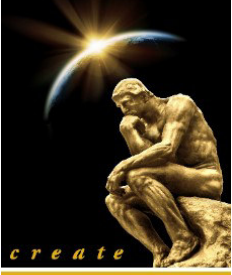
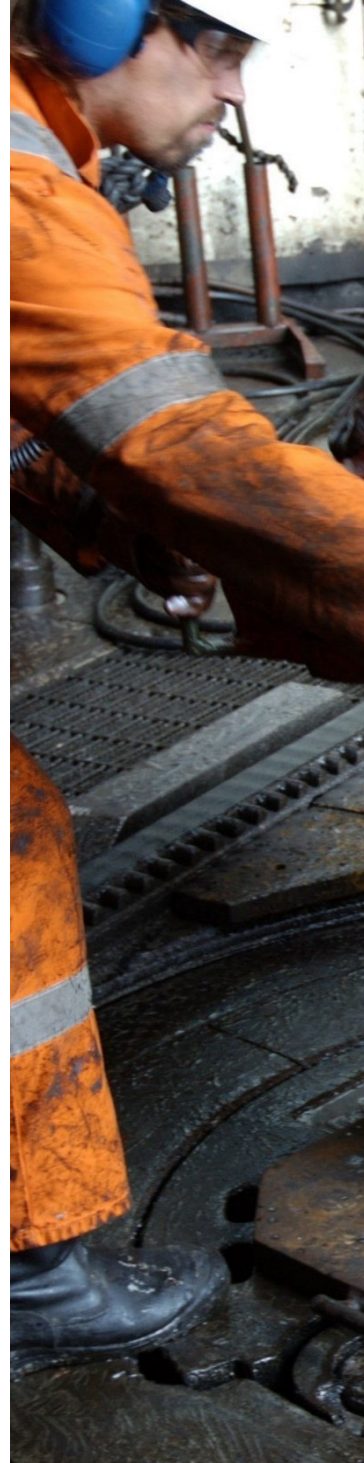


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# UNDERSTANDING WELL CONTROL



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# UNDERSTANDING WELL CONTROL

## Course Overview

### UNDERSTANDING WELL CONTROL COURSE – CONTENT AND OBJECTIVES

#### **Description:**

Understanding Well Control is not easy – we have seen the consequences of this for decades now, not least with the relatively recent Montara, Macondo, Hercules & KS Endeavour blowouts to name but a few. This course focuses upon people understanding well control, rather than upon them just passing an exam.

Worked Examples and Case Histories are studied and discussed, at the delegates pace, so that delegates become fully involved in the understanding process.

This course particularly helps those people who are nervous about taking their WellCap / IWCF exam, who are new to Well Control or who perhaps struggle a little with well control concepts or the sciences, English or well killing in general. Excellent explanatory videos, digital film, Manuals, PowerPoints & Teamwork Exercises are used throughout.

## Who Should Attend

Personnel new to the Industry; Drilling Contractor Personnel: Pump-man, Floor-men, Derrick-man; Anyone having trouble understanding Well Control or who wants to prepare for the 1 week IWCF / IADC Well Control Course; Technical Assistants; Junior Drilling Engineers; Service Company Personnel

# UNDERSTANDING WELL CONTROL

## Content

The areas of instruction, evaluation and testing will be in the following subjects:

- Basic Calculations
- Primary Well Control
- System pressure Losses
- Formation Fracture Pressures
- LOT Procedure
- MAASP and MAMW
- When, How and Where to take SCR's
- Choke Line Friction, Determining and Effects
- Drilling Fluids
- Pump Speed and Mud Weight Effects on Pressure Losses
- Formation Trends
- Top Hole Drilling / Shallow gas
- Changes in Formation Pressures
- Causes of Kicks
  - Intentional
  - Unintentional
- Tripping
- Drilling
- Kick Indicators and Response
- Secondary Well Control, Shut-in procedures API Standard 53 and Company Equipment
- Tripping
- Drilling
- Monitor and Record Shut in Data
- Shut-in Calculations
- Kill methods
- Driller's
- Wait and Weight
- Basic Surface and Subsea Accumulator System
- Basic Surface and Subsea BOP Equipment

## Objectives

### PARTICIPANTS SHOULD BE ABLE TO:

- Calculate all formula's at this fundamental level
- Demonstrate a knowledge of the importance of taking and recording SCR's
- Describe setting up of alarms and manifold systems for drilling
- Explain response to audible/visual alarms on monitoring system
- Identify drilling trend changes and correct response to same
- Describe the correct shut-in procedure
- Identify correct monitoring and collection of shut-in data
- Fill out a kill sheet
- Identify components of BOP equipment, accumulator equipment and related instrumentation
- Demonstrate an understanding of well control through past case-history study.

## Your Dedicated Coach

## Michael Gibson (PhD)



### ❖ **Overview**

- Seasoned professional with 35 years' worldwide experience on drill-ships, semi-submersibles, tender-assist units, platforms, jack-ups and land rigs.
- Extensive experience both onshore and offshore in engineering and operations for Operators and Drilling Contractors on exploration, appraisal & development wells.
- Extensive risk assessment, advisory, planning and rig-site work experience ranging from Drilling Engineer through to Drilling Supervisor, Superintendent & Drilling Manager.

### ❖ **Training**

Training experience worldwide ranges across Operators, Drilling Contractors and Service Companies both in-house and public in the following areas :-

- HPHT
- Stuck Pipe Prevention & Fishing
- Deepwater Well Engineering
- Deepwater Operations
- Directional Drilling
- Horizontal & Multilateral Wells
- Accelerated Drilling Programmes for Drilling Contractors
- Graduate Drilling Engineering for Operators
- Optimised Drilling Practices
- Well Planning & Engineering
- Well Construction
- Well Control (Advanced, Understanding, Deepwater & HPHT)

### ❖ **Consultancy**

Engineering & Operations Advisor to Operators, Drilling Contractors, Banks & Insurance Companies worldwide re Drilling & Field Development, Risk & Blowouts

- Hazard Analysis
- Offshore Operations
- Technical Advisor for HPHT Developments
- Well Control
- Technical Advisor for Deepwater Operations

### ❖ **Project**

- Project Manager for HPHT Field Development; Standard Field Development
- Production Optimisation
- Risk Mitigation
- Brownfield Re-development
- Deepwater
- Well Control
- Management Systems

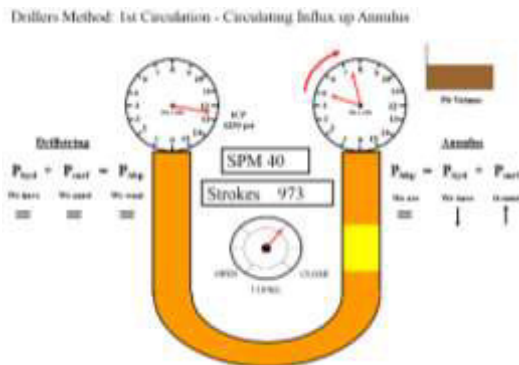
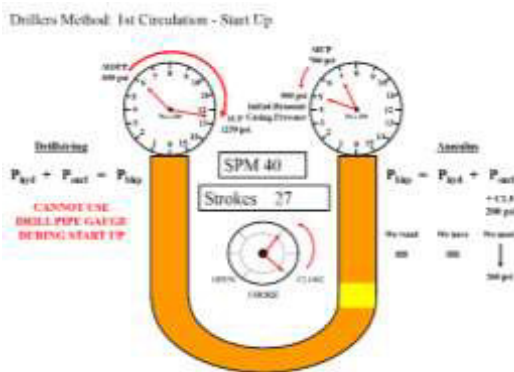
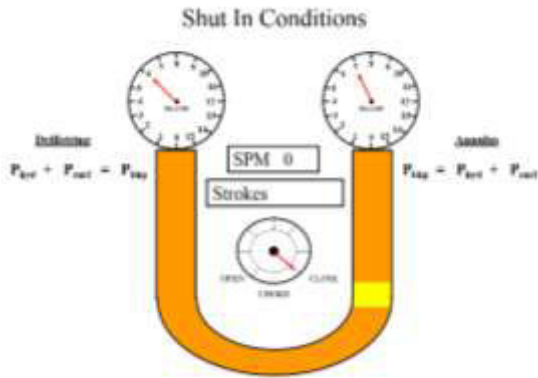
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# UNDERSTANDING WELL CONTROL

**Participants:** This course is intended for COSL personnel in the following positions:

- Pump-man, Derrick-man, Asst. Driller, Driller, Engineers, similar drill-crew levels of experience.



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# UNDERSTANDING WELL CONTROL

## DAY ONE

<u>Time</u>	<u>Subject</u>	<u>Topic</u>	<u>Source/Materials/Notes</u>
08-30	Course Introduction	Course Outline & Objectives	Well Control Manual Formulae Sheet Calculator/Pen/Ruler/Notepaper
09-00	Use of Calculator	Description of Calculator - Basic Calculations Complex Calculations	Handout "Calculator" Calculator
09-15	Exercise 1	"Calculator"	15 minutes to complete
09-30		Receive of Exercise 1	
09-40	Volumes of Tanks and Cylinders	Area of Square/Rectangle Volume of a Tank Area of a Circle Volume of a Cylinder Derivation of Constant 1029.4	Handout "Areas & Volumes" Formulae Sheet
10-10		COFFEE BREAK	
10-25	Exercise 2	"Areas & Volumes"	25 minutes to complete
10-55		Review of Exercise 2	
11-05	String and Annular Volumes	Well Schematic Drillstring Capacities/Volumes Annular Capacities/Volumes Shut In Volumes	Handout "String & Annular Formulae Sheet
12-00		LUNCH BREAK	
13-00	Exercise 3	"String & Annular Volumes"	25 minutes to complete
13-30		Review Exercise 3	
13-40	Pumps & Tripping	Pump Outputs Strokes & Time Annular Velocity Tripping Pipe	Handout "Pumps & Tripping" Formulae Sheet
14-00	Exercise 4	"Pumps & Tripping"	60 minutes to complete
15-00		COFFEE BREAK	
15-15		Review Exercise 4	
15-30	Kill sheet Volume Calculations	Description of Kill Sheet Volume Calculations	Company's Kill Sheet Data Sheet for Presentation Well
16-45		Review of Day/Homework/Course Dispersal	

# UNDERSTANDING WELL CONTROL

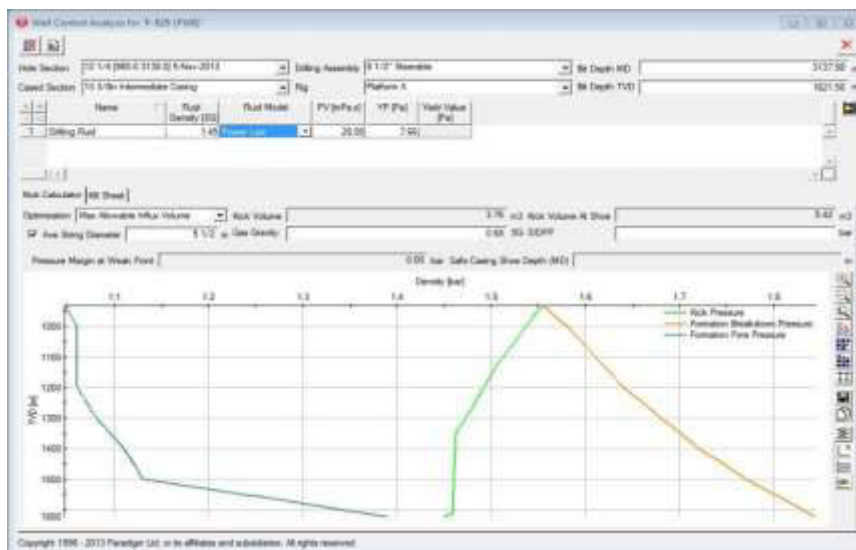
## DAY TWO

Time	Subject	Topic	Source/Materials/Notes
08-30	Review of Homework Exercise 1 Review of Day 1 Subjects		
08-45	Pressure	Pressure Gradient Hydrostatic Pressure Primary Well Control System pressure Losses BHCP/ECD Pump Speed v Pressure Mud Weight v Pressure	Handout "Pressure" Formulae Sheet COSL Well Control Manual
09-30	Exercise 5	"Pressure"	25 minutes to complete
10-00		COFFEE BREAK	
10-15		Review Exercise 5	
10-30	Slow Circulation Rates	Why take SCR's When to take SCR's How and Where	Company's Well Control Manual
10-45	Choke Line Friction Losses	Ways to determine CLFL	Company's Well Control Manual
11-00	Formation Fracture Pressure	LOT Procedure Maximum Allowable Mud Weight MAASP	Handout "Leak Off Test" Formulae Sheet Company's Well Control Manual
11-30	Exercise 6	"SCR's, CLF & Leak Off Test"	25 minutes to complete
12-00		LUNCH BREAK	
13-00		Review Exercise 6	
13-15	Causes of Kicks	Intentional Unintentional	Company's Well Control Manual
14-15	Kick Detection Manual	Drilling Indicators Tripping Indicators	Company's Well Control Manual
14-30	Shutting in and Manual monitoring	Company's policy API RP 59	Company's Well Control Manual
14-45		COFFEE BREAK	
15-00	Shut In Calculations	Formation pressure Influx Calculations Kill Mud Weight Circulating Pressures	Handout "Shut In Calculations" Formulae Sheet
15-45	Exercise 7	"Shut In Methods & Calculations"	25 minutes to complete
16-15		Review Exercise 7	
16-30	Kill Sheet	Kill Calculations on Kill Sheet	Company's Kill Sheet Data Sheet for Presentation Well
16-50		Review of Day/homework/Course Dispersal	

# UNDERSTANDING WELL CONTROL

## DAY THREE

Time	Subject	Topic	Source/Materials/Notes
08-30	Review of Homework Exercise 2 Review of Day 2 Subjects		
09-00	Case Histories	Several Case Histories	Company's Data Operator Data SPE/IADC Data
10-00		COFFEE BREAK	
10-15	Case Histories	Several Case Histories will continued to be studied	Company's Data Operator Data SPE/IADC Data
10-45	Case History Exercise		1 Hour to complete
11-45		Review Case History Exercise	
12-00		LUNCH BREAK	
13-00	Kill Methods	Introduction	Company's Well Control Manual
13-15	Kill Methods	Driller's method Wait & Weight Method	Handout "Kill Methods" Transocean Well Control Manual
14-30	Exercise 8	"Causes of Kicks, Warning Signs and kill Methods"	25 minutes to complete
15-00		COFFEE BREAK	
15-15		Review Exercise 8	
15-30	Kill Methods Manual Review	Drillers Method Wait & Weight Method	Company's Data Operator Data
16-45		Review of Day/Homework/Course Dispersal	



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# UNDERSTANDING WELL CONTROL

## DAY FOUR

<u>Time</u>	<u>Subject</u>	<u>Topic</u>	<u>Source/Materials/Notes</u>
08-30	Review of Homework Exercise 3 Review of Day 3 Subjects		
09-00	Drilling Fluids	Technology	Mud Company
09-15	Gas	Types of Gases Density Migration	Company's Well Control Manual
09-45	Stripping	Purpose Method	Company's Well Control manual
10-15		COFFEE BREAK	
10-30	Exercise 9	"Gas Behaviour & Stripping"	
10-50		Review Exercise 9	
11-00	Equipment	Accumulator System Subsea Components Subsea Signalling System Blow Out Preventers	Company's Well Control Manual
12-00		LUNCH BREAK	
13-00	Exercise 10	"Well Control Equipment"	
13-30		Review Exercise 10	
13-45	Equipment	BOP Valves Testing Mud Gas Separator	Company's Well Control Manual
14-45		COFFEE BREAK	
15-00	Tripping & Slugs	Wet & Dry Tripping Calculations Handout "Tripping & Slugs" Slug Effects	
15-30	Exercise 11	"Valves, Testing, Mud Gas Separator & Tripping"	25 minutes to complete
16-00		Review Exercise 11	
16-15 to 17-00	Revision period	To be used by students to revise any topics of week	

# UNDERSTANDING WELL CONTROL

## DAY FIVE

<u>Time</u>	<u>Subject</u>	<u>Topic</u>	<u>Source/Materials/Notes</u>
08-30	Review	Calculations General Topics	All Week's materials
10-00		COFFEE BREAK	
10-15	Review	<b>Kill Sheet</b> Strokes/Time Calculations Capacity Calculations MAASP/MAMW Annular Velocity Influx Calculations Kill Mud Weight ICP/FCP Pressure Step Down ECD Dynamic Casing Pressure	
12-00		LUNCH BREAK	
13-00		<b>Equipment</b> Subsea Components Annular Components Accumulator Functions Inside BOP'S Manifold Line Up	
14-00	Final Review Before Course Close		
16-45	Results & Course Dispersal		

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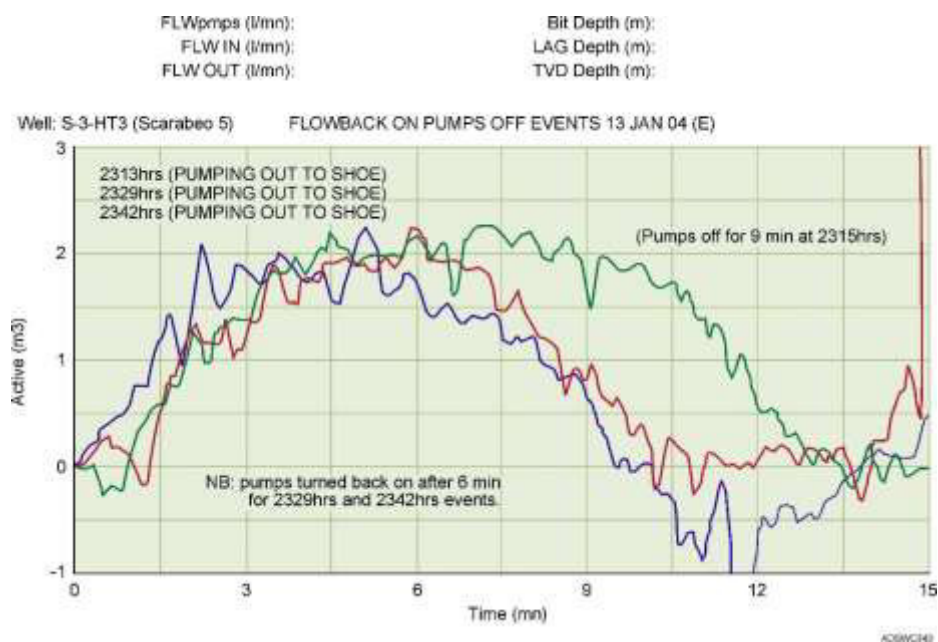
FURTHER AREAS MAY BE INCLUDED AS REQUIRED; CERTAIN CHANGES MAY BE MADE DEPENDING UPON STUDENT'S BACKGROUNDS/EXPERIENCE LEVEL.

# UNDERSTANDING WELL CONTROL

## DAY FIVE

### Final Review Before Course Close

1. Why Well Control Events Happen
2. Primary & Secondary Barriers
3. Pumps & Tripping
4. Pressure
5. Leak-Off Test
6. Shut-In Calculations
7. Kill Methods (Drillers and W&W)
8. Drilling Fluids
9. Gases
10. Stripping
11. Well Control Equipment
12. Tripping & Slugs
13. Well Control Formulae
14. Well Control Incidents
15. Deepwater Well Control Guidelines
16. Precautions in Planning HTHP Well Control
17. Kick Intensity
18. Shallow Gas Exercise
19. Well Control – Appendix 1
20. Well Control – Appendix 2





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# Contact Details



- I am interested to register for “Understanding Well Control”
- I would like to contact IDEAS for In-House Training Solutions
- I would like to contact IDEAS for In-House Consultancy Solutions
- Other enquiry

Name : \_\_\_\_\_

Job Title : \_\_\_\_\_

Company : \_\_\_\_\_

Department : \_\_\_\_\_

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