International Well Control Forum

IWCF Drilling Well Control Syllabus

Level 3 and 4

July 2017
Version 8.0

Contents

Guidance Notes

1.1. Introduction

The new syllabi will:

1) Meet the International Association of Oil and Gas Producers (IOGP) recommendations for enhancements to well control training, examination and certification as highlighted in Report 476, issued August 2016
2) Allow IWCF to continuously deliver the highest standards of well control training and assessment.

1.2. Who takes the Drilling Well Control training course?

We recommend personnel in the following positions should attend the appropriate level of training and assessment:

Level 2: Operation Team personnel - well-site based position whose action or inaction could directly influence well control assurance.
Level 3: Equipment Operator - has to perform an action to prevent or respond to well control accident.
Level 4: Supervisor - specifies and has oversight that correct actions are carried out.

1.3. How long is the training course?

The level 2 Drilling Well control training course must be a minimum 20 hours, excluding examination time.

The level 3 and level 4 Drilling Well Control training courses must be a minimum of 32 hours, excluding examination time.

1.4. How many candidates can a Centre have on a training course?

A course can have a maximum of 15 candidates on a training course (depending on room size/facilities/Assessors).

1.5. When can a candidate move on from Level 2 to Level 3 and then to Level 4?

Level 2 Drilling training courses should be run as a separate course.

Level 3 Drilling training courses may be partly combined with the Level 4 Drilling course.

If there is a syllabus learning outcome at Level 2, but not at levels 3 and/or 4, this indicates that IWCF believes Level 3 and 4 candidates should already have thorough knowledge of this syllabus category.
If there is a syllabus learning outcome for Level 3 but not at Level 4, this indicates IWCF believes all Level 4 candidates should already have thorough knowledge of this syllabus category.

If Level 3 and Level 4 Drilling Well Control training courses are partially combined, Level 3 candidates should spend time on training to improve detection and immediate response skills while the Level 4 candidates are taught advanced well control operations.

IWCF recommends a minimum three-month period to build further industry experience and competence before the candidate moves onto the next level. It is unacceptable for a Level 3 candidate to be enrolled on a Level 4 course at the same time.

2. The Level 2, 3 and 4 syllabi explained

2.1. Testing understanding

IWCF expects candidates' knowledge and understanding of basic drilling well control to be developed so that they can competently perform their assigned well control duties. It is insufficient for any candidate on any level of the course to be coached to pass the assessment.

The quality of teaching must evolve to ensure learning objectives are met. Training must be taught in line with the stipulated syllabus and it will not be sufficient to base training on "test-similar" or "test-identical" exam questions to help personnel pass the written exam". (IOGP Report 476).

2.2. Learning objectives

The learning objectives in the syllabus are based on the content (subject matter) the instructor must teach to meet the requirements of this level. The use of the wording "learning objective" is in line with the IOGP Report 476 and is a broad overview statement of what the student will be taught during the course.

Example:
'During the course, the student will gain an understanding of: Standard Well control methods'.

2.3. Learning outcomes

Learning outcomes have been developed for each of the learning objectives contained in the syllabus. The outcome indicates how each learning objective will be fulfilled with a detailed description of the skills a student must have at the end of the course. These learning outcomes are the basis for assessment questions.

Example:
'By the end of the course, the student will be able to: Define and list kill and control methods.'

2.4. Syllabus division

The written test syllabus is divided into two compulsory sections:

- Principles and Procedures
- Equipment.

2.5. Coding

Principles and procedures

	Surface	**Subsea**
Overview	DR-SF-PNP-01	DR-SS-PNP-01
Introduction to well control	DR-SF-PNP-02	DR-SS-PNP-02
Barriers	DR-SF-PNP-03	DR-SS-PNP-03
Risk management	DR-SF-PNP-04	DR-SS-PNP-04
Causes of kicks	DR-SF-PNP-05	DR-SS-PNP-05
Kick warning signs and kick indicators	DR-SF-PNP-06	DR-SS-PNP-06
Circulating system	DR-SF-PNP-07	DR-SS-PNP-07
Influx characteristics and behaviour	DR-SF-PNP-08	DR-SS-PNP-08
Shut-in procedures	DR-SF-PNP-09	DR-SS-PNP-09
Well control methods	DR-SF-PNP-10	DR-SS-PNP-10

Well control during casing and cementing	DR-SF-PNP-11	DR-SS-PNP-11
Well control management	DR-SF-PNP-12	DR-SS-PNP-12
Contingency planning	DR-SF-PNP-13	DR-SS-PNP-13

Well Control Equipment

	Surface	**Subsea**
Blow Out Preventers (BOPs)	DR-SF-EQP-01	DR-SS-EQP-01
Associated well control equipment	DR-SF-EQP-02	DR-SS-EQP-02
Choke manifolds and Chokes	DR-SF-EQP-03	DR-SS-EQP-03
Auxiliary equipment	DR-SF-EQP-04	DR-SS-EQP-04
Testing	DR-SF-EQP-05	DR-SS-EQP-05
BOP control systems	DR-SF-EQP-06	DR-SS-EQP-06

2.6. Importance Levels

All learning outcomes have an ‘importance’ level which is displayed in the far-right column of the syllabus. The importance is based on the criticality factor - the potential risk of a candidate not holding the knowledge. The levels shown below are based on the potential risk of the candidate **not** having the knowledge:

Importance	Level of risk	Explanation
10	Critical	Could lead to catastrophic damage to life, limb, environment, industry.
5	Major	Major risk factor.
4	Serious	Key knowledge – could lead to risk to life, limb and the environment.
3	Moderate	Necessary knowledge.
2	Minor	Underpinning knowledge.
1	Foundation	Foundation knowledge.

2.7. Assessment method

The Level 2 course Drilling well control course is based on:
- Written assessments.

The Level 3 and Level 4 Drilling Well control courses are based on:
- Written assessments
- A practical assessment.

PRINCIPLES AND PROCEDURES						
OVERVIEW						
Well Control Incidents						
DR-SF-PNP-01.01.01	A01.01	The impact of a well control incident.	Identify the potential impact of a well control incident on: - Personnel - Employment - Assets - Environment - Operations Reputation.	Assess the potential impact of a well control incident on: - Personnel - Employment - Assets - Environment - Operations - Reputation.	5	5

Well Control Training and Assessment						
DR-SF-PNP-01.02.01	A02.01	The need for well control training and assessment.	Explain "why are we here?" including: - Capability to apply well control skills - Trust of stakeholders - Responsibility to colleagues - Reduce the severity of impact of a well control event.	Explain "why are we here?" including: - Capability to apply well control skills - Trust of stakeholders - Responsibility to colleagues - Reduce the severity of impact of a well control event - Regulatory requirements.	4	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
INTRODUCTION TO WELL CONTROL						
Hydrostatic Pressure						
DR-SF-PNP-02.01.01	B01.01	Factors that affect hydrostatic pressure.	Explain the factors that affect hydrostatic pressure and complete calculations.	Explain the factors that affect hydrostatic pressure and complete calculations.	10	10
DR-SF-PNP-02.01.02	IB01.03	Hydrostatic pressure calculations.	Complete hydrostatic and gradient calculations including, but not limited to: - Given a fluid density, calculate a pressure gradient - Given a pressure gradient, calculate a fluid density - Given a fluid density and True Vertical Depth (TVD), calculate a pressure - Given a pressure and a TVD, calculate a fluid density - Given a pressure and a fluid density, calculate a TVD - Given two or more fluid densities and vertical intervals, calculate a pressure.	Complete hydrostatic and gradient calculations including, but not limited to: - Given a fluid density, calculate a pressure gradient - Given a pressure gradient, calculate a fluid density - Given a fluid density and True Vertical Depth (TVD), calculate a pressure - Given a pressure and a TVD, calculate a fluid density - Given a pressure and a fluid density, calculate a TVD - Given two or more fluid densities and vertical intervals, calculate a pressure.	10	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4

Formation Pressure

DR-SF-PNP-02.02.01	IB02.01	Formation pore pressure.	Describe subnormal/normal/abnormal formation pore pressures. Explain how abnormal formation pore pressure is caused: - Under compaction - Faulting - Salt domes - Aquifers.	Explain the mechanisms that can cause formation pore pressure changes: - Depletion - Injection - Diagenesis. From a given sub-subsurface prognosis, calculate the formation pore pressure.	4	4
DR-SF-PNP-02.02.02	NEW	Formation pore pressure as the lower limit of the mud weight window.	Identify from a sub-surface prognosis the required mud weight with trip margin.	Assess from a given sub-surface prognosis the minimum useable mud weight with trip margin.	5	5

Fracture Pressure

DR-SF-PNP-02.03.01	B03.01	Fracture pressure.	Explain fracture pressure and its effects.	Explain the mechanisms that cause fracture pressure changes.	5	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-02.03.02	NEW	Fracture pressure as the upper limit of the mud weight window.	Identify from a sub-surface prognosis, the maximum allowable mud weight, maximum allowable surface pressure and the potential for losses.	Assess from a given sub-surface prognosis, the maximum allowable mud weight, maximum allowable surface pressure and the potential for losses.	5	5
DR-SS-PNP-02.03.03	*SSH01.09*	*The effects of water depth on formation fracture pressure.*	*Describe how increasing water depth can affect formation fracture pressure.*	*Describe how increasing water depth can affect formation fracture pressure and assess possible solutions, for example:* - *The casing design* - *The drilling fluid density as low as possible* - *Monitor annulus pressure while drilling.*	3	3
Primary Well Control						
DR-SF-PNP-02.04.02	NEW	Factors that can influence primary well control.	Explain how hydrostatic pressure and formation pore pressure can influence primary well control.	Explain how hydrostatic pressure and formation pore pressure can influence primary well control.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-02.04.03	B04.03	Pore and fracture pressure estimation and the potential impact on primary well control.	Explain the impact of uncertain pore and fracture pressures on maintaining primary well control.	Assess a given situation, and explain the impact of uncertain pore and fracture pressures on maintaining primary well control.	5	5
Secondary Well Control						
DR-SF-PNP-02.05.01	B05.01	Secondary well control.	Outline the actions to achieve and maintain secondary well control.	Explain the actions required to monitor and maintain secondary well control.	5	5
Secondary Well Control Equipment						
DR-SF-PNP-02.06.01	B06.01	Appropriate secondary well control equipment selection.	Outline the requirements for secondary well control equipment in maintaining the barrier envelope.	Explain the requirements for appropriate secondary well control equipment in maintaining the barrier envelope.	10	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
BARRIERS						
Barrier Concept						
DR-SF-PNP-03.01.04	EQE01.02	The well barrier elements in well operations.	Identify what elements can form a well barrier envelope during drilling.	Identify what elements can form a well barrier envelope during drilling, completion, workover and abandonment operations.	5	5
DR-SF-PNP-03.01.05	NEW	The principles of different well barrier element types.	Compare mechanical and hydrostatic barriers. Hydrostatic barriers: - The density can be maintained (ability to circulate) - Can be monitored (for losses, gains or pressure). Mechanical Barriers: - If possible, will be pressure tested in the direction of flow from the well. - If they cannot be pressure tested from the direction of flow from the well, they must be risk assessed and verified.	Compare mechanical and hydrostatic barriers. Hydrostatic barriers: - The density can be maintained (ability to circulate) - Can be monitored (for losses, gains or pressure). Mechanical Barriers: - If possible, pressure tested in the direction of flow from the well. - If they cannot be pressure tested from the direction of flow from the well, they must be risk assessed and verified.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-03.01.06	NEW	Barrier terminology – 'primary' and 'secondary' barrier elements.	From a given well diagram, identify the 'primary' and 'secondary' barrier elements.	Assess from a given well situation, the primary and secondary well barrier elements during drilling, completion, workover and abandonment operations.	4	4
DR-SF-PNP-03.01.07	NEW	Verification of well barrier elements.	Describe the processes that are used to verify a well barrier element: - Confirm that it has operated correctly - Continually monitor for leaks.	Assess the processes that are used to verify a well barrier element: - Confirm that it has operated correctly - Continually monitor for leaks.	4	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Barrier Management						
DR-SF-PNP- 03.02.01	NEW	The criteria to test barrier elements.	Identify the reference sources for barrier test criteria including: - The well programme/operations manuals.	Identify the reference sources for barrier test criteria including: - The well programme/operations manuals - Industry standards - Technical specifications from equipment manufacturers.	4	5
DR-SF-PNP-03.02.02	EQE01.05	Documentation for well barrier tests.	Describe the key elements of a test document: - Testing procedure - Signature of the well owner - Accurate records.	Describe the key elements of a test document: - Testing procedure - Signature of the well owner - Accurate records.	3	4
DR-SF-PNP- 03.02.03	EQE01.06	The correct action to take when a well barrier element test fails.	Explain the correct action to take when a well barrier element fails: - During testing - In service during operations.	Explain the correct action to take when a well barrier element fails: - During testing - In service during operations.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP- 03.02.04	NEW	How to verify the continued integrity of the well barrier envelope.	Identify suitable methods of monitoring, for example: - Monitor annulus pressures - Casing wear through ditch magnets.		5	

RISK MANAGEMENT						
Well Control and Emergency Drills						
DR-SF-PNP-04.01.01	D01.01	Risk management.	Explain how to use risk management to reduce the probability of a kick and minimise the potential influx volume in a well control event.	Explain how to use risk management to reduce the probability of a kick and minimise the potential influx volume in a well control event.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-04.01.02	D01.02	The Management of Change (MOC) process.	Identify when a MOC process is required to change a well control procedure.	For a given scenario, assess the requirement for a change, and outline the MOC process to deliver that change.	5	5
DR-SF-PNP-04.01.03	M01.01	The importance of checklists for operations with well control implications.	From a given scenario, identify the primary factors to be verified as in place and functional by means of checklist: - Equipment - Procedures.	From a given scenario, demonstrate the primary factors to be verified as in place and functional by means of checklist: - Equipment - Procedures.	4	4
DR-SF-PNP-04.01.04	D02.01	The need for well control drills.	Explain the purpose of well control drills: - To reach expected competency - To maintain competency - To check that the required equipment is ready.	Explain how often well control drills should be carried out and outline the documentation required to prove competency.	5	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-04.01.05	E06.09	The management of non-shearable and non-sealable tubulars through the BOP.	Identify the checks required before placing non-shearables in the BOP: - Identify non-shearables - Identify non-sealables - Flow check - Identify methods to assure well closure.	Explain the checks required before placing non-shearables and non-sealables in the BOP. Identify the non-shearables and non-sealables and outline actions to minimise the risk.	10	10

CAUSES OF KICKS						
General						
DR-SF-PNP-05.01.01	E01.01	The causes of kicks.	Describe situations which can cause hydrostatic pressure to be less than formation pore pressure.		5	

<table>
<tr><th rowspan="2">New category</th><th rowspan="2">Previous category</th><th rowspan="2">Learning objective. During this course the student will gain an understanding of:</th><th rowspan="2">Level 3
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Learning outcome. By the end of this course the student will be able to:</th><th colspan="2">Importance</th></tr>
<tr><th>L3</th><th>L4</th></tr>
<tr><td colspan="7">Loss of Hydrostatic Pressure</td></tr>
<tr><td>DR-SF-PNP-05.02.01</td><td>E03.01</td><td>The consequences of failing to keep the hole full.</td><td>Explain what can happen if the hole is not kept full.

From given data, calculate loss of hydrostatic head.

Calculate the fluid loss before going underbalance:
- Height lost
- Barrels lost
- Tubulars pulled (dry or wet).</td><td>Explain what can happen if the hole is not kept full.

From given data, calculate loss of hydrostatic head.

Calculate the fluid loss before going underbalance:
- Height lost
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Tubulars pulled (dry or wet).</td><td>5</td><td>5</td></tr>
<tr><td>DR-SF-PNP-05.02.02</td><td>E03.02</td><td>Factors that affect fluid density.</td><td>Explain the possible causes of a reduction in fluid density:
- Adding water to the fluid system
- Use of centrifuges
- Gas-cut drilling fluid.</td><td>From a given situation, assess possible causes of fluid density reduction, and the checks required.</td><td>5</td><td>5</td></tr>
</table>

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-05.02.03	E03.04	Operations which can reduce hydrostatic head.	List the operations that can reduce hydrostatic head, for example (but not limited to): - Cement setting - Temperature effects on well bore fluids - Settling of weighting material - Swabbing.	Explain how some operations reduce hydrostatic head, for example (but not limited to): - Cement setting - Temperature effects on well bore fluids - Settling of weighting material - Swabbing.	4	4
Hydrostatic Effect						
DR-SS-PNP-05.03.01	*SSE03.05*	*The effect of fluid properties in the riser, booster, choke, and kill lines.*	*Explain the effect on well control operations of different fluids in the riser, booster, choke and kill lines.*	*Explain and calculate the effect on well control operations of different fluids in the riser, booster, choke and kill lines.*	*4*	*5*
DR-SS-PNP-05.03.02	*SSE03.07*	*The effect of riser margin on bottom hole pressure.*	*From given well data, calculate the required riser margin.*	*From given well data, calculate the required riser margin.*	*4*	*4*

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4

Gas Cutting						
DR-SF-PNP-05.04.01	E03.10	Gas cutting of drilling fluid.	Describe the effects of gas cut mud on hydrostatic pressure. Explain what actions to take: - Alert the supervisor to trend changes - Use the vacuum degasser.	For a given situation, assess the significance of the gas cutting and explain what actions to take.	4	4
DR-SF-PNP-05.04.02	NEW	The causes of gas cutting.	Differentiate between the three causes of gas cutting: - Background gas - Connection gas - Trip gas.	Analyse a given situation and explain what actions to take for: - Background gas - Connection gas - Trip gas.	4	5

Lost Circulation						
DR-SF-PNP-05.05.01	E04.01	The methods to recognise losses.	Identify how losses are recognised: - The pit levels - The rate of returns.		5	

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-05.05.02	E04.03	The potential causes of lost circulation.	Identify the causes of lost circulation.	Explain the causes of lost circulation and how to prevent them. Explain the well control implications of losses.	5	5
DR-SF-PNP-05.05.03	E04.02	The actions to take in the event of losses during normal operations.	Explain actions to take when losses are identified: - Stop drilling or tripping - Start the flow check - Alert the supervisor - Establish the rate and source of losses - Prepare to fill the hole.	For a given situation, assess and explain the course of action to take.	5	5
DR-SS-PNP-05.05.04	*SSE03.06*	*The possible consequences of losses on riser integrity.*	*Explain possible actions to take to prevent riser collapse:* - *Riser fill methods* - *Isolate the riser from well.* *Outline riser limitations.*	*For a given situation, assess and explain what actions should be taken to prevent riser collapse:* - *Riser fill methods* - *Isolate riser from well* *Identify the riser limitations.*	*5*	*5*

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Swab and Surge Effects						
DR-SF-PNP-05.06.01	E05.01	The causes of swabbing and surging.	Explain the causes of swabbing and surging: - Well and pipe/BHA geometry - Measured depth (including horizontal) - Fluid characteristics - Hole conditions and formation properties - Running and pulling speeds - Bit/stabiliser balling.	From a given situation, assess the causes of swabbing and surging: - Well and pipe/BHA geometry - Measured depth (including horizontal) - Fluid characteristics - Hole conditions and formation properties - Running and pulling speeds - Bit/stabiliser balling.	5	4
DR-SF-PNP-05.06.02	E05.02	The consequences of swabbing and surging.	Explain the consequences of swabbing and surging. Describe the actions to take to minimise swabbing and surging: - Use appropriate running and pulling speeds - Identify gains and losses.	Assess a given situation and explain possible actions to minimise swabbing and surging: - Use appropriate running and pulling speeds - Identify gains and losses - Optimise fluid properties - Optimise the hole conditions - BHA optimisation - Consider circulating during pipe movement.	5	5
DR-SS-PNP-05.06.03	*SSE05.03*	*Downhole swabbing and surging from the vessel motion on floating rigs.*	*Explain the risks of swabbing and surging due to vessel motion.*	*Explain the risks of swabbing and surging due to vessel motion.*	*4*	*4*

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Tripping						
DR-SF-PNP-05.07.01	NEW	The tripping process.	Identify operational elements for tripping: - Prepare the hole - Optimise fluid properties - Flow check - Pump a slug (POOH) - Pull out of hole/run in hole. - Monitor displacement using trip sheet and trip tank (POOH and RIH).	For a given scenario, assess the appropriate trip management procedure, for example: - Direct Supervisory oversight - Check tripping - Swabbing behaviour - Wet/Dry Trip.	4	4
DR-SF-PNP-05.07.02	NEW	The risks associated with tripping.	Explain the primary risks encountered during tripping: Pulling out of hole: - Swabbing. Running in hole - Surging.	Assess the primary risks encountered during tripping: Pulling out of hole: - Swabbing. Running in hole - Surging.	3	3
DR-SF-PNP-05.07.03	E06.01/E06.03	The use of a trip tank and trip sheet.	Describe the purpose and key elements of a trip tank: - Size - Sensitive instrumentation - Use of pump. Describe the purpose and key elements of a trip sheet.		4	

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-05.07.04	NEW	Actions to take when there are deviations from predicted trip tank volumes.	Identify gain/loss trends from trip sheet data. Outline the actions to take: - Stop tripping - Communicate to the supervisor - Flow check.	Analyse a given situation and determine the response to take if the trip sheet indicates a deviation from the expected fluid volume change.	5	5
DR-SF-PNP-05.07.05	IE06.03	The actions to take after trip sheet evaluation shows an influx.	Demonstrate the actions to take when an influx is identified: - Flow check - Run (or strip) back to bottom - Circulate the influx out through the chokes.	Justify the actions to take when an influx is identified: - Flow check - Run (or strip) back to bottom - Circulate the influx out through the chokes.	10	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-05.07.06	IE06.01	Common tripping practices.	Explain the process of pumping a 'slug' and its intended result. From given data, calculate the required slug size and pit gain due to pumping the slug. Describe the reason for having a trip margin: - To maintain BHP greater than formation pressure while pulling out of hole. Explain the process of pumping out of the hole: - Keep the hole full - Ensure the flow rate is sufficient to overcome the effects of swabbing. - Ensure the pump output is sufficient to fill the increasing space below the bit as the bit moves up.	Explain the process of pumping a 'slug' and its intended result. From given data, calculate the required slug size and pit gain due to pumping the slug. Using given data, calculate the required trip margin. Explain the principles of pumping out of hole: - Keep the hole full - Maintain BHP greater than formation pressure.	4	4
DR-SF-PNP-05.07.07	E06.06	An influx in the tubulars.	Identify factors that might cause an influx in the tubulars: - No float valves in the string - Closure of the BOP **before** closing the Drill Pipe Safety Valve (DPSV).	Explain factors that might cause an influx in the tubulars: - No float valves in the string - Closure of the BOP **before** closing the Drill Pipe Safety Valve (DPSV).	4	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-05.07.08	E06.07	A swabbed influx in a horizontal well.	Explain why swabbing may be more likely in a horizontal well and how to deal with it. From well geometry and influx location, identify the impact to bottom hole pressure. Explain the procedures and precautions required when running the bit back to bottom to circulate out the influx.	Assess the risk of swabbing an influx into a horizontal section and explain the influx identification. Explain why swabbing may be more likely in a horizontal well and how to deal with it. From well geometry and influx location, identify the impact to bottom hole pressure. Explain the procedures and precautions required when running the bit back to bottom to circulate out the influx.	4	5

New category	Previous category	Learning objective	Level 3	Level 4	L3	L4
KICK WARNING SIGNS AND KICK INDICATORS						
Kick Warning Signs and First Actions						
DR-SF-PNP-06.01.01	F02.01	Kick warning signs while drilling and/or circulating.	Identify kick warning signs including: - Rate of penetration changes - Cuttings size and shape - Drilling fluid temperature increase - Changes in gas trends at the shakers - Increase in torque and drag - A change in d-exponent. - Rate of penetration changes. - Cuttings size and shape - Downhole tool data. Drilling fluid property changes, for example density/pH/viscosity/ chlorides/temperature - Background gas. - Connection gas - Trip Gas - Increase in torque and drag.	From a given situation, verify and assess the kick warning signs.	5	5
DR-SF-PNP-06.01.02	F04.01	Kick warning signs when tripping.	Recognise warning signs when tripping: - Swabbing - Increased drag.	From a given situation, interpret relevant warning signs when tripping: - Swabbing - Increased drag.	5	5

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DR-SF-PNP-06.01.03	NEW	Actions to take after recognising a kick warning sign.	Demonstrate how to flow check the well to evaluate the warning signs - Stop Drilling - Space out the drill string for the BOP - Stop the pumps - Monitor the well for flow on the trip tank. - Communicate with the supervisor.	Assess the warning signs, decide what action is required, and communicate with the team.	5	5
Kick Indicators						
DR-SF-PNP-06.02.01	F03.01	Kick indicators and the importance of early kick detection.	Define what a kick indicator is: - Increase in flow - Increase in tank volume. Describe why detecting a kick early is important: - Minimise the kick volume - Minimise pressures on the well - Minimise the chances of losses. From well data, identify when a kick may be in progress.	Define what a kick indicator is: - Increase in flow - Increase in tank volume. Justify the importance of detecting a kick early: - Minimise the kick volume - Minimise pressures on the well - Minimise the chances of losses. From well data, identify when a kick may be in progress.	10	10

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DR-SF-PNP-06.02.02	NEW	The interpretation of well flow-back (for example: ‘finger-printing’ and trend analysis).	Differentiate between normal well behaviour and potential kick indicators.	Differentiate between normal well behaviour and potential kick indicators.	10	10
DR-SS-PNP-06.02.03	*SSF03.02*	*The effect of rig motion on detecting kick indicators.*	*Explain the problems associated with monitoring the well on a floating rig.* - *Vessel motion* - *Crane operations.*	*From a given situation, assess possible problems associated with monitoring the well on a floating rig:* - *Vessel motion* - *Crane operations.*	*10*	*10*
Shallow Gas						
DR-SF-PNP-06.03.01	F10.01	Shallow Gas	Explain why secondary well control cannot be used in the event of a shallow gas flow: - Formation breakdown - Equipment availability.	Explain why it is necessary to begin dynamic kill (tertiary well control) operations as quickly as possible.	4	3

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DR-SF-PNP-06.03.02	NEW	The consequences of shallow gas kicks.	Explain the consequences of shallow gas: - Gas around the rig leading to explosion risk and possible H2S - Equipment failure due to rapid abrasive flow - Possible broaching of gas to the surface outside the well - High noise levels making it difficult to communicate - The situation can develop very rapidly.	From a given situation, assess the consequences of shallow gas: - Gas around the rig leading to explosion risk and possible H2S - Equipment failure due to rapid abrasive flow - Possible broaching of gas to the surface outside the well - High noise levels making it difficult to communicate - The situation can develop very rapidly.	3	3
DR-SF-PNP-06.03.03	F10.02	Prevention of shallow gas kicks.	Explain the critical factors when drilling top hole with the risk of shallow gas: - Keeping the hole full - Controlled penetration rate - Drilling fluid density - Trip speed - Pump out of hole - Pump rate - Hole diameter - Kill fluid.	Assess the critical factors when drilling top hole with the risk of shallow gas: - Keeping the hole full - Controlled penetration rate - Drilling fluid density - Trip speed - Pump out of hole - Pump rate - Hole diameter - Kill fluid.	4	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-06.03.04	NEW	The requirements for operations in a shallow gas zone.	For a given scenario identify the operational requirements (procedures and equipment) in shallow gas areas: - Suspend well operations, - Keep pumping - Activate the diverter.	For a given scenario, identify the operational requirements (procedures and equipment) in shallow gas areas: - Large flow rate capacity - Large fluid volume - Riser-less - Use the appropriate diverter system (reference API RP 64).	3	4
DR-SF-PNP-06.03.05	F10.04	Managing shallow gas flow.	Describe the step-by-step procedure for rig personnel when a shallow gas kick is in progress: - With the diverter closed and operations suspended, switch to pumping kill mud - Keep the hole full - If you run out of kill mud, pump drilling mud - If you run out of drilling mud, pump water - Be prepared to pump cement.	Describe the step-by-step procedure for rig personnel when a shallow gas kick is in progress: - With the diverter closed and operations suspended, switch to pumping kill mud - Keep the hole full - If you run out of kill mud, pump drilling mud - If you run out of drilling mud, pump water - Be prepared to pump cement - Consider evacuation of non-essential personnel.	10	10

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DR-SS-PNP-06.03.06	*SSF10.05*	*Implications of drilling top hole with or without a riser.*	*Explain the principles of drilling top hole without a riser:* - *no gas directly to the rig* - *move off quickly* - *avoid collapse of the riser.*	*For a given scenario, justify the decision to drill top hole without a riser:* - *no gas directly to the rig* - *move off quickly* - *avoid collapse of riser.*	*3*	*3*
DR-SS-PNP-06.03.07	*SSF10.06*	*The methods to identify and minimise the impact of a shallow gas kick.*	*Describe the methods to identify a shallow gas kick* - *Monitor the well by Visual (ROV) and sonar* - *Surface visual (bubble watch).* *Describe the methods to minimise the impact:* - *Anchors* - *Rig move.*	*Assess the methods to identify a shallow gas kick:* - *Monitor the well by Visual (ROV) and sonar* - *Surface visual (bubble watch).* *Assess the methods to minimise the impact:* - *Anchors* - *Rig move.*	*10*	*10*

CIRCULATING SYSTEM						
Definition and Principles						
DR-SF-PNP-07.01.05	NEW	The use of barite.	Describe the potential problems with the loss of barite, for example: - Barite sag - Solid removal equipment. Calculate the barite weight required to increase the fluid density.		2	3

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DR-SF-PNP-07.01.07	G01.04	Bottom hole circulating pressure and Equivalent Circulating Density (ECD).	Given well data, calculate dynamic BHP and ECD.	Given well data, calculate dynamic BHP and ECD.	4	4
DR-SF-PNP-07.01.08	G01.05	The relationship between pump pressure and pump speed.	Given well data, calculate dynamic BHP and ECD.	Given well data, calculate dynamic BHP and ECD.	3	4
DR-SF-PNP-07.01.09	G01.06	The relationship between pump pressure and drilling fluid density.	From given data, interpret and calculate how changes in drilling fluid density can affect pressures.	Explain and calculate how changes in drilling fluid density can affect pressures.	4	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Slow Circulation Rates (SCRs)						
DR-SF-PNP-07.02.02	G01.03	The process of taking Slow Circulation Rates (SCRs).	Describe when you should take and repeat SCRs. Outline why they are measured at the remote choke panel. Demonstrate the procedure and appropriate equipment line-up for taking slow circulating rates: - Minimum of two pumps and two pump rates.	Assess when you should take and repeat SCRs. Explain why they are measured at the remote choke panel.	2	2
DR-SF-PNP-07.02.03	G02.02	The factors that influence selection of slow circulating rates.		Assess the choice of slow circulation rates because of the limitations of: - Surface equipment - Personnel (operating the equipment) - Well bore conditions - Well bore geometry.		2
DR-SS-PNP-07.02.05	*SSG02.05*	*How to establish choke line friction when using a subsea BOP.*	*Demonstrate the processes to record pressure losses at slow circulating rates to calculate choke line friction and its effect on BHP.*	*Evaluate the processes to record pressure losses at slow circulating rates to calculate choke line friction and its effect on BHP.*	*3*	*3*

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Fracture Pressure and MAASP						
DR-SF-PNP-07.03.03	H01.02	The purpose of a Leak Off Test (LOT), and the difference between a LOT and a Formation Integrity Test (FIT).	Explain the differences between a LOT and a FIT.	Explain the reasons why a LOT is carried out. Differentiate between the objectives of a LOT and a FIT.	3	3
DR-SF-PNP-07.03.04	H01.03	How to perform a LOT or a FIT.	Identify the requirements to complete a LOT or FIT: - Hole conditions - Mud weight - Line up - Instrumentation - Pump rates - Hesitation or Continuous - Volumes pumped and returned.	Outline the requirements to complete a LOT or FIT: - Hole conditions - Mud weight - Line up - Instrumentation - Pump rates - Hesitation or Continuous - Volumes pumped and returned.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-07.03.05	H01.04	The pressure versus volume graph from the LOT or FIT data.	Analyse a LOT/FIT graph to select MAASP.	From a LOT/FIT graph, identify the key information to select MAASP.	4	4
DR-SF-PNP-07.03.06	H01.05	How to select MAASP from LOT/FIT results.	From a set of LOT/FIT data, select the MAASP.	From a set of LOT/FIT data, calculate the MAASP.	4	5
DR-SF-PNP-07.03.07	H01.06	When and why MAASP must be recalculated.	Indicate when MAASP will change: - When there is a change in hydrostatic pressure.	Indicate when MAASP is going to change: for example: - Weak zone below the shoe - Losses - Change in hydrostatic pressure.	4	4

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DR-SF-PNP-07.03.08	H01.08	The principles of kick margin/tolerance/intensity and how it is applied to well operations.		For a given scenario, identify the factors affecting kick tolerance and their impact on well operations.		5
INFLUX CHARACTERISTICS AND BEHAVIOUR						
Principles						
DR-SF-PNP-08.01.01	I01.01	The different types of influx and the hazards they present.	From well observation, estimate the different types of influx fluids; - Gas (hydrocarbon, H2S, CO2) - Oil - Water - Combination of gas, oil and water. Outline the key hazards of these types of influx.	Identify the different types of influx fluids; - Gas (hydrocarbon, H2S, CO2) - Oil - Water - Combination of gas, oil and water. Outline the key hazards of these types of influx.	4	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-08.01.02	I01.02	How an influx can change as it is circulated up a well.	Describe the changes which can take place as different types of influx are circulated.	For a given scenario, assess what changes can take place as different types of influx are circulated.	5	5
DR-SF-PNP-08.01.03	I01.03	The importance and use of the gas laws.	Calculate pressure and volume at given well envelope locations (excluding temperature element).	Calculate pressure and volume at given well envelope locations (including temperature element).	4	5
DR-SF-PNP-08.01.04	I02.04	Influx migration.	Describe what can happen if an influx migrates: - in an open well - in a shut-in well.	Differentiate between what can happen if an influx migrates: - in an open well - in a shut-in well. From given data, calculate gas migration rates, pressures and volumes	3	4

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Influx Behaviour						
DR-SF-PNP-08.02.01	NEW	The effects of influx fluids on the primary fluid barrier.		From a given scenario, assess how an influx can change the properties of the primary fluid barrier: - The density - The rheology (viscosity, pH, chlorides) - The solubility.		3
DR-SF-PNP-08.02.02	I02.01	The behaviour of a hydrocarbon gas influx when circulated.	Explain how a gas influx will behave as it is circulated up a well in water based and oil based drilling fluids, and the possible effects on: - Volumes - Pressures.		3	
DR-SF-PNP-08.02.03	I02.02	The solubility of hydrocarbon, carbon dioxide and hydrogen sulphide gases when mixed under downhole conditions with water based or (pseudo) oil based drilling fluid.	Recognise the wellbore conditions under which formation gases will come out of solution, from water based and/or oil based drilling fluid.	From a given scenario, assess the wellbore conditions under which formation gases will come out of solution, from water based and/or oil based drilling fluid.	3	4

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DR-SF-PNP-08.02.04	I02.03	The behaviour of dissolved gas in different drilling fluid types when circulating the influx to surface including the effects of temperature and pressure.	For different drilling fluid types, describe how dissolved gas will behave under specific shut-in conditions. Explain how and when dissolved gas will break-out of the drilling fluid if the influx is circulated to surface List the possible consequences.	For different drilling fluid types, predict how dissolved gas will behave under specific downhole conditions. From a given scenario, estimate how and when dissolved gas will break-out of the drilling fluid if the influx is circulated to surface. Explain the possible consequences.	3	4
DR-SF-PNP-08.02.05	I02.04	The impact of downhole conditions on the hydrocarbon gas state (gas or liquid influx).	List the possible effects of gas compressibility under downhole conditions.	From a given scenario, predict the possible effects of influx phase change (gas or liquid) under downhole conditions: - Breakout - Temperature - Pressure.	3	4
DR-SF-PNP-08.02.06	I02.05	The actions required to mitigate the effects of gas break out.	Demonstrate the actions required to mitigate the potential impacts of gas break out: - Shut-in the well - Circulate bottom up through the chokes.	Outline the actions required to mitigate the potential impacts of gas break-out: - Shut-in the well - Circulate bottom up through the chokes.	3	4

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DR-SF-PNP-08.02.07	I02.06	The behaviour of a gas influx as it circulated from a horizontal well.	Recognise how a gas influx behaves in a horizontal well: - Limited migration - Limited initial differential pressures (SICP, and SIDPP) - Sweeping the horizontal section - Influx expansion when in the vertical section.	In highly deviated kick scenarios, predict when a gas influx will not behave according to the ideal gas law: - Limited migration - Limited initial differential pressures (SICP, and SIDPP) - Annular velocity sufficient to remove gas from horizontal section. - Expansion of influx when in the vertical section.	3	5
DR-SS-PNP-08.02.08	*SSE03.11*	*The effects of gas expansion in the riser.*	*Describe the effects of gas expansion in a subsea riser:* - *The potential problems at surface* - *The potential impact on BHP.* *Outline the appropriate actions to take if gas expansion in the subsea riser is identified.*	*Define the effects of gas influx phase change or breakout in a subsea riser above the BOPs:* - *The potential problems at surface* - *The potential impact on bottom hole pressure (BHP)* *Describe the appropriate actions to take if gas expansion in the subsea riser is identified.*	*5*	*10*

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DR-SS-PNP-08.02.09	*NEW*	*The actions to take with gas expansion in the riser.*	*Demonstrate the actions to take with gas expansion in the riser:* - *Close the diverter* - *Close BOP, secure and monitor* *Fill the riser with drilling fluid.*	*Justify and verify the appropriate actions to take with gas expansion in the riser:* - *Close the diverter* - *Close BOP, secure and monitor* *Fill the riser with drilling fluid.*	*10*	*10*
SHUT-IN PROCEDURES						
General Principles						
DR-SF-PNP-09.01.01	J01.01	A suitable shut-in procedure if a primary barrier fails.	Recognise a potential primary barrier failure. Demonstrate hard shut-in procedures after a kick is detected for: - Drilling - Tripping.	Recognise a potential primary barrier failure and describe the immediate implementation of one or more secondary barrier elements to rectify the situation, which procedure is: - Known by rig crew - Possible to implement - Regularly practised.	5	5

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DR-SF-PNP-09.01.02	IJ01.02	The correct equipment line-up before drilling or tripping.	Demonstrate the correct line-up of stand pipe and choke manifold before: - Drilling - Tripping.		5	
DR-SF-PNP-09.01.03	EQA06.02	The actions to prevent gas reaching the rotary table.	Demonstrate the correct course of action to prevent gas reaching the rotary table (Reference API RP 64): - With vent lines open, activate the diverter - Close the upwind vent line if required - Keep the hole full. - Monitor for vent line erosion, and subsurface leaks.	Describe the correct course of action to prevent gas reaching the rotary table (Reference API RP 64): - With vent lines open, activate the diverter - Close the upwind vent line if required - Keep the hole full - Monitor for vent line erosion, and subsurface leaks.	5	5
DR-SF-PNP-09.01.04	IJ01.04	Monitoring the well after it is shut-in.	Demonstrate how to monitor the well after it is shut-in: - Monitor well for flow - Record well pressures at regular intervals.	Interpret shut-in well data.	5	5

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DR-SS-PNP-09.01.05	*NEW*	*The actions to take with gas in the riser above the BOPs.*	*Demonstrate the course of action to take:* - *Activate diverter* - *Close the BOP* - *Keep the riser full* - *Monitor slip joint, vent line erosion, and post bubble watch.*	*Describe the course of action to take:* - *Activate diverter* - *Close the BOP* - *Keep the riser full* - *Monitor slip joint, vent line erosion, and post bubble watch.* *Assess the risks involved in having the diverter system tied into the Mud Gas Separator (MGS).*	*10*	*10*

Procedure						
DR-SF-PNP-09.02.01	J02.01	The steps to secure a well using the hard shut-in method.	Demonstrate the key steps shut-in a well, using the hard shut-in method: - Drilling on bottom - Tripping in/out of the hole - Running casing/liner/tubing/completions - Cementing - Wireline operations - Running completion.	Explain the key steps shut-in a well, using the hard shut-in method: - Drilling on bottom - Tripping in/out of the hole - Running casing/liner/tubing/completions - Cementing - Wireline operations - Running completion.	10	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-09.02.02	J02.02	How to confirm if well closure is successful and the actions to take if not.	Confirm the well is shut-in by: - Feedback from the BOP closure panels - Monitor for unplanned flow - Monitor for unplanned pressure - Verify correct functions operated - Monitor on trip tank. - Use of flow meters. Demonstrate the action to take if the well has not been successfully shut-in: - Activate a second well barrier.	Confirm the well is shut-in by: - Feedback from the BOP closure panels - Monitor for unplanned flow - Monitor for unplanned pressure - Verify correct functions operated. - Monitor on trip tank. - Use of flow meters. Demonstrate the action to take if the well has not been successfully shut-in: - Activate a second well barrier.	10	10
Hang Off						
DR-SS-PNP-09.03.01	*NEW*	*When and how to hang off the string in a well control situation.*	*Demonstrate the process to hang off the string (with the well secured):* - *Space out the tool joint(s) in the BOP (allowing for tidal range)* - *Close an appropriate ram (reference API RP 59)* - *Land off the tool joint on the ram* - *Confirm weight on the ram* - *Check ram seal (by bleeding pressure between closed preventers).*	*Outline the process to hang off the string (with the well secured):* - *Space out the tool joint(s) in the BOP (allowing for tidal range)* - *Close an appropriate ram (reference API RP 59)* - *Land off the tool joint on the ram* - *Confirm weight on the ram* - *Check ram seal (by bleeding pressure between closed preventers).*	*10*	*5*

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Wireline Operations						
DR-SF-PNP-09.04.01	J03.01	The effect of wireline and wireline tool movement on the bottom hole pressure.	Calculate the effect of wireline movement on BHP (open or cased hole).	Assess the potential effect of wireline and wireline tool movement on BHP (open or cased hole).	5	5
DR-SF-PNP-09.04.02	J03.02	How to shut-in the well during wireline operations.	Demonstrate the procedure to shut-in the well using wireline pressure control equipment.	Outline the procedure to shut-in the well using wireline pressure control equipment.	10	5
DR-SF-PNP-09.04.03	J03.03	The limitations of conventional well control equipment during wireline operations.	Identify limitations of conventional well control equipment during wireline operations: - Annulars - Shear rams - Non-shearables across the BOP.	Assess from a given scenario, the limitations of conventional well control equipment during wireline operations: - Annulars - Shear rams - Non-shearables across the BOP.	4	5

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Interpretations						
DR-SF-PNP-09.05.01	J04.01	Recording shut-in well pressures.	Explain why it is important to record shut-in well pressures. From a list, recognise stabilised pressures to complete kill sheet calculations.	From a recorded data list, determine stabilised pressures to complete kill sheet calculations.	5	10
DR-SF-PNP-09.05.02	J04.02	The possible differences between shut-in Drill Pipe Pressure (SIDPP) and shut-in Casing Pressure (SICP) gauge readings.	From given well and/or kick data, interpret any differences between SIDPP and SICP such as: - Influx density - Influx height - Annulus fluid composition (cuttings loading, varying fluid densities) - Position of the bit and or pipe - Influx in the drill string - Blockage in the annulus - Inaccuracy of the gauges - Well deviation.	From given well and/or kick data, interpret any differences between SIDPP and SICP such as: - Influx density - Influx height - Annulus fluid composition (cuttings loading, varying fluid densities) - Position of the bit and or pipe - Influx in the drill string - Blockage in the annulus - Inaccuracy of the gauges - Well deviation.	3	5

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DR-SF-PNP-09.05.03	J04.03	How to identify trapped pressure.		From given well data, identify trapped pressure and take action for: - Well supercharging - Unexpected pressure caused by injection - Incorrect shut-in procedure.		3
Observations						
DR-SF-PNP-09.06.01	J05.01	The SIDPP with a float valve in the drill string.	For a given scenario, demonstrate how to identify the SIDPP with a float valve installed.	For a given scenario, explain the method to obtain SIDPP when a float valve is installed.	5	5
DR-SF-PNP-09.06.02	J05.02	The limitations of pressure gauges and how they should be read.	Explain the limitations of pressures gauges: - Scale - Accuracy - Gauge calibration.	For a given scenario, assess the limitations of pressure gauges: - Scale - Accuracy - Gauge calibration.	3	4

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DR-SF-PNP-09.06.03	J05.03	The use of dedicated gauges for SIDPP and SICP.	Explain the reasons for varying pressure readings from several gauges in different locations.	Justify the reasons for using nominated gauges to read SIDPP and SCIP.	4	5
Influx Migration						
DR-SF-PNP-09.07.01	J06.03	The actions to take when an influx migrates in a closed well.	From well data, interpret when an influx migrates in a closed well and outline the actions to take.	For a given scenario, decide the most appropriate actions to take when an influx is migrating in a closed well.	3	5
DR-SF-PNP-09.07.02	J06.04	How to control BHP when an influx is migrating.	Recognise the fluid volume to be bled off and demonstrate how to return SIDPP to original shut-in stabilised value.	Outline how to bleed off the correct amount of fluid volume required to maintain BHP and confirm the volume is as expected by using calculations.	5	5

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WELL CONTROL METHODS						
Principles						
DR-SF-PNP-10.01.01	K01.01	Standard well control methods.	Define and list kill and control methods.	For a given scenario, assess and select the most appropriate kill method.	5	5
DR-SF-PNP-10.01.02	K01.02	The difference between controlling and killing a well.	For a given scenario, outline the situations in which a well should be killed or controlled.	Assess and select the appropriate action to take when the primary fluid barrier cannot be maintained, for example: - Insufficient weighting material - Fluid mixing equipment failure - Unable to circulate - Well intervention rig-up.	5	4
Kill Method Principles						
DR-SF-PNP-10.03.01	K02.01	The selection of kill pump rate.	Describe the effects of different kill pump rates considering: - Formation strength - Annular friction loss - Choke operator reaction time - Pump rate limitations - Well geometry - MGS capabilities.	Define an appropriate kill pump rate, considering: - Formation strength - Annular friction loss - Choke operator reaction time - Pump rate limitations - Well geometry - MGS capabilities.	3	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-10.03.02	K02.02	The appropriate kill methods with the bit on bottom.	From a given scenario, select the kill method which would result in the lowest casing shoe pressure.	From a given scenario, assess the most appropriate kill method which results in the lowest casing shoe pressure.	3	5
DR-SF-PNP-10.03.03	K02.03	The appropriate course of action to take when not on bottom.	From a given a scenario, demonstrate the safest course of action to be followed while not on bottom.	From a given scenario, assess and select the most appropriate course of action (control and kill) when not on bottom.	3	5
DR-SF-PNP-10.03.04	K02.04	Maintaining constant BHP when starting and stopping circulation.	Demonstrate how to maintain constant BHP when bringing the pump up to kill speed and shutting the pump down.	Demonstrate how to maintain constant BHP when bringing the pump up to kill speed and shutting the pump down.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-10.03.05	K02.05	How to reduce well annular pressure if MAASP (at the well weak point) is approached.	Demonstrate the actions to reduce pressure at the well weak point (for example, during start-up of pumps, circulation during kill operation).	Explain the actions to reduce pressure at the well weak point (for example, during start-up of pumps, circulation during kill operation).	4	5
DR-SF-PNP-10.03.06	K02.06	Maintaining constant BHP when changing pump speed.	From a given scenario, demonstrate how to change pump speed while maintaining constant BHP.	From a given scenario, demonstrate how to change pump speed while maintaining constant BHP.	5	5

Choke Line Friction						
DR-SS-PNP-10.04.01	*SSK02.07*	*The effect of Choke Line Friction (CLF) on BHP when starting and stopping circulation.*	*Demonstrate how to bring the pumps up to kill speed while maintaining constant BHP, considering the effect of CLF.*	*Demonstrate how to maintain constant BHP when bringing the pump up to kill speed and shutting the pump down considering the effect of CLF.*	*5*	*5*

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SS-PNP-10.04.02	*SSK02.08*	*The effect of CLF on BHP when changing pump speed.*	*Demonstrate how to change pump speed and/or shut down a kill operation while maintaining constant BHP, considering the effect of CLF.*	*Demonstrate how to maintain constant BHP when changing pump speed, considering the effect of CLF.*	*5*	*5*
DR-SS-PNP-10.04.03	*SSK02.09*	*The measures to mitigate the impact of CLF.*	*Identify the possible changes to the circulating systems and factors to reduce CLF:* - *Pump rate* - *Use of kill and choke line.*	*Assess the possible changes that can be made to the circulating systems and factors to reduce CLF.*	*3*	*5*
Driller's Method and Wait and Weight Method						
DR-SF-PNP-10.06.01	K01.02	The Driller's Method of well kill operations.	Demonstrate the role of the Driller when carrying out the Driller's Method.	Explain how the Driller's Method is carried out.	5	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-10.06.02	IK01.02	The Wait and Weight Method of well kill operations.	Demonstrate the role of the Driller when carrying out the Wait and Weight Method.	Explain how the Wait and Weight Method is carried out.	5	10
DR-SF-PNP-10.06.03	K03.02	The advantages and disadvantages of the Driller's and Wait and Weight Methods.	Outline the advantages and disadvantages of Driller's Method and the Wait and Weight Method to regain primary control.	From a given scenario, assess the advantages and disadvantages of the two methods and decide which method to use.	4	5
DR-SS-PNP-10.06.04	*SSK03.03*	*The actions required to establish kill mud weight in the riser and associated lines.*	*Demonstrate how to safely displace the riser and associated lines to kill fluid weight.*	*Outline the procedure to safely displace the riser and associated lines to kill fluid weight.*	*4*	*10*

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SS-PNP-10.06.05	*SSK03.05*	*The actions required to identify and safely remove gas trapped in or beneath the BOP.*	*Demonstrate how to remove gas trapped in the BOP*	*Estimate the volume and pressure of gas trapped in or beneath the BOP.* *Outline the procedure to safely remove the trapped gas.*	*4*	*10*
Kill Sheet Calculations (Pre-tour)						
DR-SF-PNP-10.07.01	K04.01	The requirements for a kill sheet within a well control plan.		Outline a dedicated and agreed upon plan owned by the well operator/concession owner that is routinely updated with current hole data.		5
DR-SF-PNP-10.07.02	K04.02	The requirement for an accurately completed pre-tour Surface BOP kill sheet.	Complete a pre-tour kill sheet based on well and installation data.	Complete a pre-tour kill sheet based on well and installation data.	10	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SS-PNP-10.07.03	*SSK04.03*	*The requirement for an accurately completed pre-tour Subsea BOP kill sheet.*	*Complete a pre-tour kill sheet based on well and installation data.*	*Complete a pre-tour kill sheet based on well and installation data.*	*10*	*10*
DR-SF-PNP-10.07.04	K04.05	Bottom Hole Pressure (BHP).	Calculate BHP.	Calculate BHP.	10	10
DR-SF-PNP-10.07.05	K04.06	Fracture and leak-off pressure. Maximum allowable mud weight.	Calculate maximum allowable mud weight using surface leak-off pressure data.	Calculate Maximum Allowable mud weight using surface leak-off pressure data.	10	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-10.07.06	K04.16	Maximum Allowable Annulus Surface Pressure (MAASP).	Calculate MAASP.	Calculate MAASP.	10	10
DR-SF-PNP-10.07.07	K04.08	Bottoms-up time for normal drilling.	Calculate bottoms-up time for normal drilling.	Calculate bottoms-up time for normal drilling.	10	10
DR-SF-PNP-10.07.08	K04.09	Total circulating time, including surface equipment.	Calculate total circulating time, including surface equipment.	Calculate total circulating time, including surface equipment.	10	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-10.07.09	K04.10	Surface to bit time.	Calculate surface to bit time.	Calculate surface to bit time.	10	10
DR-SF-PNP-10.07.10	K04.11	Bit to shoe time.	Calculate bit to shoe time.	Calculate bit to shoe time.	10	10
DR-SF-PNP-10.07.11	K04.12	Bottom up strokes	Calculate bottom up strokes.	Calculate bottom up strokes	10	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-10.07.12	K04.13	Surface to bit strokes	Calculate surface to bit strokes.	Calculate surface to bit strokes	10	10
DR-SF-PNP-10.07.13	K04.14	Bit to shoe strokes	Calculate bit to shoe strokes.	Calculate bit to shoe strokes	10	10
DR-SF-PNP-10.07.14	K04.15	Total circulating strokes, including surface equipment.	Calculate total circulating strokes, including surface equipment.	Calculate total circulating strokes, including surface equipment.	10	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SS-PNP-10.07.15	*SSK04.20*	*The volume required to displace the riser.*	*Calculate the volume required to displace the riser.*	*Calculate the volume required to displace the riser.*	10	10
Perform Kill Sheet Calculations (Post kick)						
DR-SF-PNP-10.08.01	K04.04	Formation pressure.	Calculate formation pressure.	Calculate formation pressure.	10	10
DR-SF-PNP-10.08.02	K04.07	Kill fluid density.	Calculate kill fluid density.	Calculate kill fluid density.	5	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-10.08.03	K04.17	Initial Circulating Pressure (ICP).	Calculate ICP.	Calculate ICP.	5	10
DR-SF-PNP-10.08.04	K04.18	Final Circulating Pressure (FCP).	Calculate FCP.	Calculate FCP.	5	10
DR-SF-PNP-10.08.05	K04.19	Pressure drop per step.	Calculate pressure drop per step.	Calculate pressure drop per step.	5	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SS-PNP-10.08.06	*SSK04.21*	*Dynamic casing pressure.*	*Calculate the dynamic casing pressure.*	*Calculate the dynamic casing pressure.*	*5*	*10*
DR-SS-PNP-10.08.07	*SSK04.22*	*Dynamic MAASP.*	*Calculate the dynamic MAASP.*	*Calculate the dynamic MAASP.*	*5*	*10*
Volumetric Methods						
DR-SF-PNP-10.09.01	K05.01	The principles of the volumetric process (Volumetric Method followed by the Lubricate and Bleed).	Describe the volumetric process: - Controlled migration of the influx to the surface - Lubricate and Bleed Method to evacuate influx from the well.	Explain the key elements of the volumetric process: - Influx expansion/migration - Maintaining BHP safety margin - Monitoring bleed off volumes - Monitoring surface pressures - Lubricate and Bleed Method to evacuate influx from the well.	3	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-10.09.02	K05.02	The procedure required for controlling a well with the Volumetric Method.	Describe the role of the Driller when carrying out the Volumetric Method to bring influx to the choke.	Outline the procedure for the Volumetric Method to bring the influx to the choke.	4	5
DR-SF-PNP-10.09.03	K05.03	When the Volumetric Method is the appropriate well control method.	Outline the situations when the Volumetric Method should be applied.	Explain the situations when the Volumetric Method should be applied.	3	5
Lubricate and Bleed Method						
DR-SF-PNP-10.10.01	NEW	The principles of the Lubricate and Bleed Method.	Describe the Lubricate and Bleed Method.	Explain the key elements of the Lubricate and Bleed Method: - Establish the safety margin - Lubricate fluid into the well - Bleed off the equivalent hydrostatic pressure of the lubricated fluid - Repeat the process.	3	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-10.10.02	K05.04	The procedure required for controlling a well with the Lubricate and Bleed Method.	Describe the role of the Driller when carrying out the Lubricate and Bleed Method to evacuate the influx from the well while preventing further inflow.	Outline the procedure for the Lubricate and Bleed Method to remove influx from the well while preventing further inflow.	4	5
DR-SF-PNP-10.10.03	K05.05	When the Lubricate and Bleed Method is the appropriate well control technique.	Outline the circumstances when the Lubricate and Bleed Method should be applied.	Explain the circumstances when the Lubricate and Bleed Method should be applied.	3	5
Stripping						
DR-SF-PNP-10.11.01	K06.01	The principles of stripping	Define the principles, and outline when stripping is appropriate.	Explain the key elements of stripping procedures: - BOP devices used (external and internal) - BOP closing pressures - Appropriate fluid monitoring tanks - Appropriate surface line configuration - Stripping bottles - Stripping sheet.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-10.11.02	K06.02	The procedure required to safely strip into a well.	Demonstrate stripping procedures: - Annular stripping - Ram to ram stripping.	From a given well scenario, determine/demonstrate the most appropriate procedure to strip into the well.	5	5
DR-SF-PNP-10.11.03	K06.03	The factors which limit or complicate the ability to strip in the hole.	Identify the limitations or complications that may affect the ability to strip in the hole.	Explain the limitations or complications that may affect the ability to strip in the hole.	4	5
WELL CONTROL DURING CASING AND CEMENTING						
Running and Pulling Casing and Liner						
DR-SF-PNP-11.01.01	L01.01	The factors that increase risk of swabbing and surging when tripping large diameter tubulars (reduced annular clearance).	Identify the factors that increase the chance of swabbing and surging when pulling and running large diameter tubulars.	From a given scenario, assess the increased chance of swabbing and surging when pulling and running large diameter tubulars.	4	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-11.01.02	L01.02	Mitigations to minimise swab and surge pressure when tripping large diameter tubulars (reduced annular clearance).	Identify actions that mitigate surge and swab pressures.	For a given scenario, justify the actions and equipment selection that mitigate surge and swab pressures.	4	4
DR-SF-PNP-11.01.03	L01.03	The limitations of self-filling float systems.	Identify the capabilities and limitations (risks) of self-filling float systems, including the failure to convert.	Assess the capabilities and limitations (risks) of self-filling float systems, including the failure to convert in the event of a well control incident. Calculate the effects on BHP if the casing float(s) fails	4	4
DR-SF-PNP-11.01.04	L01.05	How returns are monitored when tripping large diameter tubulars (reduced annular clearance).	Demonstrate how to correctly monitor returns.	Demonstrate how to correctly monitor returns.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-11.01.05	L01.06	The calculation of displacements when tripping casing liner (large diameter tubulars).	Calculate open and closed end displacements when pulling and running large diameter tubulars.	Calculate open and closed end displacements when pulling and running large diameter tubulars.	5	5
DR-SF-PNP-11.01.06	L01.07	Mitigating actions if losses occur when tripping casing liner (large diameter tubulars).	Identify the actions to take if there are losses when pulling and running large diameter tubulars: - Minor losses - Major losses - Total losses.	For a given situation, assess the actions to take if there are losses when pulling and running large diameter tubulars: - Minor losses - Major losses - Total losses.	4	4
Cementing Casing and Liner						
DR-SF-PNP-11.02.01	L02.01	The changes to BHP during a cementing operation.	For a given scenario, predict changes in BHP during cementation: - Placement - The setting process.	For a given scenario, predict the changes in BHP during cementation: - Placement - The setting process.	3	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-11.02.02	L02.02	The importance of a successful cementing job and the risk of primary barrier failure.	Identify the potential problems related to ineffective cementation: - Immediate - Life of well. Explain the factors that affect the quality of cement placement: - Expected pressure profile - Expected returns - Correct weight and quantity - Expected setting time - Plugs bump at expected volume - No back flow.	Identify the criteria for effective cementation: - Immediate - Life of well. Explain the factors that affect the quality and effectiveness of cement placement to achieve a reliable primary barrier: - Verification of cement location - Expected pressure profile to maintain BHP greater than pore pressure and less than fracture pressure - Expected returns - Correct weight and quantity - Expected setting time - Plugs bump at expected volume - No back flow - Verification of cement seal.	4	5
DR-SF-PNP-11.02.03	L02.03	The events during the life of the well that could allow formation fluids to enter the casing or casing annuli.		For a given scenario, predict events that could result in formation fluid entering the casing or casing annuli during the life of the well: - Incorrect placement - Incorrect pressure testing - Trapped pressure - Cement degradation.		3

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-PNP-11.02.04	L02.04	The actions to take if a well starts to flow during a cementing operation.	Demonstrate the actions to safely shut-in the well during a cementing operation.	Explain and verify the actions to safely shut-in the well during a cementing operation.	10	5
Shut-in Procedures When Running Casing						
DR-SF-PNP-11.03.01	L03.01	The steps to shut-in a well when running casing.	Demonstrate the actions to safely shut-in the well when running casing.	Explain and verify the actions to safely shut-in the well when running casing.	10	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
WELL CONTROL MANAGEMENT						
Well Control Drills						
DR-SF-PNP-12.01.01	M02.01	The concept and implementation of well control drills as specified by API standards.	Outline the method and demonstrate steps required for well control drills: - Pit drill - Trip drill - Strip drill - Choke drill - Diverter drill - Accumulator test.	Demonstrate the method and steps required to successfully complete well control drills: - Pit drill - BOP drill - On bottom drill - Trip pipe drill - BHA drill - Out of hole drill - Choke drill - Hang off drill (subsea) - Stripping drill - Diverter drill - Accumulator test.	10	10
DR-SF-PNP-12.01.02	M02.02	Indications that MAASP is exceeded during a well control operation.	Identify MAASP limits: - Pre-calculated value - Position of influx - Position of well weak point. Identify when MAASP has been exceeded: - Deviation of annulus pressure (followed by the drill pipe pressure) below expected values - The unplanned closure of the choke to maintain drill pipe pressure. - Decrease in well returns.	Identify MAASP limits: - Pre-calculated value - Position of influx - Position of well weak point. Identify when MAASP has been exceeded: - Deviation of annulus pressure (followed by the drill pipe pressure) below expected values - The unplanned closure of the choke to maintain drill pipe pressure. - Decrease in well returns.	3	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
CONTINGENCY PLANNING						
Recognition of Problems and First Actions						
DR-SF-PNP-13.01.01	N01.01	Indications of downhole or surface problems that can arise during well control operations.	Identify deviations from expected values on critical gauges and drill pipe pressure: - Annulus pressure - Pit level indicators - Pump rate. Demonstrate the appropriate actions to take.	Identify deviations from expected values on critical gauges and drill pipe pressure: - Annulus pressure - Pit level indicators - Pump rate. Demonstrate the appropriate actions to take.	4	5
Pressure Gauge Failure						
DR-SF-PNP-13.02.01	N02.01	How to detect when gauges are malfunctioning.	Recognise gauge malfunctions: - Lack of sensitivity - Comparison with alternative gauges - Deviation from expected pressure.	Recognise gauge malfunctions: - Lack of sensitivity - Comparison with alternative gauges - Deviation from expected pressure.	3	3

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Mud/Gas Separators (MGS)						
DR-SF-PNP-13.03.01	N03.01	The actions to take when operating limits are being reached or have been reached in a MGS.	Demonstrate how to re-establish safe operating pressures within the MGS: - Make well safe with a controlled shut-down - If required, use the bleed down line to relieve MGS pressure. - If lost, re-establish the mud seal. - Continue well kill operation with a reduced circulating rate.	Demonstrate how to re-establish safe operating pressures within the MGS: - Make well safe with a controlled shut-down - If required, use the bleed down line to relieve MGS pressure. - If lost, re-establish the mud seal. - Continue well kill operation with a reduced circulating rate.	4	5
BOP Failure						
DR-SF-PNP-13.04.01	N04.01	Leak identification and responses to well control equipment failure.	Identify well control equipment leaks and demonstrate the actions to secure the well.	Assess the potential consequences of the actions taken to secure the well once a barrier envelope has been compromised.	10	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Hydrate Formation						
DR-SF-PNP-13.05.01	N05.01	What hydrates are and the conditions likely to lead to their formation.	Define hydrates and describe the conditions that lead to their formation.	From a given situation, predict hydrate formation.	3	4
DR-SF-PNP-13.05.02	N05.01	Hydrate prevention and removal.	Identify how to minimise the formation of hydrates: - Glycol injection - Increase temperature at the hydrate location - Change the pressure regime.	Identify how and where to minimise the formation of hydrates: - Glycol injection - Increase temperature at hydrate location - Change the pressure regime. The procedure to remove them: - The use of Methanol - Increase temperature at the hydrate location - Change pressure regime.	3	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Lost Circulation During a Well Control Event						
DR-SF-PNP-13.06.01	N06.01	Monitoring and managing losses during a well control event.	Recognise the indications of lost circulation during a well control event: - Pit level predictions - Annulus pressure predictions - Relevance of influx above the weak point.	Recognise the indications of lost circulation during a well control event: - Pit level predictions - Annulus pressure predictions - Relevance of influx above the weak point. Outline appropriate actions to take such as: - Use a reduced kill speed - Reduce the choke line friction - Consider using the Volumetric Method.	4	5

WELL CONTROL EQUIPMENT

BLOWOUT PREVENTERS (BOPs)						
BOP Stack Configuration						
DR-SF-EQP-01.01.01	IEQA01.01/EQA01.01	BOP function, configuration and the well control operations that can be carried out.	From given diagrams/data, identify operations that can be carried out.	From given diagrams/data, identify operations that can be carried out.	4	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-EQP-01.01.02	EQA01.02	The overall pressure rating requirements of a BOP stack.	Analyse the BOP stack rating according to the different components and their rated working pressures.	Analyse the BOP stack rating requirements according to the expected well pressures and rated working pressure of the BOP components.	4	3
DR-SS-EQP-01.01.03	*SSEQA01.03*	*The configuration of the Marine Riser, Lower Marine Riser Package (LMRP) and subsea BOP.*	*From given diagrams/information, identify the operations that can be carried out.*	*From given diagrams/information, identify the operations that can be carried out.*	*4*	*5*

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Ram Type Preventers						
DR-SF-EQP-01.02.02	EQA02.01	The operational limits associated with particular BOP ram equipment.	Using given data, define the operating limits of BOP ram type equipment, including: - Different types (fixed, variable, blind, casing, shear) - Sealing/non-sealing - Maximum sealable or shearable diameter - Well bore pressure assist - Closing ratio - Locking - Direction of pressure - Hang off - Space out - Stripping - Pressure testing.	Using given data, analyse the operating limits of BOP ram type equipment, including: - Different types (fixed, variable, blind, casing, shear) - Sealing/non-sealing - Maximum sealable or shearable diameter - Well bore pressure assist - Closing ratio - Locking - Direction of pressure - Hang off - Space out - Stripping - Pressure testing.	5	5
DR-SF-EQP-01.02.03	EQA01.02	When the ram equipment must be changed for specific operations to ensure closure and/or shear capability.	From a given ongoing operational scenario, select which ram equipment must be changed to ensure well closure and/or shear capability.	From a given ongoing operational scenario, assess and explain which ram equipment must be changed to ensure well closure and/or shear capability.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-EQP-01.02.04	SSEQA02.02	The function and operating principles of ram locks.	Demonstrate the use of ram locks, indicate when and how the ram locks should be used by understanding the locking mechanism in use (reference to API RP 53).	Explain the operation of BOP ram locks, indicating when and how the ram locks should be used by understanding the locking mechanism in use (reference to API RP 53).	4	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Blind/Shear Ram Preventers						
DR-SF-EQP-01.03.01	EQA02.01	The operating principles of BOP blind/shear equipment.	Describe the operating principles according to: - The forces - The types of blind/shear rams - The diameter, weight and metallurgy of tubulars - Capabilities of shear rams in relation to pipe, tool joint, wireline, low force - Requirements for shear test, pipe tension, operating pressure Posting of space out instructions (reference API STD 53).	Describe the operating principles according to: - The forces - The types of blind/shear rams - The diameter, weight and metallurgy of tubulars - Capabilities of shear rams in relation to pipe, tool joint, wireline, low force - Requirements for shear test, pipe tension, operating pressure - Limited number of closure cycles Posting of space out instructions (reference API STD 53).	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-EQP-01.03.02	NEW	Shear ram operational procedures.	Demonstrate the operating procedure for shearing tubulars through the BOP: - Space out string - Centralise the pipe by closing the pipe ram below the shear ram - Hang off and reduce tension (subsea) - Open bypass valve to deliver full accumulator pressure - Operate the shear rams - Verify that the string is sheared - Ensure and verify well closure.	Outline the operating procedure for shearing tubulars through the BOP: - Space out string - Centralise the pipe by closing the pipe ram below the shear ram - Hang off and reduce tension (subsea) - Open bypass valve to deliver full accumulator pressure - Operate the shear rams - Verify that the string is sheared - Ensure and verify well closure.	10	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Annular Preventers						
DR-SF-EQP-01.04.01	EQA03.01	The operating principles of annular preventers.	Describe the capabilities and limitations of annular preventer operating performance for different applications based on: - The size of tubular - No pipe - Wireline - Element type.	Assess the capabilities and limitations of annular preventer's operating performance for different applications based on: - The size of tubular - No pipe - Wireline - Element type.	4	4
DR-SF-EQP-01.04.02	EQA03.02	The deterioration and failure of annular preventers in service.	Identify the indicators of annular deterioration/failure and outline the corrective actions to take.	Identify the indicators of annular deterioration/failure and outline the corrective actions to take.	5	4
DR-SF-EQP-01.04.03	EQA03.03	The application of the annular manufacturer data and well bore pressure.	From given manufacturer and well bore pressure data, select and adjust the annular closing pressure. Identify the appropriate timing for the adjustment during well operations.	From given manufacturer and well bore pressure data, select and adjust the annular closing pressure. Identify the appropriate timing for the adjustment during well operations.	4	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SS-EQP-01.04.04	*SSEQA03.04*	*How hydrostatic pressure can affect annular preventers.*	*Describe how sea water hydrostatic and hydrostatic pressure of the drilling fluid in the riser can affect annular capabilities.* *Outline the mitigation measures.*	*For a given scenario, predict how sea water hydrostatic and hydrostatic pressure of the drilling fluid in the riser can affect annular capabilities.* *Outline the mitigation measures.*	*2*	*2*
Side Outlet Valves						
DR-SF-EQP-01.05.01	EQA04.01	The optimal location and size of side outlet valves on a BOP stack.	From a piping layout diagram, indicate the position of the manual and hydraulically operated side outlet valves and explain why they are positioned that way.	From a piping layout diagram, explain the size and the position of the manual and hydraulically operated side outlet valves and explain why they are positioned that way.	3	3
Connections						
DR-SF-EQP-01.06.01	EQA05.01	The importance of correct gasket selection and make up procedures.	From a given diagram or description, identify the correct and incorrect make up of gaskets for specific types of connections.	From given diagrams and descriptions, identify the correct and incorrect make up of gaskets for specific types of connections.	4	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Diverters						
DR-SF-EQP-01.07.01	NEW	The two most common types of diverter.	List the capabilities and limitations of the two main types of diverter: - Conventional annular - Insert type diverter.	Compare the capabilities and limitations of the two main types of diverter: - Conventional annular - Insert type diverter.	4	4
DR-SF-EQP-01.07.02	EQA06.01	The principles of diverter operations (reference API RP 64).	Identify key components, and how and when they should be used: - Large bore pipe - Geometry and position of vent line - Wind direction - Purpose of locking mechanisms - Top hole.	For a given scenario, assess key components, and how and when they should be used: - Large bore pipe - Geometry and position of vent line - Wind direction - Purpose of locking mechanisms - Top hole.	5	5
DR-SF-EQP-01.07.03	SSEQA06.03	The operating mechanisms of common types of diverters used (reference API RP 64).	From a specific layout, list the sequence of opening and closing the different elements and operating principles.	From a specific layout, list the sequence of opening and closing the different elements and operating principles.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
ASSOCIATED WELL CONTROL EQUIPMENT						
Inside BOPS (IBOPs) and Drill Pipe Safety Valves (DPSVs)						
DR-SF-EQP-02.01.01	EQB01.01	The different types of safety valves.	Differentiate between: - The Drill Pipe Safety Valve (DPSV) - Inside Blow out preventer (IBOP) - Drop-in back pressure valve. - Float valves and flapper valves - Top drive or Kelly mounted safety valve.	For a given scenario, justify the use of an appropriate safety valve: - The Drill Pipe Safety Valve (DPSV) - Inside Blow out preventer (IBOP) - Drop-in back pressure valve. - Float valves and flapper valves - Top drive or Kelly mounted safety valve.	4	5
DR-SF-EQP-02.01.02	EQB01.03	The application of the IBOP.	Describe the use of the IBOP in a well control event.	Assess the impact of the IBOP in a well control event.	5	5
DR-SF-EQP-02.01.03	EQB01.04	The capabilities and limitations of using float/flapper valves in the string.	Describe the use of the float/flapper valves in the string.	Assess the impact of using float/flapper valves in the string.	3	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-EQP-02.01.04	EQB01.05	DPSV installation during tubular running operations.	Describe and demonstrate the procedure used for installation, closure and verification of sealing for a DPSV during tubular running operations.	For a given scenario, justify and demonstrate the appropriate course of action to secure the string while running tubulars: - Differential fill up equipment - Top drive mounted tubular fill up equipment - Back flow through the string.	5	4
CHOKE MANIFOLDS AND CHOKES						
Routing of Lines						
DR-SF-EQP-03.01.01	EQC01.01	The alternative circulating routes to the well and through the choke manifold during well control operations.	From a diagram of the piping system, for the standpipe and choke manifolds, indicate possible valve status for a specific circulating path.	From a simple diagram of the piping system for the standpipe and choke manifolds, indicate the possible valve status for a specific circulating path.	4	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Manual and Remote Chokes						
DR-SF-EQP-03.02.01	EQC02.01	The operating principles and limitations of adjustable chokes (reference API STD 53).	Outline the operating principles and the safety critical inspections required: - Function check (for example at shift handover) - Cleanliness check (for example flushing lines during an SCR) - Planned maintenance routines.	For a given scenario, interpret the operating principles and the safety critical inspections required.	2	5
AUXILIARY EQUIPMENT						
Mud Gas Separators (MGS)						
DR-SF-EQP-04.01.01	EQD01.01	The operating principles and limitations of a Mud Gas Separator (MGS).	Recognise the operational limitations of the MGS. From given data, calculate the pressure that there is gas 'blow-through'.	For a given situation, interpret the critical operating limits and determine the actions to take in order to prevent the loss of the liquid seal.	4	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Vacuum Degasser						
DR-SF-EQP-04.02.01	EQD02.01	The operating principles and the role of a vacuum degasser.	Outline the principles, operational considerations and limitations of the vacuum degasser.	Explain the principles, operational considerations, and limitations of the vacuum degasser.	3	4
TESTING						
BOP and Equipment Testing						
DR-SF-EQP-05.01.01	EQF01.01	The importance of the procedures for maintaining and testing BOP stack and choke and kill manifolds (reference API standards).	Identify the criteria for a successful pressure test: - Direction of pressure applied - Volume to be pumped - Instrumentation - Test fluids - Test duration - Safe pressure bleed off and monitored flow returns.	Schedule and validate successful pressure testing: - Direction of pressure applied: - Volume to be pumped - Instrumentation - Test fluids - Test duration - Test records - Safe pressure bleed off and monitored flow returns.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-EQP-05.01.02	NEW	The required frequency and test values of BOPs and well control equipment during well operations (reference API STD 53).		Explain the frequency of testing: - Before installation - On installation - During well operations. Define the relevant test values applied during well operations: - Before installation - On installation - During well operations.		5
DR-SF-EQP-05.01.03	EQF01.02	Monitoring the non-pressured side of the barrier being tested.	From given BOP and choke/stand pipe diagrams, indicate the appropriate line-up to monitor for flow or pressure build up when performing specific pressure tests.	For a given scenario, justify an appropriate line-up to monitor for flow or pressure build up when performing specific pressure tests.	5	5
DR-SS-EQP-05.01.04	*EQF01.03*	*The inverted test ram in a subsea BOP stack.*		*For a given scenario, explain the use of inverted test rams in a subsea BOP stack and outline the limitations of inverted test rams.*		*3*

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-EQP-05.01.05	EQF01.04	The pressure test requirements for DPSVs and IBOPs.	Define the pressure test requirements for DPSVs and IBOPs.	Explain the pressure test procedures for DPSVs and IBOPs.	5	5
DR-SF-EQP-05.01.06	NEW	The required frequency and test values for DPSVs and IBOPs (reference API standards).		Explain the frequency of testing: - Before installation - On installation - During well operations Define the relevant test values applied during well operations: - Before installation - On installation - During well operations.		3
DR-SF-EQP-05.01.07	EQF01.05	The required BOP operating pressures and closing times (reference API standards).	Identify correct closing pressures and duration for given BOP type and size.	Verify correct operating pressures and closing times for given BOP type and size.	3	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-EQP-05.01.08	EQF01.06	Pressure and strength ratings for equipment used to test well control equipment.	From data provided, define the rating of the equipment to use in the test process.	From data provided, calculate the rating of the equipment to use in the test process.	3	4
DR-SF-EQP-05.01.09	EQF01.07	The function test requirements for BOP, valves and manifolds (reference API STD 53).	Describe the function test requirements for BOP, valves and manifolds: - Before installation - On installation - During well operations.	Explain the function test requirements for BOP, valves and manifolds: - Before installation - On installation - During well operations.	5	5
DR-SF-EQP-05.01.10	NEW	The correct procedures to test diverter systems (reference API standards).	Identify the criteria for a successful diverter test: - Direction of pressure applied - Venting or flow - Volume to be pumped - Instrumentation - Test fluids.	Schedule and validate a successful diverter test: - Direction of pressure applied - Venting or flow - Volume to be pumped - Instrumentation - Test fluids - Test duration - Test records.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-EQP-05.01.11	NEW	The frequency and test values required for diverter systems (reference API standards).		Explain the frequency of diverter testing: - Before installation - On installation - During well operations. Define the relevant test values applied during well operations: - Before installation - On installation - During well operations.		5
Inflow Testing						
DR-SF-EQP-05.02.01	EQF02.02	The principles of inflow testing.	Identify why inflow tests are carried out: - Test barriers in direction of flow - When you cannot apply positive pressure upstream of the barrier.	Explain why inflow tests are carried out: - Test barriers in direction of flow - When you cannot apply positive pressure upstream of the barrier.	5	5
DR-SF-EQP-05.02.02	EQF02.03	Factors to be considered during an inflow test.		Determine possible leak paths and their effect. From given pressure profiles, recognise thermal expansion and/or flow.		5

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DR-SF-EQP-05.02.03	EQF02.04	Mitigations to minimise the kick size if the test should fail.	Recognise the indications that an inflow test has failed and explain the immediate actions to take: - Monitor - Identify - Course of action to regain primary well control.	Verify that an inflow test has failed and explain the immediate actions to be taken: - Monitor - Identify - Course of action to regain primary well control.	5	5
DR-SF-EQP-05.02.04	EQF02.05	The procedures required for an effective inflow test.	Demonstrate the appropriate steps for an inflow test and the line-up required: - Monitor - Record - Document approval.	Verify the appropriate steps for an inflow test and the line-up required: - Monitor - Record - Document approval.	5	5
BOP CONTROL SYSTEMS						
BOP Control Systems						
DR-SF-EQP-06.01.02	EQG01.02	The general operating principles of the remote-control panel.	Demonstrate and verify the operating sequence used on the remote-control panel to operate the BOPs.	Explain and verify the operating sequence used on the remote-control panel to operate the BOPs.	5	5

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-EQP-06.01.03	EQG01.03	The normal operating pressures and stored volumes contained in the BOP control system (reference API spec 16D).	Define the normal operating pressures and the stored volumes contained in the BOP control system.	Define the normal operating pressures and calculate the required stored volumes contained in the BOP control system.	5	5
DR-SF-EQP-06.01.04	NEW	The normal operating pressures and stored volumes contained in the diverter control system (reference API spec 16D).		Define the normal operating pressures and stored volumes contained in the diverter control system.	5	5
DR-SF-EQP-06.01.05	EQG01.04	The purpose and criteria for a successful accumulator drawdown test (reference API STD 53).	Define the procedure for an accumulator drawdown test.	Verify the results of an accumulator drawdown test. Outline the actions to take if the accumulator drawdown test fails.	4	4

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SF-EQP-06.01.06	EQG01.06	How to confirm if a specific function has successfully operated.	Demonstrate the checks required to confirm if a given function has successfully occurred.	Verify if a given function has successfully occurred.	10	10
DR-SF-EQP-06.01.07	EQG01.07	Possible functional problems during BOP/Diverter operations.	Diagnose the cause of a malfunction: - Leaking surface hoses - Malfunctioning manipulator valve - Pressure regulator failure - Reservoir fluid levels. Demonstrate immediate alternative actions to take	Diagnose the cause of a malfunction: - Leaking surface hoses - Malfunctioning manipulator valve - Pressure regulator failure - Reservoir fluid levels. Demonstrate immediate alternative actions to take.	5	10

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
Subsea BOP Control Systems						
DR-SS-EQP-06.02.01	*SSEQG01.09*	*The general operating principles of subsea BOP control systems.*	*From a diagram or description, outline the sequence of operation of a BOP control system:* - *Pods* - *SPMs* - *Shuttle valves* - *Electro-hydraulic interface.*	*From a diagram or description, explain the operating principles of a BOP control system:* - *Pods* - *SPMs* - *Shuttle valves* - *Electro-hydraulic interface.*	*5*	*5*
DR-SS-EQP-06.02.02	*SSEQG01.11*	*The general operating principles of the remote-control panel with a subsea installed BOP.*	*Describe the operating principles of the remote-control panel.*	*Explain the operating sequence used on the remote-control panel to operate the subsea installed BOPs.*	*5*	*5*
DR-SS-EQP-06.02.03	*NEW*	*How to confirm if a specific function has successfully operated on a subsea BOP.*	*Demonstrate the checks required to confirm that a given function has successfully occurred.*	*Verify if a given function has successfully occurred.*	*10*	*10*

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SS-EQP-06.02.04	*NEW*	*Functional problems during operations of a subsea installed BOP.*	*Diagnose the cause of a malfunction:* - *Leaking power hose* - *Leaking signal line* - *Malfunctioning SPM valve* - *Shuttle valve* - *Malfunctioning manipulator valve.* *Demonstrate immediate alternative actions*	*Recognise the cause of a malfunction:* - *Leaking power hose* - *Leaking signal line* - *Malfunctioning SPM valve* - *Shuttle valve* - *Malfunctioning manipulator valve.* *Demonstrate immediate alternative actions.*	*5*	*5*
DR-SS-EQP-06.02.05	*SSEQG01.12*	*The purpose of having accumulator bottles at the subsea BOP.*	*Explain why accumulator bottles should be suitably pre-charged and mounted on the BOP.*	*Explain why accumulator bottles should be suitably pre-charged and mounted on the BOP.* *Calculate the required pre-charge for accumulator bottles mounted on a subsea BOP.*	*2*	*3*

New category	Previous category	Learning objective. During this course the student will gain an understanding of:	Level 3 Learning outcome. By the end of this course the student will be able to:	Level 4 Learning outcome. By the end of this course the student will be able to:	Importance L3	Importance L4
DR-SS-EQP-06.02.06	*SSEQG01.13*	*The secondary closure systems and emergency device that are installed on the subsea BOP stack (reference to API STD 53).*	*Identify the requirement for secondary control systems:* - *ROV intervention* - *Acoustic control system.* *Identify the requirement for emergency systems:* - *'Dead man' system* - *Auto-shear* - *Emergency Disconnect Systems/Sequence (EDS).* *Outline when they would be used.*	*Explain the requirement for secondary control systems:* - *ROV intervention* - *Acoustic control system.* *Explain the requirement for emergency systems:* - *'Dead man' system* - *Auto-shear* - *Emergency Disconnect Systems/Sequence (EDS).* *Outline when they would be used and frequency of testing.*	*4*	*5*