

WellCAP Cross-reference Tool*
DRILLING OPERATIONS
WCT-2DS-X – SUPERVISORY LEVEL

WELLCAP WCT-2DS SUPERVISORY LEVEL		REFERENCE TO APPLICATION MATERIALS (Note Where Each Topic Can Be Found)			
WELLCAP OUTLINE NO.	TRAINING TOPIC	MANUAL (Cite Chapter and Page No.)	LECTURE (Note Day/Time of Course Outline)	SIMULATION (Identify Exercise)	OTHER RESOURCE (Identify Video, CBT Program, Handout, Etc.)
I.	CAUSES OF KICKS				
A.	Unintentional flow				
B.	Intentional flow				
II.	KICK DETECTION				
A.	Kick indicators				
B.	Warning signals that kick may be occurring or is about to occur				
C.	Indicators of possible increasing formation pressure				
D.	Importance of timely response to kick indicators				
E.	Distinguishing kick indicators/warning signals from other occurrences				
III.	PRESSURE CONCEPTS AND CALCULATIONS				
A.	Types of pressure				
B.	Calculations				
C.	Conversion of pressure to an equivalent mud weight				

* To further facilitate cross-referencing, the proposed document may include a margin or parenthetical reference to the appropriate WellCAP outline number.

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D.	Volume/Height relationship and effect on pressure				
E.	Drop in pump pressure as fluid density increases during well control operations				
F.	Maximum wellbore pressure limitations				
IV.	PROCEDURES				
A.	Alarm limits				
B.	Pre-recorded well control information				
C.	Flow checks				
D.	Shut-in				
E.	Well monitoring during shut-in				
F.	Response to massive or total lost circulation				
G.	Tripping				
H.	Well control drills: types and frequencies				
I.	Formation competency				
J.	Stripping operations				
K.	Shallow gas hazards				
V.	GAS CHARACTERISTICS AND BEHAVIOR				
A.	Gas types				
B.	Density				
C.	Migration				

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D.	Expansion				
E.	Compressibility and phase behavior				
F.	Solubility in mud				
VI.	FLUIDS				
A.	Types of drilling fluids				
B.	Fluid property effects on pressure losses				
C.	Fluid density measuring techniques				
D.	Mud properties following weight up and dilution				
VII.	CONSTANT BOTTOMHOLE PRESSURE WELL CONTROL METHODS				
A.	Objectives of well control methods				
B.	Principles of constant bottomhole pressure methods				
C.	Example steps for maintaining constant bottomhole pressure well control: Driller's or Wait and Weight methods				
D.	Well control kill sheets				
E.	Well control procedures				
F.	Other well control procedures				
VIII.	EQUIPMENT				

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A.	Well control related instrumentation				
B.	BOP configuration				
C.	Manifolds and piping				
D.	Valving				
E.	Auxiliary well control equipment				
F.	BOP closing unit - function and performance				
G.	Testing/Completion pressure control equipment				
H.	Pressure and function tests				
I.	Well control equipment arrangements				
IX.	GOVERNMENT, INDUSTRY AND COMPANY RULES, ORDERS AND POLICIES				
A.	Incorporate by reference				
B.	Bridging Documents				

X.	SUBSEA WELL CONTROL (REQUIRED FOR SUBSEA ENDORSEMENT)				
A.	Subsea equipment				
B.	Diverter system				
C.	Kick detection issues				
D.	Procedures: C&K line friction, trapped gas, clearing riser, disconnect/reconnect, spacing/hang-off, water depth effect on formation competency				
E.	Compensating for hydrostatic head changes in choke lines				
F.	Hydrates				
XI.	SHUT-IN FOR SUBSEA AND DEEPWATER WELLS				
A.	Shut-in for subsea wells				
XII.	SHUT-IN FOR SUBSEA AND DEEPWATER WELLS				
A.	Constant bottom hole pressure methods				
B.	Bullheading				
C.	Number of choke and kill lines				
D.	Volumetric Method				
E.	Dynamic lubrication methods				

XIII.	SUBSEA AND DEEPWATER WELL CONTROL – SHALLOW FLOW (S)				
A.	Shallow flow(s) prior to BOP installation				
B.	Shallow flow detection				
C.	Shallow flow prevention technique, procedures and practices				
D.	Shallow flow well control methods				
XIV.	SUBSEA AND DEEPWATER WELL CONTROL – KICK PREVENTION AND DETECTION				
A.	Kick Prevention and Detection				
B.	Riser gas considerations				
XV.	SUBSEA AND DEEPWATER WELL CONTROL – BOP ARRANGEMENTS				
A.	Subsea BOP Stack				
B.	Choke manifold system				
C.	Choke control systems				
D.	Diverter System – Floating Unit				
XVI.	SUBSEA AND DEEPWATER WELL CONTROL – RISER SYSTEM				
A.	Riser considerations				
B.	Boost lines				

C.	Fill-up valves (dump valve)				
XVII.	SUBSEA AND DEEPWATER WELL CONTROL – ROV INTERVENTIONS				
A.	Minimum subsea BOP/ROV intervention functions				
B.	Common BOP override functions				
XVIII.	SUBSEA AND DEEPWATER WELL CONTROL – DRILLING FLUIDS				
A.	Subsea drilling fluid considerations				
B.	Fluid storage				
XIX.	SUBSEA AND DEEPWATER WELL EMERGENCY DISCONNECT				
A.	DP emergency disconnect considerations				
XX.	SPECIAL SITUATIONS (OPTIONAL)				
A.	Hydrogen sulfide (H ₂ S)				
B.	Horizontal well control considerations				
C.	Off bottom kills				
D.	Underground blowouts				
E.	Combination thief and kick zones				
F.	False kick indicators				

G.	Pipe reciprocation during well kill (biaxial loading)				
H.	Underbalanced drilling				
I.	Slim-hole well control considerations				
J.	Coiled tubing				
K.	Snubbing				
L.	New well control technology and equipment				
M.	High pressure/high temperature considerations				
N.	Tapered string/tapered hole				
O.	Wellhead component failure points				
P.	Shut-in and circulating kick tolerance				