

From Theory to Action - going live with RP

Bergen 27.09.2016

Tommy Lien | Senior LCI Process Coordinator - OBI

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)

RP Best Practice Doc. Handling

RP Appendix C and D

[illegible]

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 a easy archive solution (through DTS) in case of risk of bankruptcy of supplier.

RP Appendix A, B and D

[illegible]

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:

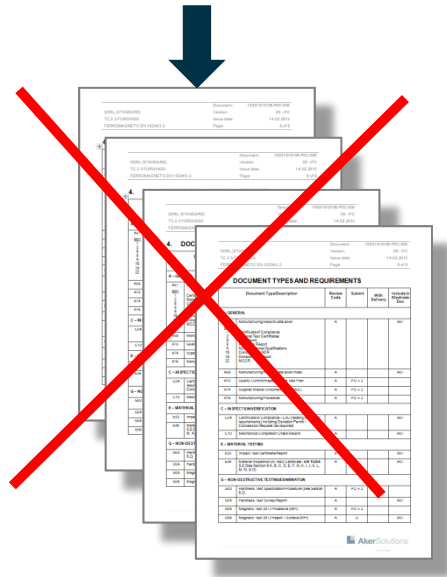
- Not all Operators have been involved in the JIP for the DNVGL-RP-O101, and might not accept to follow this. This might result in establishing project specific supplier requirements, customizing admin documentation scope of delivery, thus **driving cost upwards**
- Forced deviations from Contractors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

Areas of implementation – Material Information Requirements

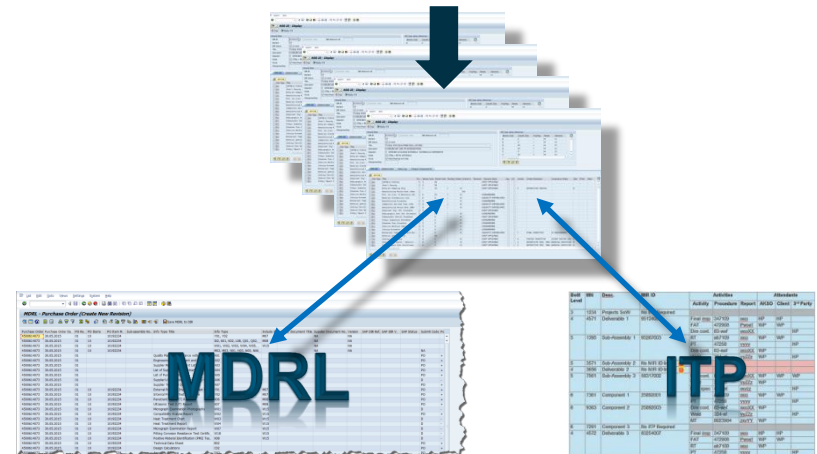
Future of material information handling in Aker Solutions:

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

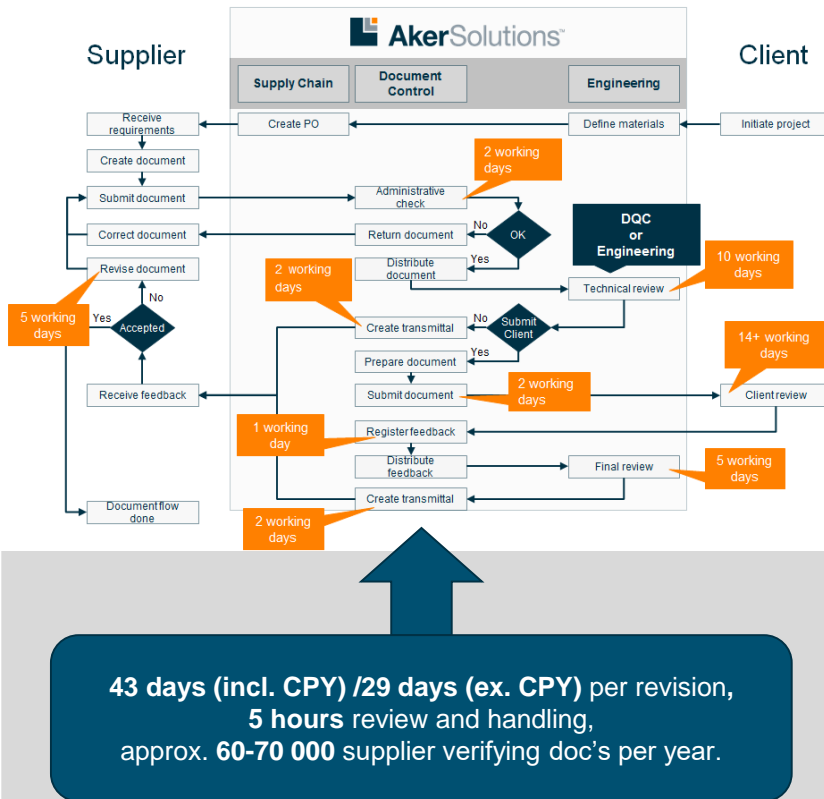
This tool enables proper and secure routines to ensuring control of retained records and creating an opportunity to gain trust with Operators.

Areas of implementation – MRB Traceability Matrix

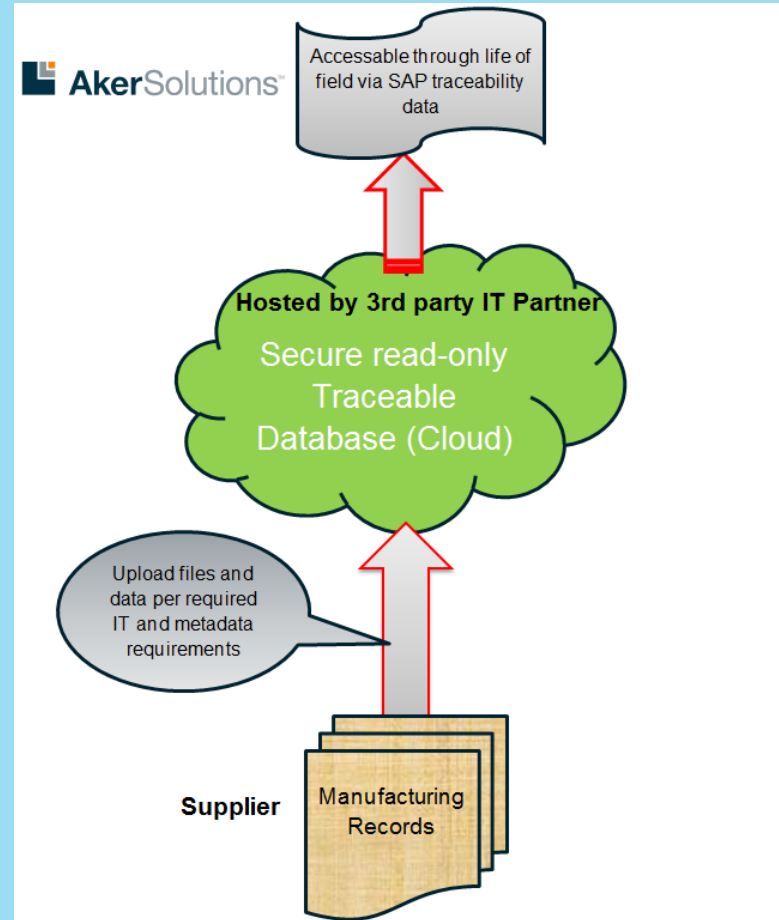
[illegible]

Areas of implementation – Doc Archive Solution

Supplier MRB Process today



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

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!

Copyright and Disclaimer

Copyright

Copyright of all published material including photographs, drawings and images in this document remains vested in Aker Solutions and third party contributors as appropriate. Accordingly, neither the whole nor any part of this document shall be reproduced in any form nor used in any manner without express prior permission and applicable acknowledgements. No trademark, copyright or other notice shall be altered or removed from any reproduction.

Disclaimer

This Presentation includes and is based, inter alia, on forward-looking information and statements that are subject to risks and uncertainties that could cause actual results to differ. These statements and this Presentation are based on current expectations, estimates and projections about global economic conditions, the economic conditions of the regions and industries that are major markets for Aker Solutions ASA and Aker Solutions ASA's (including subsidiaries and affiliates) lines of business. These expectations, estimates and projections are generally identifiable by statements containing words such as "expects", "believes", "estimates" or similar expressions. Important factors that could cause actual results to differ materially from those expectations include, among others, economic and market conditions in the geographic areas and industries that are or will be major markets for Aker Solutions' businesses, oil prices, market acceptance of new products and services, changes in governmental regulations, interest rates, fluctuations in currency exchange rates and such other factors as may be discussed from time to time in the Presentation. Although Aker Solutions ASA believes that its expectations and the Presentation are based upon reasonable assumptions, it can give no assurance that those expectations will be achieved or that the actual results will be as set out in the Presentation. Aker Solutions ASA is making no representation or warranty, expressed or implied, as to the accuracy, reliability or completeness of the Presentation, and neither Aker Solutions ASA nor any of its directors, officers or employees will have any liability to you or any other persons resulting from your use.

Aker Solutions consists of many legally independent entities, constituting their own separate identities. Aker Solutions is used as the common brand or trade mark for most of these entities. In this presentation we may sometimes use "Aker Solutions", "we" or "us" when we refer to Aker Solutions companies in general or where no useful purpose is served by identifying any particular Aker Solutions company.