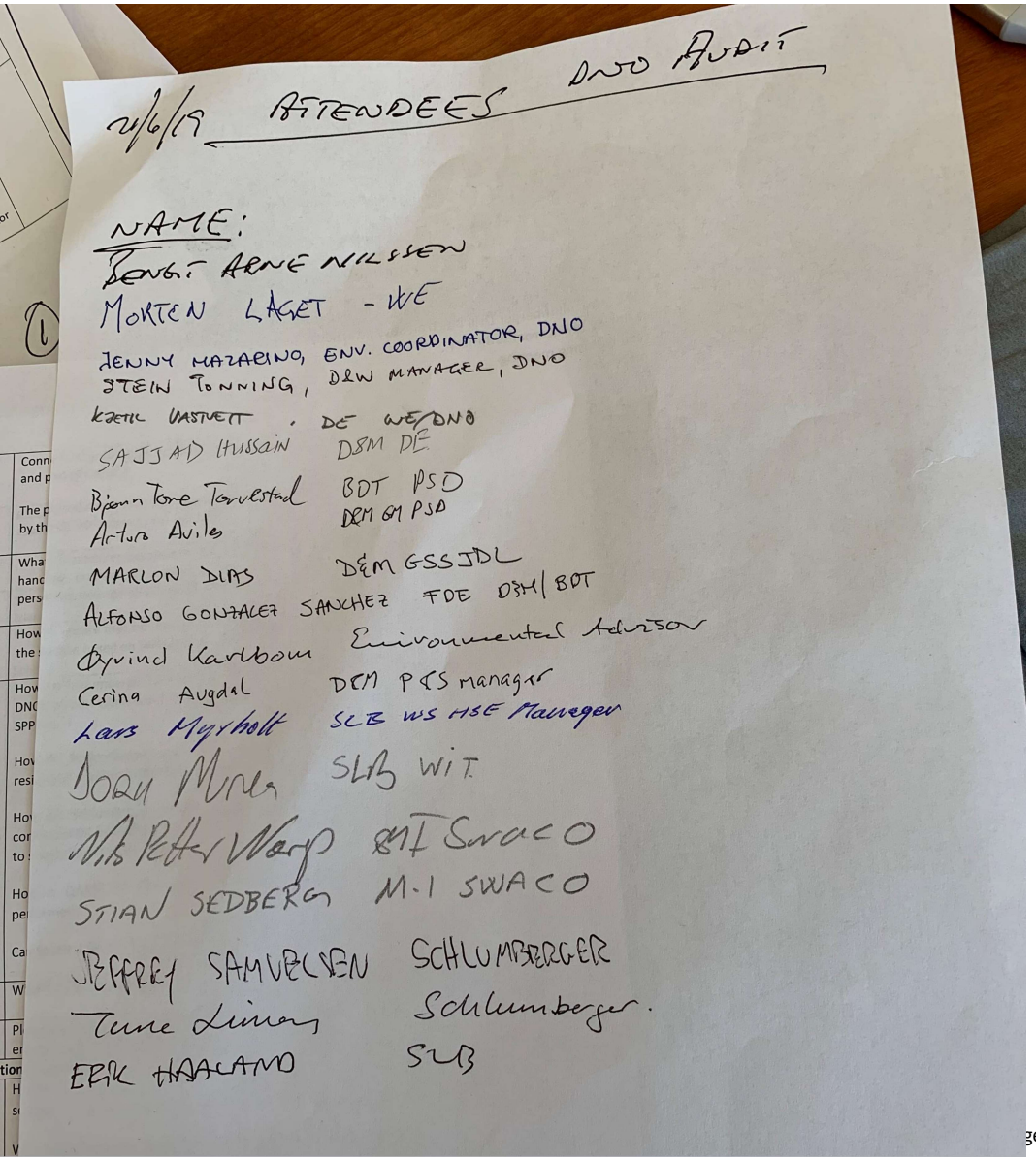
DNO/Well Expertise Audit for the Canela well

Stavanger 21 June 2019

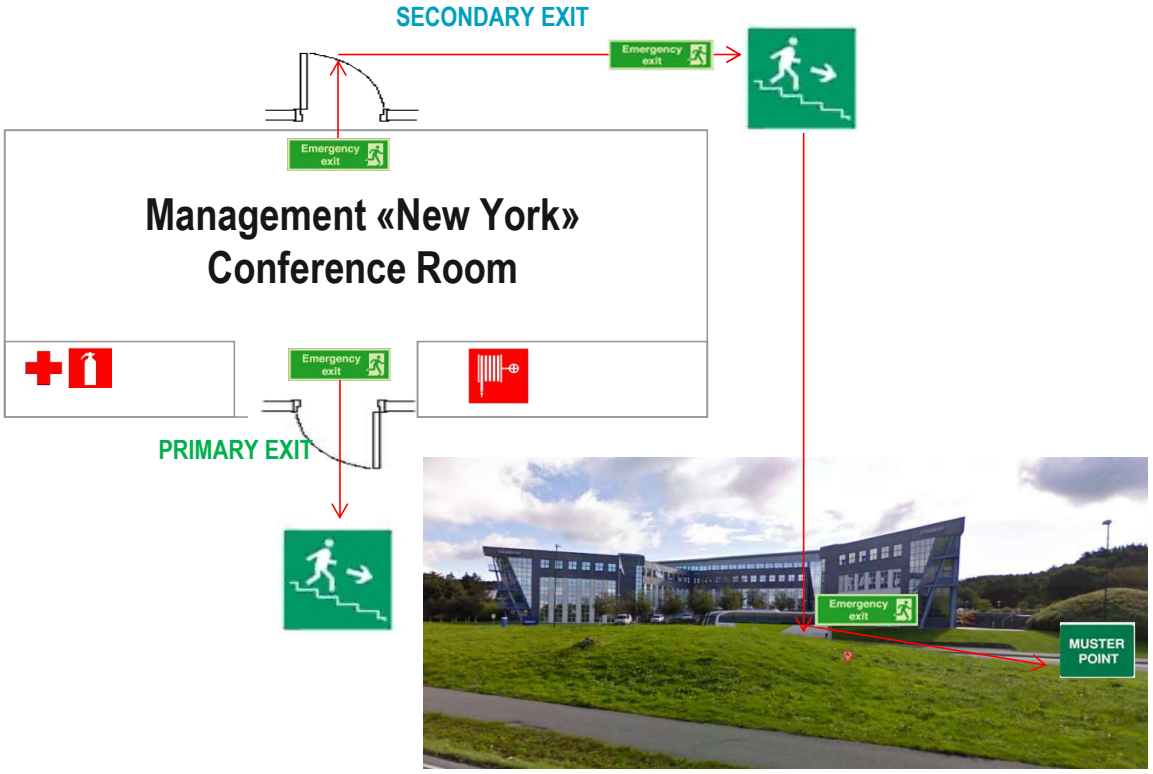
Schlumberger SAFE

HSE SCA



Attendees List

Safety Briefing - S400 Conference Room R3

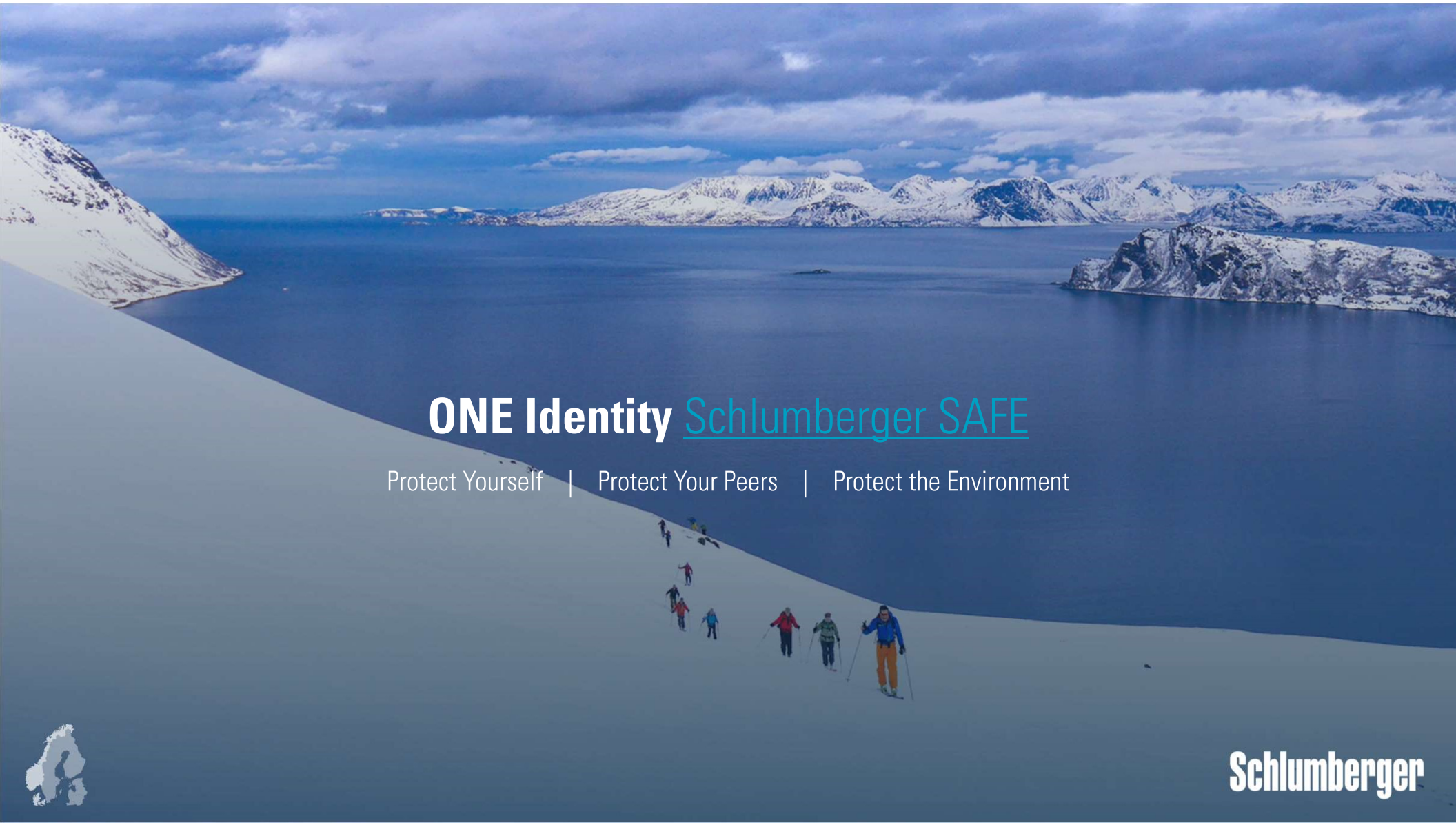


- No drills planned
- In case of an emergency evacuation the alarm will give 3 signals followed with a PA message
- Used the stairs not the elevator
- Please follow your host all the way to the muster point
- First Aid trained personell in the reception

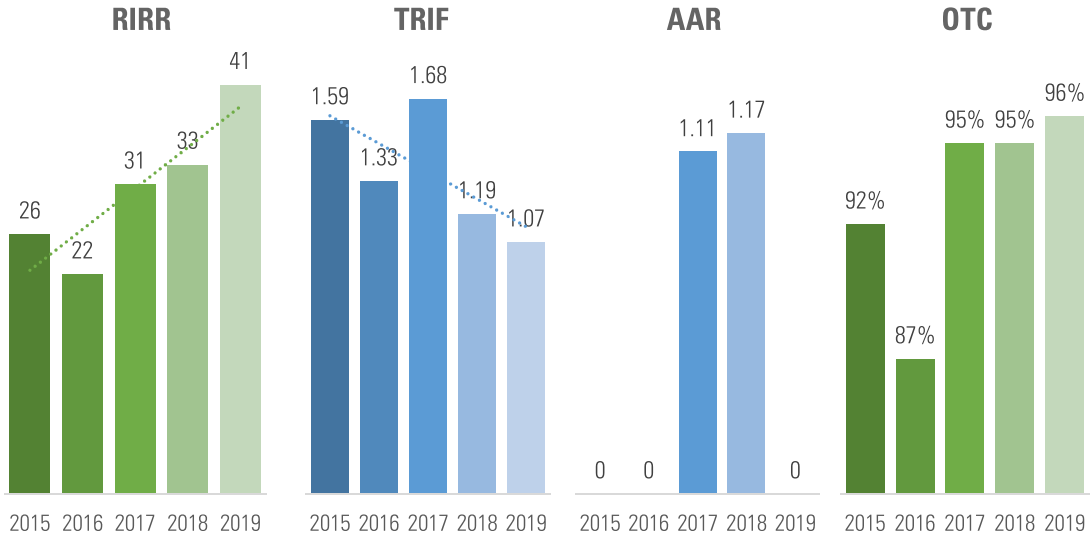
Schlumberger SAFE

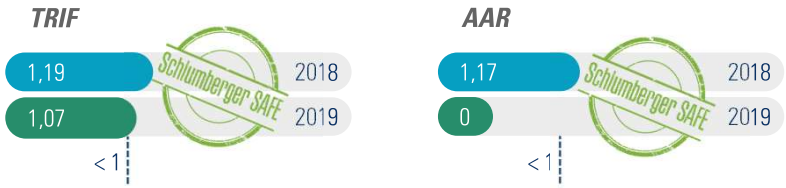
Agenda

- 11:00-11:15 Welcome and Introduction
- 11:15-11:30 Schlumberger Safety Moment + Schlumberger HSE Performance
- 11:30-12:00 Schlumberger Cement and Mud
- 12:00-12.30 Lunch
- 12:30-13:00 Schlumberger Cement and Mud
- 13:00-13.20 Schlumberger Mudlogging
- 13:20-13:40 Schlumberger DD/MWD/LWD
- 13:40-14:00 Schlumberger Drill Bits
- 14:00-14:30 Verification team internal summary
- 14:30-15:00 Verification closing meeting


ONE Identity Schlumberger SAFE
Protect Yourself | Protect Your Peers | Protect the Environment
Schlumberger

SCA our HSE Results





HSE SCA

Lowlights 2019 YTD

- Total 4 Recordable Injuries - Wells (MI, BDT and WL)

Highlights 2019 YTD

- SCA TRIF at 1,07 = Schlumberger SAFE
- SCA AAR at 0 = Schlumberger SAFE
- SCA RIRR > 40 & OTC > 95% = On Target

Focus Ahead

- SCA Getting ready for the LIFE SAVING RULES Campaign - Who are you saving your life for?

Schlumberger SAFE

Verification Meeting - Schlumberger Cementing

DNO, Well Expertise - Canela

21-June-2019

Schlumberger SAFE

HSE SCA

2.1 Support

- Schlumberger to plan for experience transfer meeting after CNOOC wells as DNO expects little information handed over prior to Canela start up.
  - WIT UK team was approached with regards to the experience transfer. This will be done as soon as the work on the UK sector is finalized.

2.2 Personnel

- Offshore personnel selection
  - Maintain as much consistency in crews as possible.
- WIT Cement Coordinator
  - Dedicated JDL to follow up on the operations.

HSE – Working Environment, Chemicals & Environment

HSE SCA

Schlumberger SAFE

3.1 - Chemical Management

- REACH: Are all your chemical components of individual products registered? Are all SDS' in accordance with REACH?
  - All the chemicals intended for Island Innovator – Canela have been REACH-registered. The SDSs are in accordance with REACH. Schlumberger GRC-C (Global Regulatory Compliance – Chemicals) has its own REACH-team.

- Explain process for ensuring that chemicals and cement on rig meets specification of laboratory tests.

  Confirmation lab tests are completed with rig chemicals and same LOT number. Samples can either be taken when sent from the supply base. Samples are QA/QC when they arrive at the LAB (density measurement).

ID	Title	Risk assessed by	Location	Activity	Tradegroup	Product	Auth for Use	QA	Initial Skin	Initial Air	Skin	Air	Date
CR-SLB-180004	D193 - Fluid Loss Additive	Nadya Lyapunova	Well Services (WS)\Rigs\Island Innovator	Connecting / disconnecting Wipe up	Wellservice worker	D193 - Fluid Loss Additive	AC		3	1	2	1	19.01.2018
CR-SLB-180005	D956 - G + silica cement	Nadya Lyapunova	Well Services (WS)\Rigs\Island Innovator	Connecting / disconnecting Sampling of chemicals Visual inspection	Wellservice worker	D956 - Glass G-Silica Blend	AC		3	3	1	1	19.01.2018
CR-SLB-170103	HEMPEL'S THINNER 08080 used on Island Innovator	Nina Øvrehus	Well Services (WS)\Rigs\Island Innovator	Mixing (manually) Passive exposure. Painting with brush and roll	Process technician	HEMPEL'S THINNER 08080	A		3	3	2	1	23.06.2017
CR-SLB-170099	Sodium Fluoride used on Island Innovator	Nina Øvrehus	MI-SWACO\Offshore\Island Innovator	Filling / emptying Sampling of chemicals Wipe up	Lab technician	Sodium fluoride for analysis EMSURE® ACS,ISO,Reag. Ph Eur	A		2	3	1	1	22.06.2017
CR-SLB-170096	Potassium Chromate 5% used on Island Innovator	Nina Øvrehus	MI-SWACO\Offshore\Island Innovator	Sampling of chemicals Filling / emptying Mixing (manually) Wipe up	Lab technician	POTASSIUM CHROMATE 5%	A		3	2	2	1	22.06.2017
CR-SLB-170102	Loctite 243 and 272 used on Island Innovator	Nina Øvrehus	Wireline (WL)\Offshore\Island Innovator	Assemble /disassemble Assemble /disassemble	Process technician	LOCTITE 243 Loctite 272	A		3	2	1	1	22.06.2017
CR-SLB-170097	Potassium hydroxide 8 N used on Island Innovator	Nina Øvrehus	MI-SWACO\Offshore\Island Innovator	Sampling of chemicals Moving / transporting Mixing (manually) Filling / emptying Wipe up	Lab technician	POTASSIUM HYDROXIDE 8 N	A		3	2	2	1	22.06.2017
CR-SLB-170098	Sodium Hydroxide 1N/8N used on Island Innovator	Nina Øvrehus	MI-SWACO\Offshore\Island Innovator	Wipe up Mixing (manually) Filling / emptying Sampling of chemicals Moving / transporting	Lab technician	SODIUM HYDROXIDE 1 N SODIUM HYDROXIDE 8 N	A		3	2	2	1	22.06.2017
CR-SLB-170095	CHEMSTAR ANTIFREEZE SUPER used on Island Innovator	Nina Øvrehus	Well Services (WS)\Rigs\Island Innovator	Filling / emptying	Process technician	CHEMSTAR ANTIFREEZE SUPER	A		1	3	1	1	22.06.2017
CR-SLB-170101	HACH Formazin Turbiditet Standard used on Island	Nina Øvrehus	MI-SWACO\Offshore\Island Innovator	Sampling of chemicals	Lab technician	HACH Formazin Turbiditet Standard	A		3	2	2	1	22.06.2017

3.1 - Chemical Management

- Measurement program, how is it developed and updated? What does it include?
  - The SLB-crew creates environmental reports after each job. For cementing the amount of chemicals used, left in well, discharged, or sent to shore is measured during the job. EiC enters the data into Client's environmental reporting database. Obsolete chemicals are sent to shore for re-use or for disposal

Miljøregnskap

Forbruk og utsumption and discharge of cement chemicals

Felt / Field					Total Well									
Gråspett					Forbruk Consumption Used		Reinjected Reinjected		Til land som avfall Sent to shore		Etterlatt i brønn Left in Well		Til sjø To Sea	
Handelsn					Amount		Amount		Amount		Amount		Amount	
Chemical	13 3/8" Csing	9 5/8" Casing	P&A	Contingency										
B143						0 Kg		0 Kg		0 Kg		0 Kg		0 Kg
B151					1200 Ltr	1380 Kg		0 Kg		0 Kg	1000 Ltr	1150 Kg	200 Ltr	230 Kg
B165					3600 Ltr	4068 Kg		0 Kg		0 Kg	3000 Ltr	3390 Kg	600 Ltr	678 Kg
B174					544 Kg	544 Kg		0 Kg		0 Kg	374 Kg	374 Kg	170 Kg	170 Kg
B018					31238 Ltr	43108 Kg		0 Kg		0 Kg	30038 Ltr	41452 Kg	1200 Ltr	1656 Kg
B213					3542 Ltr	4250 Kg		0 Kg		0 Kg	3092 Ltr	3710 Kg	450 Ltr	540 Kg
B237						0 Kg		0 Kg		0 Kg		0 Kg		0 Kg
B298						0 Kg		0 Kg		0 Kg		0 Kg		0 Kg
B323					4000 Ltr	3520 Kg		0 Kg		0 Kg	2000 Ltr	1760 Kg	2000 Ltr	1760 Kg
B411					554 Ltr	526 Kg		0 Kg		0 Kg	479 Ltr	455 Kg	75 Ltr	71 Kg
D077					1560 Ltr	2153 Kg		0 Kg		0 Kg	1260 Ltr	1739 Kg	300 Ltr	414 Kg
D095					1133 Kg	1133 Kg		0 Kg		0 Kg	1080 Kg	1080 Kg	53 Kg	53 Kg
D157					6000 Kg	6000 Kg		0 Kg		0 Kg	5000 Kg	5000 Kg	1000 Kg	1000 Kg
D168					3600 Ltr	3888 Kg		0 Kg		0 Kg	3000 Ltr	3240 Kg	600 Ltr	648 Kg
D174					1200 Kg	1200 Kg		0 Kg		0 Kg	1000 Kg	1000 Kg	200 Kg	200 Kg
D176					1200 Kg	1200 Kg		0 Kg		0 Kg	1000 Kg	1000 Kg	200 Kg	200 Kg
D191						0 Kg		0 Kg		0 Kg		0 Kg		0 Kg
D193					6000 Ltr	6000 Kg		0 Kg		0 Kg	5400 Ltr	5400 Kg	600 Ltr	600 Kg

3.1 - Chemical Management

- It is expected that all Schlumberger chemicals on Island Innovator have updated SDS. How do you secure that all chemicals taken onboard are registered in the rig's system (EcoOnline) or in binders on the rig? Please verify.
  - This is covered by SLB Norwegian appendix to QHSE std 8- ENVIRONMENT, and QHSE std 6 – HEALTH. the crew is required to have hard copies of the SDSs available. According to QUEST reporting system, the Schlumberger crew is frequently checking and replacing SDS-hard copies
  - The Schlumberger chemicals intended for operation are approved by current operating oil company. This is handled by EiC and HSE.
  - The maintenance / workshop chemicals have been subject to application through the Drilling contractor application system.
- How to ensure that no non-approved chemicals enter the rig? Routines for ensuring compliance with AfD (remove CNOOC chemicals).Please provide your procedures for these two cases.
  - Mobilization is requested by the JDL in accordance with the chemicals planned for the project. This chemicals are added in advance to the discharge permit.

3.2 – BAT practise and development of new chemicals

- Please summarize ongoing work on development of new chemicals used in Schlumberger and replacement strategy of Red and Yellow chemicals.
  - WS: Chemical list with green, yellow and Y2-chemicals. Phase-out plans on red and Y2-chemicals.

Schlumberger - Cementing chemicals - Island Innovator

Code	Product name	Hazard labelling	HFK	Environmental classification	Yx	Comment
B018	Antisedimentation Agent	.	1	Green		
B151	High-Temperature Retarder	.	1	Green		
B165	Environmentally Friendly Dispersant	.	1	Green		
B174	Viscosifier for MUDPUSH II spacer	.	1	Green		
D031	Barite	.	1	Green		
D075	Silicate Additive	NC	1	Green		
D077	Liquid Accelerator	H319	2	Green		
D081	Liquid Retarder	-	1	Green		
D095	Cement Additive	-	1	Green		
D157	Weighting Agent	-	1	Green		
D174	Expanding Cement Additive	H315, 319	2	Green		
D176	High Temperature Expanding Additive	-	1	Green		
D903	Cement Class C	H315, H318, H335	3	Green		
D907	Cement Class G	H315, H318, H335	3	Green		
D956	G- Cement + silica	H315,318,335,373	5	Green		Contains Respirable Crystalline Silica
B411	Liquid Antifoam	-	1	Yellow	Y1	SAS - Slurry Air Separator seveloped
D168	UNIFLAC* L	-	1	Yellow	NA	
D250	Surfactant	H304, 318, 315, 332	3	Yellow	NA	Replacement of D191
U066	Mutual Solvent	H302,312,315,319,332	3	Yellow	NA	Heating causes toxic vapours
B213	Dispersant	-	1	Yellow	**Y2**	No alternative identified yet.
D193	Fluid Loss Control Additive	H317, EUH208	4	Yellow	**Y2**	PLONOR Alternative - B298, not suitable for cold wells

3.3 – Working Environment

- **WE request that a plan/date for the working environment mapping is established. Please verify**.
  - A general mapping of the working environment (including chemicals) was done in July 2017. An update re-verification of WE with RUG (Risk Exposed Groups) was performed in August 2018.
  - Generally, the rig owner does the working environment mapping on the rig. That is the basis for operator and service companies.
- **Have Schlumberger performed a working environment /WEAC mapping of the unit?**
  - WEAC made in July 2017. Updated in July 2018.

Island Innovator - SLB Job Categories and Risk exposure

Segment	Job Categories	Description	Survey	Chemicals	Noise	Ergonomic	Vibration	Radiation	Illumination	Climate / indoor climate	Comment / Follow up
Schlumberger DS	Drilling Engineer (Mud engineer)	Planning of mixing operations in office, updating reports on usage of chemicals, calibration, recap, environment, lab inventory and ordering chemicals and bulk, testing of drilling fluids in mud lab. On deck checking containers for received chemicals and counting shaker screen stock. MPA area calibrating equipment. Testing slop for CRI in mud lab.	General rig visit at CCB Survey done by I-SOS GHRA ChemiRisk	Use of lab chemicals, including potassium chromate. Taking samples in Pit room. ChemiRisk, working procedures in place . Some ChemiRisks are in Yellow (not red). **HR 9**	**I-SOS 2015:** Mud lab <60 dB(A) OK **HR 2**	**I-SOS 2015:** Benches not adjustable, but no information about heavy / difficult lifting or ergonomic tasks. **HR 4**	No information or experience of tools or equipment creating vibration **HR 4**	NA	**I-SOS 2015** Measurements show good illumination in lab and in office (>300 lux) - OK **HR 4**	Indoor lab ventilation should be checked **HR 6**	Indoor lab ventilation should be checked
Well Services (WIT - Cementing)	WS Field Specialist (Cementer)	Cementing operation. Responsible for running the cement job. Pre-mixing of chemicals prior to cement operation . Mixing on the fly. Wash-up (after cement job). Maintenance, testing. Pressure testing. Taking cement samples	General rig visit at CCB. Survey done by I-SOS GHRA ChemiRisks	ChemiRisks: Liquid chemicals, **HR 9.** Cement, **HR 3** Silica Cement: **HR 4** Exposure maintenance chemicals and oils and oil. **HR 4**	Cement room during operation: 90-95 dB(A) Stay during operation is < 3 hours. Use of double ear portection. **HR 8** Engine room: 107 dB(A). Normally no stay **HR6** Cement control room OK. **HR 4**	Access, heavy lifting **HR 6** Work at computer, monotonous work **HR 6** I-SOS: Poor access to control panel in the cement unit. Some control units are also placed very low. Operation normally is run from the mud control room. Workbench is not adjustable. Rarely manned.	**HR 4**	NA	Measurements May 2015 concluded OK **HR 4** Cement roof still has bad illumintation. Needs follow up?	**HR4**	. Check circumstances around cement roof (light)
	Equipment Operators (C	Helping during cementing operation. Pre-mixing of chemicals prior to pumping operation. Wash-up/cleaning of lines. Maintenance, testing. Pressure testing. Taking chemical samples									

3.3 – 3.4 Working Environment

- Familiarity with rig and continuity of personnel to reduce risk of spill to sea.
  - Schlumberger cementing will aim to continue with the crew that was previously operationg on INN. Extra personnel picked based on expereince with cement unit. Experience transfer between crews will be performed in advance.
- Is health risk assessment for chemicals planned used on Island Innovator done? (General or rig specific assessments?
  - Yes. There is a chemrisk evaluation performed for INN.
- Please present Schlumberger's system for follow up of incidents and non-conformances, both HSE and Quality related.
  - QUEST – Practical demo can be performed.
- How to avoid spill to sea. Please provide with internal procedure or proposed procedure for operation on INN.
  - Cementing has the responsibility for the lines, valves and connections within the Cement unit. In addition to Risk Assessments (HARC), Schlumberger utilises Standard Work Instructions for hte correct operations of these.
  - The overboard drain from the cement unit on the Island Innovator cannot be opened by accident as it is locked. A Permit To Work and key from the drilling Section Leader is required to open the drain.

4.0 – WE verification of Schlumberger Cementing

4.1 – Cement operations onboard Island Innovator

- Explain main issues on Island Innovator today for cementing operations such as chemical storage, working environment, logistics, cement dust from cement operations, etc?
  - No issues with regards to cementing operations, chemical storage, logistics, dust, etc. Noisy in the service office as we are too many people sharing the same room.
- Explain how the cement is transferred from the cement silo to the cement unit throughout a cement job. List if any general problems with rig air, plugged lines or crane operations?
  - The cement is transferred from the silos to the cement unit through fixed pipework. We have not had any general problems with rig air, plugged lines or crane operations.
- Schlumberger's performance and non-productive time on Island Innovator in 2017 and 2018. Present reasons and statistics for the rig.
  - Only one recorded event since 2017. Mixing system malfunction was unnoticed causing batch of cement to be mixed without retarder agent.
- Schlumberger to demonstrate benefits and synergy effect of using both cement and mud services from same company.
  - Good understanding on the way the drilling fluids and cementing fluids are interacting.
  - Simulations accuracy double checked between disciplines.
  - Personnel x-training.

4.0 – WE verification of Schlumberger Cementing

4.2 – Equipment and Chemicals

- Experience on Island Innovator with operation of cement head, reliability of the cement head and type used. Recommend technology for future operations on Island Innovator?
  - We have used the Schlumberger SDL for launching darts in a combination with SSR Weatherford system. No issues with handling the tools on the rig
- Cement stand on Island Innovator, are Schlumberger delivering cement stand to current operations? The P&A cementing operations require either a cement stand or a cement swivel. Please recommend what should be used for the Canela operations?
  - Liner job cement heads have not been supplied by WIT. Cement stand is not supplied by WIT, however most of the times, a cement stand can be build offshore.
- Please highlight any potential risks for the planned cement job on Canela with respect to Schlumberger equipment and rig and 3rd party interfaces (XO for Dril-Quip running tool, cement job for topholes etc).
  - No particular issues identified. Dedicated JDL to follow for the operations on daily basis and handle the equipment orders.
- Please recommend preferred cementing method for 20" casing. Stab in system from WF is currently quoted in RfQ.
  - Recommended method would be inner string or conventional (with bottom and top wiper plugs).
  - If stab-in method would be preferred, a different manufacturer should provide the equipment.
- Please prepare a logistics plan for volumes and chemicals. DNO plan on sending a spud vessel from Tananger and will be able to carry premix and chemicals north. Supply base under operations will be in Kristiansund.
  - Chemicals and equipment to be sent from Tananger. During operations, the appointed supply base can be used.
- List plan for bridge plugs and retrievable plugs.
  - Bridge plugs will be provided by Well Expertise. The retrievable plugs (DLTs – v6 rated) are included in the section packages.

4.0 – WE verification of Schlumberger Cementing

4.2 – Equipment and Chemicals

- Backup float equipment and shoe tracks from previous wells managed by Well Expertise are usable for Canela well.
  - Primary and BU float equipment placed on order for the whole project.
  - Use of Well Expertise equipment can be evaluated.

- Will cement and chemicals from the CNOOC operations be backloaded?
  - CNOOC operations are handled by the WIT UK team. Operations in Norway are planned with local chemicals.

4.0 – WE verification of Schlumberger Cementing

4.3 – QA / QC

- Verify internal procedure for having cement recipe ready in case shallow gas incident during drilling of pilot hole.
  - If a shallow gas risk is identified in the planning phase of the well, pilot testing will be started in advance so a design will be available.
  - Closer to the operations, the testing will be performed with the actual chemicals.

4.0 – WE verification of Schlumberger Cementing

4.4 – Personnel Competency

- **Schlumberger is expected to keep current crew onboard that knows Island Innovator setup and operations. DNO request that the crew is not changed out for the duration of the well. Please verify.**
  - No current crew on INN. Once the operations starts the crew will remain steady.
- **Schlumberger to provide DNO with CV's for crew.**
  - Will be provided once the crew is arranged.
- **Are the cement crews on Island Innovator today trained in using down hole equipment including bridge plugs, storm valves etc?**
  - Will be confirmed once the crew is decided.
- **Explain current requirements for cementers to operate down hole equipment.**
  - PDEP, competency platform.
  - Local refresher course on retrievable DHT once the crew is decided.

4.0 – WE verification of Schlumberger Cementing

4.5 – AOB

- Please present any other concerns or questions you might have to ensure a safe and efficient operation.
  - NA.

DNO/Well Expertise Audit for the Canela well

Schlumberger - mud services

21th of June – 2019

Schlumberger

AGENDA

5.0	**DNO/WE verification of Schlumberger Mud services.**		
5.1	Mud operations onboard Island Innovator	Present main issues on Island Innovator today for mud operations such as chemical storage, working environment, logistics, fumes in shaker room, etc Present Schlumberger Mud's performance and non-productive time on Island Innovator 2018. Present reasons and statistics for the rig.	
5.2	Canela Specific Mud Program	Please present one page mud program – 5 min There is a risk for losses during drilling of the Canela well, especially for the 12 ¼" section. What is the Schlumberger proposed requirement for offshore and onshore backup volumes? Please also present LCM program. How is the drilling fluid mixed in Kristiansund controlled prior to be loaded onto PSV to ensure that it meets required drilling fluid specifications? Will it be new mud with no HC contamination from other reservoairs?	
5.3	QA/QC	Verify how mud programs and ECD calculations are QC'ed internally, especially for high rheology and cold mud start of 12 ¼" section. How can volume of slop generation be minimized in cooperation with Soiltech? How is used mud fingerprinted, 3rd party? How can Schlumberger assure used mud is suitable for Canela?	
5.4	Personnel competency	Schlumberger is expected to keep current crew onboard that knows Island Innovator setup and operations. DNO request that the crew is not changed out for the duration of the well. Please verify. Schlumberger to provide DNO with CV's for crew.	
5.5	Test equipment	Schlumberger to provide with checklist for standard laboratory equipment covered by contract and available on Island Innovator. Slop needs to be tested for Flash point. Please verify if this is supplied by Schlumberger.	
5.6	AOB	Please present any other concerns or questions you might have to ensure a safe and efficient operation.	

Schlumberger

Mud operations onboard Island Innovator

- Present main issues on Island Innovator today for mud operations such as chemical storage, working environment, logistics, fumes in shaker room, etc

Limited chemical capacity outside of sack store due to many skips, but no show stopper. Chemicals had to be dropped off by crane and moved into sack store immediately.

Limited pit capacity – should not be an issue for the Canela well.

Did not experience very high temperatures (50-55 deg C) in the shaker room. Circ temp: 108-120 C, Water depth: 301m

Cuttings handling – changed to vacuum system due to high angle (45 degree upward) on cuttings conveyor. Removed conveyor, installed a tray at the end of horizontal conveyer, cuttings transported manually by vacuum hose to 2 CDP arms, then to skips.

The high angle conveyor has not been tried.

Not a satisfactory solution for handling oilbased cuttings.

- Present Schlumberger Mud's performance and non-productive time on Island Innovator 2018. Present reasons and statistics for the rig

No fluids related NPT

Schlumberger

Canela Specific Mud Program

- Please present one page mud program – 5 min

- There is a risk for losses during drilling of the Canela well, especially for the 12 ¼" section. What is the Schlumberger proposed requirement for offshore and onshore backup volumes? Please also present LCM program.

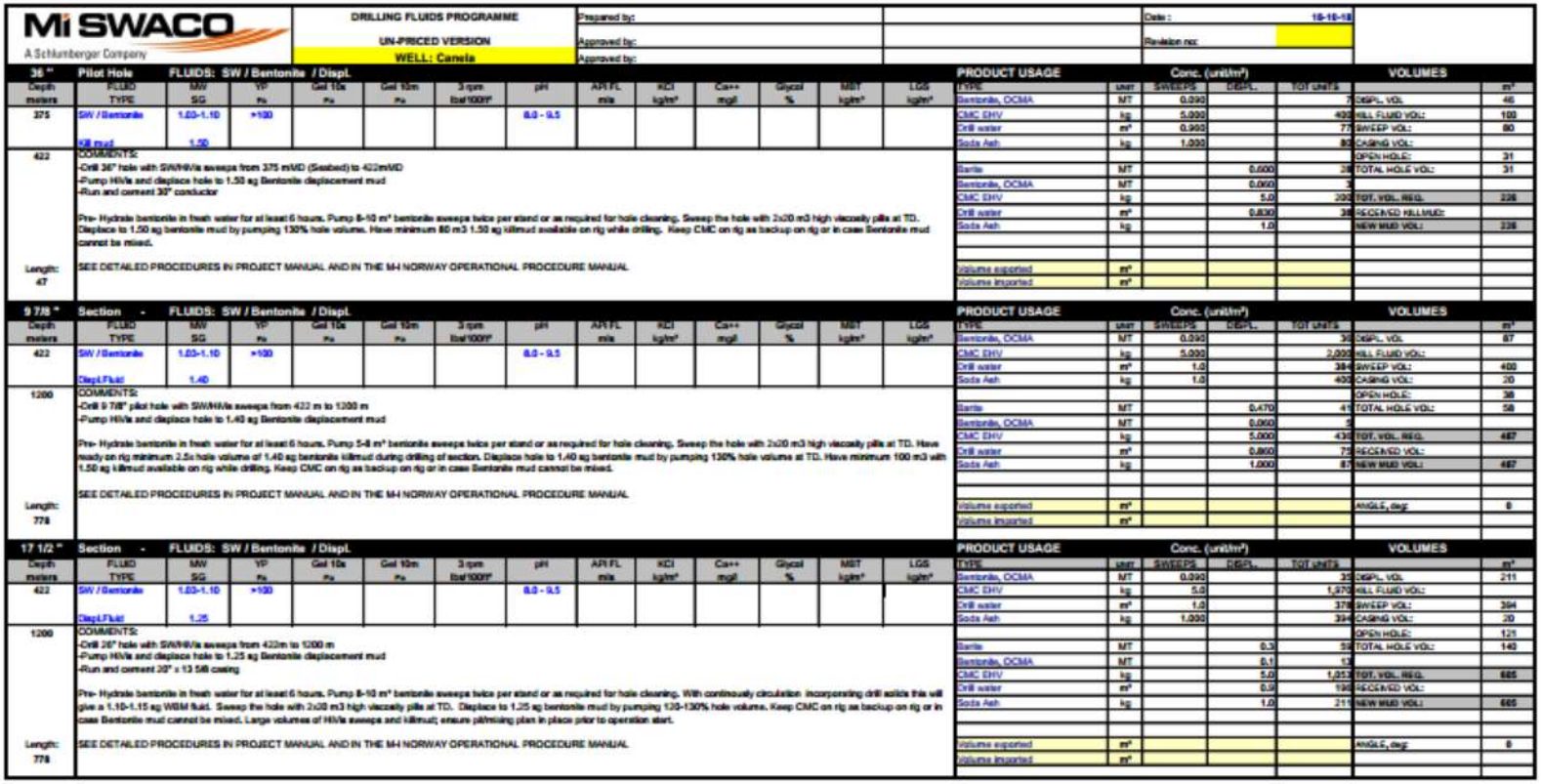
- How is the drilling fluid mixed in Kristiansund controlled prior to be loaded onto PSV to ensure that it meets required drilling fluid specifications? Will it be new mud with no HC contamination from other reservoirs?

Fluids will be controlled by performing mud checks at the base – according to PR.41

The plan is to utilize used drilling fluid.

Schlumberger

Please present one page mud program – 5 min



MI SWACO
A Schlumberger Company

DRILLING FLUIDS PROGRAMME
UN-PRICED VERSION
WELL: Canela

Prepared by:
Approved by:
Approved by:

Date: 18-10-18
Revision no:

36 " Pilot Hole FLUIDS: SW / Bentonite / Displ.

Depth meters	FLUID TYPE	MW SG	YP Pa	Gel 10s Pa	Gel 10m Pa	3 rpm lbs/100ft²	pH	API FL ml/s	KCl kg/m³	Ca++ mg/l	Glycol %	MBT kg/m³	LGS kg/m³
375	SW / Bentonite	1.03-1.10	>100				8.0 - 9.5						
	Kill mud	1.50											

COMMENTS:
-Drill 36" hole with SW/HiVis sweeps from 375 mMD (Seabed) to 422mMD
-Pump HiVis and displace hole to 1.50 sg Bentonite displacement mud
-Run and cement 30" conductor

Pre- Hydrate bentonite in fresh water for at least 6 hours. Pump 8-10 m³ bentonite sweeps twice per stand or as required for hole cleaning. Sweep the hole with 2x20 m3 high viscosity pills at TD. Displace to 1.50 sg bentonite mud by pumping 130% hole volume. Have minimum 80 m3 1.50 sg killmud available on rig while drilling. Keep CMC on rig as backup on rig or in case Bentonite mud cannot be mixed.

SEE DETAILED PROCEDURES IN PROJECT MANUAL AND IN THE M-I NORWAY OPERATIONAL PROCEDURE MANUAL

Length: 47

PRODUCT USAGE	unit	Conc. (unit/m³) SWEEPS	DISPL.	TOT UNITS
Bentonite, OCMA	MT	0.030		7
CMC EHV	kg	5.000		400
Drill water	m³	0.900		77
Soda Ash	kg	1.000		80
Barite	MT		0.600	28
Bentonite, OCMA	MT		0.000	3
CMC EHV	kg		5.0	200
Drill water	m³		0.830	38
Soda Ash	kg		1.0	
Volume exported	m³			
Volume imported	m³			

VOLUMES	m³
DISPL. VOL	46
KILL FLUID VOL:	102
SWEEP VOL:	80
CASING VOL:	
OPEN HOLE:	31
TOTAL HOLE VOL:	31
TOT. VOL. REQ.	226
RECEIVED KILLMUD:	
NEW MUD VOL:	226

9 7/8 " Section - FLUIDS: SW / Bentonite / Displ.

Depth meters	FLUID TYPE	MW SG	YP Pa	Gel 10s Pa	Gel 10m Pa	3 rpm lbs/100ft²	pH	API FL ml/s	KCl kg/m³	Ca++ mg/l	Glycol %	MBT kg/m³	LGS kg/m³
422	SW / Bentonite	1.03-1.10	>100				8.0 - 9.5						
	Disp.Fluid	1.40											

COMMENTS:
-Drill 9 7/8" pilot hole with SW/HiVis sweeps from 422 m to 1200 m
-Pump HiVis and displace hole to 1.40 sg Bentonite displacement mud

Pre- Hydrate bentonite in fresh water for at least 6 hours. Pump 5-8 m³ bentonite sweeps twice per stand or as required for hole cleaning. Sweep the hole with 2x20 m3 high viscosity pills at TD. Have ready on rig minimum 2.5x hole volume of 1.40 sg bentonite killmud during drilling of section. Displace hole to 1.40 sg bentonite mud by pumping 130% hole volume at TD. Have minimum 100 m3 with 1.50 sg killmud available on rig while drilling. Keep CMC on rig as backup on rig or in case Bentonite mud cannot be mixed.

SEE DETAILED PROCEDURES IN PROJECT MANUAL AND IN THE M-I NORWAY OPERATIONAL PROCEDURE MANUAL

Length: 778

PRODUCT USAGE	unit	Conc. (unit/m³) SWEEPS	DISPL.	TOT UNITS
Bentonite, OCMA	MT	0.090		38
CMC EHV	kg	5.000		2,000
Drill water	m³	1.0		384
Soda Ash	kg	1.0		400
Barite	MT		0.470	41
Bentonite, OCMA	MT		0.060	5
CMC EHV	kg		5.000	430
Drill water	m³		0.860	75
Soda Ash	kg		1.000	87
Volume exported	m³			
Volume imported	m³			

VOLUMES	m³
DISPL. VOL	87
KILL FLUID VOL:	
SWEEP VOL:	400
CASING VOL:	20
OPEN HOLE:	38
TOTAL HOLE VOL:	58
TOT. VOL. REQ.	467
RECEIVED VOL:	
NEW MUD VOL:	467
ANGLE, deg:	0

17 1/2 " Section - FLUIDS: SW / Bentonite / Displ.

Depth meters	FLUID TYPE	MW SG	YP Pa	Gel 10s Pa	Gel 10m Pa	3 rpm lbs/100ft²	pH	API FL ml/s	KCl kg/m³	Ca++ mg/l	Glycol %	MBT kg/m³	LGS kg/m³
422	SW / Bentonite	1.03-1.10	>100				8.0 - 9.5						
	Disp.Fluid	1.25											

COMMENTS:
-Drill 26" hole with SW/HiVis sweeps from 422m to 1200 m
-Pump HiVis and displace hole to 1.25 sg Bentonite displacement mud
-Run and cement 20" x 13 5/8 casing

Pre- Hydrate bentonite in fresh water for at least 6 hours. Pump 8-10 m³ bentonite sweeps twice per stand or as required for hole cleaning. With continously circulation incorporating drill solids this will give a 1.10-1.15 sg WBM fluid. Sweep the hole with 2x30 m3 high viscosity pills at TD. Displace to 1.25 sg bentonite mud by pumping 120-130% hole volume. Keep CMC on rig as backup on rig or in case Bentonite mud cannot be mixed. Large volumes of HiVis sweeps and killmud; ensure pit/mixing plan in place prior to operation start.

SEE DETAILED PROCEDURES IN PROJECT MANUAL AND IN THE M-I NORWAY OPERATIONAL PROCEDURE MANUAL

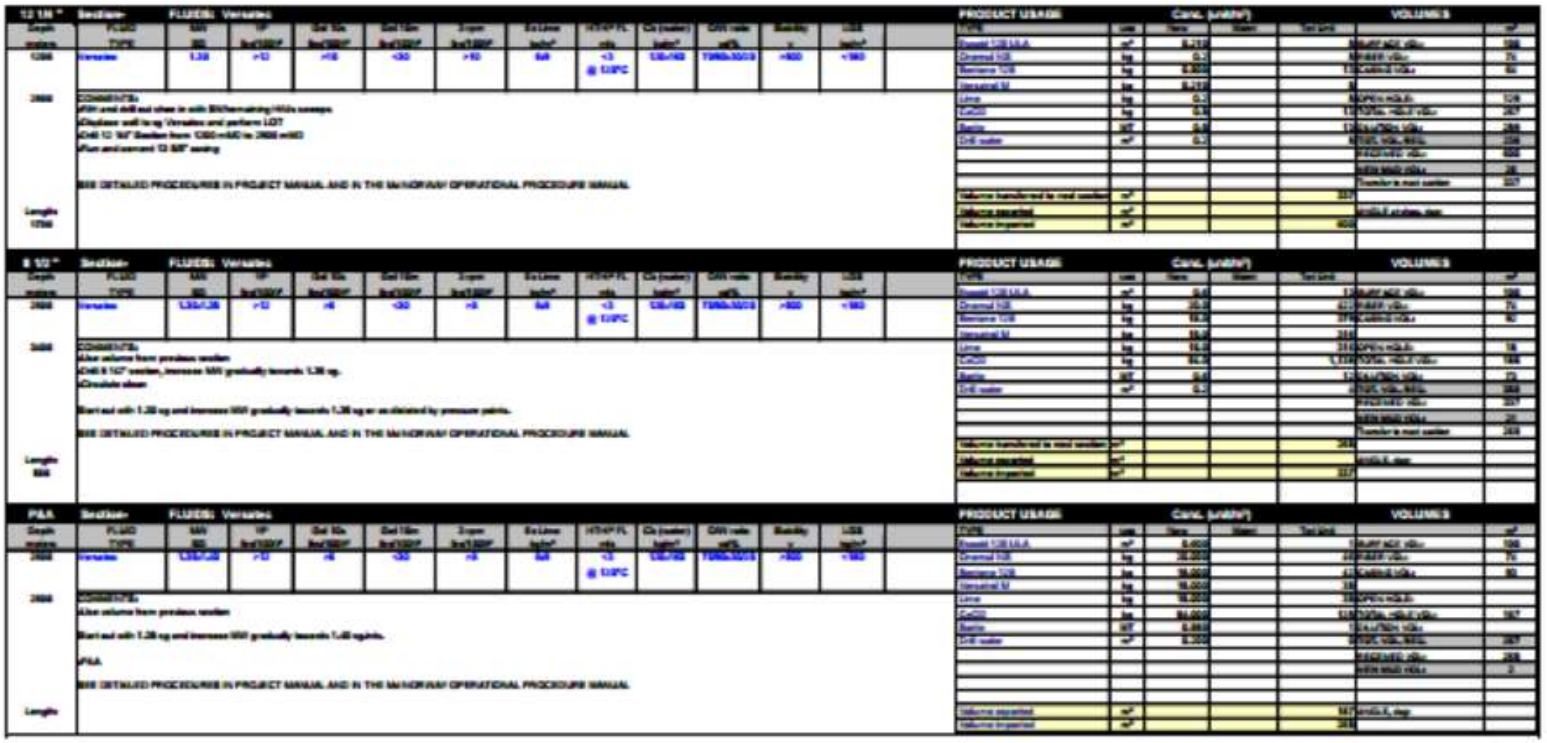
Length: 778

PRODUCT USAGE	unit	Conc. (unit/m³) SWEEPS	DISPL.	TOT UNITS
Bentonite, OCMA	MT	0.090		35
CMC EHV	kg	5.0		1,970
Drill water	m³	1.0		378
Soda Ash	kg	1.000		394
Barite	MT		0.3	59
Bentonite, OCMA	MT		0.1	13
CMC EHV	kg		5.0	1,053
Drill water	m³		0.5	190
Soda Ash	kg		1.0	211
Volume exported	m³			
Volume imported	m³			

VOLUMES	m³
DISPL. VOL	211
KILL FLUID VOL:	
SWEEP VOL:	394
CASING VOL:	20
OPEN HOLE:	121
TOTAL HOLE VOL:	140
TOT. VOL. REQ.	685
RECEIVED VOL:	
NEW MUD VOL:	685
ANGLE, deg:	0

Schlumberger

Please present one page mud program – 5 min



Schlumberger

LCM program

REV 0

MI SWACO
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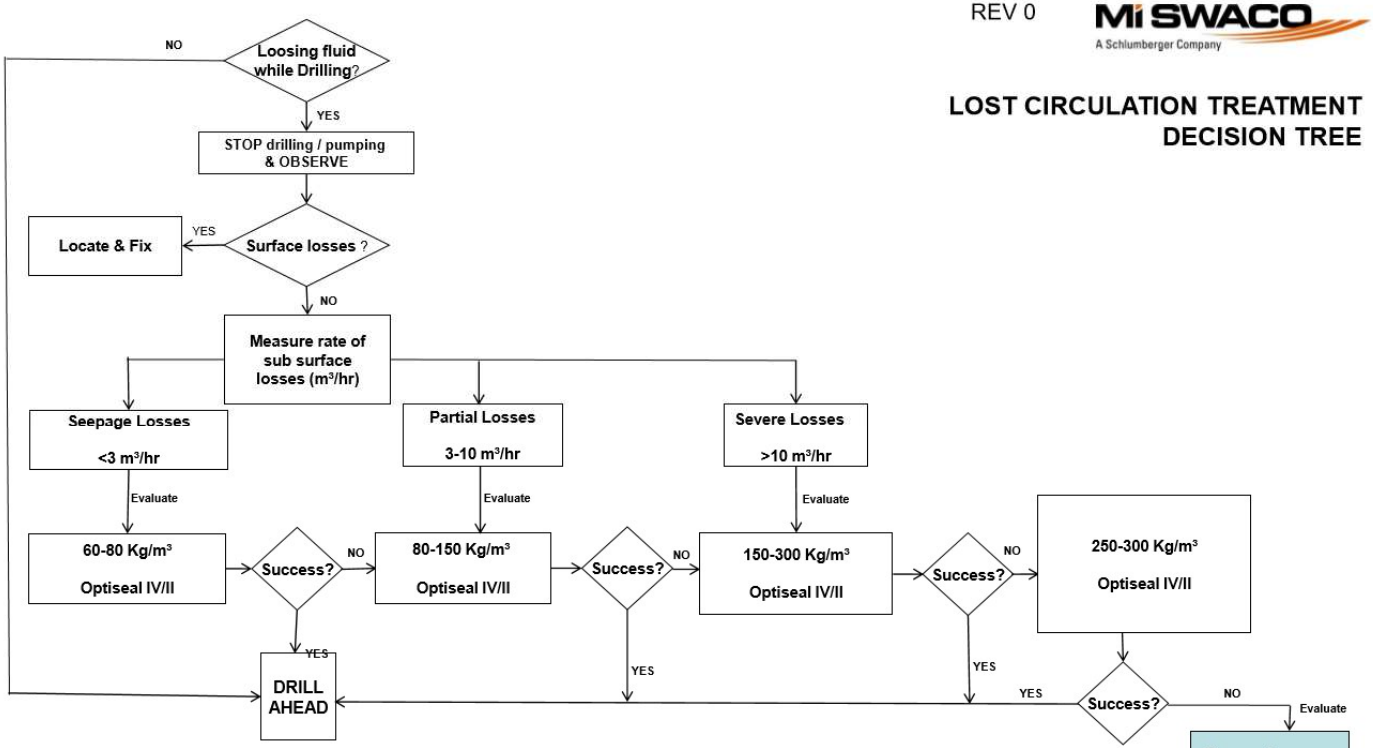
LOST CIRCULATION TREATMENT DECISION TREE



PRODUCT	SG	d10	d50	d90	Component
OPTISEAL IV	2.7	91	456	851	Calcium Carbonate
OPTISEAL II	2.4	53	479	927	Calcium Carbonate / Graphite

Schlumberger

QA/QC

- Verify how mud programs and ECD calculations are QC'ed internally, especially for high rheology and cold mud start of 12 ¼" section.

The mud programs are QC'ed through peer assists. In addition the OOC (Onshore Operation Centre) will be able to QC the ECD calculations.

- How can volume of slop generation be minimized in cooperation with Soiltech?

Schlumberger and Soiltech would need to look at the opportunities for minimizing slop together. The sooner we all start looking into this, the more likely we will succeed.

- How is used mud fingerprinted, 3rd party? How can Schlumberger assure used mud is suitable for Canela?

The used mud can be tested internally using GC (gas chromatography). For further testing 3rd party company is recommended to use.

Schlumberger

Personnel competency

- Schlumberger is expected to keep current crew onboard that knows Island Innovator setup and operations. DNO request that the crew is not changed out for the duration of the well. Please verify.

Currently no Schlumberger fluids crew on Island Innovator. We have quite a few people with experience from Island Innovator and we will - to our best extend - utilize people with experience from Island Innovator.

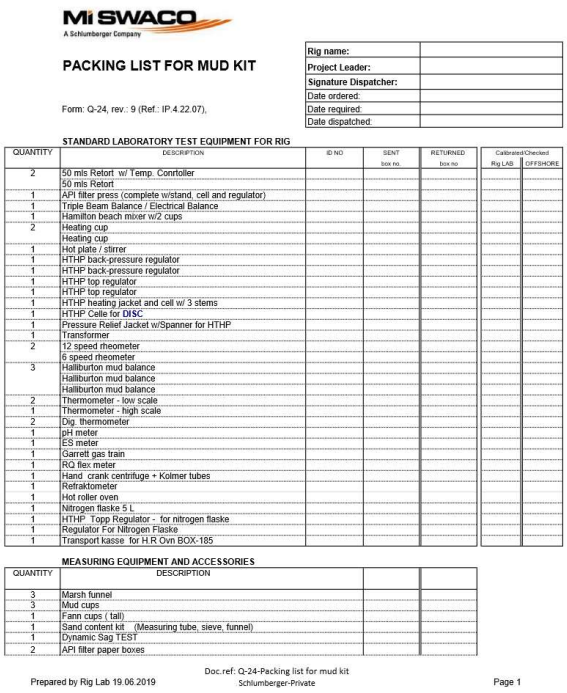
- Schlumberger to provide DNO with CV's for crew.

CV's will be sent to DNO as soon as the crew are set.

Schlumberger

Test equipment

- Schlumberger to provide with checklist for standard laboratory equipment covered by contract and available on Island Innovator. Slop needs to be tested for Flash point. Please verify if this is supplied by Schlumberger.



MI SWACO
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PACKING LIST FOR MUD KIT

Form: Q-24, rev.: 9 (Ref.: IP.4.22.07),

Rig name:	
Project Leader:	
Signature Dispatcher:	
Date ordered:	
Date required:	
Date dispatched:	

STANDARD LABORATORY TEST EQUIPMENT FOR RIG

QUANTITY	DESCRIPTION	ID NO	SENT box no.	RETURNED box no	Calibrated/Checked Rig LAB	OFFSHORE
2	50 mls Retort w/ Temp. Conrtoller					
	50 mls Retort					
1	API filter press (complete w/stand, cell and regulator)					
1	Triple Beam Balance / Electrical Balance					
1	Hamilton beach mixer w/2 cups					
2	Heating cup					
	Heating cup					
1	Hot plate / stirrer					
1	HTHP back-pressure regulator					
1	HTHP back-pressure regulator					
1	HTHP top regulator					
1	HTHP top regulator					
1	HTHP heating jacket and cell w/ 3 stems					
1	HTHP Celle for DISC					
1	Pressure Relief Jacket w/Spanner for HTHP					
1	Transformer					
2	12 speed rheometer					
	6 speed rheometer					
3	Halliburton mud balance					
	Halliburton mud balance					
	Halliburton mud balance					
2	Thermometer - low scale					
1	Thermometer - high scale					
2	Dig. thermometer					
1	pH meter					
1	ES meter					
1	Garrett gas train					
1	RQ flex meter					
1	Hand crank centrifuge + Kolmer tubes					
1	Refraktometer					
1	Hot roller oven					
1	Nitrogen flaske 5 L					
1	HTHP Topp Regulator - for nitrogen flaske					
1	Regulator For Nitrogen Flaske					
1	Transport kasse for H.R Ovn BOX-185					

MEASURING EQUIPMENT AND ACCESSORIES

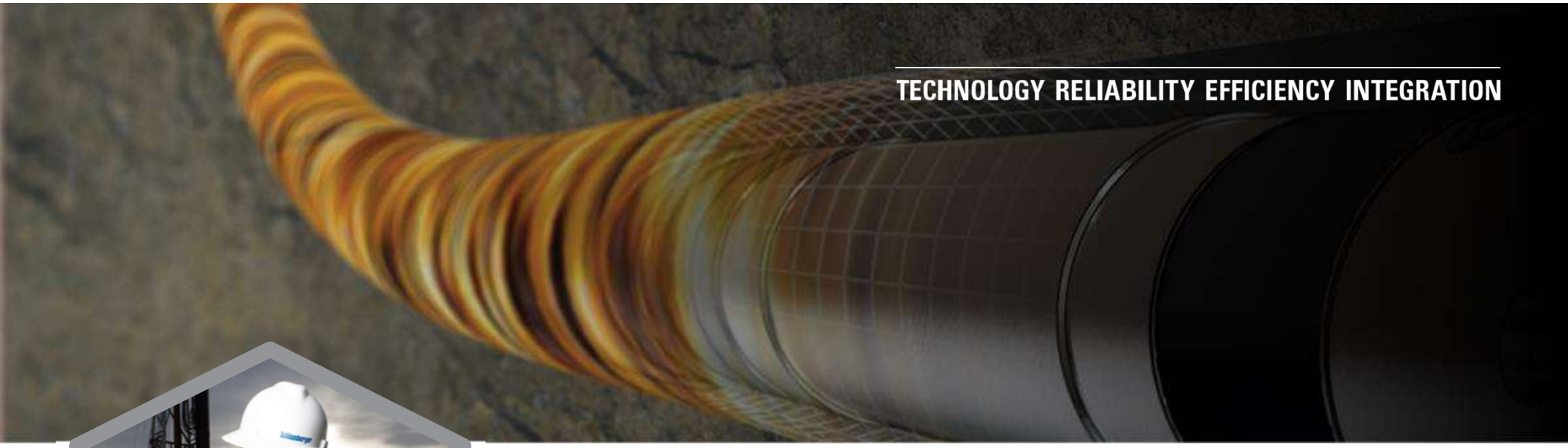
QUANTITY	DESCRIPTION		
3	Marsh funnel		
3	Mud cups		
1	Fann cups (tall)		
1	Sand content kit (Measuring tube, sieve, funnel)		
1	Dynamic Sag TEST		
2	API filter paper boxes		

Doc.ref: Q-24-Packing list for mud kit
Prepared by Rig Lab 19.06.2019 Schlumberger-Private Page 1

Schlumberger have Flash point test kit, hence can be supplied by Schlumberger.

Note: Flash point test kit is not part of the standard laboratory equipment package.

Schlumberger

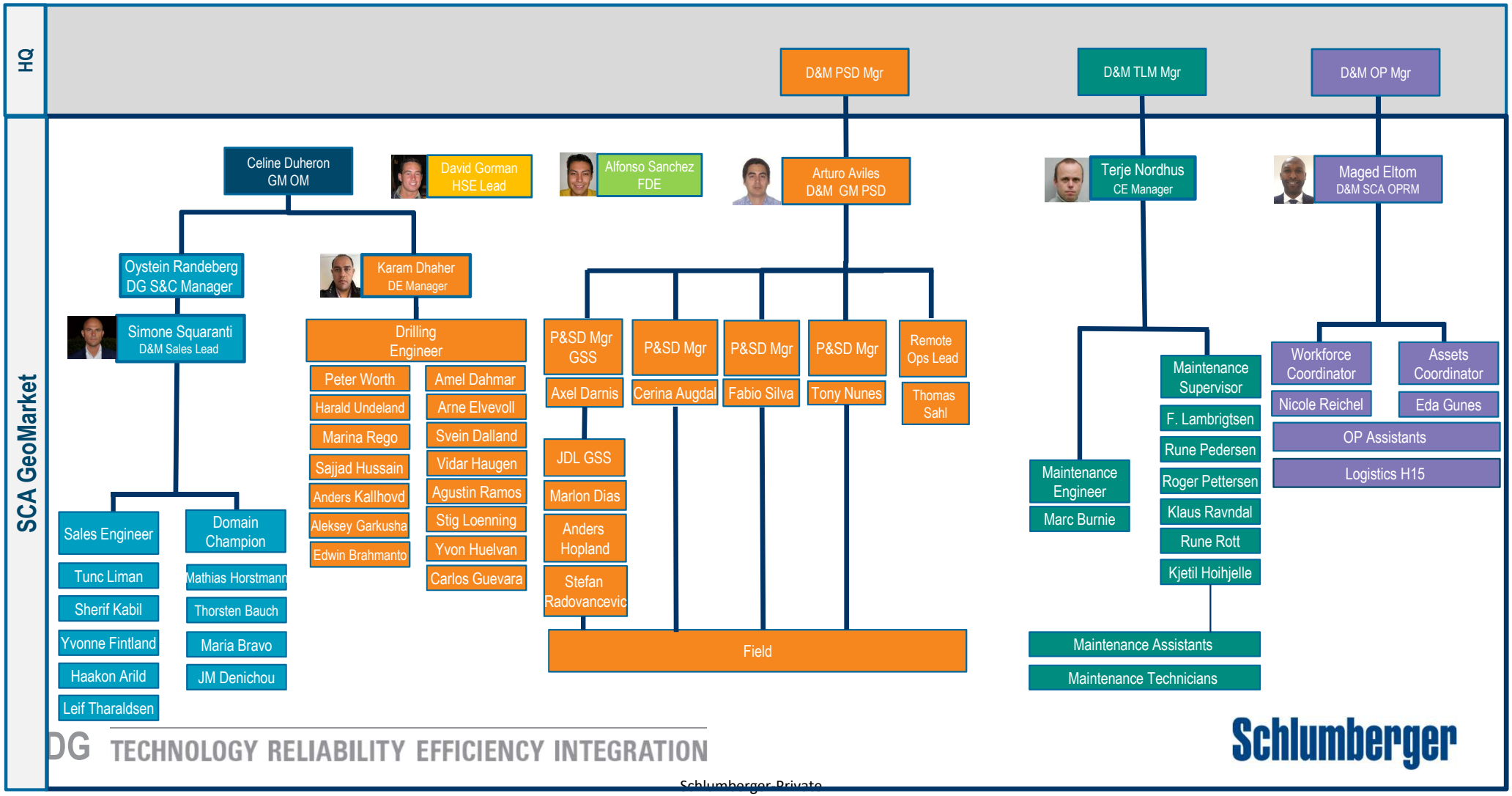


D&M

DNO - Canela

Schlumberger

D&M SCA STRUCTURE



Geoservices Mudlogging

GAS EQUIPMENT
- Installed at the Active Pit and Shale Shaker, working fine
- Degasser and Analyzer worked fine

PIT SENSOR
- Signal from rig via Profibus link
- No issues on previous job

DEPTH ENCODER
- Signal from rig via Profibus
- Backup sensor can be installed

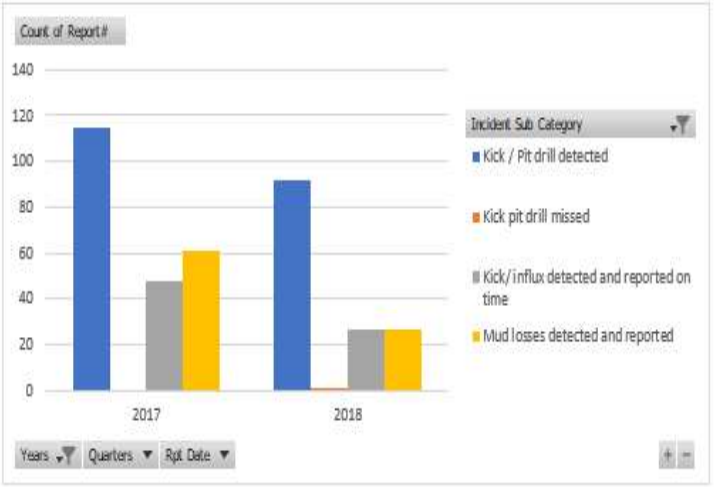
CREW
- Competent and experienced crew to be provided
- Can assign some crew member who have worked on this rig before
- No changes during the project

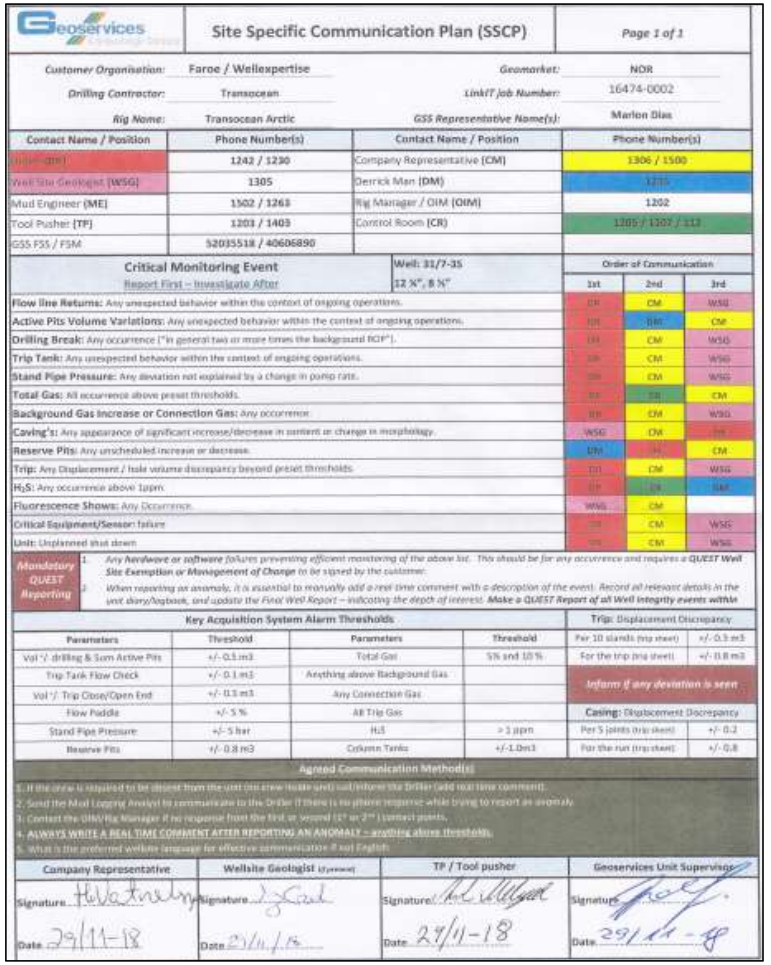
Geoservices Mudlogging

QUALITY

- Well Control focus
- Communication Plan

Count of Report#	Column Labels				
Row Labels	Kick / Pit drill detected	Kick pit drill missed	Kick/ influx detected and reported on time	Mud losses detected and reported	Grand Total
⊕2017	115		48	61	224
⊕2018	92	1	27	27	147
Grand Total	207	1	75	88	371





Geoservices — Site Specific Communication Plan (SSCP) — Page 1 of 1

Customer Organisation: Faroe / Wellexpertise — Geomarket: NOR
Drilling Contractor: Transocean — Link'IT Job Number: 16474-0002
Rig Name: Transocean Arctic — GSS Representative Name(s): Marion Dias

Contact Name / Position	Phone Number(s)	Contact Name / Position	Phone Number(s)
[illegible]	1242 / 1230	Company Representative (CM)	1306 / 1500
Well Site Geologist (WSG)	1305	Derrick Man (DM)	1235
Mud Engineer (ME)	1502 / 1263	Rig Manager / OIM (OIM)	1202
Tool Pusher (TP)	1203 / 1403	Control Room (CR)	1205 / 1107 / 113
GSS FSS / FSM	52035518 / 40606890		

Critical Monitoring Event — Report First – Investigate After — Well: 31/7-35 — 12 ¼", 8 ½"

Order of Communication: 1st / 2nd / 3rd

	1st	2nd	3rd
Flow line Returns: Any unexpected behavior within the context of ongoing operations.	DR	CM	WSG
Active Pits Volume Variations: Any unexpected behavior within the context of ongoing operations.	DR	DM	CM
Drilling Break: Any occurrence ("in general two or more times the background ROP").	DR	CM	WSG
Trip Tank: Any unexpected behavior within the context of ongoing operations.	DR	CM	WSG
Stand Pipe Pressure: Any deviation not explained by a change in pump rate.	DR	CM	WSG
Total Gas: All occurrence above preset thresholds.	DR	DR	CM
Background Gas Increase or Connection Gas: Any occurrence	DR	CM	WSG
Caving's: Any appearance of significant increase/decrease in content or change in morphology.	WSG	CM	CM
Reserve Pits: Any unscheduled increase or decrease.	DM	CM	CM
Trip: Any Displacement / hole volume discrepancy beyond preset thresholds.	DR	CM	WSG
H_2S: Any occurrence above 1ppm	DR	DR	DR
Fluorescence Shows: Any Occurrence.	WSG	CM	
Critical Equipment/Sensor: failure	DR	CM	WSG
Unit: Unplanned shut down	DR	CM	WSG

Mandatory QUEST Reporting
1. Any hardware or software failures preventing efficient monitoring of the above list. This should be for any occurrence and requires a QUEST Well Site Exemption or Management of Change to be signed by the customer.
2. When reporting an anomaly, it is essential to manually add a real time comment with a description of the event. Record all relevant details in the unit diary/logbook, and update the Final Well Report – indicating the depth of interest. Make a QUEST Report of all Well Integrity events within

Key Acquisition System Alarm Thresholds

Parameters	Threshold	Parameters	Threshold
Vol +/- drilling & Sum Active Pits	+/- 0.5 m3	Total Gas	5% and 10 %
Trip Tank Flow Check	+/- 0.1 m3	Anything above Background Gas	
Vol +/- Trip Close/Open End	+/- 0.1 m3	Any Connection Gas	
Flow Paddle	+/- 5 %	All Trip Gas	
Stand Pipe Pressure	+/- 5 bar	H_2S	> 1 ppm
Reserve Pits	+/- 0.8 m3	Column Tanks	+/-1.0m3

Trip: Displacement Discrepancy

Per 10 stands (trip sheet)	+/- 0.3 m3
For the trip (trip sheet)	+/- 0.8 m3

Inform if any deviation is seen

Casing: Displacement Discrepancy

Per 5 joints (trip sheet)	+/- 0.2
For the run (trip sheet)	+/- 0.8

Agreed Communication Method(s):
1. If the crew is required to be absent from the unit (no crew mobile unit) call/inform the Driller (add real time comment).
2. Send the Mud Logging Analyst to communicate to the Driller if there is no phone response while trying to report an anomaly.
3. Contact the OIM/Rig Manager if no response from the first or second (1st or 2nd) contact points.
4. ALWAYS WRITE A REAL TIME COMMENT AFTER REPORTING AN ANOMALY – anything above thresholds.
5. What is the preferred website language for effective communication if not English:

Company Representative	Wellsite Geologist (if present)	TP / Tool pusher	Geoservices Unit Supervisor
Signature: [illegible]	Signature: [illegible]	Signature: [illegible]	Signature: [illegible]
Date: 29/11-18	Date: 29/11/18	Date: 29/11-18	Date: 29/11-18

Schlumberger

Geoservices Mudlogging

QUESTION

- "It is a risk of instable formations at Kvitnos Fm (shear failure). How is this best detected and how will SLB ensure that this is detected early enough to introduce mitigating measures (ie increase MW or run 13 3/8" cont casing)?"
- Look out for cavings indicating mechanical rock failure at the shale shakers
- Monitor and alarms for abnormal drilling parameters, eg Torque

CLARIFICATIONS REQUIRED

- Rig survey required to confirm if any changes in Scope Of Work
- Gas Analyzer installed in the Derrickman office, propose to change location
- Data Analyst were located in the collaboration room and Mudloggers in the unit. Will it be same setup?
- On Island innovator, rig provided the unit. Will it be same setup?

MU and racking of BHA 2018

- Graaspett: Racked 36in and other BHAs without problem
- DWOP: Island innovator crew mentioned they don't like to rack
- Space out required for iron roughneck to make up stabilizers

Island Innovator Quality Statistics

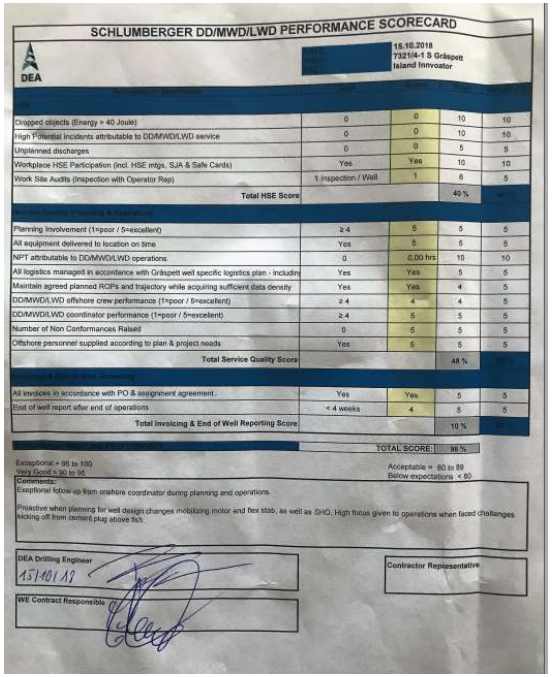
27 – Total Runs

2085 – Total BRT Hours

9900 – Total Meters Drilled

0 – Total TFF

5 – NPT Hours



SCHLUMBERGER DD/MWD/LWD PERFORMANCE SCORECARD

DEA

15.10.2018
7321/4-1 S Gråspett
Island Innovator

Dropped objects (Energy > 40 Joule)	0	0	10	10
High Potential incidents attributable to DD/MWD/LWD service	0	0	10	10
Unplanned discharges	0	0	5	5
Workplace HSE Participation (incl. HSE mtgs, SJA & Safe Cards)	Yes	Yes	10	10
Work Site Audits (Inspection with Operator Rep)	1 inspection / Well	1	5	5
Total HSE Score			40 %	
Planning Involvement (1=poor / 5=excellent)	≥ 4	5	5	5
All equipment delivered to location on time	Yes	5	5	5
NPT attributable to DD/MWD/LWD operations	0	0,00 hrs	10	10
All logistics managed in accordance with Gråspett well specific logistics plan - includin	Yes	Yes	5	5
Maintain agreed planned RCIPs and trajectory while acquiring sufficient data density	Yes	Yes	4	5
DD/MWD/LWD offshore crew performance (1=poor / 5=excellent)	≥ 4	4	4	5
DD/MWD/LWD coordinator performance (1=poor / 5=excellent)	≥ 4	5	5	5
Number of Non Conformances Raised	0	5	5	5
Offshore personnel supplied according to plan & project needs	Yes	5	5	5
Total Service Quality Score			48 %	
All invoices in accordance with PO & assignment agreement.	Yes	Yes	5	5
End of well report after end of operations	< 4 weeks	4	5	5
Total Invoicing & End of Well Reporting Score			10 %	
		TOTAL SCORE:	98 %	

Exceptional = 95 to 100
Very Good = 90 to 95
Acceptable = 80 to 89
Below expectations < 80

Comments:
Exceptional follow up from onshore coordinator during planning and operations.

Proactive when planning for well design changes mobilizing motor and flex stab, as well as SHO. High focus given to operations when faced challanges kicking off from cement plug above fish.

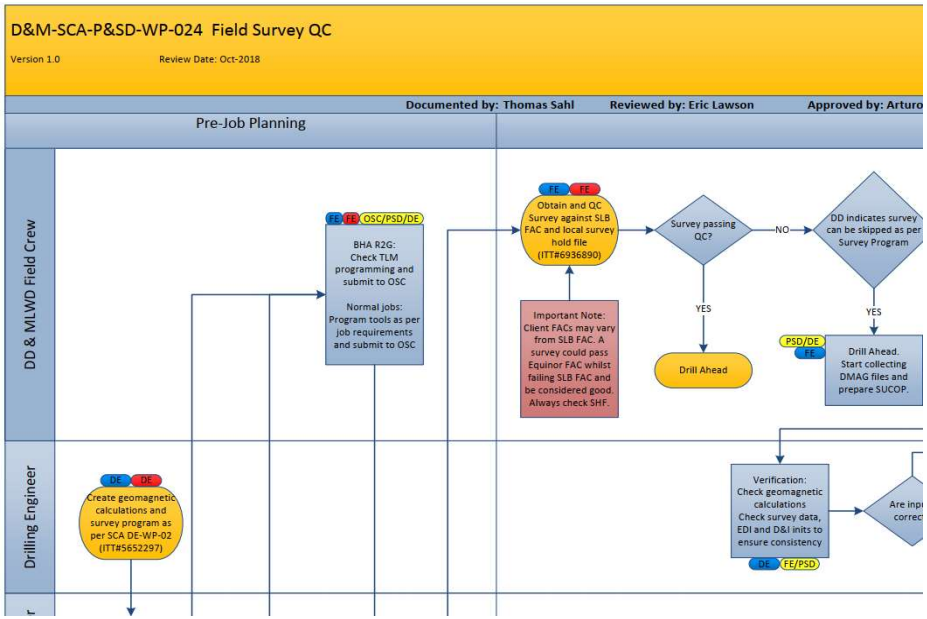
DEA Drilling Engineer
15/10/18

Contractor Representative

WE Contract Responsible

Optimize connection time

- What to do when surveys not passing QC: D&M SCA-P&SD-WP-024 Field Survey QC?...Investigation with local survey specialist/MultiTaction analysis (Normally we don't stop drilling)



Connection Procedure

Do not wait for in-sync unless required by DD

Connection procedure
Important! Survey after connection

KPI`s:
- **W2W< 7 min**
- **S2S< 3,5 min**

- **Drill stand down**
(Driller to inform on radio when connection passes table for depth calibration – do not stop)

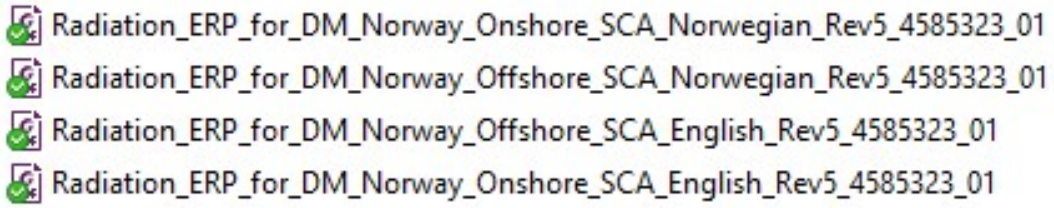
- **Pull off bottom + 2 m using max 1 min**
  - Keep drilling RPM
  - Keep 100% flow
  - Read torque and weight as required.
- **Stop rotation**
- **P/U and record stable up and down weight**
  - Pull up and go down, max 10 m/min
  - 100% flow moving up (If ECD is high, stop 10sec on top before moving down)
  - 80% flow moving down if conditions allows (consider surge effect)
- **Set slips and make connection**
  - Fill pipe immediately w/ 400 - 800 lpm while making up connection
  - Do not start rotation
- **Survey and Start up sequence**
  - When returns increase to 100% flow (stable pressure)
  - Open compensator if required
  - Increase to drilling RPM
- **Drill ahead.**
  - Check pressure response when going on bottom

Radiation

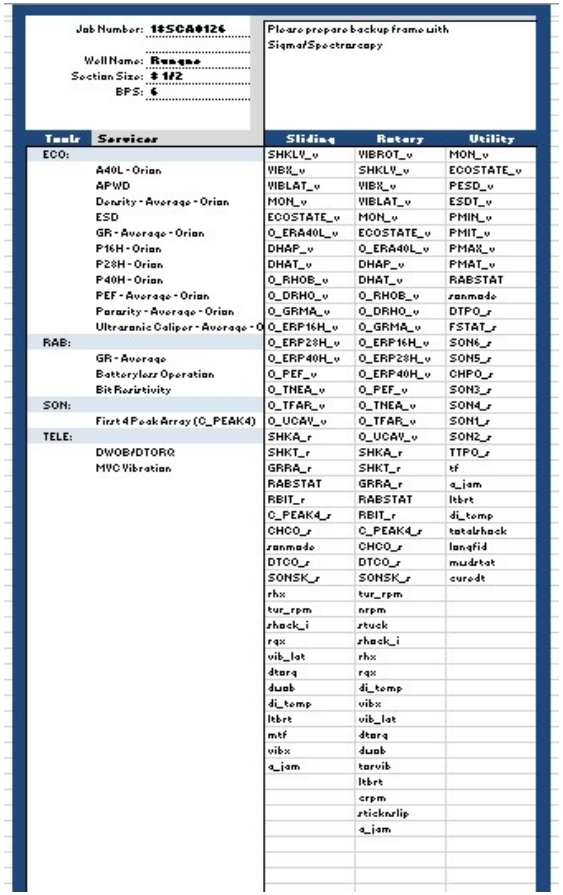
What procedures/regulations are Schlumberger working by when handling radioactive sources on the rig? Track record, training of personnel, emergency response team.

- Offshore Team (16th-June check)
  - L2C2 Compliance – 100%, Assist RA operations (97/97)
  - L2C1 Compliance – 98.2%, Lead RA operations (54/55)

- Emergency Response Team as per Emergency Response Plan
  - Ref. Attachments



Data quality



Job Number: 18SCA0126
Well Name: Ranque
Section Size: 8 1/2
BPS: 6

Please prepare backup frame with SigmaSpectroscopy

Tools	Services	Sliding	Rotary	Utility
ECO:		SHKLV_v	VIBROT_v	MON_v
	A40L - Orian	VIBX_v	SHKLV_v	ECOSTATE_v
	APWD	VIBLAT_v	VIBX_v	PESD_v
	Density - Average - Orian	MON_v	VIBLAT_v	ESDT_v
	ESD	ECOSTATE_v	MON_v	PMIN_v
	GR - Average - Orian	O_ERA40L_v	ECOSTATE_v	PMIT_v
	P16H - Orian	DHAP_v	O_ERA40L_v	PMAX_v
	P28H - Orian	DHAT_v	DHAP_v	PMAT_v
	P40H - Orian	O_RHOB_v	DHAT_v	RABSTAT
	PEF - Average - Orian	O_DRHO_v	O_RHOB_v	zanmode
	Porosity - Average - Orian	O_GRMA_v	O_DRHO_v	DTPO_r
	Ultrasonic Caliper - Average - O	O_ERP16H_v	O_GRMA_v	FSTAT_r
RAB:		O_ERP28H_v	O_ERP16H_v	SON6_r
	GR - Average	O_ERP40H_v	O_ERP28H_v	SON5_r
	Batterylazz Operation	O_PEF_v	O_ERP40H_v	CHPO_r
	Bit Resistivity	O_TNEA_v	O_PEF_v	SON3_r
SON:		O_TFAR_v	O_TNEA_v	SON4_r
	First 4 Peak Array (C_PEAK4)	O_UCAV_v	O_TFAR_v	SON1_r
TELE:		SHKA_r	O_UCAV_v	SON2_r
	DWOB/DTORQ	SHKT_r	SHKA_r	TTPO_r
	MVC Vibration	GRRA_r	SHKT_r	tf
		RABSTAT	GRRA_r	a_jam
		RBIT_r	RABSTAT	ltbrt
		C_PEAK4_r	RBIT_r	di_temp
		CHCO_r	C_PEAK4_r	totalshock
		zanmode	CHCO_r	lanqfid
		DTCO_r	DTCO_r	mudrtat
		SONSK_r	SONSK_r	curodt
		rhx	tur_rpm	
		tur_rpm	nrpm	
		zshock_i	zstuck	
		rqx	zshock_i	
		vib_lat	rhx	
		dtorq	rqx	
		dumb	di_temp	
		di_temp	vibx	
		ltbrt	vib_lat	
		mtf	dtorq	
		vibx	dumb	
		a_jam	torvib	
			ltbrt	
			crpm	
			zticknrlip	
			a_jam	

- Real time order form (RTOF) created by P&SD manager after discussion with DNO geologist
- Frames for real time data transmission created by MLWD
- Frames QCed by Onshore Support Center against RTOF
- Onshore Support Center QC programming of tools with correct frames

QA/QC

Flow rates as per DNOs request

- Review of QHARC with DNO/Well expertise (Simulations/Drilling Program/DOP,s)

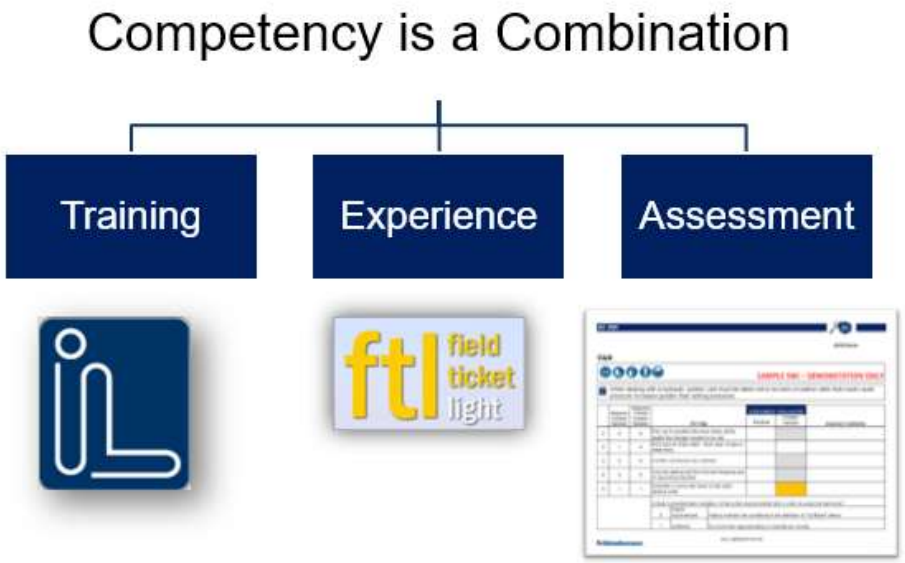
Sensor offset as per DNOs request

- Drilling Engineer will finalize BHA's with DNO & communicate with P&SD

Tool order to shipment: D&M SCA-PSD-WP-006 TCO work process

- Drilling engineer QC TCO, techs do buddy check, field crew QC as per standard work instructions
- QA/QC formation evaluation and directional data
- Formation evaluation: Log quality manual for each tool. QC indicators in RT frame. QC process for RM data delivery: D&M SCA-P&SD-WP-003 Data Delivery & Archiving Process
- Directional data: DE checks surveys every morning, Survey report to be part of DDR.

Personnel Competency



Training

- Schools (Training Center Abu Dhabi/France) or virtual

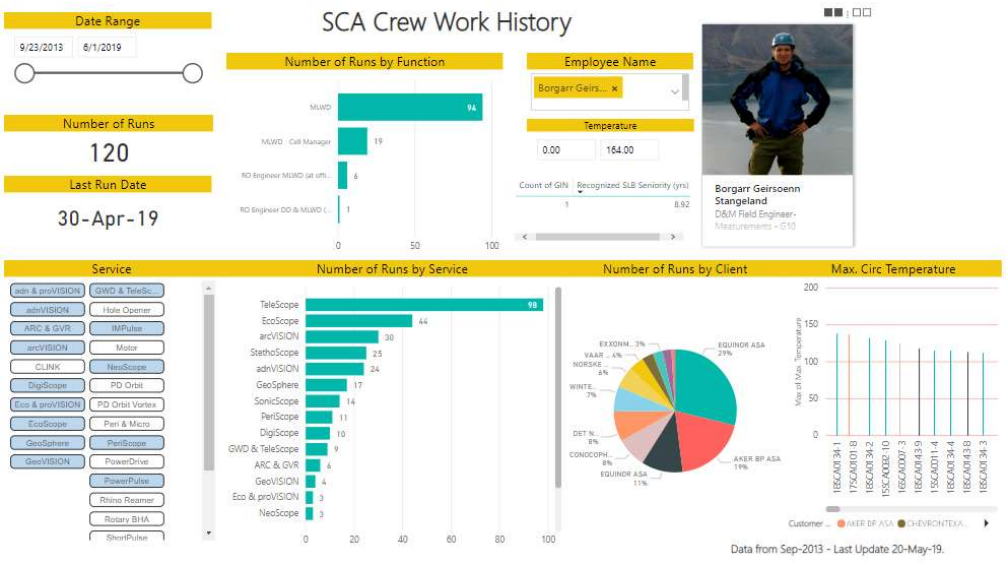
Experience

- Rig days and technologies ran captured in FTL. Once the run is done PSD manager QC's and approves experience credits

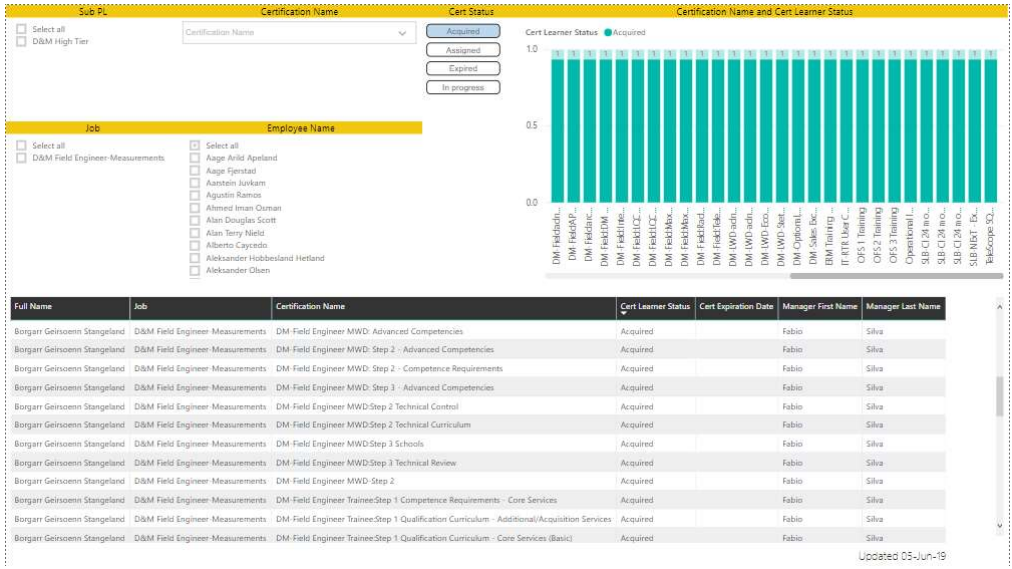
Assessment

- Competency sheets (practical assessment or technical interviews) done by lead hand and approved by PSD/FDE manager

Personnel Competency



Example Experience Summary



Example Training Record

Trajectory

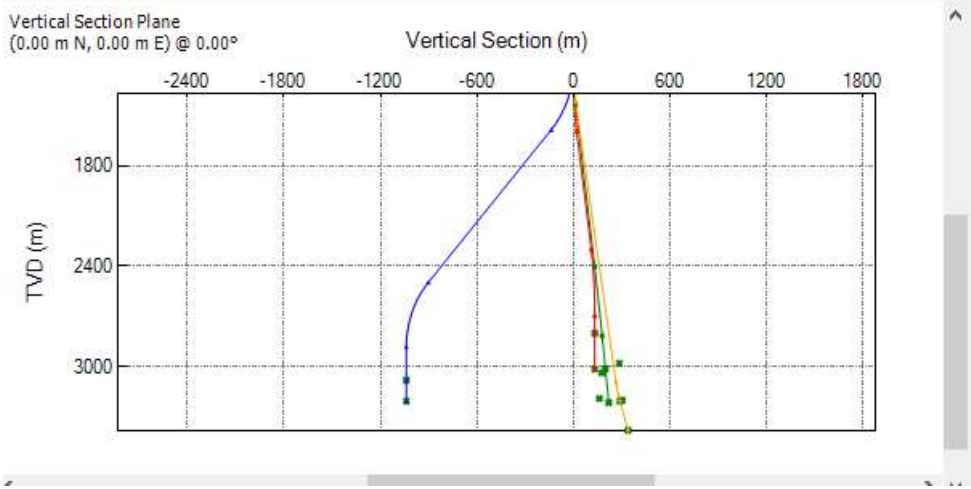
Beta Well Path - suggestion reservoir section 2.0_12 June 2019

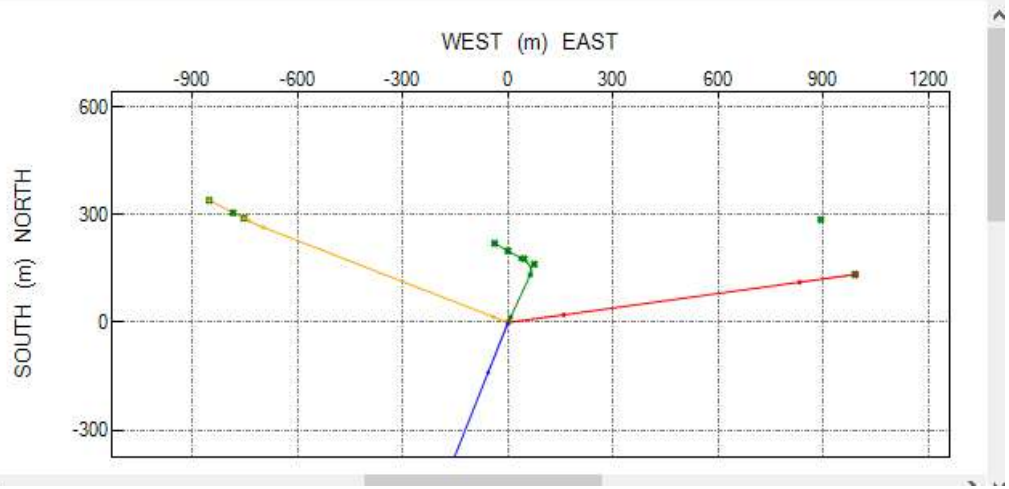
Save | Save as... | Settings | Targets... | Import data... | Export data... | Analyze Anti-Collision... | Report... | Plot... | Close

Horizontal Ref: Well: Canela/Borehole: Canela Depth Ref: Borehole: RKB

	Section	Comments	MD (m)	Incl (°)	Azim Grid (°)	TVD (m)	VSEC (m)	NS (m)	EW (m)	Northing (m)	Easting (m)	DLS (°/30m)	GTF (°)	BR (°/30m)
1		Tie-In	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7246820.00	416070.00		0.00	
2		KOP	1200.00	0.00	25.49	1200.00	0.00	0.00	0.00	7246820.00	416070.00	0.00	0.00	0.00
3		EOC #1 (3D-S)	1431.43	7.71	25.49	1430.73	14.04	14.04	6.69	7246834.04	416076.69	1.00	0.00	1.00
4	JS	KOP #2	2412.04	7.71	25.49	2402.47	132.86	132.86	63.34	7246952.82	416133.32	0.00	-119.51	0.00
5		EOC #2	2830.56	12.13	298.93	2816.47	179.73	179.73	36.79	7246999.67	416106.78	1.00	0.00	0.32
6		Beta Primary w...	3030.56	12.13	298.93	3012.00	200.06	200.06	0.00	7247020.00	416070.00	0.00	0.00	0.00
7	JS	Beta Primary_T...	3237.18	12.13	298.93	3214.00	221.07	221.07	-38.01	7247041.00	416032.00	0.00		0.00

Show Detailed Info:





36 x 42” BHA

	Desc.	Manu.	Serial Number	OD (in) / ID (in)	Max OD (in)	Bot Type / Top Type	Bot Gender / Top Gender	FN OD (in) / FN Length (m)	Length (m)	Cum. Length (m)	Cum. Weight (t)
				10.000				0.000			
1	36in MT Bit	Schlumberger		3.750	36.000	7-5/8 REG	Pin	0.00	0.85	0.85	0.3
				9.500		7-5/8 REG	Box				
2	9.5" Bit Sub w/ n-p Float	Schlumberger		3.000	9.500	7-5/8 REG	Box		0.91	1.76	0.6
	35 7/8" Steel String			9.500		7-5/8 REG	Pin				
3	Stabilizer	Schlumberger		3.000	35.875	7-5/8 REG	Box		3.59	5.35	4.6
				9.690		7-5/8 REG	Pin				
4	9 1/2" Non Mag Pony	Schlumberger		3.000	9.690	7-5/8 REG	Box		4.37	9.72	6.1
	Crossover 7 5/8" REG PIN x			9.500		7-5/8 REG	Pin				
5	7 5/8" H90 BOX	Schlumberger		3.250	9.500	7-5/8 H90	Box		0.70	10.42	6.3
				9.000		7-5/8 H90	Pin				
6	TeleScope 900 (D&I)	Schlumberger		5.900	9.160	7-5/8 H90	Box		9.09	19.51	8.5
	NM Crossover x 7 5/8 H90			9.000		7-5/8 H90	Pin				
7	PIN x 7 5/8 REG BOX	Schlumberger		3.000	9.500	7-5/8 REG	Box		0.70	20.21	8.7
				9.500		7-5/8 REG	Pin				
8	1 x 9 1/2" NMDC	Schlumberger		3.000	9.500	7-5/8 REG	Box		9.30	29.51	11.6
				9.500		7-5/8 REG	Pin				
9	1 x 9 1/2" NM Pony	Schlumberger		3.000	9.500	7-5/8 REG	Box		2.70	32.21	12.5
				9.500		7-5/8 REG	Pin				
10	1 x 9 1/2" DC	Rig		3.000	9.500	7-5/8 REG	Box		9.30	41.51	15.5
	Spaceout sub for BHA			9.500		REG	Pin	0.000			
11	handling	Schlumberger		3.000	9.500	REG	Box	0.00	2.43	43.94	16.3
				10.000		REG	Pin				
12	42" Hole Opener	Schlumberger		3.000	42.000	REG	Box		2.80	46.74	20.8
				9.500		REG	Pin				
13	Float sub with NP float valve	Schlumberger		2.500	9.500	REG	Box		0.70	47.44	21.1
				9.500		REG	Pin	0.000			
14	9 1/2" Pony DC	Schlumberger		3.000	9.500	REG	Box	0.00	2.50	49.94	21.9
				9.500		7-5/8 REG	Pin				
15	3 x 9 1/2" DC (3 joints)	Rig		3.000	9.500	7-5/8 REG	Box		27.00	76.94	30.5

Sensor Offset from Bit (m)	
D+I	14.08

9 7/8" BHA

	Desc.	Manu.	Serial Number	OD (in) / ID (in)	Max OD (in)	Bot Type / Top Type	Bot Gender / Top Gender	FN OD (in) / FN Length (m)	Length (m)	Cum. Length (m)	Cum. Weight (t)
1	9 7/8" Bit	Schlumberger		8.000 / 3.250	9.875	6-5/8 REG	Pin		0.27	0.27	0.1
2	Bit sub with NP float	Schlumberger		7.500 / 2.813	7.880	6-5/8 REG / 6-5/8 REG	Box / Box		1.22	1.49	0.3
3	arcVISION (GR, RES, APWD)	Schlumberger		8.250 / 2.810	9.100	6-5/8 REG / 6-5/8 FH	Pin / Box		6.28	7.77	1.6
4	TeleScope (D&I)	Schlumberger		8.250 / 5.109	8.410	6-5/8 FH / 6-5/8 FH	Pin / Box		8.27	16.04	3.3
5	SonicVision 825	Schlumberger		8.250 / 5.807	9.370	6-5/8 FH / 6-5/8 REG	Pin / Box	8.250 / 1.41	9.75	25.79	5.3
6	8" NMDC	Schlumberger		8.000 / 2.813	8.000	6-5/8 REG / 6-5/8 REG	Pin / Box		9.47	35.26	7.4
7	5 x 8" Collar, 5 1/2" recess (5 joints)	Rig		8.000 / 2.813	8.000	6-5/8 REG / 6-5/8 REG	Pin / Box		44.51	79.77	17.3
8	Jar	Schlumberger		8.250 / 3.000	8.375	6-5/8 REG / 6-5/8 REG	Pin / Box		10.07	89.84	18.9
9	5 1/2" Running Pup	Schlumberger		8.000 / 3.000	8.000	6-5/8 REG / 6-5/8 REG	Pin / Box		3.00	92.84	19.6
10	6 x 8" Collar, 5 1/2" recess (6 joints)	Rig		8.250 / 2.813	8.250	6-5/8 REG / 6-5/8 REG	Pin / Box		54.86	147.70	29.8

Sensor Offset from Bit (m)	
APWD	3.52
ARC Resistivity	4.23
ARC Gamma Ray	4.31
D+I	11.91
Sonic	21.73

26” BHA

	Desc.	Manu.	Serial Number	OD (in) / ID (in)	Max OD (in)	Bot Type / Top Type	Bot Gender / Top Gender	FN OD (in) / FN Length (m)	Length (m)	Cum. Length (m)	Cum. Weight (t)
1	26" Bit	Schlumberger		15.600 3.750	26.000	 7-5/8 REG	 Pin		0.59	0.59	0.7
2	25 3/4" Near Bit Stabilizer w/np float	Schlumberger		9.500 3.000	25.750	REG REG	Box Box	9.500 0.64	3.05	3.64	1.6
3	9 1/2" NM Pony Collar	Schlumberger		9.688 3.125	9.688	REG REG	Pin Box	9.688 4.51	4.03	7.67	2.9
4	TeleScope 900 (D&I)	Schlumberger		9.000 5.900	9.160	7-5/8 REG 7-5/8 H90	Pin Box		7.54	15.21	4.7
5	ARC-9	Schlumberger		9.000 3.000	10.000	7-5/8 H90 7-5/8 H90	Pin Box		5.49	20.70	6.0
6	NM Crossover 7 5/8" REG PIN x 7 5/8" H90 BOX	Schlumberger		9.500 3.250	9.500	7-5/8 H90 7-5/8 REG	Pin Box		1.00	21.70	6.3
7	9 1/2" NMDC	Schlumberger		9.500 3.000	9.500	7-5/8 REG 7-5/8 REG	Pin Box		7.65	29.35	8.8
8	9 1/2" NMDC	Schlumberger		9.500 3.000	9.500	7-5/8 REG 7-5/8 REG	Pin Box		7.65	37.00	11.3
9	1 x 9 1/2" DC	Rig		9.500 3.000	9.500	7-5/8 REG 7-5/8 REG	Pin Box		9.00	46.00	14.1
10	3 x 9 1/2" DC (3 joints)	Rig		9.500 3.000	9.500	7-5/8 REG 7-5/8 REG	Pin Box		27.00	73.00	22.8

Sensor Offset from Bit (m)	
D+I	11.33
APWD	16.61
ARC Resistivity	17.32
ARC Gamma Ray	17.40

17 1/2” Contingency BHA

	Desc.	Manu.	Serial Number	OD (in) / ID (in)	Max OD (in)	Bot Type / Top Type	Bot Gender / Top Gender	FN OD (in) / FN Length (m)	Length (m)	Cum. Length (m)	Cum. Weight (t)
				9.500							
1	17 1/2" Bit	Schlumberger		3.750	17.500	7-5/8 REG	Pin		0.35	0.35	0.1
	17 1/4" NB stabilizer w/NP			9.000		7-5/8 REG	Box				
2	float	Schlumberger		3.000	17.250	7-5/8 REG	Box		1.52	1.87	0.5
	Crossover 7 5/8" REG PIN x			9.500		7-5/8 REG	Pin				
3	7 5/8" H90 BOX	Schlumberger		3.250	9.500	7-5/8 H90	Box		0.80	2.67	0.8
	arcVISION (GR, RES,			9.000		7-5/8 H90	Pin				
4	APWD)	Schlumberger		3.000	10.000	7-5/8 H90	Box		5.49	8.16	2.1
				9.000		7-5/8 H90	Pin				
5	TeleScope 900 (D&I)	Schlumberger		5.900	9.160	7-5/8 REG	Box		7.54	15.70	3.9
				9.500		7-5/8 REG	Pin				
6	17 1/4" NM Stabilizer	Schlumberger		3.000	17.250	7-5/8 REG	Box		2.25	17.95	4.6
				9.500		7-5/8 REG	Pin				
7	9 1/2" NMDC	Schlumberger		3.000	9.500	7-5/8 REG	Box		7.65	25.60	7.1
				9.500		7-5/8 REG	Pin				
8	9 1/2" NMDC	Schlumberger		3.000	9.500	7-5/8 REG	Box		7.65	33.25	9.5

Sensor Offset from Bit (m)	
APWD	4.07
ARC Resistivity	4.78
ARC Gamma Ray	4.86
D+I	11.82

12 1/4” BHA

	Desc.	Manu.	Serial Number	OD (in) / ID (in)	Max OD (in)		Bot Type / Top Type	Bot Gender / Top Gender	FN OD (in) / FN Length (m)	Length (m)	Cum. Length (m)	Cum. Weight (t)
1	12 1/4" Bit	Schlumberger		8.000 / 3.250	12.250		/ REG	/ Pin		0.31	0.31	0.1
2	PD 900 X6 RA 12 1/4" Slick CC	Schlumberger		9.000 / 5.125	11.960		6-5/8 REG / 6-5/8 REG	Box / Box	8.250 / 0.51	4.21	4.52	1.2
3	12 1/8" Stabilized Receiver w/ NP float	Schlumberger		9.750 / 3.750	12.125		6-5/8 REG / 6-5/8 FH	Pin / Box	8.250 / 0.46	1.77	6.29	1.7
4	Flex Collar	Schlumberger		8.250 / 5.000	8.500		6-5/8 FH / 7-5/8 H90	Pin / Box	8.125 / 0.58	3.09	9.38	2.1
5	arcVISION (GR, RES, APWD)	Schlumberger		9.000 / 3.000	10.000		7-5/8 H90 / 7-5/8 H90	Pin / Box	9.125 / 1.46	5.73	15.11	3.5
6	TeleScope 900 (D&I)	Schlumberger		9.160 / 5.900	9.160		7-5/8 H90 / 7-5/8 H90	Pin / Box		8.32	23.43	5.5
7	Crossover 7 5/8" H90 PIN x 6 5/8" FH BOX	SLB		9.000 / 2.500	9.000		7-5/8 H90 / 6-5/8 FH	Pin / Box		1.00	24.43	5.8
8	12 1/8" NM in-line stabilizer	Schlumberger		8.250 / 2.813	12.125		6-5/8 FH / 6-5/8 FH	Pin / Box		1.52	25.95	6.1
9	SonicVision	Schlumberger		8.250 / 5.807	12.000		6-5/8 FH / 6-5/8 REG	Pin / Box	8.250 / 1.41	10.03	35.98	8.1
10	12 1/8" String stab	Schlumberger		8.250 / 2.813	12.125		6-5/8 REG / 6-5/8 REG	Pin / Box		1.52	37.51	8.4

Sensor Offset from Bit (m)	
D+I	2.65
APWD	10.99
ARC Resistivity	11.70
ARC Gamma Ray	11.75
D+I	19.24
Sonic	31.92

8 1/2” BHA

	Desc.	Manu.	Serial Number	OD (in) / ID (in)	Max OD (in)	Bot Type / Top Type	Bot Gender / Top Gender	FN OD (in) / FN Length (m)	Length (m)	Cum. Length (m)	Cum. Weight (t)
				5.750				0.000			
1	8 1/2" PDC Bit	Schlumberger		2.250	8.500	4-1/2 REG	Pin	0.00	0.24	0.24	0.0
				6.750		4-1/2 REG	Box				
2	NM Bit sub w/np Float	Schlumberger		2.500	6.750	4-1/2 IF	Box		0.80	1.04	0.2
				6.750		4-1/2 IF	Pin				
3	GVR-6 2 x 8 1/4" Stabilizers	Schlumberger		4.880	8.250	5-1/2 FH	Box		3.08	4.12	0.7
	EcoScope (GR, RES, DEN,			6.875		5-1/2 FH	Pin	6.875			
4	NEU, APWD)	Schlumberger		2.000	8.250	5-1/2 FH	Box	1.88	7.90	12.02	2.0
				6.750		5-1/2 FH	Pin	0.000			
5	TeleScope (D&I)	Schlumberger		5.109	6.890	5-1/2 FH	Box	0.00	8.20	20.22	2.6
				6.900		5-1/2 FH	Pin	6.900			
6	SonicScope 675	Schlumberger		5.157	8.250	5-1/2 FH	Box	1.75	9.75	29.98	4.3

Sensor Offset from Bit (m)	
GVR Gamma Ray	1.79
Ring Resistivity	2.14
BD Resistivity	2.33
BM Resistivity	2.50
BS Resistivity	2.63
Gamma Ray	5.91
APWD	6.07
Density	7.31
Ultrasonic Caliper	7.53
Resistivity	8.95
Neutron	9.21
D+I	16.12
Sonic	25.78

How do Schlumberger ensure that the most suitable bits for the different sections on Canela are used?

Receive well info from client engineer, evaluate drilling program with associated risks

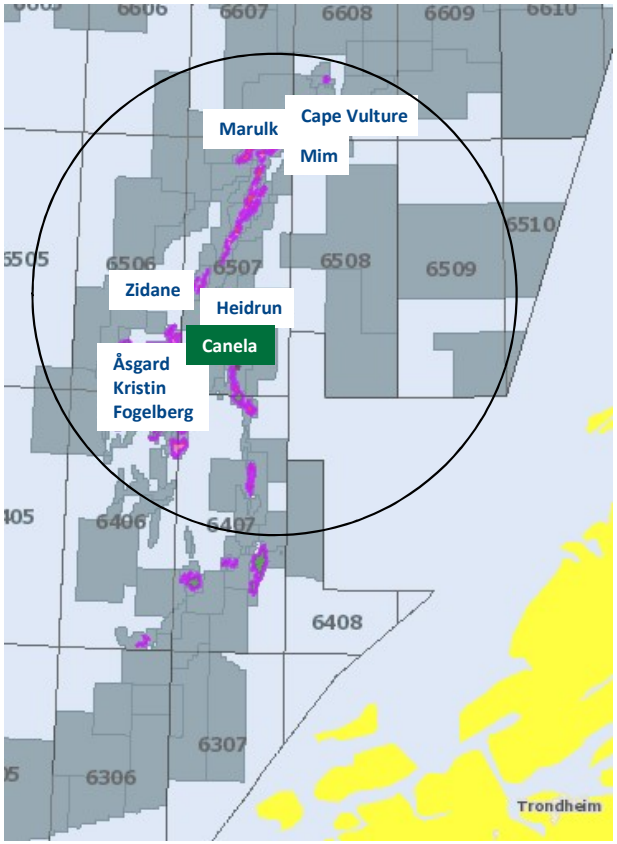
Do a offset radial DRS (Drilling Record System Database) search for bit runs (all vendors) and check relevant runs found with similar depths/intervals/lithologies.

Check BHA reports from offset wells where available

Discuss with SLB DD or BDT sales engineer with offset experience

Use closest DBOS (drillbit optimization system) hardness plot to better understand formation hardness and drillability as a function of depth

Engineering check – can new tech be implemented for improved drilling efficiency? IDEAS analysis if needed.



SMITH BITS
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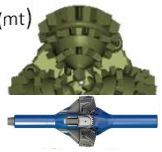
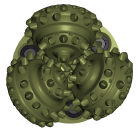
How do Schlumberger ensure that the most suitable bits for the different sections on Canela are used?

Info	Std. tech	Hazards/ROP	Possible upgrade	Selection info and reason for upgrade (where suggested)
36x42 340-437m	XR+ (mt) 	Occasional boulders Shallow gas Hole inclination Wellhead fatigue		36"bits together with 42" hole openers have been used since 2010 in the North Sea and have over 35 runs. This BHA has efficient P/U and L/D times, is safer from an HSE point of view then its 17 ½" x 26x36 x 42 counterpart, and yields a high ROP potential. Tophole bits in offset wells are coming out with little we[illegible] and the proposed 36x42 has been used in close offset wells to Canela.
9 7/8» pilot 437-1200m	GF15 (tci) 	Occasional boulders Hole inclination Shallow gas		A majorit[illegible]f insert bit[illegible]m all vendors have been used in the offset area with the proposed bit being [illegible]ed for the offset [illegible]elberg well with good results, but where a suggested denser insert is s[illegible]ested in the EOW repo[illegible]. The Gemini Dynamic Twin Seal System is the industry leader in du[illegible]ility and r[illegible]liability. Offe[illegible]g two precisely configured seals with extraordinary material prop[illegible]es, [illegible]mini bits deliver c[illegible]nsistent performance over long run intervals. Offsets show a majori[illegible] insert bits being used in this size and interval.
26» 437-1200m	GS04 (tci) 	Occasional boulders Hole inclination Shallow gas		[illegible]ajority o[illegible]sert bits from all vendors have been used in the offset area with the proposed bit [illegible]ed for the offset Fogelberg well with good results and was also recommended to be run same d[illegible]gn again in similar formations. The bit has the patented Gemini twin seal system, sealed precision roller bearings, intermediate dome center jet and vectorized extended nozzles for optimized hydraulic capabilities.
12.25 1200-2900m	MDSi716 	[illegible]e cleaning Lo[illegible]s Tigh[illegible]le Wellbo[illegible]stability Gas fille[illegible]ndst[illegible] stringers Limestone stringers	X[illegible] AxeBlade 	The MDSi716 has a proven track record from previous operations in the North Sea (+100 runs), with good ROP and stability with excellent dulls due to high performance cutters, as well as excellent directional response. Offsets show some rollercone bits being used but with poor dulls. The proposed Axe bit has cutters that dig deeper with less energy, produces less reactive torque for a more stable BHA, has more diamond in the cutter (good in abrasive formations), uses stinger backup cutters which yield higher impact resistance, have large waterways/JSA. An Bit/BHA analysis done for offset well Dvalin (DEA) favors the use of this bit in this formation.
8.5 2900-3400m	MDSiZ616 	Well control Stringers Diff.sticking Coring in interbedded fmts. Abrasive sandstones, conglomerates	XZ616 AxeBlade 	Ofsset wells show mainly 7 bladed 16mm bits being used in the offset area. Some low ROPs due to HP and shale plasticity as a result in very deep sections, +4000mMD. Offset wells Fogelberg and Zidane EOW reports indicates a more aggressive cutting structure is preferred for better ROP response. The proposed bit upgrade has Axe cutters which dig deeper with less energy, produces less reactive torque for a more stable BHA, has more diamond in the cutter (good in abrasive formations), uses stinger backup cutters which yield higher impact resistance, good for possible conglomeritic formation, have large waterways/JSA. An extensive Bit/BHA analysis done for offset well Dvalin (DEA) favors the use of this bit in this formation.

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What experiences do Schlumberger DBS have from operations on INN?

2014 Lundin 16/1-18 (Edvard Grieg)

2015 Lundin 7220/11-2 (Alta)

2016 Lundin 16/4-10 (Luno)

2017 Lundin 16/1-27 (Edvard Grieg)

2018 Spirit 6506/9-4 (Fogelberg)

2018 Spirit 7322/7-1 (Scarecrow)

2018 RWE-DEA 7321/4-1 (Gråspett)

BIT INFORMATION						MD			TOTAL	ROP	DULL CONDITION								Comments
No.	Size	Make	Type	Ser. No.	Jets / TFA	In	Out	m	hrs	m/hr	IR	OR	D	L	B	G	O	R	
1	9 7/8	Smith	GFi05VCPS	RJ3784	2x18 + 1x20 / TFA 0.804	331	1381	1050	35.2	29.8	3	1	BT	M	E	I	No	TD	Pilot hole
2	36	Smith	XR+C	RG0912	6 x 18, 1 x 16	331	397.6	66.6	16.2	4.1	2	2	WT	A	E	In	No	TD	26 To TD
3	26	Smith	GS04BCPS	RG0321	1x24,1x22,1x18,1x16	397.6	1381	983.4	34.2	28.8	1	1	WT	A	E	In	No	TD	Wear on Stabs and PD pads
4	17 1/2	Lyng	Vibx 6633PS3	105020	2x14, 3x 15 / TFA 1.509	1381	2290	909	26.9	33.8	1	1	WT	A	X	In	No	TD	17 1/2 To TD
5	12 1/4	Lyng	Vibx6633PS6A	105113	3 x 16, 3 x 18 / TFA 1.335	2290	4465	2175	96.7	22.5	0	1	WT	G	X	In	No	TD	12 1/4 To TD
6	8 1/2	Lyng	Vibx6642ABS3	105125	6 x 13 / TFA 0.778	4465	4519	54	11.5	4.7	1	0	CT	C	X	In	No	CP	Drill to core point
7	8 1/2	Lyng	Vibx7342DS4	104993	7 x 12 / TFA 0.773	4618	4738	120	13.1	9.2	1	1	WT	A	X	In	LN	TD	1 lost nozzle partially blckd waterways
7rr	8 1/2	Lyng	Vibx7342DS4	104993	7 x 12 / TFA 0.773	4738	4738	0	0.0	0.0	1	1	WT	A	X	In	LN	LOG	Wipertrip

SMITH BITS
A Schlumberger Company

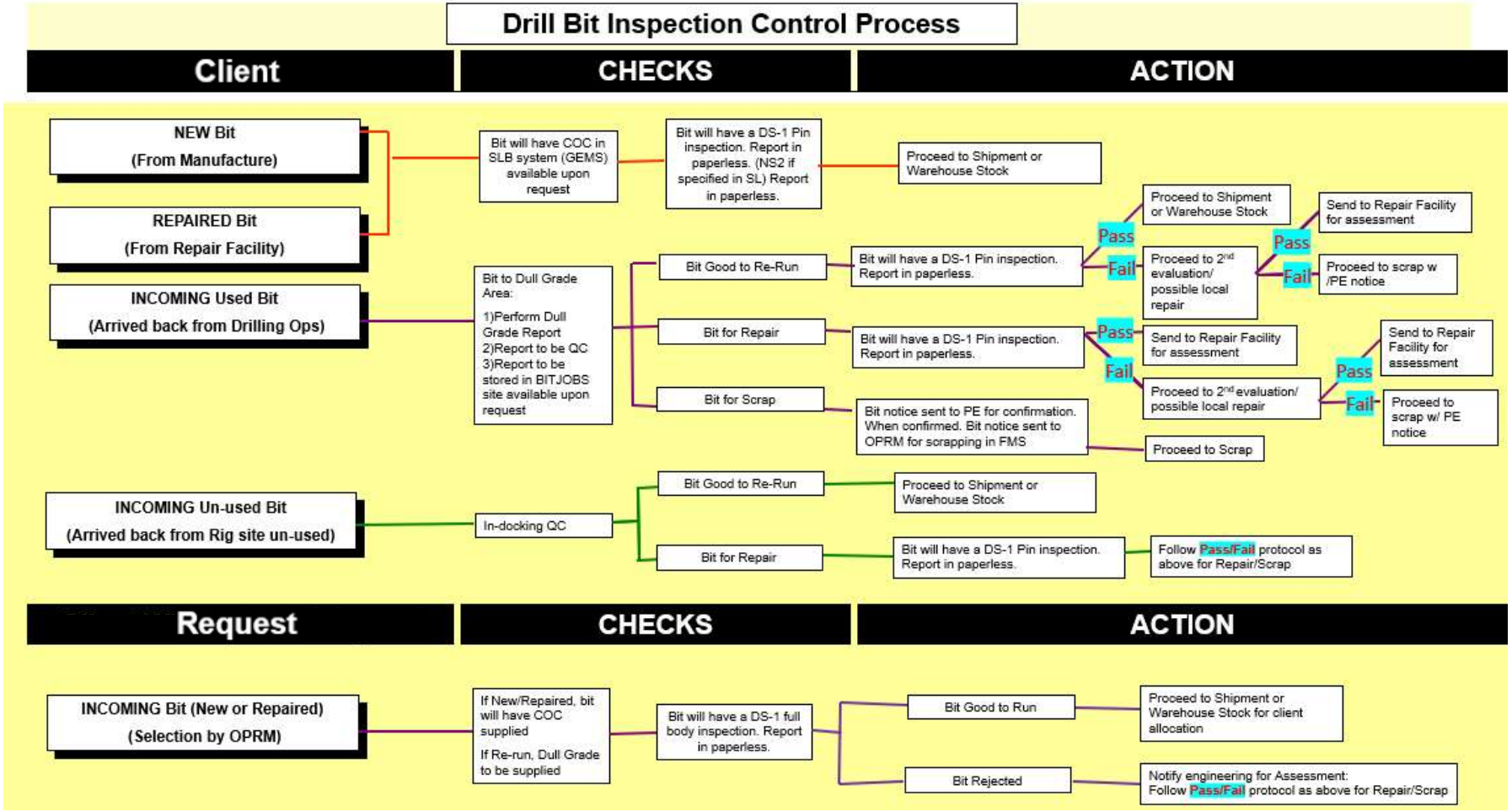
Any suggestions to improve safety and efficiency?

Action 1: Use a 36” bit with the 42” hole opener versus the 17 ½” bit with 26x36 X 42 heavy duty hole opening assembly
Improvement: Less HSE impact due to a lighter BHA, easier and quicker handling.

Action 2: Heavy steel bit cages have been used in the past to protect PDC drill bits when being shipped offshore on pre-made assemblies. These heavy cages are challenging to handle properly and as a mitigation a special plastic drill bit protector will be used the bigger size PDC bits.

SMITH BITS
A Schlumberger Company

How do Schlumberger ensure that the correct bits (including correct nozzles, tool kit and backup) are delivered in due time?



How do Schlumberger ensure that the correct bits (including correct nozzles, tool kit and backup) are delivered in due time?

- Use internal systems iDistrict and Qtrac for planning
- Dedicated SLB D&M Service Delivery Manager responsible for each different rig
- RACI job flow
- The Bits warehouse holds and maintains a live planner that is reflecting Qtrac. Bits Shipping List is returned to OPRM (Operations management) and Sales, and then OPRM make a shipping ticket which is being sent to the client. D&M then update their TCOs (Tool collar orders) with the information they receive, we then verify their input against our shipping ticket and fill it all into our live planner and “green the job out”. STs vs Qtrac is monitored daily.
- To make sure that everything is prepared correctly we have check list for both OPS and Warehouse in the Bits Shipping List.
- Personnel packing the Backup Bits & Parts have access to the live planner and can easily see what Bits that needs to be sent loose for each rig/section. When OPRM does the paperwork for the department that packs the bit, they also verify the Backup Bits & Parts vs the Live planner as a last line of defense.

RACI: Bits From Order To The End Of Well "The Process"	Sales Team	Product Engineer	Optimization Engineer	OPRM	BIT TEAM HIS Supervisor	Warehouse Team	BIT TEAM HIS	DRILCO	Client
Sales/Ordering/Planning Process									
Get order confirmation/well information from the client	RA								
Inventory search internal	RA	C							
Inventory search external (WWI stock)		C		RA					
PO/Contract confirmation	RA			I					
Product order (SCOR)		C		RA					
Get Bits on hold in the Stocklist	C			RA					
Create Shipping list for the job (Remember to use the latest revision found on SCA Local site in inTouch)	RA								
Send Shipping list for verification/peer review	RAC								
Send Shipping list to the warehouse team per e-mail	RA			I					
Send Shipping list with serial numbers and relevant information to admin				I	I	RA			
Enter Shipping list details into PMS to produce Shipping ticket				RA					
Send Shipping ticket to the sales rep (owner of the job)				RA					
Send shipping ticket to those involved internally and externally				RA					
Send draft flash/invoice internal	RA			CI					I
Send draft flash/invoice to the client	C			RA					I
Send final invoice to the client				RA					
Updating of Bits load-out planner					RA				
Monitoring: Bits load-outs, BT vs TCO					RA				
Warehouse Maintenance/Outgoing Process									
Request Shipping lists as per Bits load-out planner						RA			
Receiving Shipping list via e-mail from the sales rep	A					R			
Arrange inspection (DS1/NS2) as per Shipping list instructions						RA		I	
QC check against stocklist and physically availability in the warehouse				I		RAC			
When Bit has been located, check if O-rings are correctly installed / install new O-rings if needed						RAC			
Use Nozzle gauge prior to installation of Nozzles						RAC			
Nozzles installed in Bit according to Shipping list order						RAC			
Locate and check bit breaker and spare nozzles according to the Shipping list order						RAC			
If PDC 12 1/4" or less, follow the local BWI (BWI 12 1/4" and less PDC Bit Nozzle Installation) step by step						RA			
If three cone bit, the center jet nozzle (Df 101 & Df 91) requires torque (Df101+Df91=90ft/lbs & Df91 = 75ft/lbs)						RA			
Check that the bit breaker fits the bit prior to packing						RA			
Pack bits & parts in dedicated boxes/pelicases						RA			
Deliver the Bits for pre-make to New Bits Area						RA			
Pack the backup Bits & parts on pallets and deliver to Logistics Area						RA			
Label all bits & parts with Client, Rig Name, Well nr, Bit type, Customer type, Date, and packed by						RA			
Shipping Process									
Send complete Shipping list with serial numbers to OPRM				CI		RA			
Create Shipping ticket in PMS according to the details in the Shipping list				RA		C			
Send Shipping ticket to the warehouse team and Sales rep (owner of the job)	I			RA		I			
Update the stocklist				RA		I			
Print 3 copies of the Shipping ticket (1 for the archive and 2 for the truck driver)				I		RA			
Send signed (by truck driver) Shipping ticket to OPRM				I		R			
Archive signed Shipping ticket in customer files						R			
Docking In									
Check Bits & parts according to Shipping ticket						RA			
Comments (used/unused) to be added to Shipping ticket				I		RA			
Check outstanding items	AC					R			
Dock in Bits in PMS/Stocklist				RA					
Create dull grade tags (Form 155 Rev_08)						RA	I		
Warehouse Incoming Process (Un-used Bits)									
Arrange Breaking of Bits with the other departments in h15 (Collar team, RSS team, DD team)					I	RA	R		
Unpack Bit and unscrew all nozzles from the Bit						RA			
Store Nozzles in the labeled nozzle boxes in the nozzle room						RA			
Box the Bit, pack on pallet, table to pallet with Bit serial number and size and store back in rack read for next job						RA			
Store the Bit breaker back on designated pallet in the Bit breaker rack						RA			
Warehouse Incoming Process (Used Bits)									
Arrange Breaking of Bits with the other departments in h15 (Collar team, RSS team, DD team)					I	RA	R		
Steamclean the Bit and move it to the Dull grade area for Dull grading						RA			
Remove Nozzles and tag bit with already filled in dull grade tags (Form 155 Rev_08)							RA		
Dull grade and file the dull grade report in the local server (\\scafil01\department\Ands#IT\Technique\BITS) for Qcing					I	I	RA		
Dull grade report Qcing, Qced reports to be filed in the local server (BIT_JOBS)		RA			I	I			
Update stocklist with dull grade results	I			I		RA			
Re-runnable Bits to be moved to DRILCO for DS1 inspection - If pass, proceed to Shipment or to Warehouse stock						RA		I	
Bit for repair to be moved to DRILCO for DS1 inspection, If pass, send to repair facility for assesment						RA		I	
Bit for scrap, notice to be sent to Product engineer for Qcing - If Product engineer confirms, notice to be sent to OPRM for scrapping in PMS		CI		I		RA			
Inspection reports to be made available in paperless within deadline						I		RA	
End of Job/Well Process									
Send Dull grade reports to client	RA	C							I
Send Service Quality Survey to client	RA								I

Responsible: Do the job. Execute. (Complete the task and be fully responsible)
Accountable: Make the decision. Take ultimate ownership. (Individual having decision making authority)
Consulted: who has to be consulted prior to completing a task (2 way communication)
Informed: who has to be informed when the tasks is/has been performed (1 way communication).