MCE Deepwater Development 2017 =

DNV GL guideline removes unnecessary subsea documentation

-An industry collaboration

Bjørn Søgård DNV GL

DNV.GL



NH GRAND HOTEL KRASNAPOLSKY • AMSTERDAM • 3-5 APRIL 2017

- 1. The working phase, the JIP working process
- 2. The construction of the RP
- 3. Results by implementing the RP.



Subsea standardised documentation – How did it start?



2013: Subsea Standardization Workgroup

Focus Areas Selected

- 1. Unified Specifications and QA/QC for subsea forgings
- 2. Subsea component catalogue with configurable solutions
- 3. Universal Workover systems
- 4. Brownfield subsea re-engineering
- 5. Standardized subsea documentation
- 6. Compliance with established equipment standards







JIP Std Subsea Doc participants

Companies	& Organizations	Туре	2014	2015	2016
Aker Solution	s L Aker Solution	IS" EPC			
BrightPort	BRIGHTPOR	T SUP/IT			
Centrica	centric	OP OP			
DEA	D	OP			
Det Norske	6 0:14	P OP			
DNV GL	DNV	EPC			
ENI		ОР			
FMC TI	-FMO	EPC			
GDF Suez	GDF SVez	OP			
Kongsberg	KON	EPC			
Lundin	Lundin	OP			
GCE Subsea	GCE Global Centres of Expertise	TRADE ORG			
	TOTAL				13

Companies & Organizations	Туре	2014	2015	2016
Norsk Olje og Gass _{Norskolje} &gass	OBS			
Oceaneering OCEANEERING	SUP			
OneSubsea OneSubsea	EPCI			
PSA ettocicusticsynet	OBS			
Statoil	OP			
Subsea7 Subsea 7	EPCI			
Subsea Valley (SSV <mark>subsea valley.</mark>	TRADE ORG			
SUNCOR SUNCOR	OP			
TOTAL	20	17	17	13



A broader view on standardization







Scope SPS/SURF Lifecycle, information flow...





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Scope of the RP

The scope includes engineering, procurement, manufacturing, testing and mechanical completion and applies to;

- Permanently installed subsea equipment
- Temporary equipment delivered to Operator (lifting and transportation equipment, intervention equipment and tooling)

The main assemblies and equipment within the battery limits are:

- Wellhead System
- X-mas tree System
- Manifold and Subsea Structures
- Subsea Control System
- Static and Dynamic Umbilicals
- Flexible Risers and Flowlines
- Rigid Pipelines
- Tie-in System
- Lifting and Transport Equipment
- Intervention and Tooling

(Referring to ISO 13628-1)





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The Subsea Doc Recommended Practise (RP) contains;





Illustration of documentation transmittal between Operators, System suppliers and Suppliers







Joint Industry Project Standardising Subsea Documentation





Table A1 to B10 (Operator – Contractor)

Less Doc Types

	A	В	C	D	E	F	G	н		J	K	L	M	N	0	Р	Q	R	S			V	W	X	Y	2
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	Sub-system, assemblies and equipment		ion	12	ebo	8	Ced	Sci	t e	ed (E.	5		Arra	cSc	ā	tri	Dra	5	tion	Dat	ata	Sup	15		t ar
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	2				N5	N4	N3	N15	N16			N12	N1	N9		N8	N13	N17		N6	N2	N7	1			Ne
	3 MANIFOLD SAND STRUCTURES			0				0																0		
	4 MANIFOLD AND SUBSEA STRUCTURES	N11	x	x	0		x	x						0	0	0	R	0	0			0	x		1	
	5 STEEL STRUCTURE ASSEMBLY			X	•	•			•				•	•			•	•	•		-	_			-	
- 1	6 MECHANICAL EQUIPMENT (HATCHES, DAMPERS ETC AS APPLICABLE)			X		•			•				•	•		/	•		•					X	-	
	7 LARGE BORE PIPING (PRODUCTION AND INJECTION SYSTEMS)		X	X	0	•					х			0			•									
	8 SMALL BORE PIPING (HYDRAULIC AND CHEMICAL SYSTEMS)		X	X	0	•					х						•									
	9 HYDRAULIC ACCUMULATOR / SEA CHEST		X	X		•							•				•							X		
	10 HOT STABS (INCLUDING RECEPTACLE)					•							•	٠			•			-				X		
11	11 GUIDEPOSTS			X		•	X		•				•	0			X	X		•						
	12 PROTECTION STRUCTURES / FREE STANDING STRUCTURES	N18		X	٠	•			•					0		~	•		•	٠			X	×	•	•
	13 VALVES FOR MANIFOLDS																_									
	14 SMALL BORE VALVES, ROV OPERATED (HYDRAULIC / CHEMICAL)		X	X		•					x		•	0			R	٠	•		0		<u> </u>	_	—	•
	15 BALL AND GATE VALVES, HYDRAULICALLY OPERATED	-	X	X		•	X				X		•	0	•		R	•	•		0		<u> </u>	<u> </u>	+	•
	16 BALL AND GATE VALVES, ROV OPERATED		X	X		•	~				X		•	0			R	•	•		0		<u> </u>	<u> </u>	+	•
	17 CHOKE VALVE AND ACTUATOR 19 CHEMICAL INJECTION THROTTLE VALVE DETRIBUARIE (CITV)	+	×	×			×				×		•	0	•		в	•		•	0		<u> </u>		+	
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	20 STEEL STRUCTURE ASSEMBLY		^	x			^	^	•				•		•	<u> </u>							<u> </u>	<u> </u>	-	
	21 SUCTION ANCHORS (If part of Structure)	-		x										•				•					-	-	-	
	22 MUDMAT (If part of Structure)	-		X	•	•			_			•	•	•			•	_	•						+	
	23 PILES (If part of Structure)			x	•	•						•	•	•			•								<u> </u>	
	24 GROUT STABS (INCLUDING RECEPTACLE)					•							•	٠			•	٠	•				X			
	25 LEVELLING SYSTEM (PIPING, VALVES, SUCTION HATCH, STAB)			X		•			•				•	٠			•	٠	•							
	26 PERMANENT GUIDEBASE (PGB) (If part of structure)			X	•	•			•				•	٠			•	•	•	•						•
	27 GUIDEPOSTS			X		•	X		•					0			•		•	٠			X	X		•
	28																									
	29 NOTES	$ \land$																								
	N1: The Functional Design Spesification (FDS) shall include design, manufacturing and test														\frown											
	requirements for equipment and components. A separate FDS may be prepared to cover design													γ												
	30 requirements on system level, FDS should include thermal insulation system where applicable.	-																								
	31 included in OMM if agreed haveen the parties.						1 a 1											~				L .	1			
	32 3: FEAT for Manifold and Structures system includes stack-up and interchangeability testing	-			٩q	ree	ed-	mı	nır	ma	11 (re	auı	re	d)	lis	it c)† (10(cur	ne	enta	atı∕	on	(
	M: Dispatch dossier for each batch of delivered items. This is a compilation of evicting	1										_														
	documentation and normally not a separate document in MDR Whole title not expressed in this table					(b	V (DD	era	ato	rs	. C	on	tra	act	or	s a	inc	1 S	un	pli	ier	5)			
		"				1	1					1 -					Ē .				P		, , ,			



..Resulting in the following table in the RP

mmended practice, DNVGL-RP-O101 – Edition June 2016

Page 23

ub-system, assemblies and equipment functions	Document types: NOTES	Design report	Dispatch dossier	FAT procedure	Functional design specification	General arrangement drawing	Manufacturing and quality control Rec.	Operation and maintenance manual	Product data sheet	Scope of supply drawing	Spare parts interchangeability register	Stack-up-drawing
OTES		N3	N1				N6	N4	N4	_		-
							_	0		0	0	0
onductor housing		x			х	0	R	x		x	x	
ellhead housing		х			х	0	R	х		х	х	
asing hanger c/w pup		х			х	0	R	х		х	х	
ack off/seal assembly		х			х	0	R	х		х	х	
prrosion caps	N5	Х			х	0	R	х		Х	х	
OTES:												
11 Dispatch dossier for each batch of delivered items												
12 Not used												
Wellhead fatigue and deflection analysis shall be covered otherwise agreed in contract.	n design i	eport. De	sign rep	orts shal	l be issu	ed to op	erator o	to third	party fo	r verifica	ation unl	ess
14 Information covered by product data sheet shall be includ	ed in OMN	I. Outline	installati	ion proce	edure sha	all be inc	luded in	OMM or	issued a	as a sepa	arate doo	cument.
15 Corrosion caps are installed on wellhead when no Xmas tr	ee is insta	lled										
I6 Manufacturing and quality control records shall be availab and Table C-3 for details	e during t	he life of	the field	and are	either re	etained b	y suppli	er or ser	nt to pur	chaser. S	See Table	e B-11
X This is documentation that is covered by the documentation	on for the	sub-syste	ım (welli	nead syst	tem)							
Documentation required for the project phase - to be tran	smitted fi	om syste	m suppli	er to ope	rator							
R Documentation to be retained at system supplier during p	roject exe	cution										
Documentation also required for the operational phase -to	he transr	nitted fro	m eveter	n cupolie	r to the	operator	during	the proje	act phase	-		



JIP Subsea Documentation



DNVGL-RP-O101 is independent of company systems and work processes.



What O101 say and not say.....

DNV GL RP O101 does not say anything of:

- 1. Document content (would like to detail out standard ToCs)
- 2. Quality of the document
- 3. Acceptance criterion to functionality for the products
- 4. Fit for purpose of the component or equipment (in a larger system)
- 5. Meeting quality objectives for the product or measure the quality towards a design basis.
- And Appendix D describes the listed documents with a description of *what* the content is expected to be and the *purpose* of the documents.



Implementation approaches...

And results!



Into the heart of implementation – need for collaboration

MCE Deepwater Development 2017

FMC Technologies





Statoil – Technical Requirement





Governing document	Classification: Open Teo rec 20	chnical Juirem 15-05	and ent, -13	l pro TR2	ofe 23	es 81	si 1,	on Va	al al i	d	fr	01	1
	Electrical Part 1 of 2:		1		-	v	2	e 0	• <mark>0</mark>	•	0	• •	
LCI Requirements		lef.	landover format	filestone	attery	us duct	:lectric Motor - High voltage	ilectric Motor – Low voltage	ectrical cathodic protection	ectrical neater control (EK tag) lectrical process heaters	ectrical space heater	lood lights	reduency converter (ER tad)
Operation and maintenance (OM)	Certificate of conformance	5.40	PDF	≥ LCI2	B	8	ж	ш	шı х)	иш х	ш	ш	ц х
Technical and professional requirement, TR2381, Final Ver. 5, valid from 2015-05-13 Owner: Leader TEX LCI	Circuit/Wiring diagram	5.43	PDF	LCI 2	x		x	x	x)	x			x
Validity area: Available for implementation/Available for implementation/On- and offshore	Data sheet - Product	5.57	PDF	LCI 2	х	x	х	x)	x			Х
	Detail drawing with parts lis	5.76	PDF	LCI 1			x		x >	x			x
	Documentation for dispatch receipt, storage and presen	ation <u>5.79</u>	PDF	LCI 1	х		x)	x			x
	Explosion protection certific	ates <u>5.100</u>	PDF	LCI 2			23 X	23 X	23 X	23 23 X	23 X	23 X	Ī
	General Arrangement Draw	ing <u>5.121</u>	PDF	LCI 2	X X	х	х	x	x	x			Х
	Installation, Operation and Maintenance manual (IOM	manual) <u>5.147</u>	PDF	LCI 1	x	x	х		x	x			>
	Manufacturing Record Bool	(MRB) <u>5.167</u>	PDF	LCI 2			24 X		24 X	24			,
	Single line diagram (Suppli	r) <u>5.215</u>	PDF	LCI 2									
	Single line diagram (Supplic									_			

RP Input



Views and trends from one of the JIP Members (Operator)

- Tested the applicability of RP O101, resulted in 86% matching for the selected project
- Potential to reduce the amount of reviews for Operator with 42% and for Contractor with 49%
- Interest in reusing documentation between projects
- Interest in copying documentation within projects
- Less transactions
- Improving DC/DM working procedures, emphasize on collaboration

Supplier	Total Docs in MDR	Total Docs in	Total Docs in this XL	Found in RP	Not found in RP	Optional Docs (or Topside)	G1/R	G2/S	Not found in	/RP Match%	Average reviews	Average personn el	Estimated Time pr review	Total hrs	Potential saving (hrs)
		130	130	122	8	1	93	0	0	93,85%	1,05	6,23	1,5	1 275,6	912,5
	117	60	59	38	21	0	16	10	0	64,41%	1,85	4,71	1,5	771,1	209,1
	279	279	279	234	45	1	25	11	0	83,87%	1,09	3,45	1,25	1 311,5	117,5
	90	116	116	112	4	1	4	16	9	96,55%	1,09	2	1,5	379,3	13,1
	45	44	44	35	9	0	8	18	7	79,55%	1,14	4,18	0,5	104,8	19,1
	79	103	102	96	6	0	35	28	0	94,12%	1,09	7,03	1	781,6	268,2
	83	77	77	68	9	0	63	4	0	88,31%	1,17	8,01	1	721,6	590,4
	12	4	4	3	1	0	2	1	0	75,00%	1	9	1,5	54,0	27,0
	16	15	15	8	7	0	6	2	0	53,33%	1	8,07	1,5	181,6	72,6
	30	9	9	6	3	0	4	0	0	66,67%	1,22	8	1,5	131,8	58,6
1	21	18	18	10	8	0	6	3	0	55,56%	1,11	8	1,5	239,8	79,9
		9	9	6	3	0	5	1	0	66,67%	1,33	8	1,5	143,6	79,8
	101	92	92	88	4	0	43	36	9	95,65%	1,28	8	0,75	706,6	330,2
	73	60	60	51	9	0	36	7	0	85,00%	1,48	8	0,75	532,8	319,7
		9	9	6	3	0	0	4	0	66,67%	1	8	0,75	54,0	0,0
Summary	946	1025	1023	883	140	3	346	141	25	86%	1,19	6,71	18	7 389,7	3097,8







Summary for standardization

Company standards (procedures) have a positive effect on businesses because they help

improve internal processes

- When it comes to relationships between suppliers and customers, industry-wide standards are the main instruments used to *lower transaction costs*
- Standardisation creates *predictability* throughout the supply chain
- The cost battle cannot be won by initiatives enforced to one party only! The entire supply chain has to contribute (Operators, System suppliers, Suppliers)



Conclusions from project experience

- The RP has proved in projects to save resources and costs
- The RP has proved to be a good structure for sharing environment and databases
- The RP has proved to be an enabler for new contracting strategies between Operator, SPS and SURF

