

Lesson plan 5 Wire line operation Level 3, 4						
Time	Lecture	Content	Delivery Method for level 3	Delivery Method for level 4	Teaching Aids	Assessing & Understanding
08:00 - 08:30		Homework revision	Check the answers for yesterday homework with students and discuss the correct answers	Check the answers for yesterday homework with students and discuss the correct answers	Verbal White board	Discussion
08:30 - 09:00	5.1	Application WL When wireline is used and the different types available	Compare the different types of wireline available: - Slickline - Braided line - Electric line - Fiber optic cable - Digital slickline. For each type of wireline, explain the uses and limitations	Compare the different types of wireline available: - Slickline - Braided line - Electric line - Fiber optic cable - Digital slickline. For each type of wireline, explain the uses and limitations	Verbal White board Power Point	Discussion
	5.2	Equipment WL Wireline equipment in different operating environments	Explain why it is important to use the correct wireline equipment for different parameters: - Pressure ratings - Flow - Fluid composition - Temperature - Connection compatibility Explain why compatibility with external equipment systems is important: - Drilling rig - Production facility - Remote	From a given situation assess if the wireline equipment is suitable for different parameters: - Pressure ratings - Flow - Fluid composition - Temperature - Connection compatibility Explain why compatibility with external equipment systems is important: - Drilling rig - Production facility - Remote	White board Power Point video	Open questions Q & A

	5.3	<p>Surface PCE Stack WL PCE required for wireline operations</p>	<p>Explain the function and positioning of the surface PCE components required for different wireline operations:</p> <ul style="list-style-type: none"> - Slickline - Braided line - Electric line - Fiber optic cable - Digital slickline 	<p>From a given situation, assess the surface PCE components required and explain their function for different wireline operations:</p> <ul style="list-style-type: none"> - Slickline - Braided line - Electric line - Fiber optic cable - Digital slickline 	White board Power Point	Open questions Q & A
09:00 - 10:00	5.4	<p>Primary Barrier Elements WL Primary barrier elements used during wireline operations</p>	<p>Describe the function and positioning of primary barrier elements used during different wireline operations:</p> <ul style="list-style-type: none"> - Slickline - Braided line - Electric line - Fibre optic cable - Digital slickline <p>Outline the operating limits of wireline primary barrier elements:</p> <ul style="list-style-type: none"> - Height limitations - Access for maintenance 	<p>Describe the function and positioning of primary barrier elements used during different wireline operations:</p> <ul style="list-style-type: none"> - Slickline - Braided line - Electric line - Fibre optic cable - Digital slickline <p>Outline the operating limits of wireline primary barrier elements:</p> <ul style="list-style-type: none"> - Height limitations - Access for maintenance 	Manual Power Point	Open questions Q & A
10:00 - 10:30	5.5	<p>Primary Barrier Elements WL Slickline primary barrier sealing elements and how to operate them correctly</p>	<p>Explain how the slickline primary barrier sealing element will operate:</p> <ul style="list-style-type: none"> - Using operating pressures - With hydraulic connections - With the risk of contamination/chemical issues <p>Explain how the internal</p>	<p>Explain how the slickline primary barrier sealing element will operate:</p> <ul style="list-style-type: none"> - Using operating pressures - With hydraulic connections - With the risk of contamination/chemical issues. 	White board Power Point	Group discussion

			stuffing box BOP or plunger will operate	Explain how the internal stuffing box BOP or plunger will operate		
10:30 - 11:00	5.6	Primary Barrier Elements WL Braided line/electric line primary barrier sealing elements and how to operate them correctly	<p>Explain how the braided line/electric line barrier sealing element will operate:</p> <ul style="list-style-type: none"> - Using operating pressures - With hydraulic connections - With the risk of contamination/chemical issues including grease injection. <p>Explain how the internal grease injection head BOP or ball check valve will operate</p>	<p>Explain how the braided line/electric line barrier sealing element will operate:</p> <ul style="list-style-type: none"> - Using operating pressures - With hydraulic connections - With the risk of contamination/chemical issues including grease injection. <p>Explain how the internal grease injection head BOP or ball check valve will operate</p>	Power point	Discussion
11:00 - 11:30		Lunch Break				
11:30 - 11:45	5.7	Primary Barrier Elements WL Primary barrier element integrity during wireline operations	<p>Explain the factors that can affect the primary barrier element integrity during wireline operations:</p> <ul style="list-style-type: none"> - Hydraulic pressure - Roughness of the wireline - Fluid composition - Maintenance - Running speeds 	From a given situation, explain how to prevent primary barrier element failure considering the following factors: <ul style="list-style-type: none"> - Hydraulic pressure - Roughness of the wireline - Fluid composition - Maintenance - Running speeds 	Power point Manual	Open questions Q & A
	5.8	Secondary Barrier Elements – BOPs (Ram Type Preventers) WL Secondary barrier	Describe the function and positioning of secondary barrier elements (wireline BOPs)	From a given diagram, assess if the wireline BOP space-out and configuration is	Power point Video	Open questions Q & A

		elements (wireline BOPs) used during wireline operations	used during wireline operations, and its operating limits including potential for failure: <ul style="list-style-type: none"> - Slickline - Braided line - Electric line - Fibre optic cable - Digital slickline 	suitable for the operation		
11:45 - 12:00	5.9	Secondary Barrier Elements – BOPs (Ram Type Preventers) WL BOP ram configurations for different types of wireline	From a given situation, identify the required changes to the wireline BOP ram configuration for: <ul style="list-style-type: none"> - Changes to cable diameter and type. - Different fluid composition - Changes to pressure and temperature 	From a given situation, assess the required changes to the wireline BOP ram configuration for: <ul style="list-style-type: none"> - Changes to cable diameter and type. - Different fluid composition - Changes to pressure and temperature 	White board Power Point Video	Open questions Q & A
	5.10	Secondary Barrier Elements – BOPs (Ram Type Preventers) WL How to operate secondary barrier elements (slickline BOPs)	Explain how to operate secondary barrier elements (slickline BOPs) during wireline operations	From a given situation, explain the actions to take if the secondary barrier elements (slickline BOPs) fail to seal or function	White board Power Point	Class discussion
12:00 - 12:15	5.11	Secondary Barrier Elements – BOPs (Ram Type Preventers) WL How to operate secondary barrier elements (braided line/electric line BOPs)	Explain how to operate secondary barrier elements (braided line/electric line BOPs) during wireline operations Explain why rams are inverted	From a given situation, explain the actions to take if the secondary barrier elements (braided line/electric line BOPs) fail to seal or function	Power Point	Open questions Q & A

	5.12	<p>Shearing Devices WL Wireline shearing devices</p>	<p>Explain the function, positioning and operating limits of wireline: - Shear ram - Shear/seal ram/valve - Wire cutting valve.</p> <p>Explain when to use wireline: - Shear ram - Shear/seal ram/valve - Wire cutting valve</p>	<p>Explain the function, positioning and operating limits of wireline: - Shear ram - Shear/seal ram/valve - Wire cutting valve.</p> <p>Explain the consequences of wire fall-back and the tool string straddling the tree valves or the SSSV.</p> <p>From a given situation, assess why and when to use wireline: - Shear ram - Shear/seal ram/valve - Wire cutting valve</p>	White board Power Point	Open questions Q & A
12:15 - 12:30	5.13	<p>PRESSURE CONTROL (BARRIER ELEMENTS AND ENVELOPES) PRINCIPLES WL Grouping barrier elements into barrier envelopes during wireline operations</p>	<p>From a given wireline situation or surface rig-up diagram, identify which are primary and secondary barrier elements and group them into envelopes</p>	<p>From a given changing wireline situation or surface rig-up diagram, identify which are primary and secondary barrier elements and group them into envelopes</p> <p>Assess from a given barrier configuration and PCE design if the wireline operation can be completed safely</p> <p>Assess where potential leak paths may develop</p>	White board Power Point Manual	Open questions Q & A

	5.14	<p>Other operations - PCE Stack WL</p> <p>The PCE rig-up during wireline fishing operations</p>	<p>Explain the function of surface PCE specific for wireline fishing operations</p>	<p>From a given situation, assess the specific PCE required for wireline fishing operations</p>	Power Point	Discussion
12:30 - 12:45	5.15	<p>Safely repair or replace a failed primary barrier element WL</p> <p>Secondary barrier elements and envelopes for slickline operations if a primary barrier element fails</p>	<p>Explain the correct actions to take if a primary barrier element fails during slickline operations</p> <p>Describe how and when to apply the secondary barrier elements/envelopes considering:</p> <ul style="list-style-type: none"> - Equipment operating limits - Testing after closure - Monitoring for pressure - Double barrier protection 	<p>From a given situation, explain the correct actions to take if a primary barrier element fails during slickline operations considering:</p> <ul style="list-style-type: none"> - How to maintain double barrier protection - Operating limits of secondary barrier element - Ability to verify barrier envelope integrity 	Power Point Manual	Group discussion
	5.16	<p>Safely repair or replace a failed primary barrier element WL</p> <p>Secondary barrier elements and envelopes for braided line/electric line operations if a primary barrier element fails</p>	<p>Explain the correct actions to take if a primary barrier element fails during braided line/electric line operations</p> <p>Describe how and when to apply the secondary barrier elements/envelopes considering:</p> <ul style="list-style-type: none"> - Equipment operating limits - Testing after closure - Monitoring for pressure - Double barrier 	<p>From a given situation, explain the correct actions to take if a primary barrier element fails during braided line/electric line operations considering:</p> <ul style="list-style-type: none"> - How to maintain double barrier protection - Operating limits of secondary barrier element - Ability to verify barrier envelope integrity 	White board Power Point	Open questions Q & A

			protection			
12:45 - 13:00	5.17	PCE Rig Up WL The equipment required for a safe and compatible wireline PCE rig-up	Explain which PCE is required to complete a safe and compatible wireline rig-up	Analyse given information on the PCE stack, and explain which equipment is required to complete a safe and compatible wireline rig-up	White board Power Point	Open questions Q & A
	5.18	PCE Testing WL The specific requirements for pressure testing/function testing PCE including wireline BOPs, shear/seal BOPs and valves	Explain how to do pressure tests and function tests on the PCE with wire in place	From a given situation, verify how to do pressure tests and function tests on the PCE with wire in place, and assess if the test results are acceptable	White board Power Point Manual	Open questions Q & A
13:00 - 13:30	5.19	PCE Testing WL Testing the BOP with test rods	Explain how to test the wireline BOP with test rods Explain why it is important to use the correct test rods	From a given situation, verify how to test the wireline BOP with test rods, and assess if the test results are acceptable Explain why it is important to use the correct test rods	White board Power Point Manual	Open questions Q & A
	5.20	Operational Considerations (with well control consequences) WL The reason for wireline drift runs	Explain why it is important to run a suitable wireline drift (gauge cutter) when first entering the well	Explain why it is important to run a suitable wireline drift (gauge cutter) when first entering the well	Verbal Manual	Discussion
13:30 - 13:45	5.21	Operational Considerations (with well control consequences) WL Surface Controlled Sub Surface Safety	Explain why it is important that the SCSSSV is held open, and why it must be monitored throughout the operation	From a given situation, explain what actions to take to maintain SCSSSV integrity	White board Manual	Discussion

		Valve (SCSSSV) integrity during a wireline operation				
	5.22	Operational Considerations (with well control consequences) WL Use and limitations of wireline cutter bars	Explain how to use wireline cutter bars Explain what to do if there is not enough tool string weight to act against the well pressure	From a given situation, explain when and how to use wireline cutter bars Explain what to do if there is not enough tool string weight to act against the well pressure	White board Power Point	Open questions Q & A
13:45 - 14:00	5.23	Operational Considerations (with well control consequences) WL Force created by well pressure, flow and conditions compared to tool string/cable weight	Explain the force created by well pressure, flow and conditions. Identify when this could be a problem	Explain the effects of flow and well condition changes on the tool string Describe the steps required to manage the problem	White board Manual	Open questions Q & A
14:00 - 14:15	5.24	Controlled Well Shut in WL Tool string positioning across the wireline BOP	From a given diagram or description, assess wireline BOP space-out considering tool string positioning, and identify potential problems	From a given diagram or description, assess a tool string position/wireline BOP space out problem and what actions to take	White board Power Point	Group Discussion
14:15 - 14:30		Coffee Break				
14:30 - 14:45	5.25	Controlled Well Shut in WL Operating a wireline BOP	Outline how to operate a wireline BOP when: - Installing a wireline cutter bar - Managing a wireline fish at surface	From a given situation, assess how to operate a wireline BOP when: - Installing a wireline cutter bar - Managing a wireline fish at	White board Power Point	Class discussion

				surface		
14:45 - 15:15	5.26	<p>Controlled Well Shut in WL</p> <p>How to shut in the well quickly and safely with or without wireline in the hole</p>	<p>Explain how to safely shut in the well during a wireline operation:</p> <ul style="list-style-type: none"> - With wireline in the hole - Without wireline in the hole - With tools positioned at surface 	<p>From a given situation assess how to safely shut in the well during a wireline operation:</p> <ul style="list-style-type: none"> - With wireline in the hole - Without wireline in the hole - With tools positioned at surface 	Manual Power Point	Open questions Q & A
	5.27	<p>Loss of Pressure Control During Well Intervention Operations WL</p> <p>What to do if there are defects that could affect BOP function during a wireline operation</p>	<p>From a given diagram or description of a wireline BOP, explain what to do when a defect occurs:</p> <ul style="list-style-type: none"> - Leaking flange/fitting connections - Leaking o-ring connections - Leaking weep holes - Damaged seals - Grease system in braided line 	<p>From a given diagram or description of a wireline BOP, explain what to do when a defect occurs:</p> <ul style="list-style-type: none"> - Leaking flange/fitting connections - Leaking o-ring connections - Leaking weep holes - Damaged seals - Grease system in braided line <p>Explain the further actions required once the situation is made safe</p>	Manual Power Point	Open questions Q & A
15:15 - 15:30	5.28	<p>Loss of Pressure Control During Well Intervention Operations WL</p> <p>What to do if there is a failure in one component of the PCE during a slickline operation</p>	<p>Explain how to make the situation safe while maintaining control of the well if there is a failure in one component of the PCE during a slick line operation</p>	<p>Assess what to do if there is a failure in one component of the PCE during a slickline operation, and explain the further actions required once the situation is made safe</p>	White board Power Point Manual	Open questions Q & A

<p>15:30 - 15:45</p>	<p>5.29</p>	<p>Loss of Pressure Control During Well Intervention Operations WL What to do if there is a failure in one component of the PCE during a braided line/electric line operation</p>	<p>Explain how to make the situation safe while maintaining control of the well if there is a failure in one component of the PCE during a braided line/electric line operation</p>	<p>Assess what to do if there is a failure in one component of the PCE during a braided line/electric line operation, and explain the further actions required once the situation is made safe</p>	<p>White board Power Point Manual</p>	<p>Discussion</p>
<p>15:45 - 16:00</p>	<p>5.30</p>	<p>Loss of Pressure Control During Well Intervention Operations WL What to do if the wire is damaged during a wireline operation</p>	<p>Explain how to make the situation safe while maintaining control of the well if the wire is damaged during a wireline operation</p>	<p>From a given situation, assess what to do if the wire is damaged during a wireline operation, and explain the further actions required once the operation is made safe</p>	<p>White board Power Point Manual</p>	<p>Open questions Q & A</p>
<p>16:00 - 16:15</p>	<p>5.31</p>	<p>Loss of Pressure Control During Well Intervention Operations WL What to do if there is a hydraulic control line leak on the Xmas Tree hydraulic master valve during a wireline operation</p>	<p>Explain how to make the situation safe while maintaining control of the well if there is a hydraulic control line leak on the Xmas Tree hydraulic master valve during a wireline operation</p>	<p>From a given situation, assess what to do if there is a hydraulic control line leak on the Xmas Tree hydraulic master valve during a wireline operation, and explain the further actions required once the operation is made safe</p>	<p>Manual</p>	<p>Open questions Q & A</p>
<p>16:15 - 16:30</p>	<p>5.32</p>	<p>Loss of Pressure Control During Well Intervention Operations WL What to do if the hydraulic control line of the Surface Controlled Sub Surface Safety Valve (SCSSSV) leaks during a wireline operation</p>	<p>Explain how to make the situation safe while maintaining control of the well if there is a leak on the SCSSSV hydraulic control line during a wireline operation</p>	<p>From a given situation, assess what to do if there is a leak on the SCSSSV hydraulic control line during a wireline operation, and explain the further actions required once the operation is made safe</p>	<p>White board Power Point</p>	<p>Open questions Q & A</p>

	5.33	<p>Loss of Pressure Control During Well Intervention Operations WL</p> <p>What to do if the BOP hydraulic control unit or hoses fail during a wireline operation</p>	<p>Explain how to make the situation safe while maintaining control of the well if the BOP hydraulic control unit or hoses fail during a wireline operation</p>	<p>From a given situation, assess what to do if the BOP hydraulic control unit or hoses fail during a wireline operation and explain the further actions required once the operation is made safe</p>	<p>White board Power Point Manual</p>	<p>Open questions Q & A</p>
16:30 - 16:45	5.34	<p>Loss of Pressure Control During Well Intervention Operations WL</p> <p>What to do if the wire breaks and falls downhole during a wireline operation</p>	<p>Explain how to make the situation safe while maintaining control of the well if the wire breaks and falls down hole during a wireline operation</p>	<p>From a given situation, assess what to do if the wire breaks and fall downhole during a wireline operation, and explain the further actions required once the operation is made safe</p>	<p>White board Power Point</p>	<p>Discussion</p>
	5.35	<p>Loss of Pressure Control During Well Intervention Operations WL</p> <p>What to do if an alarm sounds when wireline is in the well and you are required to muster in a safe area</p>	<p>Explain how to make the operation safe while maintaining control of the well if an alarm sounds and you are required to muster in a safe area when wireline is in the well</p>	<p>From a given situation, assess what to do if an alarm sounds and you are required to muster in a safe area when wireline is in the well and explain the further actions required once the operation is made safe</p>	<p>Power Point</p>	<p>discussion</p>
1 Hr.		<p>Homework exercises</p>			<p>Exercise Book</p>	<p>To be discussed next day</p>