DIGITAL STANDARDS IN OIL AND GAS

Todd Wohling, CSEP

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Prologue: EMEASEC 2018

- Irfaan Khalid presents: A Preliminary Comparative Study of Requirements Structure and Quality in Industry Standards
- 30-40 requirements in standards across industries analyzed and scored for compliance with INCOSE Handbook v 4.0
- Of the organizations, Standards Development Organizations scored lowest
  - Of them NORSOK scored lowest
  - On industry basis, O&G scored low

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Standards Distribution in 2018

- Document centric solution is PDFs
  - Secure
  - Unusable in RM tools
- SE activities require manual translation of data
  - Commonly PDF -> Excel via manual copy/paste
  - National Institute of Standards and Technology (NIST) 800-12 on Joint Polar Satellite System (~2011-2012)
- Academic engagement with NORSOK in 2018 for "import of XML into requirement management (RM) tools"

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Early Efforts

- ISO Technical Committee 67 (TC/67) Three Task Forces
  - TF1: Requirement Quality (ISO Dir 2)
  - TF2: "Sentence Centric" solution (Object Oriented)
  - TF3: "Data Centric" solution
- International Association of Oil & Gas Producers (IOGP) Requirement Digitalization Task Force (RDTF) Workstreams (2018)
  - W/S A&D: Data Model for Digital Requirements
  - W/S B: Requirement Quality
  - W/S C: Data Exchange

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Standards Norway's Implementation of NISO STS XML

- NISO STS XML does not have a leaf tag for requirements
- Standards Norway chose <named-content> as the container for requirements
- NISO STS XML Tags use both child tags and XML attributes to convey data
- Extended NISO STS XML isn't any more importable to RM tools than PDF…
- So something needs to happen to the data to make it usable

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Turning NISO STS XML to ReqIF

- Intech Convert is an XML Transformation Stylesheet (XSLT)
  - NISO STS XML as input
  - ReqIF as output
- ReqIF is importable into most common RM tools

DOORS	JAMA
Cradle	Polarion
Visure	DNG

- Development and conversion in Eclipse development environment

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Ongoing Efforts: IOGP Joint Industry Programme-33

- IOGP Joint Industry Programme 33 (JIP33) initiated in 2016
- Burning Platform for JIP33
  - 50% of exploration and production projects overran scheduled completion dates
  - 75% of exploration and production projects exceeded budget by 50%
  - Forecast capital expenditure 2018-2025: $3 Trillion
- Add overlays to the existing standards documents to create something new

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What is the benefit?

- RM Tool analysis functionality
  - Traceability analysis during design phase
  - Compliance analysis during V&V
- Transfer of data between organizations
  - Standards in source XML or in converted ReqIF
  - Standards + Overlays: IOGP Joint Industry Project (JIP33) in ReqIF
  - Common understanding of requirement baseline
- Requirement Reuse
  - Component requirements flowed down verbatim
  - Standards + Overlays on multiple projects

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Recent Events:

- IOGP JIP-33: 55 sets of overlays created as of 2024
- JIP33 agreement with American Petroleum Institute (API) to incorporate JIP33 overlays into standards
- 13 NORSOK standards converted
- Imports of Converted ReqIF confirmed in

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Digital Standards: Going Forward

- NISO needs to close on tagging for requirements
  - <named-content> works, but has consequences
  - Requirement tag must be a leaf
- Distribution of Standards should itself be standardized
  - SDOs use RM tools to generate and distribute standards
  - Adapt current standards with JIP33 overlays
  - Produce in NISO XML; convert to ReqIF

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Questions / Answers