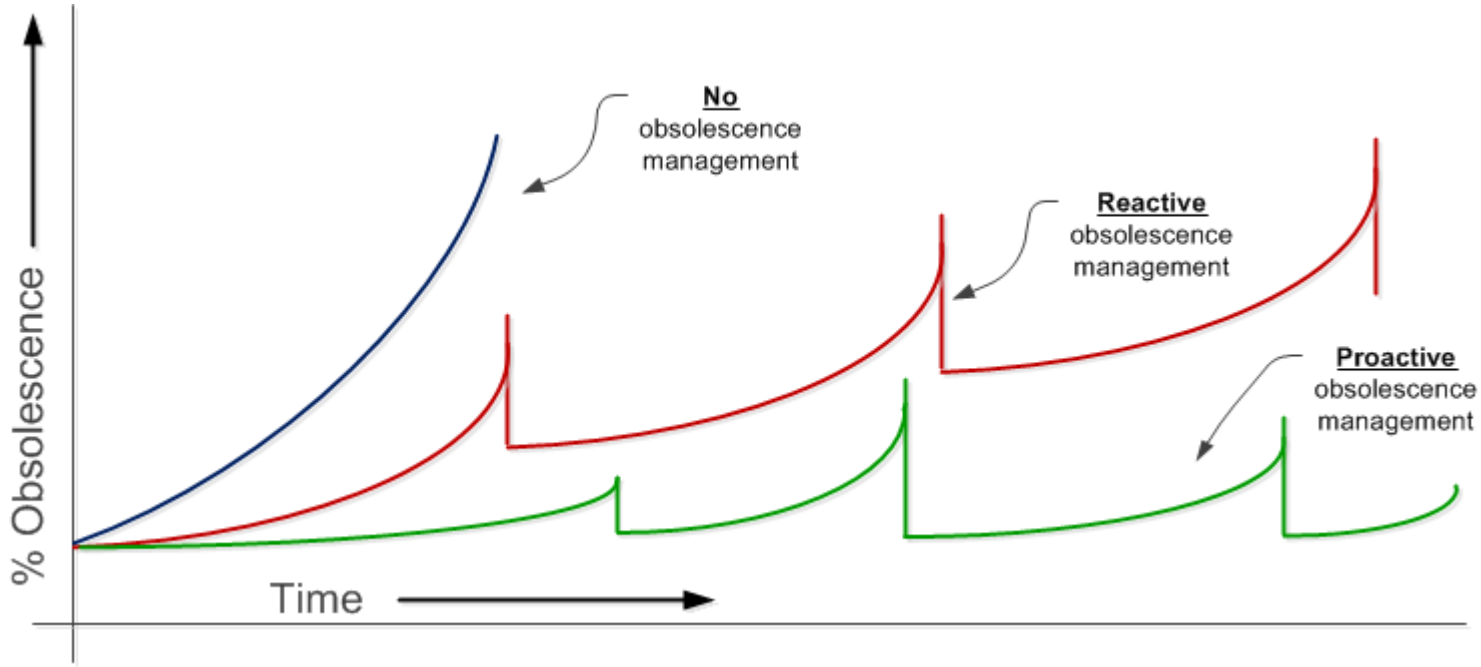
- NLGP is a **simple pipeline control system**.
  - Early subsea electronics control system.
  - Installed between 1982 and 1985.
  - Operating well beyond original design life.
- Supplier **unable to repair.**
  - Parts not available.
  - No one with detailed NLGP design knowledge is still working.
- 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**.



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

1. The Obsolescence Minefield – A guide for senior executives Component Obsolescence Group 2007.
2. Management of component obsolescence in the military electronic support environment - Meyer, 2002.
3. Obsolescence management, Application guide, BS IEC 64202:2007.
4. Are you managing your obsolescence risks ?, Saul, MCE, 2006.
5. Obsolescence Management for Long-life Contracts: Francisco, Rajkumar and Essam, 2009.
6. RoHS - Restriction of the Use of Certain Hazardous Substances, https://www.gov.uk/rohs-compliance-and-guidance
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