From Theory to Action - going live with RP

Bergen 27.09.2016

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Agenda

**LCI** – what drives cost and schedule in Projects?

**Motivation:** Reduced document volume and hence reduce cost

**Summarized benefits**

**Implementation**
LCI – what drives cost and schedule in Projects?

Unpredictability:
- LCI requirements in standards and Company Specifications are too general/too high level.
- Each individual equipment and component must be evaluated for required documentation, with each new Contract.
- Different interpretation of requirements by Operator, Contractor and Supplier, i.e. too many ‘nice to haves’ are delivered.
- Unpredictable workload ➔ Supplier ➔ Contractor ➔ Operator

Admin. Requirements:
- Customizing documentation (Client front page/Dwg title block)
- Large number of documents sent for client review*
- Cumbersome workflow between parties*

MRB process
- Large amount of manufacturing records to be compiled into books
- Large amount of MRBs to be reviewed by client
- MRB process designed for late review, hence difficult to deliver on-time

*Note: it is not necessarily the amount of documents that drives cost, it’s the review process.
Motivation: Reduced document volume and hence reduce cost

- The new DNVGL-RP-O101 will give us the following opportunities:
  - **Cost** documentation deliverables more **accurately**
  - **Schedule** documentation deliverables with greater **predictability** and **accuracy** of workload
  - **Standardize** documentation requirements towards suppliers
  - Utilize own and supplier documentation **re-use concepts**
  - **Decrease review time and engineering hours** during project execution
  - **Decrease cost** of document control and LCI services in projects

Based on this, our target is to reduce total amount of documents and decrease handling time, but still ensure sufficient quality control, as well as traceability and availability of any required documentation for future operation and maintenance.
Summarized benefits – Contractor point of view

- **Less room for interpretation**: RP specifically identifies minimum ‘information’ required for subsea deliverables on a detailed level.
- Allows for combining required ‘information’ into documents in accordance with each system suppliers/sub-suppliers best practice. I.e. THI, PSI, PDS → IOM.
- Minimizes admin requirements for document format (i.e. no Client front page, dwg title blocks, Client Document Number, etc.).
- Client review of documentation to be performed from a risk- and value added perspective.
- Re-use of documentation (received once, no re-submission).
- Majority of MRBs - retained.
- No manufacturing and testing procedures to be submitted to Client, with the exception of EFAT & FAT Procedures for some assemblies.
- Assume to reduce cost by 30 – 50% (depending on variables and client req).
Enablers:

- **Material Information Requirements (MIR) Tables** to be established and the RP to be the guideline.
- **Supplier Doc Archive Solution**: All documentation retained with suppliers, can be transferred and stored in an easy archive solution (through DTS) in case of risk of bankruptcy of supplier.

Enablers:

- **Material Information Requirements (MIR) Tables** to be established and RP shall be the ‘main rule’ for documentation to be submitted to Clients on the MDL, for System, sub-system, assembly, equipment levels.
- **RP to be standard for Tender sell-in; Tender engine**
- **New SAP functionality** to enable control of re-use/generic documentation towards Clients.
- **MRB Traceability Matrix** – to verify traceability, doc progress and completion
Areas of implementation – **Project Execution**

For any contractor it is critical that Operators understand and prepare for running Projects the RP way:

**Enablers:**
- **Standardizing** their documentation scope requirements in accordance with RP
- **Adapting PLM system** to archive and handle traceability without customized document format
- Adapt PLM system to **enable re-use of documentation**
- **Adapt review process** to ensure reduction of amount of documentation to be reviewed only based on risk- and value added philosophy
- Open up for **alternative forums to perform documentation review**

**Risks:**
- Not all Operators have been involved in the JIP for the DNVGL-RP-O101, and might not accept to follow this. This might result in establishing project specific supplier requirements, customizing admin documentation scope of delivery, thus **driving cost upwards**
- Forced deviations from Contractors established best practice (RP) will increase internal and upwards cost, never allowing Contractor to become fully efficient
Areas of implementation – Material Information Requirements

Future of material information handling in Aker Solutions:
Implementation of database controlled requirements to replace standard Documentation Requirement List (DRL) documents.

Manual single word doc process with limited information

PLM automatic quality process with complete information
Areas of implementation – **Material Information Requirements**

- Enable full control of material information requirements in PLM
- Simplified tool for defining correct material information requirements
- Enable simplification of SMDL and ITP processes
- Improved quality of information requirements
- Simplify document handling processes
- Support improved and **reduced number of intervention activities**
- Support information requirement process in tender phase

Today we have approximately **2000** active materials that will be reviewed, updated and converted into the MIR system to reflect the RP requirements.

Material requirements will be established **based upon RP guidelines** and philosophy, but will **also reflect contractors internal process** needs.
Areas of implementation – Supply Chain

Any Supplier delivering to Aker Solutions on Projects utilizing the RP, will experience the following positive trickle-down effects:

**Opportunities:**
- Greater utilization of re-use concept
- Larger amount of retained documentation (MRBs, manufacturing and test procedures, etc.)
- Reduce document customization as Aker Solution adapts PLM system to archive and handle traceability without customized document format.
- Positive scheduling impact due to faster documentation turn-around, less documentation sent on Review
- Reduce number of man-hours

**Risks:**
- Not all Operators have been involved in the JIP for the DNVGL-RP-O101, and might not accept to follow this. This might result in establishing project specific supplier requirements, customizing admin documentation scope of delivery, thus driving cost upwards.
- Forced deviations from Suppliers established best practice (RP) will increase suppliers and Contractors cost, never allowing Suppliers to become fully efficient.
- Retained documentation availability during life of field
Areas of implementation – **MRB Traceability Matrix**

RP recommends that majority of manufacturing records & quality control documents shall be ‘retained’ by System supplier/suppliers.

Aker Solutions has developed a new lean process for handling manufacturing records & quality documentation.

This process involves a new **MRB Traceability Matrix Tool** with the following benefits:

- **Makes it possible to monitor and control** the scope of manufacturing and quality records from early in Construction phase, to secure that records are completed together with hardware deliveries.
- **Transparency** towards Operators through sharing progress status and trace of the records for the SoS throughout project execution.
- **Remove cost** for in-house compilation of MRB's.
- **MRB Traceability Matrixes** will be the **final handover** to Operator.

This tool enables proper and **secure routines to ensuring control of retained records** and creating an opportunity to **gain trust** with Operators.
Areas of implementation – MRB Traceability Matrix

TUBING HANGER PROD. 5X2, VXT, ASSEMBLY (MAT. NO. 10210771, Serial No. 317782-001)

<table>
<thead>
<tr>
<th>BOM and traceability information</th>
<th>Information Types</th>
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- **Green cell = As built**
- **Red cell = not As built yet**
- **X = applicable for scope in BOM**

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September 27, 2016 | Slide 12
Supplier MRB Process today

43 days (incl. CPY) /29 days (ex. CPY) per revision, 5 hours review and handling, approx. 60-70 000 supplier verifying doc’s per year.

Potential future process

Benefits:
- Reduce review workflows
- Remove cost for compiling books
- Manufacturing records available through life of field

Areas of implementation – Doc Archive Solution
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A need for a web based archive/cloud solution is critical as it is a key enabler on the road to simplification of documentation handling.

Proper and secure routines for archiving and sharing documentation are paramount in establishing trust in the industry. Finding solutions that allow access to information during entire life of field has to be one of the highest priorities on the agenda.

While the industry is looking for a common business solution, Aker Solution intends to use existing Data Transfer System (DTS) for transfer of documentation from suppliers. The plan is to modify DTS to easily receive ‘retained’ files, for automatic download to SAP PLM.
Conclusion

Whenever you are an operator, a contractor or a supplier – take the time to **review and analyze the benefits** of the RP. **Utilize these benefits in any and every discussion you have** – this will support the much needed **movement in the industry**!

Make a commitment to be an ambassador for the RP and challenge anyone who still insists on working the old-school way

**RP is a much needed game-changer this industry has been craving** – **be sure to be a part of it!**
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