IOGP JIP 33 Subsea XT Specification
A New Era Common Approach

Giorgio Pastore
Eni SpA

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Where it all started

The O&G Community at the WEF is composed of NOCs, IOCs and Independents representing approximately 40% of global oil supply as well as Services and Equipment companies

Context

Between 2010-2014, 75% of large E&P projects exceeded budget by 50% on average, and 50% of projects exceeded schedule by almost 40%.

Objective

The Capital Project Complexity initiative seeks to drive a structural reduction in upstream project costs and schedule improvement with a focus on industry-wide, non-competitive collaboration and standardization.

Vision

The vision for the industry is to standardize specifications for procurement for equipment and packages, facilitating improved standardization of major projects across the globe.

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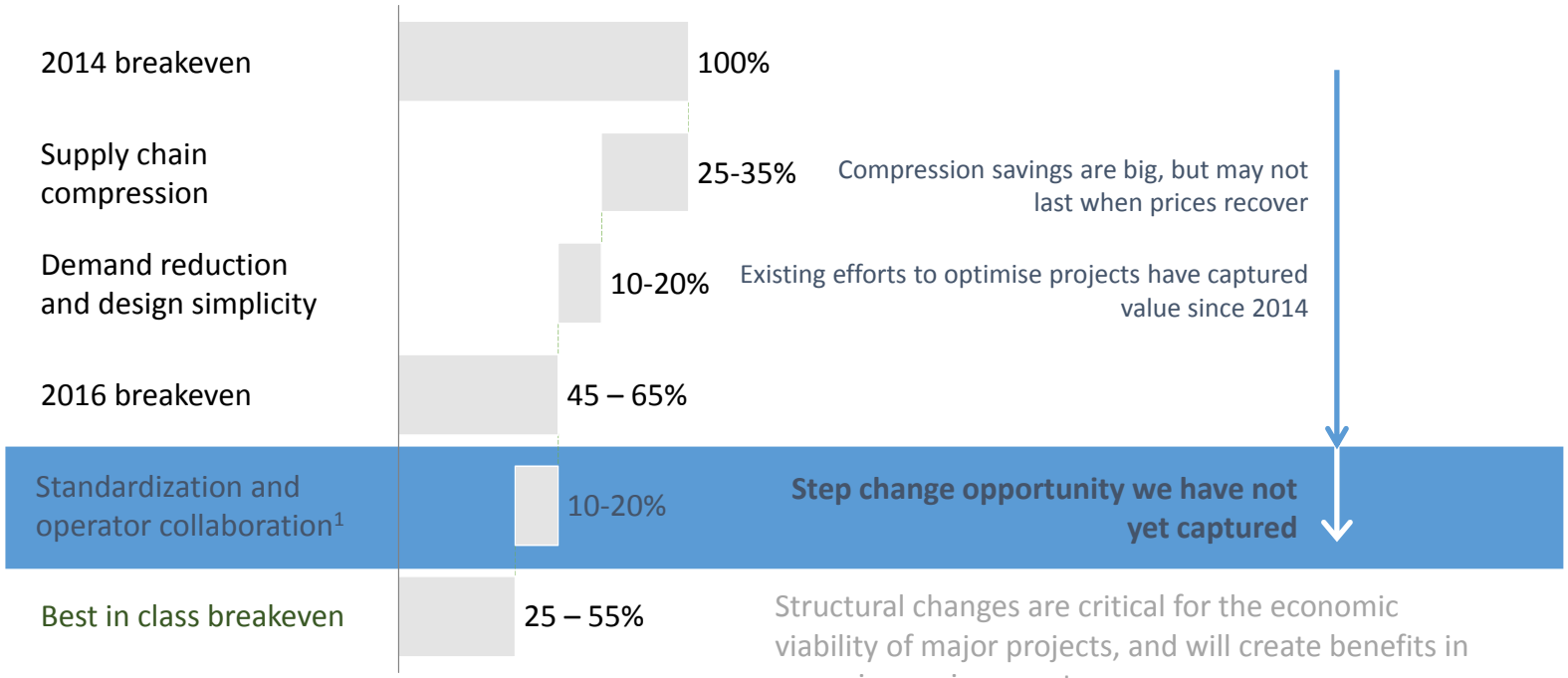
Standardization is a key lever we can pull as an industry to structurally reduce large capital project lifecycle costs

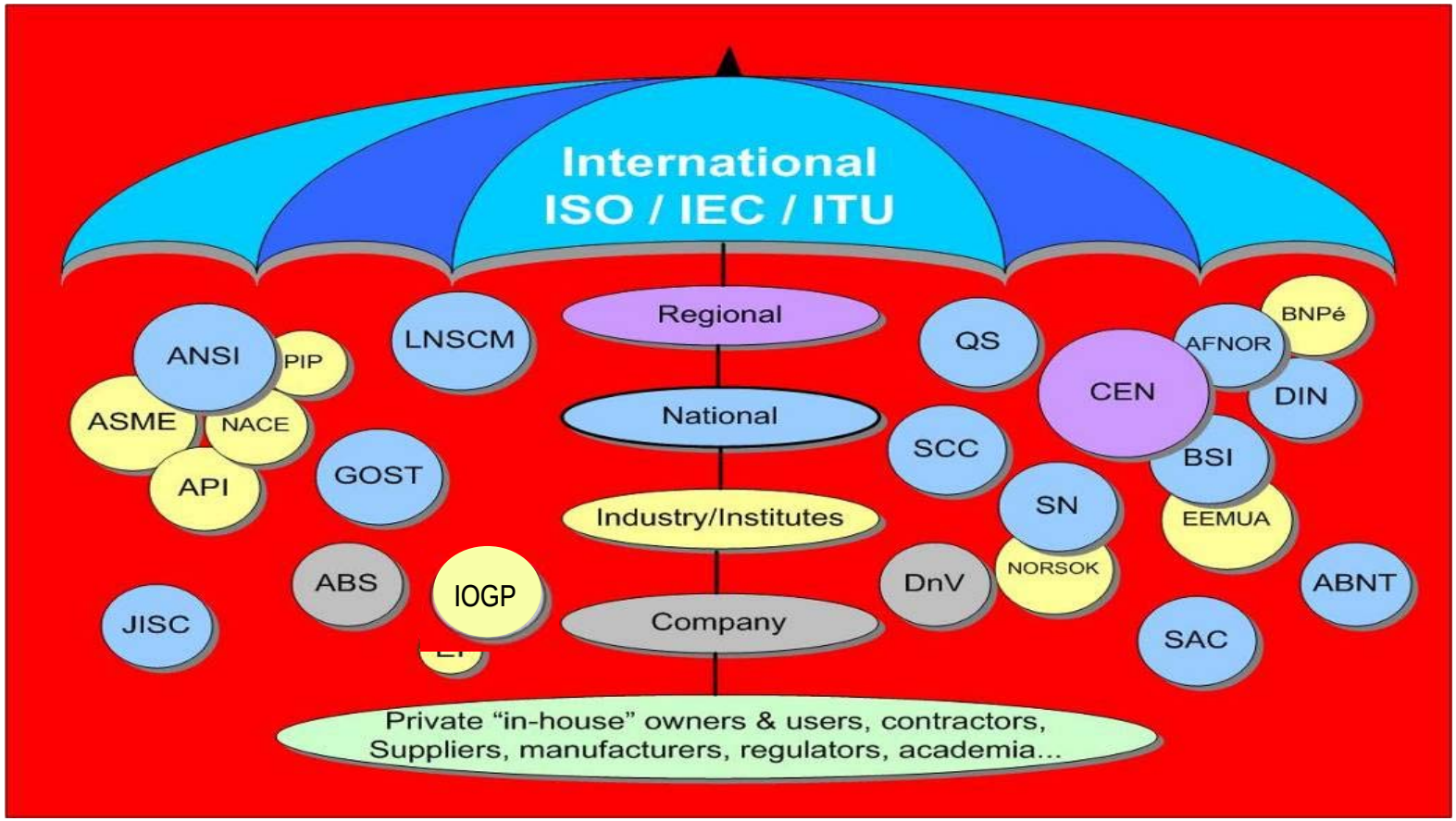
Average breakeven cost for an example major capital project



1. Includes a portion of cost of quality savings

Source: McKinsey Energy Insights

Lots of different standards developing organizations ..... and lots of different Operator Specifications!



We need to focus!

International Association of Oil & Gas Producers

IOGP's Members produce 40% of the world's oil and gas – safely, efficiently and reliably

IOGP works on behalf of the world's oil and gas companies and organizations to promote safe, responsible and sustainable exploration and production

The Association encompasses many of the world's leading publicly-traded, private and state-owned oil and gas companies, industry associations and major upstream service companies

- 78 Member Companies
- 3 offices – London, Brussels, Houston

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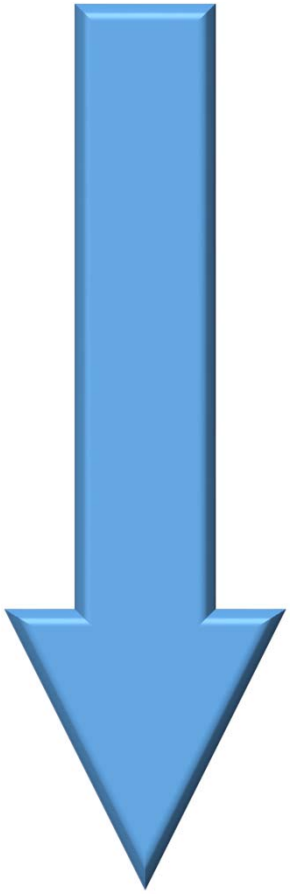
More information at **www.iogp.org/international-standards**

How do we drive costs down?



Simplification

- Design-to-cost – always minimum solution as starting point
- Drive for significant efficiency improvements in all cost

Standardization

- Standardize on cost effective design and limit variations
- Extensive effort to remove company specific requirements

Industrialization

- Maximize use of industry standards and supplier solutions
- Systematically strive for re-use of the Harmonised Industry Specification

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JIP33 Benefits to the Supplier

Optimization through simplification and standardization

Benefits

Bids and proposals

- **Standard bid template and clarification process**
  - Fewer questions to answer
  - Less deviation requests
  - Increased focus
  - Quicker response and decisions possible
- **Saved time, resources and costs**

Engineering and manufacturing

- **Harmonized engineering / more certain information**
  - Streamlined design and approval process
  - Fewer last-minute changes / interruptions
  - Fewer inspection hold points / quicker release
  - Repeatability enables continuous improvement
- **Enhanced efficiency and quality of supply**

Installation and commissioning

- **Streamlined equipment simplifies fleet management**
  - Reduced wiring / testing / tools / spare parts
  - Fewer items on secondary punch list
  - Condensed commissioning time
  - Reduced drawing updates required
- **Enhanced reliability and improved safety**

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JIP33 Vision & scale up

JIP33's vision for the industry is to unlock significant value and drive a permanent reduction in project costs through use of industry-level, global technical specifications for procurement of bulk materials, packages, modules and potentially, even projects

Phase 4 – Scale up

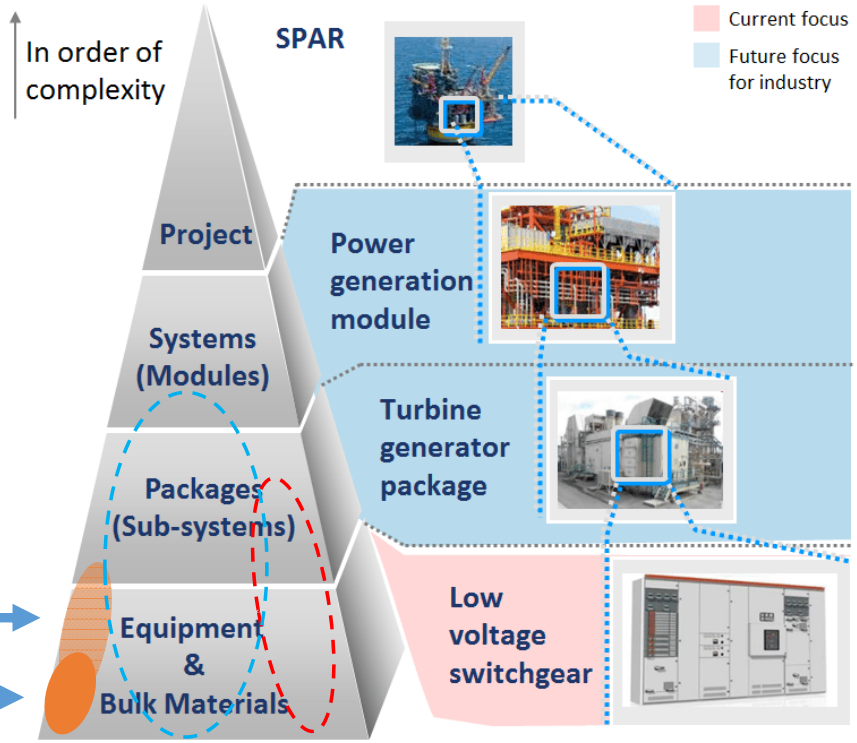
Phase 3 – Scale up

Scale Up – Number / Complexity

Proof of Concept

Phase 2

Phase 1 "Pilot"



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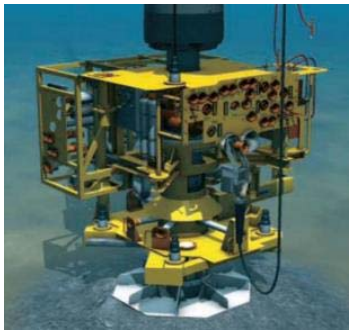
JIP33 Phase 1 equipment specifications for procurement

Ball valves

IOGP S-562 is based on API 6D 24th edition Specification for pipeline and piping valves.

Subsea xmas trees



IOGP S-561 is based on API Spec 17D subsea wellheads and XT requirements.

Low voltage switchgear

IOGP S-560 is based on the IEC 61439 low-voltage switchgear and controlgear assemblies.

Piping material

IOGP S-563 is based on NORSOK M-630 datasheets.

Specifications have been reviewed by suppliers:

AMPO, PENTAIR, AkerSolutions, Score Group plc, CAMERON, OneSubsea A Schlumberger Company, proserv, FMC, Perar, VALVITALIA GROUP, ABB, EATON, Rockwell International, POWELL VALVES, oliver valvetek, SIEMENS, Schneider Electric, DRIL-QUIP

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JIP33 Mandate & process

Develop standardized equipment specifications for procurement

Sub teams must understand the cost and justify the safety or business value where proposed requirements exceed minimum proven industry practice.

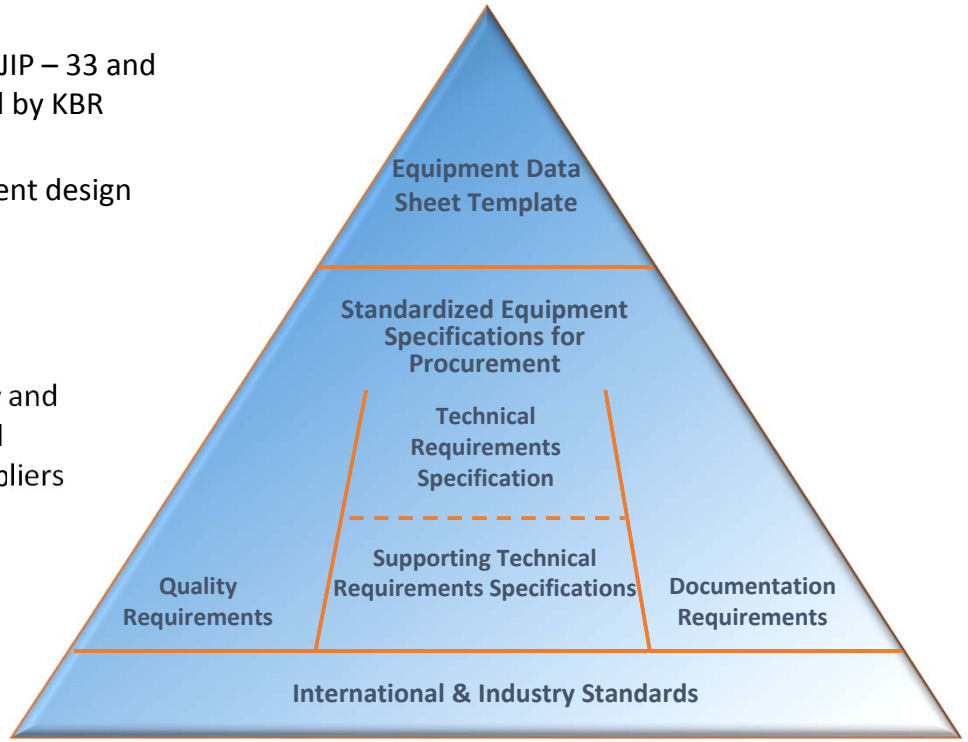
Subsea Xmas Tree example

Draft: Created under Subsea Committee prior JIP – 33 and further developed by JIP sub teams, supported by KBR technical experts, based on:

- The participating operating companies current design and procurement specifications.
- Supplement relevant industry standards.

Revision 1: Prepared by IOGP following review and alignment amongst the JIP members' technical experts and including first alignment with Suppliers

Revision 2: Issued by IOGP following further review with members and feedback by suppliers. Issued Nov ember 2016



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Work Group 9 – Phase 1 Deliverables
Supplementary requirements to API 17D – Subsea trees

- IOGP Specification 561 Rev 2 issued November 2016
- This Specification supplements API Spec 17D and is written as an exception style document. It gives preferred standard solutions and sets minimum requirements in interests of reaching agreed industry solutions.
- It is supported by two supplementary documents:
  - Supplier Deliverables Requirements List (561L)
  - Purchase Order Quality Requirements (561Q)

JIP 33 – Phase 2 Project Objectives

1. Agreed Procurement Specifications that focuses on Capex reduction, without losing sight of life cycle cost.
2. Applies to a significant portion of the oil & gas market
3. Minimised set of common supplementary requirements
   - reduced complexity and repetition / easier to apply / meets needs of operators
4. Broad adoption by IOGP Members
   - phasing out of individual company specifications
5. Supplier Involvement enabling future savings opportunities
   - suppliers adapt to common / standardized requirements
6. Complete and published by Mid 2018

JIP 33 Phase 2 – WG9 Scope and Boundaries

Title	Subsea Trees

Scope:	Update S561 Re v2 pilot phase specification covering the following aspects:
	• Address outstanding members comments from pilot phase and final alignment with Suppliuers
	• Update existing standard tree configuration and develop 3 further ones:
	  • Concentric Mono-Bore Vertical Tree on Tubing Head Spool (THS)
	  • Horizontal Tree, on wellhead
	  • Vertical, Dual-Bore Tree on wellhead
	  • Concentric Mono-Bore Tree, on wellhead – TH Annulus Isolation
	• Define Functional requirements for a Production Wing Block Assembly (PWBA) as a test for subsequent inclusion of other assemblies. Functional requirements definition will be limited for Phase 2 to the Block forging supply, including Materials, Welding & Inspection and associated documentation
	• Liaise with API17D Standards sub-committee to agree alignment

Boundaries:	• All Tree types, 10ksi pressure rating
Exclusions:	• Other sub-assemblies to be identified but not developed at this stage

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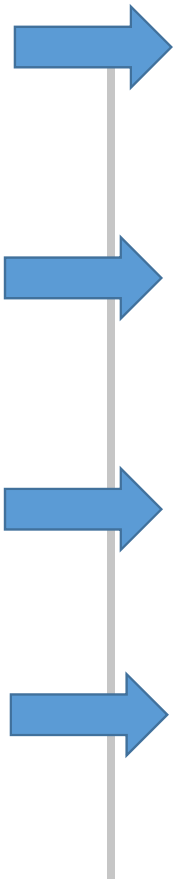
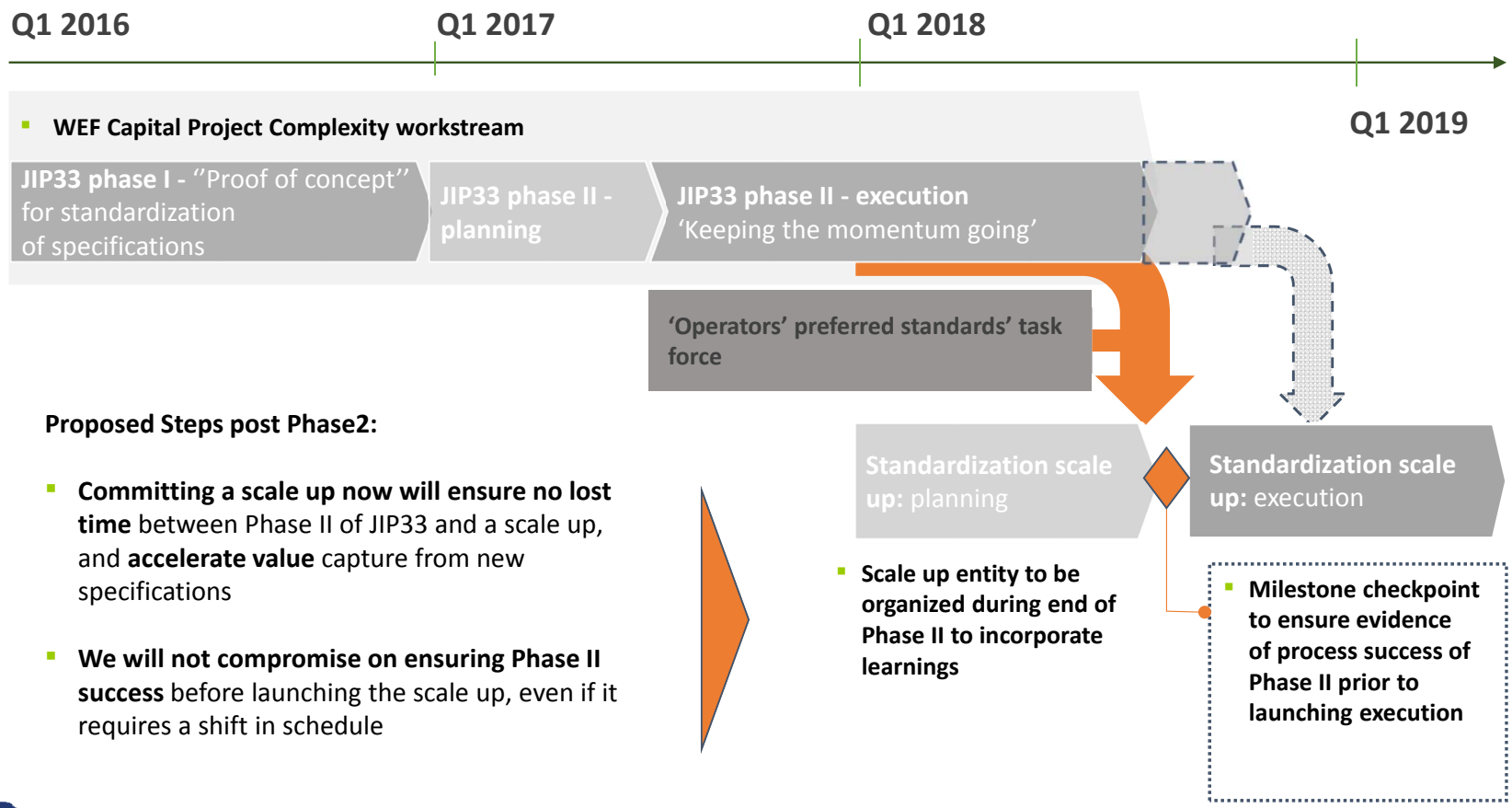
WG 9 Phase 1 and Phase 2 Criticalities

- Some Companies have already advanced internal standardization programs
- Common link among Reservoir, D&C, Engineering and Operation.
- A subsea XT is a “system” rather than a “single item”.
- Vendors have initiated their own “standardization/optimization” processes.



- Need to ensure to maintain existing best practices and results
- Need to combine different approaches, philosophies and specific technical requirements
- Need a P&ID to define it.
- Need to be “In phase” with Vendors processes to enhance efficiency avoiding disruption. Vendor Commitment and input is fundamental

Standardization Timeline - Phase 1 to Phase 3 and beyond (2019+)



Proposed Steps post Phase2:

- **Committing a scale up now will ensure no lost time** between Phase II of JIP33 and a scale up, and **accelerate value** capture from new specifications
- **We will not compromise on ensuring Phase II success** before launching the scale up, even if it requires a shift in schedule

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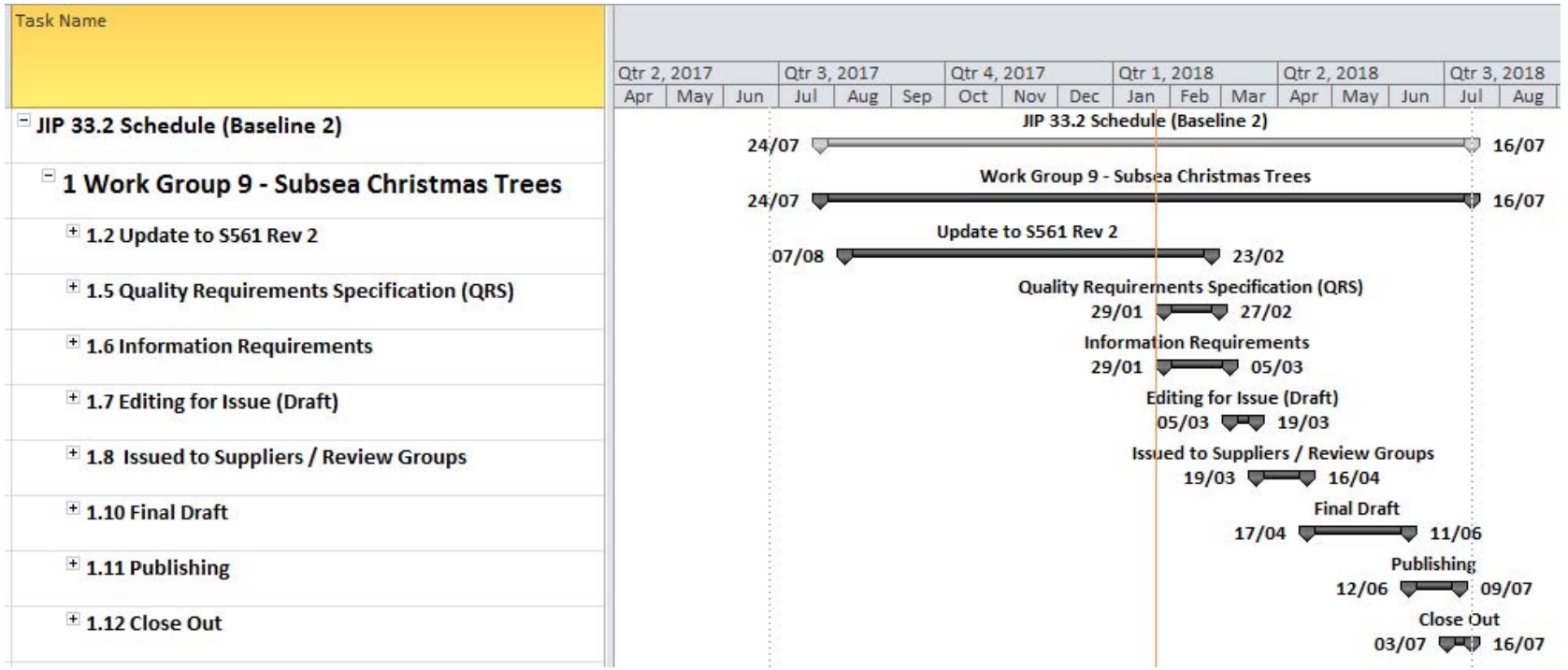
WG9 Summary Schedule



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THANK YOU

For more information please contact:

Giorgio Pastore
Eni SpA
Offshore Systems Engineering – Senior Knowledge Owner
IOGP JIP 33 – WG9 Lead SME
Ph. +39 02 520 61922
Mob. +39 347 6447871

www.iogp.org

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