



ABERDEEN DRILLING INTERNATIONAL

IWCF Level 4 Drilling Well Control

OVERVIEW

The **IWCF Level 4 Drilling Well Control** course is essential training for those working in wellsite supervisory roles and for office-based personnel that are primarily involved in the operational decision-making process and/or well design. The course aims to build on Level 3 course content (including kick detection and shut-in) and focus on more complex aspects of well control and well kill methodology.

DESIGNED FOR

The Level 4 (Supervisor) course is designed for anyone working in a supervisory role and involved in the well design and operational decision-making process of drilling, such as a **Drilling Supervisor, Superintendent or Company Man, Tool Pusher, OIM, or Rig Manager**. To view the full list of recommended job titles, please refer to the IWCF website: www.iwcf.org/programmes

Please note: IWCF training levels 2 to 4 are designed to be sequential and first-time candidates are expected to complete Level 2 before progressing to Level 3 or Level 4. However, the training levels are also designed to be role-specific and dependent on the candidate's work experience. For guidance and advice on which level of training you are eligible for, please get in touch.

COURSE DELIVERY

The course is delivered through presentation of a series of interactive lectures supported by videos and animations, group discussion, and drilling simulation exercises, supplemented by a classroom workbook and further self-study exercises. Level 4 training may be partly combined with Level 3 training for common modules and during simulator-based training with each candidate assuming their respective role as per normal drilling operations. The course is delivered over 5 days and includes IWCF written assessments on the final day.

CERTIFICATION

Candidates may select either "Combined" (Surface & Subsea) or "Surface Only" BOP Stack certification. Successful completion of the course and a pass mark of 70% or above in all IWCF practical and written assessments will result in IWCF Level 4 certification which is valid for two years.

ENTRY REQUIREMENTS

The candidate must be pre-registered with IWCF and able to provide his/her 6-digit IWCF Candidate Registration (CR) Number. *What is an IWCF CR Number?* [Symbol] Prior certification is not required but previous experience in supervisor role during drilling operations is assumed. Please contact us to discuss candidate suitability if you have any doubts or queries.

LEARNING OBJECTIVES

At the end of the course delegates will be able to:

- Perform static & dynamic pressure calculations across a range of wellbore and formation conditions
- Calculate volumes and capacities for a range of drilling and tripping operations and calculate the effects on bottom-hole pressure during these operations
- Explain the effects of gas migration on wellbore pressures and calculate pressures along the wellbore using Boyle's Law
- Describe the causes of kicks for on bottom and off-bottom conditions



- Complete a kill sheet for vertical and deviated wells
- Specify the well control equipment requirements for surface &/or subsea operations
- Describe the principles underpinning the constant bottom hole pressure methods of well kill
- Using a simulator, determine the appropriate well kill method, direct the driller and successfully kill the well.

INDICATIVE COURSE CONTENT

The course covers the following modules:

Essential geology – This section introduces the four essentials of a hydrocarbon reservoir, namely the reservoir rock properties (porosity and permeability), a source rock, a geological trap and a seal. A range of examples of traps are described and explained.

Formation pressure and identifying increases in formation pressure - Within this section the origins of abnormal formation pressure are explained including under compaction, artesian effects and pressure in gas caps. The fundamentals of formation fracture pressure are explained. The various ways in which increasing formation pressure can be deduced (increasing ROP, gas cut mud, shale density etc.) are described and explained. The driller's actions on a drilling break are described.

Capacities and volumes – The basic mathematics required to calculate capacities and volumes along the wellbore are explained.

Wellbore pressures – Building on the origin of abnormal pressure, this section looks at static and dynamic pressure along the wellbore using examples and delegate exercises. Included in this section are explanations and calculations for gas migration and expansion, maximum allowable surface pressure and the effect on bottom-hole pressure of a range of operations including tripping, disconnecting the riser, swabbing, running casing, pumping slugs and others.

Causes of kicks – An essential part of well control is to understand the causes of kicks, many of which are due to poor communication and awareness on the part of the drill crew. A full range of causes are described. Using examples, kick tolerance and the importance of kick tolerance to well integrity is explained.

Kill sheets – Following an explanation of the purpose of a kill sheet delegates will complete a number of kill sheets for vertical and horizontal wells and answer a range of questions from the kill sheets. The consequences of using a vertical kill sheet on a deviated well on bottom-hole pressure are explained using sample completed kill sheets.

Well kill methods – The advantages and disadvantages of the hard and soft shut-in methods are explained. Constant bottom-hole pressure methods of well control are described and explained and examples are provided of surface pressure changes as the influx is circulated out of the well. The effect of choke line friction in subsea well kill is explained using examples.

Well control equipment – The principle items of secondary well control equipment (accumulators, BOP and rams, choke manifold and remote choke panel) are described and examples of sizing and rig-up of this equipment is explained.