



OFFSHORE NORGE

WHO WE ARE

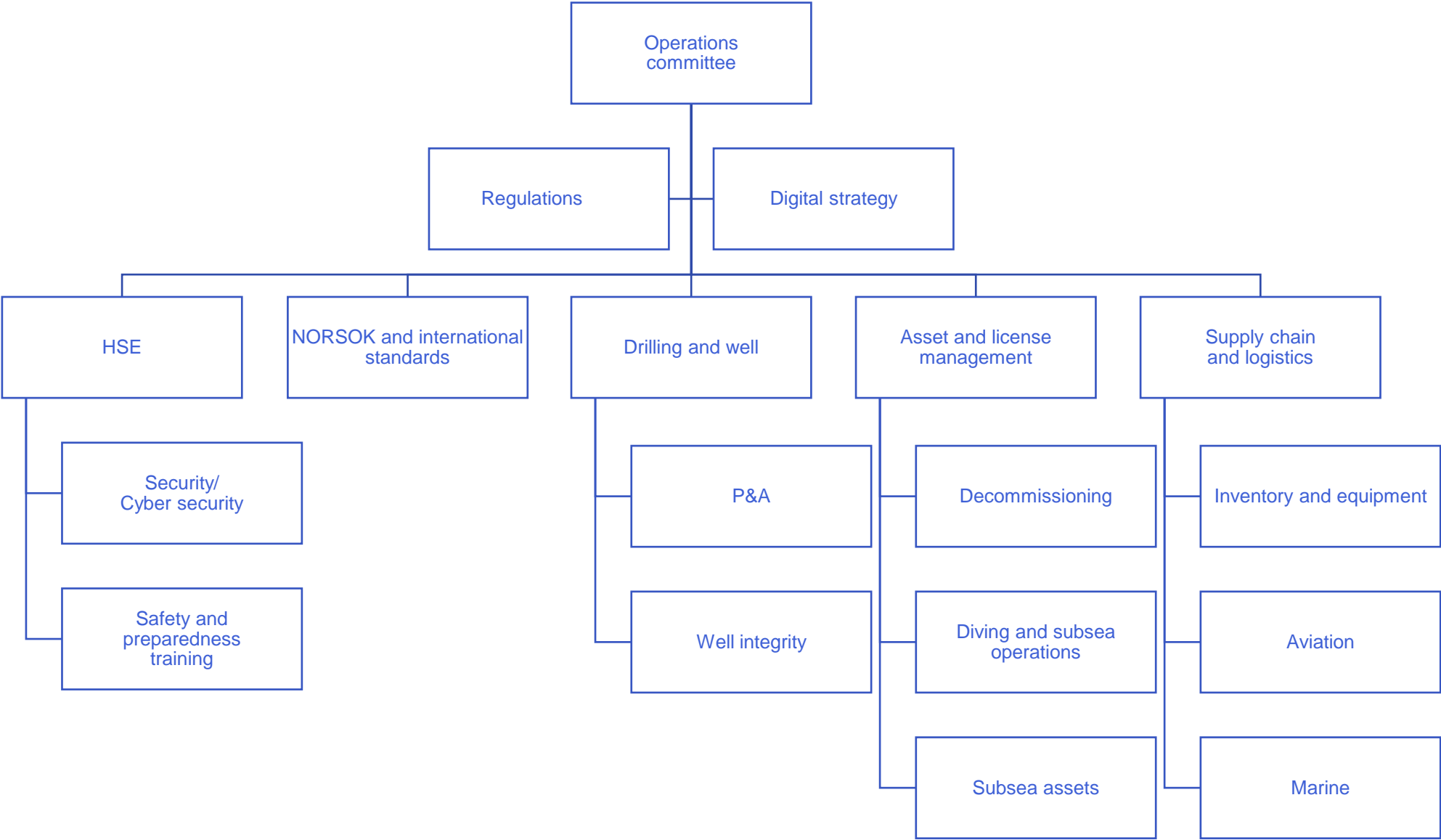
Offshore Norge organises companies producing oil and gas, suppliers to activities on the Norwegian continental shelf, as well as companies in ocean-based renewable energy production and offshore mineral extraction.

We fulfil a range of roles:

- Employer organisation
- Interest group toward authorities and society
- Arena for industry cooperation
- Offshore Norge represents over 100 member companies with around 35.000 employees



OPERATIONS COMMITTEE – FORA/NETWORKS





OFFSHORE NORGE

WELL CONTROL

ORGANIZATION



- Forum for drilling and well
 - Follows up matters within drilling & well operations, well control incidents, well integrity and P&A
 - High focus on exchange of experience and best practices
 - Participants Operators / Partners on the NCS, typically at drilling manager level
 - Each year summarizes well control incidents for a given year with a recommendation on improvements
- Well incident task force
 - Focus on sharing and learnings from well control incidents
 - Participants selected operators / partners, drilling contractors, well interventional companies
 - 4 meetings each year, where minimum **one meeting focuses solely on well intervention**
 - Periodically develops «A sharing to be better case»

OFFSHORE NORGE GUIDELINE 135



135 – Offshore Norge
Recommended guidelines for
Classification and categorization of well
control incidents and well integrity
incidents

Final

Objective

- Categorization and classification of well control incidents.
- Classification of well integrity incidents in the operational and production phases.
- Correct evaluation and alerting, notification and reporting to the authorities.
- Learning and experience transfer from well incidents.

OFFSHORE NORGE GUIDELINE 135



Degree of seriousness	Well intervention	Guidance
Level 1- Red Critical well control incidents	1. Blowout	1. Blowout to environment or facility. Failure of primary and secondary barriers that can be handled by relief well drilling, capping or handled on the installation.
	2. Failure of primary and secondary barriers	2. Well control equipment damaged from external loads or non-shearable item stuck across BOP and safety head. Well flowing to surroundings. Well killed or well capped on location.
Level 2 – Yellow Serious well control incidents	1. Failure of primary well barrier. Activation of secondary well barrier – no other redundant barrier elements available.	1. Well secured by closing one single valve (safety head or XT valve). String blocking other valves preventing redundant barrier element.
	2. Failure of primary well barrier. Activation of secondary well barrier – other redundant barrier elements available	2. Well secured by closing one single valve (safety head or XT valve). Additional valve(s) available to act as redundant barrier element.
Level 3 – Green Regular well control incidents	1. Temporary reduction of well barrier element function	1. Failure of one well barrier element. Activation of redundant well barrier elements and reestablishment of well barrier element within primary barrier. Secondary barrier intact.
Level 4 – Non-Classified (NC)	1. Very small leak, no activation of BOP necessary.	1. Very small leak, able to pull out of hole and close normal lubricator valves to repair leak. Two barriers intact.
	2. Loss of primary or secondary barrier without influx into the well.	2. Incidents where a barrier is compromised but no influx has occurred.

Matrix for categorization and classification of well control incidents - Well intervention operations.

Tan = Alert to PSA according to management regulation

Blue = Notification to PSA according to management regulation

Grey = Alert or Notification to PSA depending in potential in accordance with Management Regulations § 29

Form: [Confirmation of alert/notification to Petroleum Safety Authority](#)

OFFSHORE NORGE GUIDELINE 135



Well control incident

Location: <Location>
Rig type: <Rig type>
Well type: <Well type>
Date: <Date>

Plan:
 • Description of plan.....

Operation with course of events:
 • Event description.....

Reason for events:
 • Free text evaluation

Lessons Learned:
 • Free text evaluation

Recommended actions:
 • Free text evaluation



Well control incident category:

Well control incident



Location: <Location>
Rig type: <Rig type>
Well type: <Well type>
Date: <Date>

Critical Issues:
 • Free text evaluation

Direct Cause:		Underlying Cause:	
<input type="checkbox"/>	Prognosis incorrect	<input type="checkbox"/>	Risk accepted
<input type="checkbox"/>	Shallow gas	<input type="checkbox"/>	Error in program / procedure
<input type="checkbox"/>	Shallow water flow	<input type="checkbox"/>	Procedure not followed
<input type="checkbox"/>	Incorrect mud weight	<input type="checkbox"/>	Lack of competence
<input type="checkbox"/>	Swabbing	<input type="checkbox"/>	Communication error (missing, wrong, incomplete, etc.)
<input type="checkbox"/>	Ballooning	<input type="checkbox"/>	Incorrect use of equipment
<input type="checkbox"/>	HC accumulation below barrier element	<input type="checkbox"/>	Equipment failure
<input type="checkbox"/>	Surface pressure control system failure	<input type="checkbox"/>	BOP failure
<input type="checkbox"/>	Downhole mechanical barrier failure	<input type="checkbox"/>	Other:
<input type="checkbox"/>	Downhole cement / casing barrier failure	<input type="checkbox"/>	
<input type="checkbox"/>	Other:	<input type="checkbox"/>	



OFFSHORE NORGE

SHARING TO BE BETTER

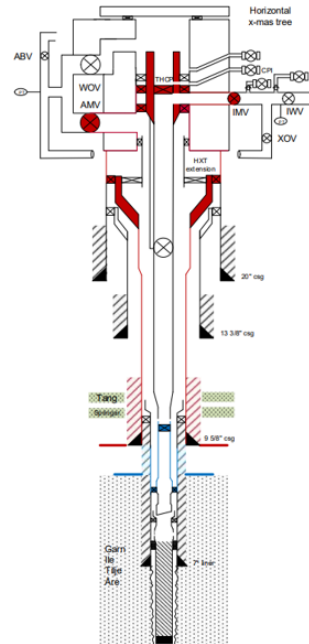
SHARING TO BE BETTER



PLANNED OPERATIONS

- P&A and perform sidetrack on 21 years old subsea injector.
- Well have been re-drilled and recompleted several times. This is 4th track.
- 13 3/8" and 9 5/8" casing installed in 2014 in oil based mud. Last operation on well, a recompletion in 2017.
- Pre-P&A performed by RLWI (Riserless Light Well Intervention). Installed deep mechanical plug, cut tubing and displaced A-annulus to new fluid from cut and up.
- Planned as standard P&A including pulling tubing, 9 5/8" casing and 13 3/8" casing. Next sidetrack to start from 20" casing using whipstock.

- Which risks do you recognise for this type of P&A operation?
- What are the main differences plugging subsea wells compared to platform wells?
- How would you prepare for this operation?



Barrier status after RLWI operation:

Well barrier elements	Ref. WBEAC tables	Verification of barrier elements
PRIMARY		
1. In-situ formation	51	Stress: 1.02 kg
2. Cement outside 7" liner	22	Verified by logging
3. 7" liner	2	Pressure tested to 310 bar WH with 1.45 kg DBM
4. Injection packer	7	Pressure tested to 310 bar WH with 1.05 kg brine
5. Tubing	25	Pressure tested to 310 bar WH with 1.05 kg brine
6. Mechanical plug	28	Pressure tested according to LMI program
SECONDARY		
1. In-situ formation	51	Stress: 1.75 kg
2. 9 5/8" casing cement	22	Verified by job performance
3. 10 3/4" x 9 5/8" casing with casing hanger	2	Pressure tested to 310 bar WH with 1.45 kg DBM
4. Wellhead with 10 3/4" seal assembly	5	Pressure tested to 310 bar WH with 1.50 kg DBM
5. Tubing hanger with seals	10	Pressure tested to 310 bar WH with 1.05 kg brine
6. Tubing hanger crown plug	11	Pressure tested according to LMI program
7. X-mas tree connector	31	Pressure tested to 310 bar WH
8. X-mas tree valves/body	31	Pressure tested to 310 bar WH with 1.05 kg brine
Disp. no.	Comment	
well integrity issues		

- Periodically, the well incident task force
 - selects one well control incident with respect to high possibility of learnings
 - develops case/training package to be shared publically
- So far 23 cases developed
- Feedback from contractor / supplier industry as users of this information – extremely positive and high usage with respect to training of personell