







The Importance of Digital Requirements Writing and the Future of Digital Standards

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Standardization





Levels of standardization

Bearings shall be electrically insulated. (fixed)

When low-speed barring is required, the machine bearing shall be lubricated irrespective of the specified lubrication system. (conditional)

> Independently mounted fan impellers shall be keyed or shrink fitted to the rotor shaft. (alternative)

| Row# | Ref. Clause | Description | Purchaser requirement | Purchaser requirement UOM | Supplier offered value | Supplier offered UOM | Additional notes | Issu |
|------|----------------|----------------------------------|-----------------------|---------------------------------|------------------------|-------------------------|------------------|------|
| | | Applicable rotor balancing grade | G2,5, G1,0, G0,665 | | G2,5, G1,0, G0,665 | | | |





Transition to writing digital requirements



The JIP33 digital workflow



Improvement in parent standard digitization



Metadata



Requirements management – explorer & dashboard



Jama views – technical requirement (TR)



Jama views - information requirement (IR)



JOINT INDUSTRY PROGRAMM

Collaboration in the digital tool

- @mentioning people/groups generate e-mail notifications
- *@mentioning items adds traceable cross-references*
- lactions tracked on user dashboard
- #hashtags are searchable





Improved quality and traceability





CFIHOS Overview

The purpose of CFIHOS is to create a handover specification that can be implemented by operators, contractors and equipment manufacturers and suppliers to standardize the specification of information handover requirements for a project.

That is required to own, operate, maintain a facility safely, efficiently and demonstrate compliance to the regulator.

This will significantly lower the lifecycle cost associated with incorrect and missing information required to operate a facility.

KSTEP

Standard Norge

READI 🐊

DEXPI^{® Data Exchange in}

We have a strategic network of ten MOU partners, we are in the final stages of agreeing a further three MOUs

POSC Caesar SEIIA.SE

Our membership currently stands at 81 organisations with 400+ SMEs participating



Requirements writing



A Common Problem

Nearly **10%** of project costs increases are due to poorly written requirements

Nearly **50%** of unsuccessful projects fail to meet their goals due to poorly written requirements

More than **half** of all engineering errors originate in the way the requirements were written





Common requirement writing errors





Requirements Writing

| Quality Analysis | Unclear – Risk of being misunderstood by a reader. | | | | | |
|-----------------------|---|--|--|--|--|--|
| carefully randing one | Unverifiable – Too vague to be proven. | | | | | |
| Consistency | Uncontrolled Terms - Multiple names for the same object. | | | | | |
| | Improper Units - Different systems of units used. | | | | | |
| Similarity | Duplication - The same information repeated. | | | | | |
| | Contradiction – Conflicting information in the same document. | | | | | |
| V avscribe | | | | | | |



Improvement in writing – integrated language processing



Removes dependence on external tools

- saves time
- improves traceability Instant user feedback
- promotes sentence-centric requirement writing





Requirement quality

Supplementary requirement text (requirement)

- Short, concise and exactly <u>one</u> imperative – common understanding for a JIP33 minimum essential requirement.

| REQUIREMENT I.D.: XX-DL-35 | All Alerts | | |
|----------------------------|--------------------------------|-----------------|--------|
| I. | QUALITY SCORE NO IMPERATIVES | Quality Score: | |
| | EARS NON COMPLIANT | No Imperatives | |
| | | All Alerts | 2 |
| | | | G |
| | | | G |
| | | E EARS Non-cont | orming |



Requirement quality

Supplementary requirement text (requirement)

- Short, concise and exactly <u>one</u> imperative – common understanding for a JIP33 minimum essential requirement.



No Problems Found that impact the Quality Score

Minor Problems such as the excessive use of continuances

Major Problem such as the use of a single vague, subjective or weak term, or negative imperatives

Multiple Major Problems such as the use of vague, subjective, and weak terms and negative imperatives

Critical Problems including several major problems, multiple "shall" statements, or missing "shall"

Quality Warnings that do not impact the score including Universal Quantifiers and Passive Voice

Hydraulic chambers **shall** be provided with two ports for flushing.

Hydraulic chambers shall have ports of a **suitable** size for flushing.

Hydraulic chambers **should** have two ports located at **extreme** ends to allow **efficient** flushing.



JIP33 digital successes

JIP33 is leading the way in digitization!

Engagement of the entire O&G industry and the SDO world Feeding back JIP33 content into the parent standards

Supplier and EPC input and feedback Standardization = less engineer hours /clarifications / exceptions

Standardization of digital content across all specifications

Work with software companies for product improvement







All





Direct "digital" exports of IOGP JIP33 specifications

Data Exchange to generate mapping file

| o file | | ReqIF | | Data Exchange validation report |
|-----------|--------------------------|--|---------------------------------|---------------------------------|
| | Data Exchange for Jama S | oftware - v3.7.0 - <https: iogp.jamaclou<="" td=""><td>id.com></td><td></td></https:> | id.com> | |
| | File Help | | | |
| | | DATA EXCHANGE | | |
| | Import | Export | | |
| | Purpose | O Exchange Export Only | | |
| | Target Tool | Jama ReqIF [STANDARD] | • | |
| | Export From | Location Filter Base | line | _ |
| | Project | S-729 (EI18) - Control Valves [279] | ▼ Select | |
| | Location | Technical Requirements Document [24 | 1090 v Include in Export | |
| | Mapping File | JIP33 TR mapping v2.json | Rem Edit | |
| | Export to | C:\Jama DX3\Exports | Select | |
| | | | Export | ~ |
| | <[| | | > |



The future of digital standards

The JIP33 library

"approved" items = fast tracked

(e.g. manufacturers standard vs manufacturer's standard)

Other initiatives

Smart procurement data sheets Working with the SDOs on digitalization Using the metadata to unlock other opportunities Shorter time to publication

Workflow improvements

Software to further standardize terminology across our standards New artificial intelligence (AI)



Thank you for your time and attention \odot



Scan the QR code to complete or go to https://forms.office.com/e/7WfazCDKzb









An IOGP programme

For more information please contact:

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Requirement quality

A requirements analysis tool

The software 350+ phrases and terms,

CUSTOMIZABLE for discipline/project status.

Mention consistency, similarity – configurable to subject

It starts with looking for "shall"....



Waffle...non requirements



NOTES – TO BE DELETED

SUPPLIERS – LOW CARBON/ energy transition -

Mention breakouts. (for QVS and Jama)

JIP33 vs SDO timeline

Standardization of clause not done currently by SDO

Version and commenting history

Why are digital requirements important for the supplier / EPC?

- Workflow feedback loops innovation corporate knowledge?
- •Not everyone has English as their first language METADATA

•Exports have justifications, guidance and verification





| REQUIREMENT I.D.: XX-DL-35 | 2 All Alerts | | |
|----------------------------|--------------------------------|----------------------|--------|
| | QUALITY SCORE NO IMPERATIVES | Quality Score: | |
| | EARS NON COMPLIANT | No Imperatives | 0 |
| | | All Alerts | 2 |
| | | | G |
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| | | EARS CNON-CONIC | orming |
| | | Insert EARS Template | |

Removes dependence on external tools

- saves time
- improves traceability
- Instant user feedback
- promotes sentence-centric requirement writing

| EQUIREMENT T | EXT: | | | | | | | | | | | | | | | |
|--|------------------------------------|-------------------------------|----------|---------|-----|--------|---|--------------------|------------|-----------|----------|-----------------------|------------|--|--------------------------|---|
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| REQUIREMENT I. | D. : XX-TR-17 | 294 | | | | | | Alerts | | | | | | | | |
| REQUIREMENT LI ame plates shall l vets or screws. | D. : XX-TR-17 be affixed | 294 with 316L | stainles | s steel | | | All QL | Alerts | /ARNING | PASS | IVE VOL. | | Qua | lity Scor | e: | |
| REQUIREMENT LI ame plates shall i vets or screws. | D. : XX-TR-17 be affixed | ²⁹⁴ with 316L | stainles | s steel | | | All QL EA | Alerts JALITY V | VARNING | PASS | IVE VOL. | | Qua All | lity Scor Alerts | e: | |
| REQUIREMENT LI ame plates shall l vets or screws. | D. : XX-TR-17 | ²⁹⁴ 1 with 316L | stainles | s steel | | | All QL EA | Alerts JALITY V | VARNING |) PASS | IVE VOL. | | Gua All | lity Scor Alerts Warning: | e: | |
| REQUIREMENT LI ame plates <u>shall</u> vets or screws. | D. : XX-TR-17 be affixed | 294 I with 316L | stainles | s steel | | | All QL EA | Alerts JALITY V | VARNING | PASS | IVE VOL | | Gua All | lity Scor Alerts Warning: Unit Con | e: 5 sistency | |
| REQUIREMENT LI ame plates shall l vets or screws. | D. : XX-TR-17 | 294 I with 316L | stainles | s steel | | | All QL EA | Alerts JALITY V | VARNING | PASS T | IVE VOL. | | Gua All | Alerts Warning: Unit Con | e: s sistency | 2 |
| REQUIREMENT LI ame plates <u>shall</u> rets or screws. | D.: XX-TR-17 | 294 With 316L | stainles | s steel | | | All QL EA | Alerts JALITY V | VARNING | T PASS | IVE VOL. | | Gua All | Alerts Warning: Unit Con Similarity EARS | e: s sistency / | 2 |

QVscribe



Requirement quality - QVScribe

Supplementary requirement text (requirement)

- Short, concise and exactly <u>one</u> imperative – common understanding for a minimum essential requirement.

| Qual | ity Score Summary | av scribe | |
|-------|---|--|---|
| Score | Reason for this score | Risk and Action | |
| 5 | No problems found with this requirement that impact the Quality Score. | Very Low Risk Includes exactly one imperative and uses clear, unambiguous terminology to express the requirement. | Hydraulic chambers <u>shall</u> be provided with two ports for flushing. |
| 4 | Minor problems with this requirement. These may include: - Excessive use of continuances - No Directives (off by default) | Low Risk These issues are generally low-risk but they make the requirements more difficult to work with and should be addressed. | |
| 3 | Major problem with this requirement. These may include: - A single vague, subjective, or weak term - A single negative imperative | Medium Risk The presence of these terms usually indicates that the meaning of the requirement will be ambiguous, and it may be difficult to test. | |
| 2 | Multiple major problems with this requirement. These include more than one: - Vague, subjective, or weak terms and/or - Negative imperatives | High Risk Having multiple quality issues within the same requirement heightens the risk of misinterpretation. This can lead to product failure or costly rework. | |
| 1 | Critical problems with this requirement. These may include: - No imperative or multiple imperatives, and/or - Several vague, subjective, or weak terms | Very High Risk Requirements that have problems with the imperatives or more than two instances of problematic language represent the highest risk. It is likely that important information will be missed in the development process. | Hydraulic chambers should have two ports locateat extreme ends to allow efficient flushing. |
| | Quality Warnings were found in this requirement. These may include: Universal Quantifiers, Passive Voice, Incomplete Sentences, and/or Justification Information | Potential for Risk The proper use of phrases identified in these categories depends on the context in which they are used. When these potential issues are found a warning will be shown but they do not impact the Quality Score. | |





Improved quality and traceability





Stakeholder Review – Operators, water mist suppliers ...

| | PROJECTS REVIEWS ADMIN | | | IOGP-JIP33 Mark Davies (IOGP) Help |
|----------------|--|--------------------------------------|--|--|
| views All Revi | EWS (1202) | | | FILTER BY VIEW BY Gro Habe |
| tart a review | | | | There were determined and end of the end of the |
| ר בי גר גר | Name | Project | STREAM PROJECTS REVIEWS ADMIN IOGP-JIP33 | Mark Davies (IOGP) Help Log Out Actions |
| EV-883 | ES20 - Water Mist Fire Protection - Information Requirements (Danfoss) | S-719 (ES20) - Water Mist Fire Prote | S20 - Water Mist Fire Protection - Technical Requirements (VID Fire Kill) - V2 - My STATUS Moderator Closed: 04/12/2019 | Ø < 🕞 💩 🔂 |
| EV-684 | ES20 - Water Mist Fire Protection - Data Sheet (Danfoss) | S-719 (ES20) - Water Mist Fire Prote | 7 items Y Filter I Find C Highlighting: ON View | Actions ▼ Export ▼ |
| EV-685 | ES20 - Water Mist Fire Protection - Technical Requirements (Danfoss) | S-719 (ES20) - Water Mist Fire Prote | This review is closed | Recan |
| EV-686 | ES20 - Water Mist Fire Protection - Quality Requirements Review (Firenor) | S-719 (ES20) - Water Mist Fire Prote | 1147.9 2 S719-SET-28 - Dat | a Sheet Elements × |
| EV-687 | ES20 - Water Mist Fire Protection - Information Requirements (Firenor) | S-719 (ES20) - Water Mist Fire Prote | Above section amendment: | comment |
| REV-688 | ES20 - Water Mist Fire Protection - Data Sheet (Firenor) | S-719 (ES20) - Water Mist Fire Prote | Title: Design Objectives and Fire Test Protocol | |
| EV-689 | ES20 - Water Mist Fire Protection - Technical Requirements (Firenor) | S-719 (ES20) - Water Mist Fire Prote | Below section amendment: No information entered | errington (Ultrafog) Comment |
| EV-690 | ES20 - Water Mist Fire Protection - Quality Requirements Review (Marioff) | S-719 (ES20) - Water Mist Fire Prote | 1147.1 9.1 0 · · · · · · · · · · · · · · · · · · | 19 V2 [] |
| V-691 | ES20 - Water Mist Fire Protection - Information Requirements (Marioff) | S-719 (ES20) - Water Mist Fire Prote | Above section amendment: No information entered | te following are added to the datasheet: |
| V-692 | ES20 - Water Mist Fire Protection - Data Sheet (Marioff) | S-719 (ES20) - Water Mist Fire Prote | LV r Title: General Prer | notor efficiency class and rating - e.g. IE3, NEMA nium efficiency, etc |
| .V-893 | ES20 - Water Mist Fire Protection - Technical Requirement (Marioff) | S-719 (ES20) - Water Mist Fire Prote | Below section amendment: No information entered | and emergency power supply details - |
| EV-694 | ES20 - Water Mist Fire Protection - Quality Requirements Review (Phirex) | S-719 (ES20) - Water Mist Fire Prote | 1.147.15 9.15 P | ses & phase configuration, etc |
| EV-898 | ES20 - Water Mist Fire Protection - Information Requirements (Phirex) | S-719 (ES20) - Water Mist Fire Prote | Where current fire test proposals do not exist, fire scenario solutions shall be engineered by developing an even of the state of the s | requirements - e.g., minimum duration (hours, |
| V-697 | ES20 - Water Mist Fire Protection - Data Sheet (Phirex) | S-719 (ES20) - Water Mist Fire Prote | The performance of the system design shall be consistent with the testing (see Chapter 17). | er the entire system) |
| V-698 | ES20 - Water Mist Fire Protection - Technical Requirements (Phirex) | S-719 (ES20) - Water Mist Fire Prote | ID: S719-TR-2880 • Con Above existent • Con | trol voltage |
| V-899 | ES20 - Water Mist Fire Protection - Quality Requirements Review (Ultrafog) | S-719 (ES20) - Water Mist Fire Prote | Add new section | |
| V-700 | ES20 - Water Mist Fire Protection - Information Requirements (Ultrafog) | S-719 (ES20) - Water Mist Fire Prote | Fire Scenario Engineered Solutions Resolve Below section amendment: | 🖒 • Delete 👻 |
| V-705 | ES20 - Water Mist Fire Protection - Data Sheet Review (Ultrafog) | S-719 (ES20) - Water Mist Fire Prote | No information entered Justification: | |
| V-708 | ES20 - Water Mist Fire Protection - Technical Requirements (Ultrafog) | S-719 (ES20) - Water Mist Fire Prote | where current meters protocors do not exist, the clause permiss the development of a roous water mist the protection system. Evidence shall be provided for the performing a testing that is perturbant to the risk; carried out by conducted by an internationally recognized fire testing laboratory. Accompanied with a full report describing the results of the of the component evaluations. The passifial interia shall also be established prior to fire testing. The manufacturer's design installation and maintenance manual is also a requ process with qualified 3rd parties. | Indispondence and a second sec |
| EV-707 | ES20 - Water Mist Fire Protection - Quality Requirements Review (VID Fire Kill) | S-719 (ES20) - Water Mist Fire Prote | | ∅ < С 💩 台 |
| | 0409 (MSR 2005) | | Above section amendment: | |

What is JIP33?

- IOGP-led development of procurement specifications for equipment in the O&G industry.
- Collaboration by 12 major energy sector operators.
- Supplementary specifications (when possible) to existing industry standards/specifications.
- Content fed back to the SDOs for inclusion in the next edition of the parent standard.
- •Aker Solutions responsible for project management services and provision
- of subject matter experts. Change to mention supplier involvement?

ExonMobil equinor







ER PETROBRAS







Digital workflow





Improvements in efficiency through digitalization - tbc

What has worked?

- Commenting and collaboration
- Digitization of parent standard structure
- Integrated tools
- Reuse of common components

What has yet to be fully realized?

- Automation of document production
- Reuse of common requirements



Improvement in efficiency – still to be realized

Automation of document
 production



Reuse of common requirements



Improvement in efficiency - reuse of common components

Common components:

- not re-inventing the wheel each time
- easy to re-use and update across specifications
- provides a basis for re-use one size does not fit all
- improve consistency across specifications

Examples of common components:

- boilerplate information
- normative references
- terms, definitions, acronyms, abbreviations and symbols
- standard documentation (information requirements)



Jama views - explorer & dashboard





Jama views – single item, datasheet element



An IOGP programme

NT INDUSTRY PROGRAMM

rdizing procurement specificati

| roject change project | Learn more 🛎 🕴 🖓 XFile-ACT-3:Warm-up em 🛎 🖓 Activities 🛎 | XFile-DSE- | 10:Manufactu (8) | | |
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Unique identifier tbc



•Each individual item has its unique ID.

Sxxx-ZZ-nnnn

- xxx denotes specification number
- ZZ denotes item type, TR technical requirement, DSE datasheet item, IR information requirement etc.
- nnnn denotes sequential number
- •What's the purpose of the global ID?

Requirements shall be unique and stand alone.



Jama views – datasheet element (DSE)



JOINT INDUSTRY PROGRAMM

Jama views – quality requirement (CASR)





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