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Multimedia Training Courses on:
Well Control & Well Intervention

Well Control Surface

Well control Equipment

Well control Subsea

Subsea Equipment

Well Intervention

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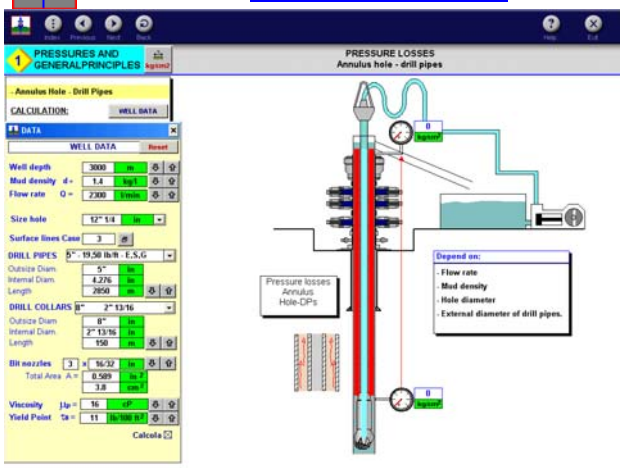
Update to March 2022

MULTIMEDIA TRAINING COURSES

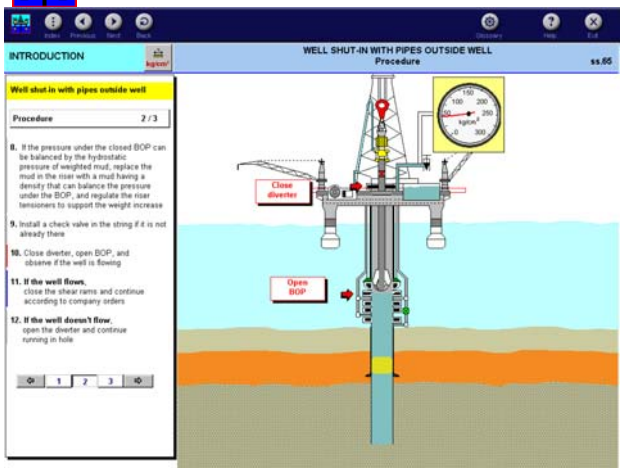
Well Control & Well Intervention – release 5.0 – 2022

WELL CONTROL

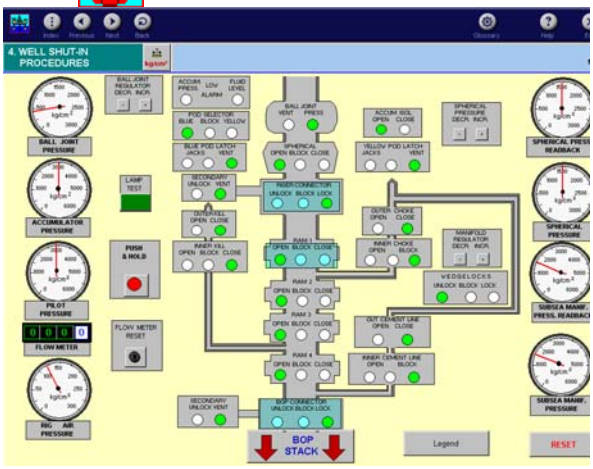


SURFACE EQUIPMENT

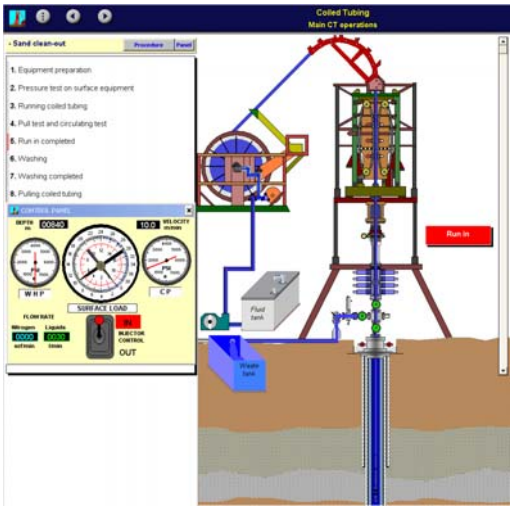
SUBSEA WELL CONTROL



SUBSEA EQUIPMENT



WELL INTERVENTION



FEATURES

The courses have been designed with the idea of facilitating access to contents and their comprehension.

The attempt to achieve these objectives has led us to develop a set of tools for rapid navigation between sections of the course (index, map, route, search, bookmark) and to use different ways of presenting information (text, voice, video clips, self-assessment tests). The list of some this features is given below.

- Voice guide
- Interactive text
- Interactive animations
- Video clips
- Theory consolidation
- Intermediate self-assessment tests
- Final tests
- Glossary and Text search
- Display of path completed
- Bookmarking

- Page size 1024 x 768 px.

Browser-style interface, for a more functional and intuitive use.

AVAILABLE LANGUAGES

The Training Courses are available in the following languages:

Italian (ALL)

English (ALL)

Spanish (ALL)

French (ALL)

Russian (Only Surface)

CBT on WELL CONTROL

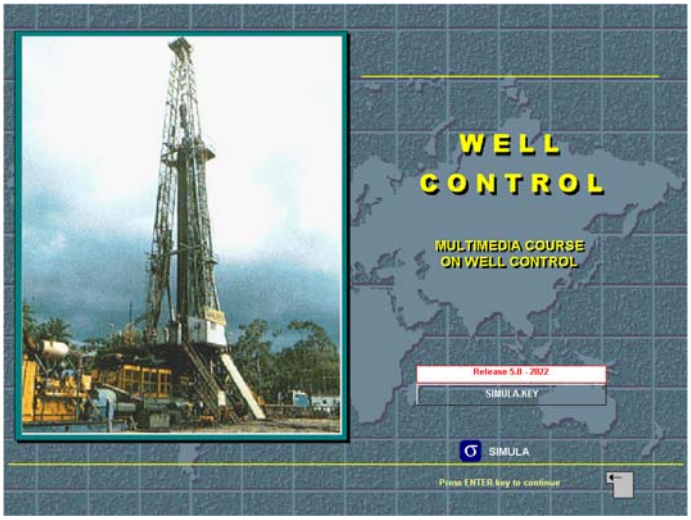
CBT on WELL CONTROL

1. **CBT Surface Well Control**
2. **CBT Surface Equipment**
3. **CBT Subsea Well Control**
4. **CBT Subsea Equipment**

1. CBT Surface Well Control

Training course on Techniques and procedures for well control during drilling:

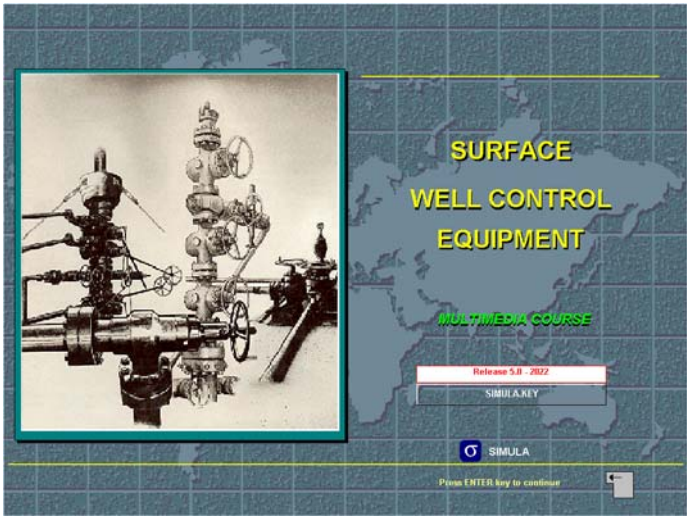
- Pressures and general principles
- Causes of kicks
- Kick indicators
- Well Shut-in procedures
- Well control methods
- Horizontal well



2. CBT Surface Equipment

Training course on Surface Equipment for Well control activities:

- Annular BOP
- Ram BOP
- Auxiliaries equipment
- High Pressure Mud Circuit
- BOP Stack
- Accumulator



3. CBT Subsea Well Control

Training course on Techniques and procedures for well control during drilling with semisubmersible rigs(subsea BOP):

- Introduction and Pressures
- Shallow gas
- Causes of kicks
- Kick indicators
- Well Shut-in procedures
- Well control methods

4. CBT Subsea Equipment

Training course on Equipment for Well control activities on offshore

- Annular BOP (subsea installation)
- Ram BOP (subsea installation)
- High Pressure Mud System
- BOP Stack (subsea configuration)
- Accumulator
- Control system
- Diverter
- - Riser

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SURFACE WELL CONTROL

1. CBT SURFACE WELL CONTROL

Training course on Techniques and procedures for well control during drilling for Driller and Supervisor.

Main Index

1. PRESSURES AND GENERAL PRINCIPLES

2. CAUSES OF KICKS

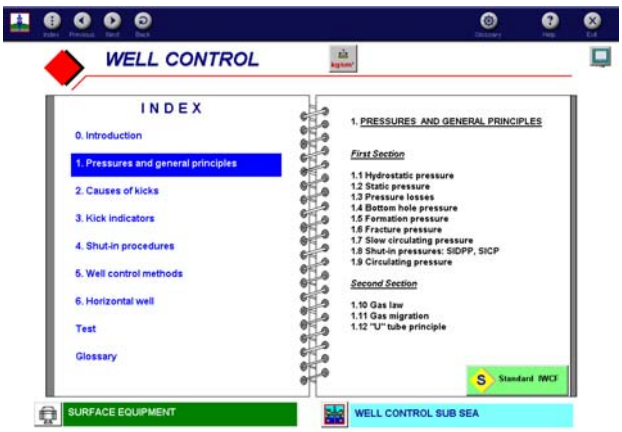
3. KICK INDICATORS

4. WELL SHUT-IN PROCEDURES

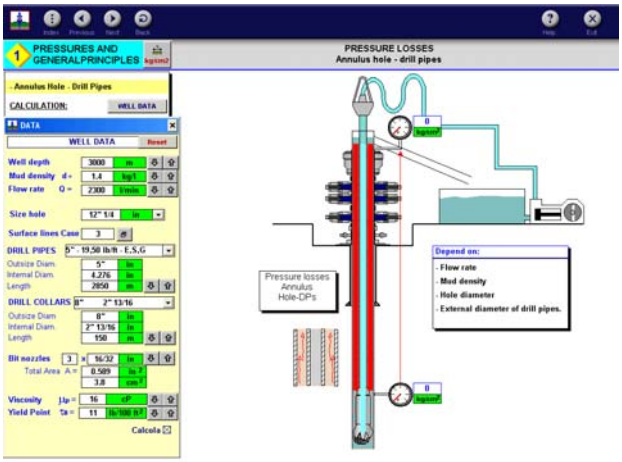
5. WELL CONTROL METHODS

6. HORIZONTAL WELL

TEST AND KILL SHEET

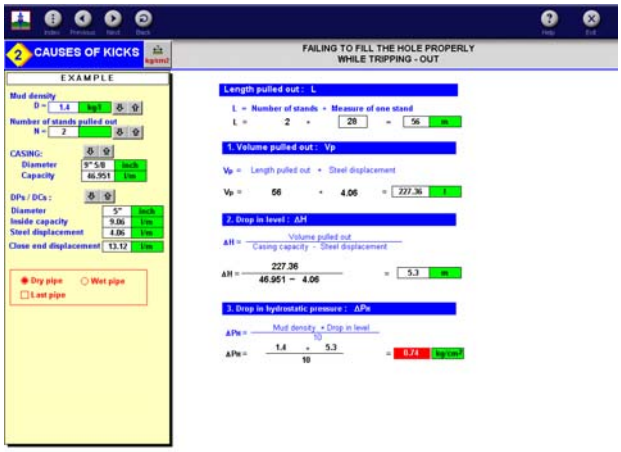


MODULE 1: PRESSURES AND GENERAL PRINCIPLES



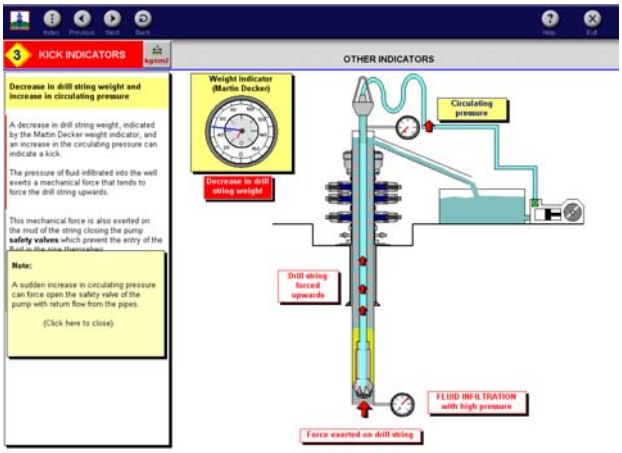
1.1 Hydrostatic pressure
1.2 Static pressure
1.3 Pressure losses
1.4 Bottom hole pressure
1.5 Formation pressure
1.6 Fracture pressure
1.7 Slow circulating pressure
1.8 Shut-in pressures: SIDPP, SICP
1.9 Circulating pressure
1.10 Gas law
1.11 Gas migration
1.12 U tube principle

MODULE 2: CAUSES OF KICKS



2.1 Generality
2.2 Abnormal pressure
2.3 Failing to fill the hole properly while pulling-out
2.4 Swabbing
2.5 Lost circulation
2.6 Decrease mud weight
2.7 Gas-cut mud
2.8 Particular situations

MODULE 3: KICK INDICATORS



3.1 Generality
3.2 Flow rate increase
3.3 Hole keeps flowing with pumps stop
3.4 Pit volume increase
3.5 Increase of penetration rate
3.6 Incorrect hole fill up volume while tripping out
3.7 Pump pressure decrease - pump strokes increase
3.8 Gas-cut-mud
3.9 Others kick indicators

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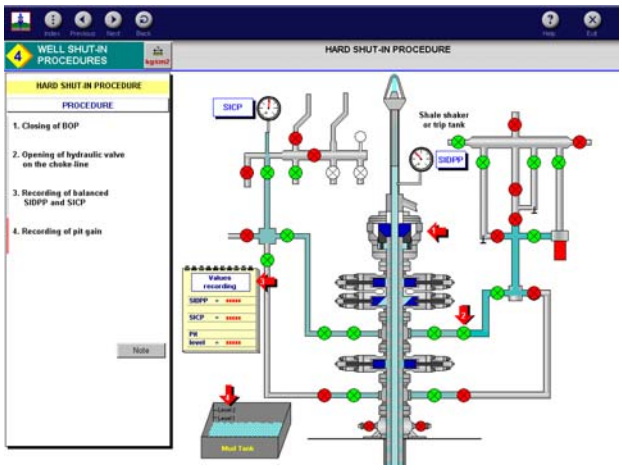
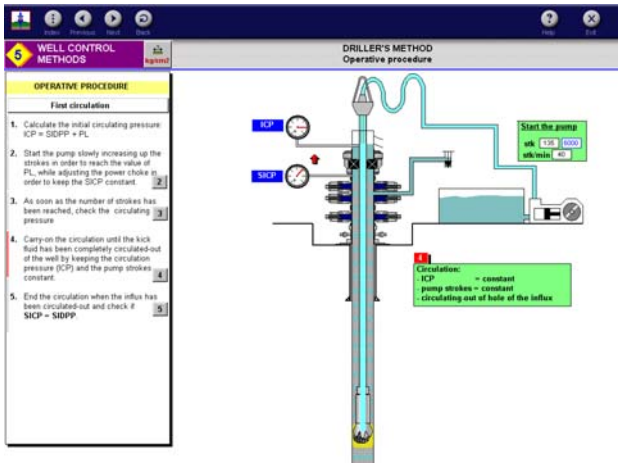
MODULE 4: SHUT-IN PROCEDURES



4.1 Soft and hard shut-in procedures
4.2 Shut-in while drilling.
4.3 Shut-in while tripping:
- with drill pipes (DPs)
- with drill collars (DCs)

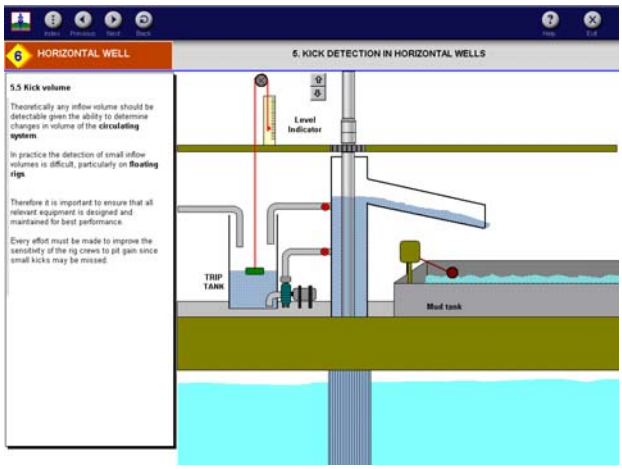
4.4 Stabilization of pressures: SIDPP and SICP

MODULO 5: WELL CONTROL METHODS



5.1 Generality
5.2 Driller's method
5.3 Pressure at the shoe
5.4 Wait and weight method
5.5 Considerations on driller's and wait and weight methods
5.6 Kick tolerance
5.7 Volumetric method
5.8 Lubrication method
5.9 Stripping and snubbing
5.10 Problems and analysis during well control

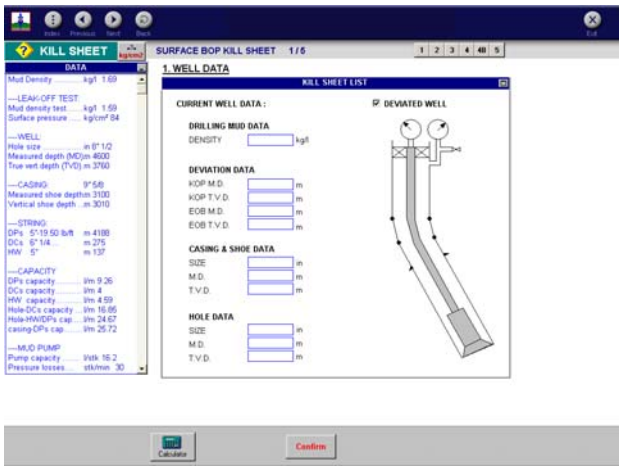
MODULE 6: HORIZONTAL WELL



6.1 Introduction
6.2 Classification system and advantages for horizontal wells
6.3 Kick for horizontal wells
6.4 Recognising and evaluating kicks
6.5 Kick detection in horizontal wells
6.6. Methods of well control for horizontal wells

TEST AND KILL SHEET

- General tests
. Pressures and general principles
. Causes of kicks
. Kick indicators
. Shut-in procedures
. Well control methods
- Kill sheet filling in



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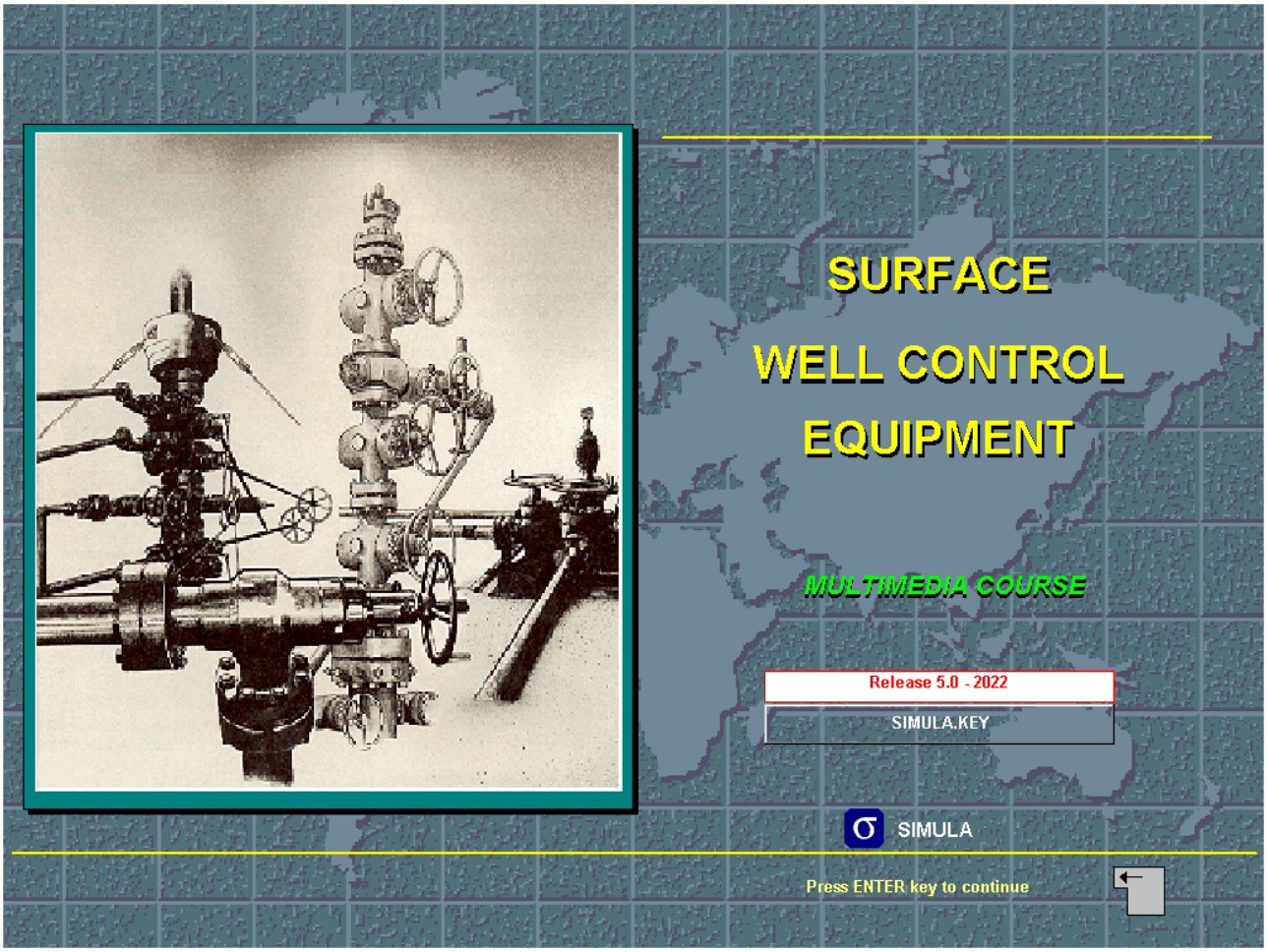
SURFACE WELL CONTROL

2. CBT SURFACE EQUIPMENT

Training course on Surface Equipment used on Well Control activities, for Driller and Supervisor



Main Index

1. ANNULAR BOP
2. RAM BOP
3. AUXILIARIES
4. HIGH PRESSURE CIRCUIT
5. BOP STACK
6. ACCUMULATOR

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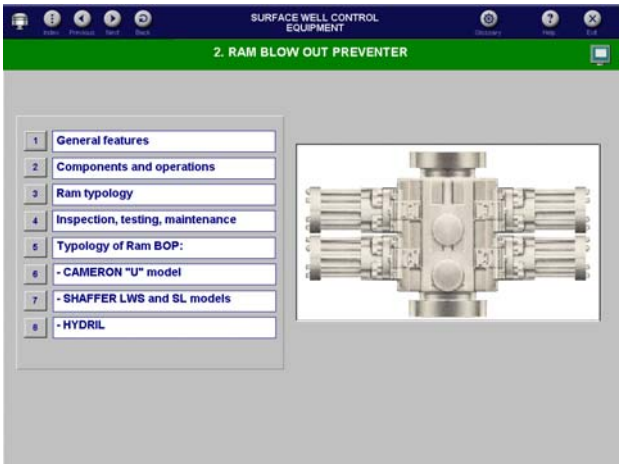
MODULE 1: ANNULAR BOP

- Generality
- Components
- Operational principles
- Inspection, maintenance, tests
- Hydril BOP
- NL Shaffer BOP
- Cameron BOP
- Stripping operations

MODULE 2: RAM BOP

- General features
- Components and operations
- Ram typology
- Inspection, testing, maintenance
- Typology of Ram BOP:
    - o CAMERON "U" model
    - o SHAFFER LWS and SL models
- - HYDRIL

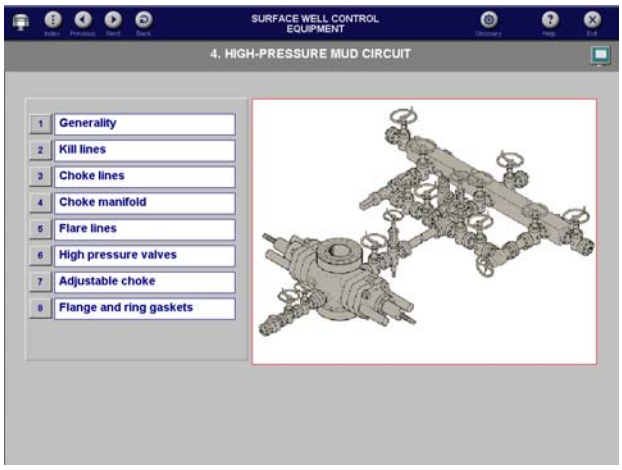


MODULE 3: AUXILIARIES

- Safety valves and cocks:
    - Upper kelly cock
    - Lower kelly cock
    - Drill pipe safety valves
    - Inside BOP
- Degasser
- Instruments:
    - Trip tank / possum belly
    - Level indicators
    - Flow meter
    - Mud density detector
    - Gas detector
    - Pump stroke counter

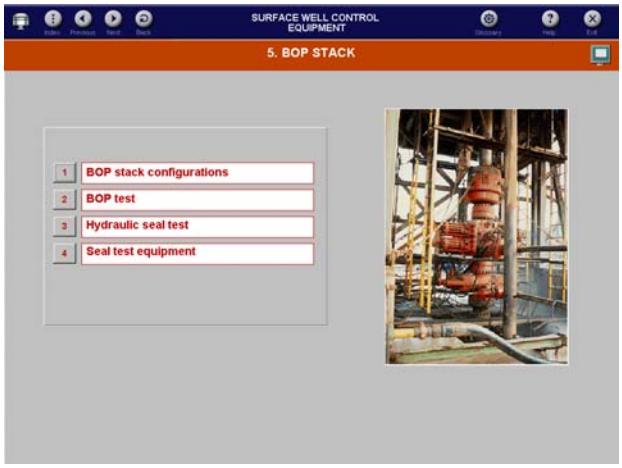
MODULE 4: HIGH PRESSURE CIRCUIT

- Generality
- Kill lines
- Choke lines
- Choke manifold
- Flare lines
- High pressure valves
- Adjustable choke
- Flange and ring gaskets



MODULE 5: STACK BOP

- BOP stack configurations
- BOP test
- Hydraulic seal test
- Seal test equipment



MODULE 6: ACCUMULATOR

- Generality
- Dimensional data
- Features
- Accumulator test
- KOOMEY Accumulator:
  - Remote control panel
  - Operations
  - Failures and defecting functioning
  - Maintenance

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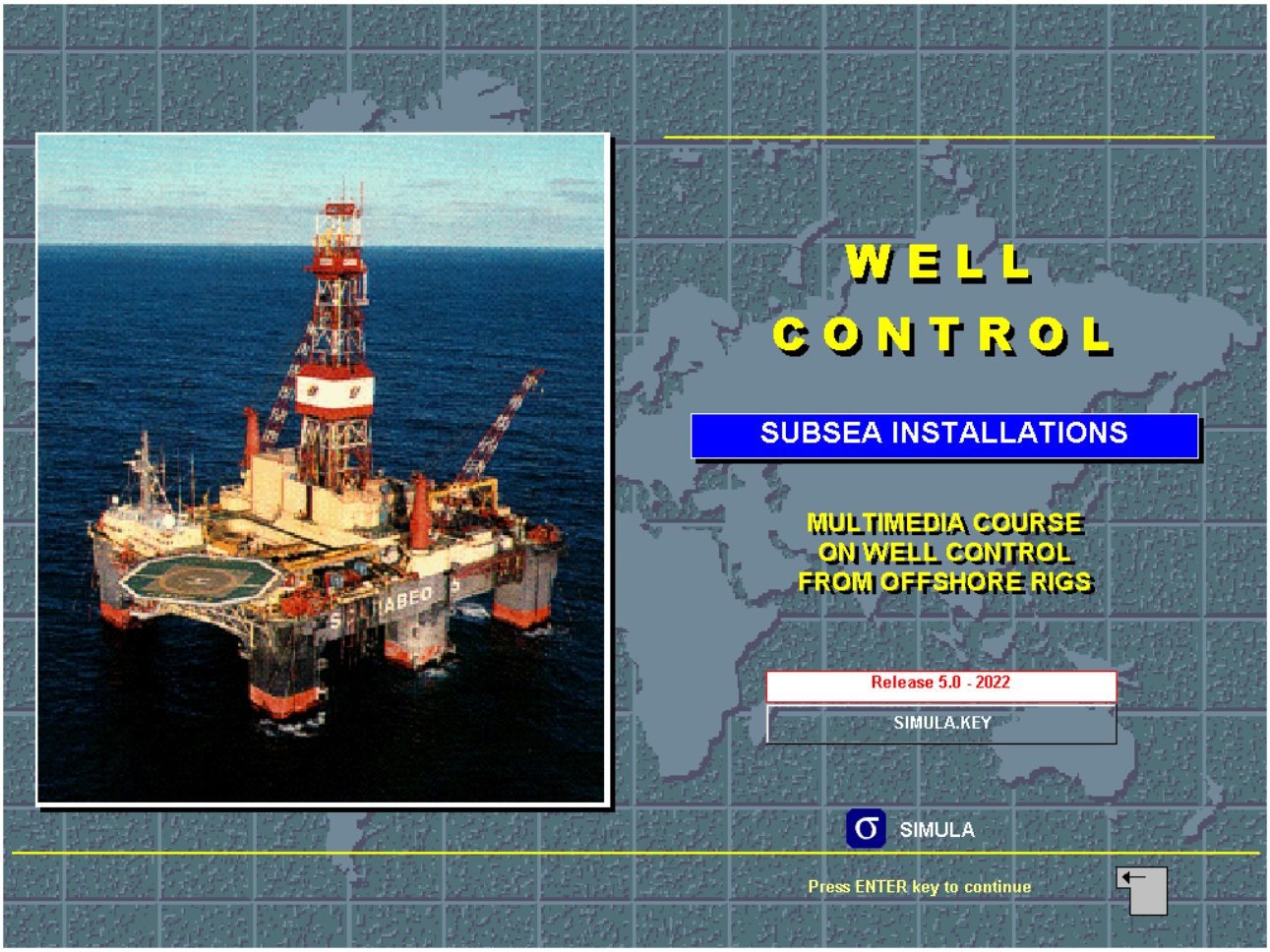
SUBSEA WELL CONTROL

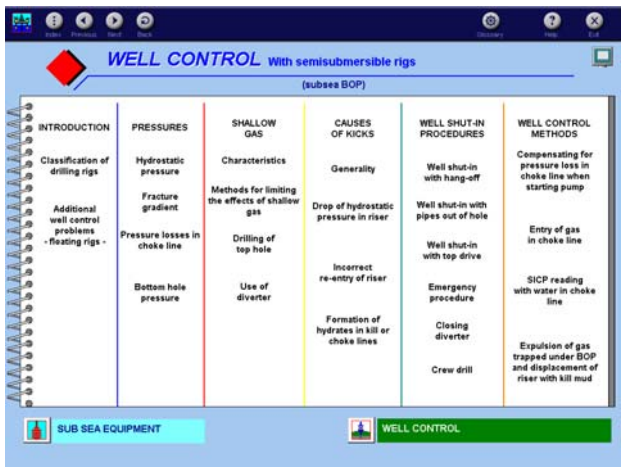
3. CBT SUBSEA WELL CONTROL

Training course on Techniques and procedures for well control during drilling on floating rigs for Driller and Supervisor



Main Index

1. PRESSURES
2. SHALLOW GAS
3. CAUSES OF KICKS
4. WELL SHUT-IN PROCEDURES
5. WELL CONTROL METHODS



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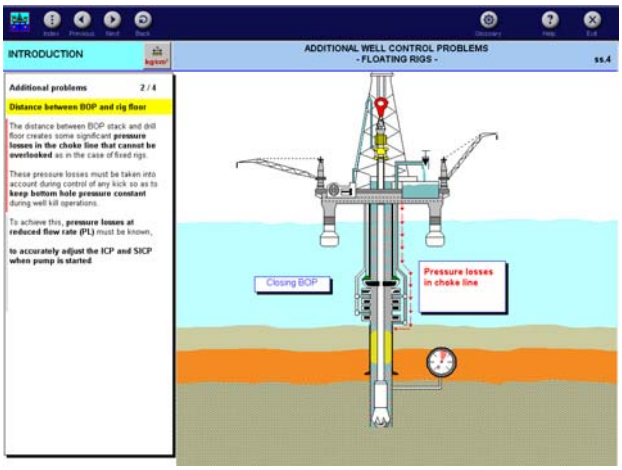
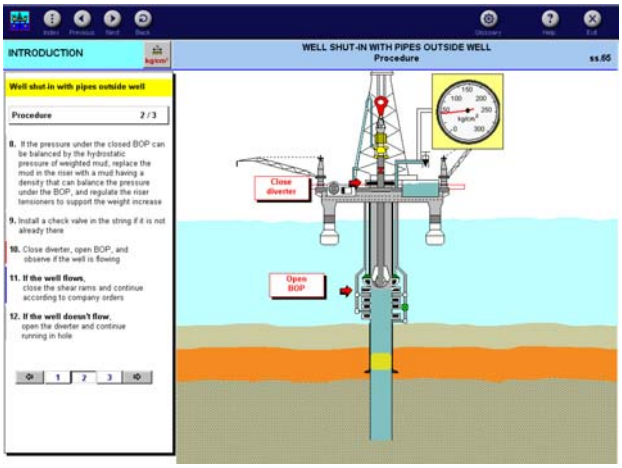
MODULE 1: PRESSURES

- Hydrostatic pressure
- Fracture gradient
- Pressure losses in choke line
- Bottom hole pressure



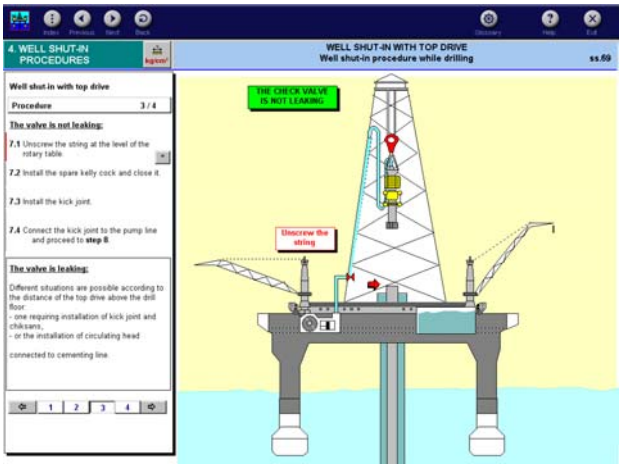
MODULE 2. SHALLOW GAS

- Characteristics
- Methods for limiting the effects of shallow gas
- Drilling of top hole
- Use of diverter



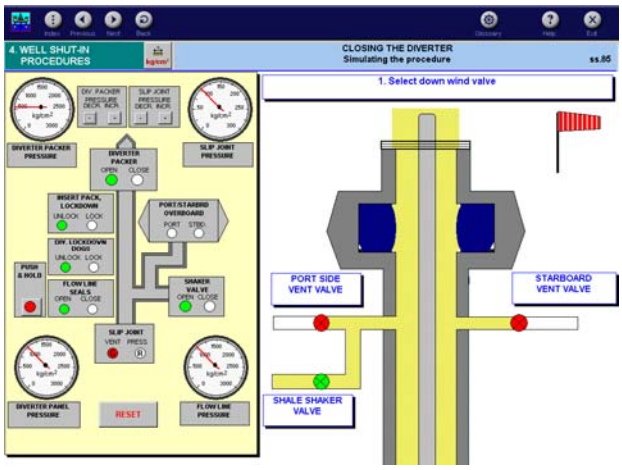
MODULE 3. CAUSES OF KICKS

- Generality
- Drop of hydrostatic pressure in riser
- Incorrect re-entry of riser
- Formation of hydrates in kill or choke lines



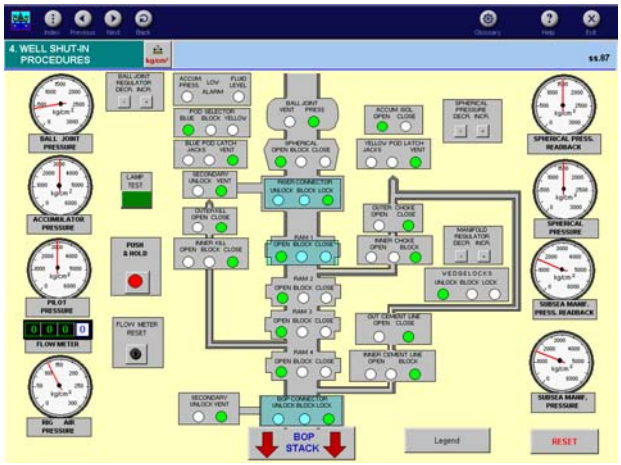
MODULE 4. WELL SHUT-IN PROCEDURES

- Well shut-in with hang-off
- Well shut-in with pipes out of the hole
- Well shut-in with top drive
- Emergency procedure
- Closing diverter
- - Crew drills



MODULE 5. WELL CONTROL METHODS

- Compensating for pressure loss
- in choke line when starting pump
- Entry of gas in choke line
- SICP reading with water in choke line
- Expulsion of gas trapped under BOP



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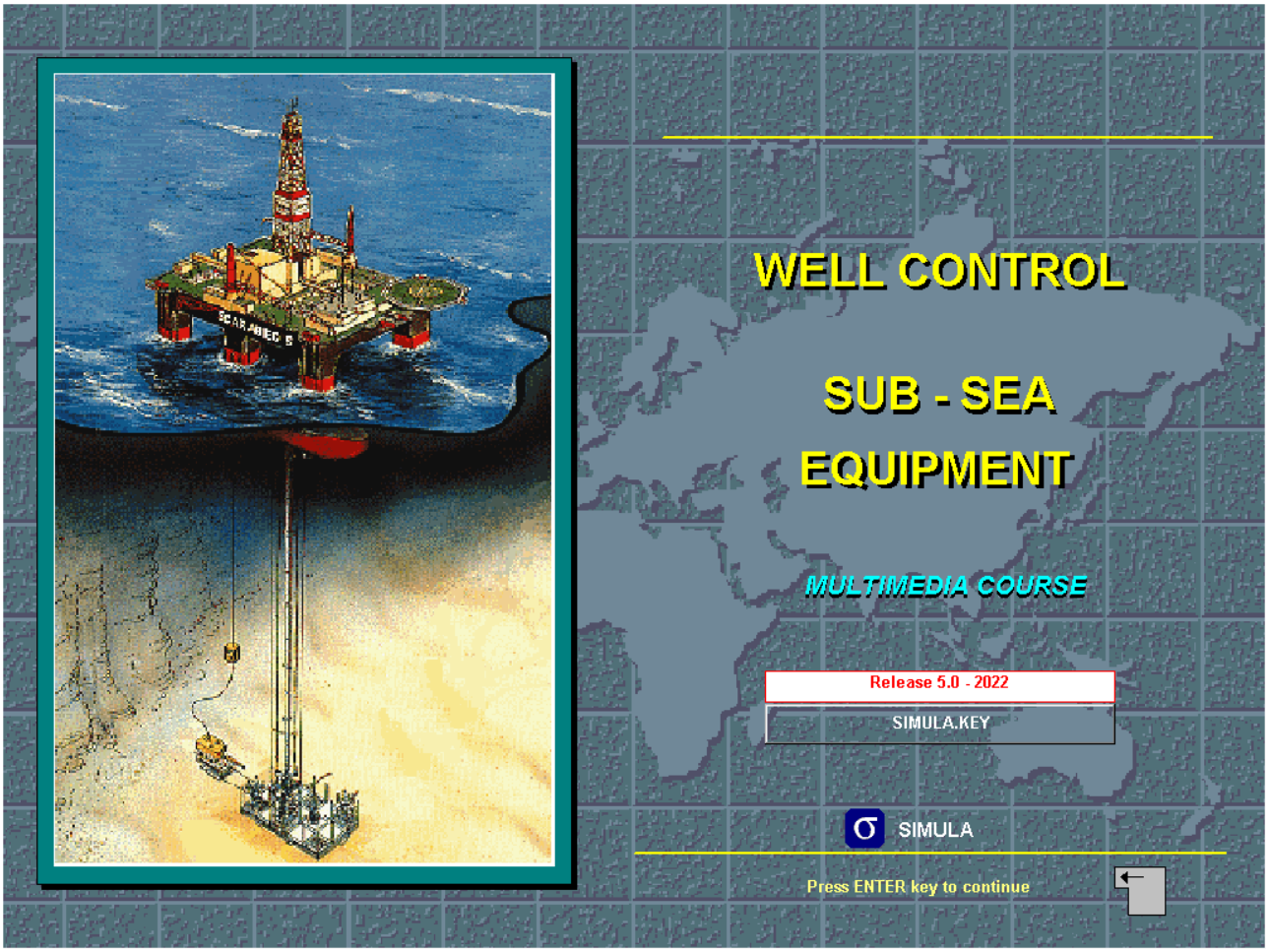
SUBSEA WELL CONTROL

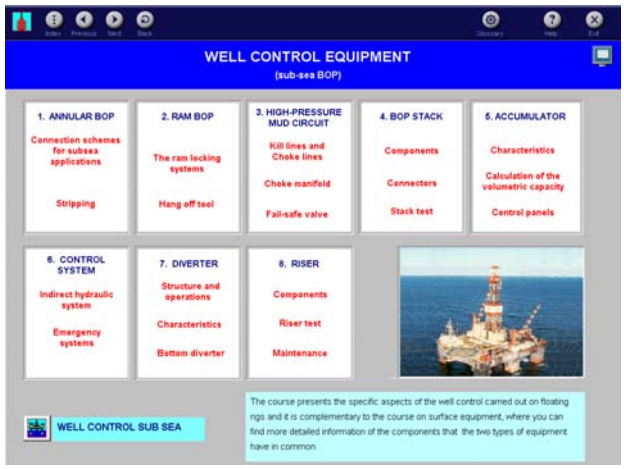
4. CBT SUBSEA EQUIPMENT

Training course on Subsea Equipment used on Well Control activities for: Driller and Supervisor.



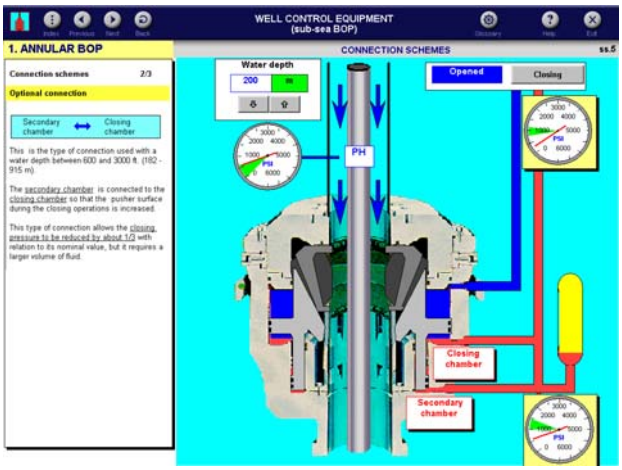
Main Index

1. ANNULAR BOP
2. RAM BOP
3. HIGH-PRESSURE MUD CIRCUIT
4. BOP STACK
5. ACCUMULATOR
6. CONTROL SYSTEM
7. DIVERTER
8. RISER



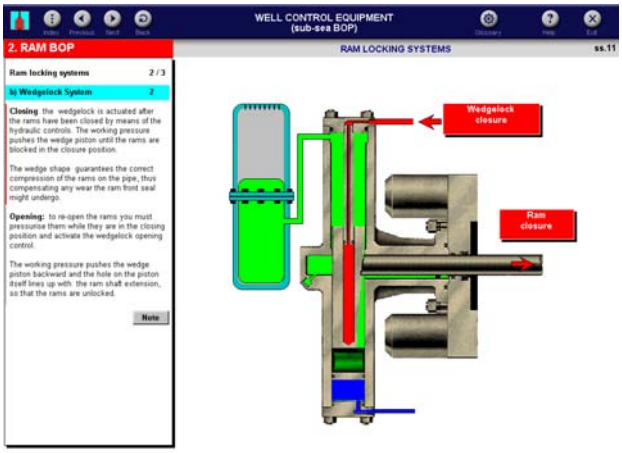
MODULE 1: ANNULAR BOP

- Generality
- CONNECTION SCHEMES
  - Standard connection
  - Optional connection
  - Connection with fluid compensation element
- STRIPPING



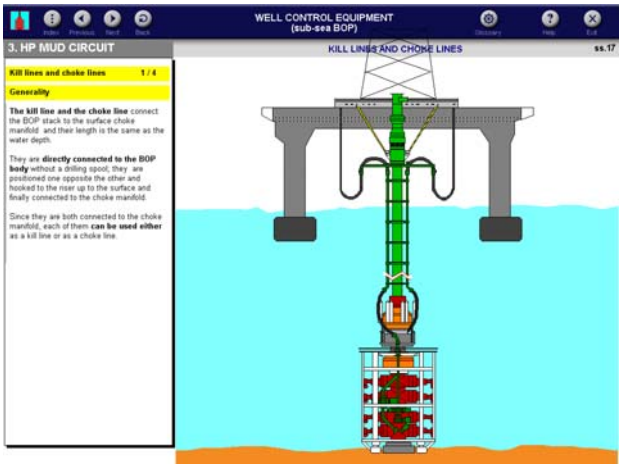
MODULE 2: RAM BOP

- Closing time
- RAM LOCKING SYSTEMS
  - Poslock System
  - Wedgelock System
- HANG OFF TOOL
- Procedure

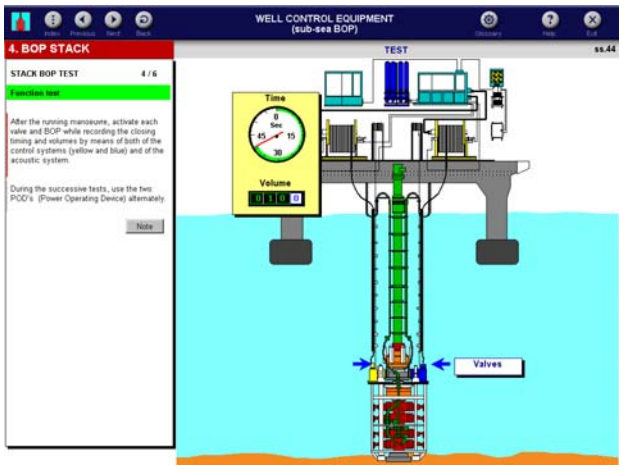


MODULE 3: HIGH-PRESSURE MUD CIRCUIT KILL LINES AND CHOKE LINES

- Generality
- Characteristics
- CHOKE MANIFOLD
- Pressure test
- FAIL-SAFE VALVE
- CAMERON DF Type

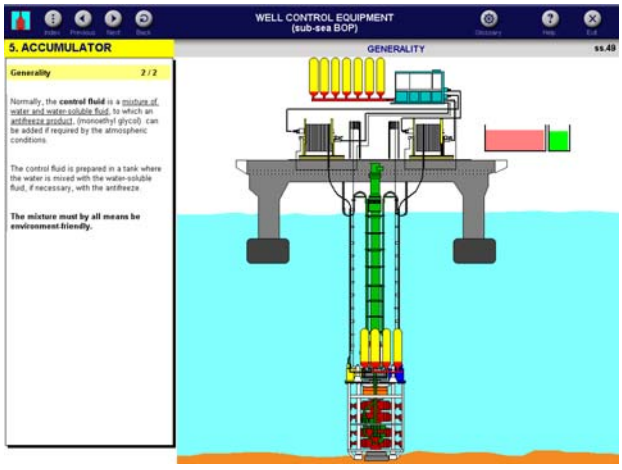


MODULE 4: STACK BOP COMPONENTS



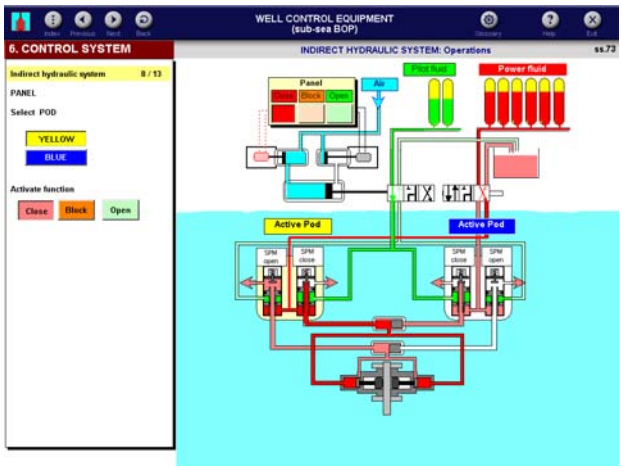
- Lower Marine Riser Package
- BOP Stack
- CONNECTORS
- Riser connector
- Well head connector
- Kill and choke line connectors
- VETCO connector mod. H4
- CAMERON mod. 70 Connector
- STACK BOP TEST
- Pressure test
- Function test
- Surface test equipment
- Bottom test equipment

MODULE 5: ACCUMULATOR



- Description
  - Control fluid
- CHARACTERISTICS
  - Closing time
  - Volumetric capacity
- Calculation of volumetric capacity
  - Example
- CONTROL PANELS
  - Control panel scheme
- CONTROL MANIFOLD

MODULE 6: CONTROL SYSTEM

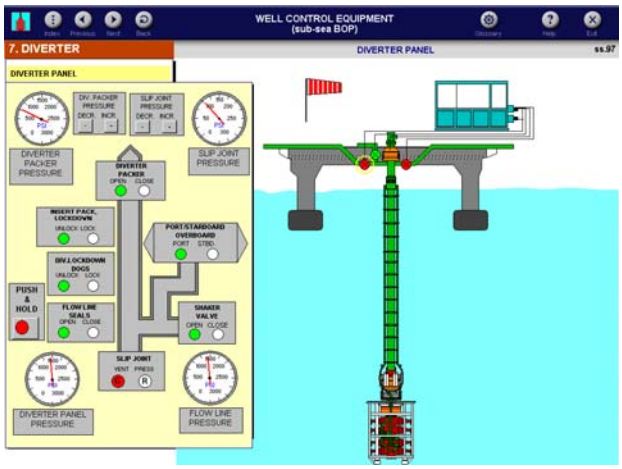


- GENERALITY
- INDIRECT HYDRAULIC SYSTEM
  - Pilot circuit
  - Working circuit
  - Canals Yellow and Blue
  - OPERATIONS
  - Selection of the active POD
  - Activate function
  - Panel
  - COMPONENTS
  - Hose bundle
  - Control system (POD)
  - Shuttle valve
  - Sub sea regulators
- EMERGENCY SYSTEMS
- Acoustic system
  - Subsea unit
  - Transmission system
  - Acoustic system accumulators
  - Working pressure and power

  - Operating test
- ROV panels
- Emergency recovery system
- Nitrogen reserve unit

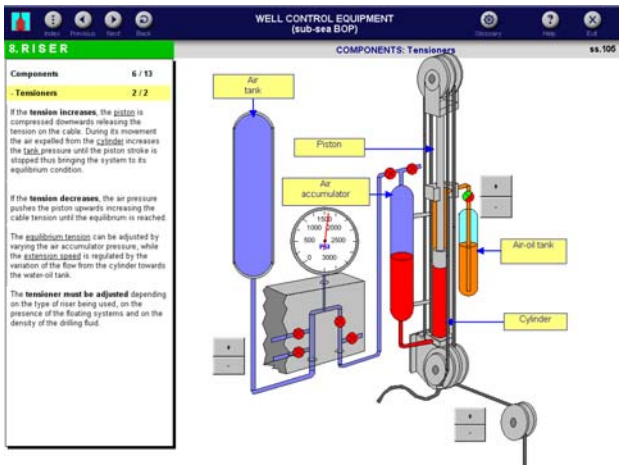
MODULE 7: DIVERTER

- STRUCTURE AND OPERATIONS
  - Components
  - Closure of the diverter
- CHARACTERISTICS
  - Response times
  - Accumulator capacity
  - Charging pumps
  - Manifold of the diverter control
  - Control panel
- DIVERTER PANEL
- SUBSEA DIVERTERS



MODULO 8: RISER

- COMPONENTS
  - Flexible joints
  - Telescopic joint
  - Tensioners
  - Riser joint
  - Booster line
  - Fill-up valve
  - Riser instrument joint
  - Buoyancy
- RISER TEST
- MAINTENANCE



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CBT on WELL INTERVENTION

Training course on Techniques and procedures for well control during Well intervention and Workover activities.

Course with animations and audio on all main equipment and procedures for Well Intervention and Workover.

Training course for Well Intervention or Workover activities and for IWCF certification on Well Intervention Pressure Control.

Main Index

1. INTRODUCTION

2. COMPLETION EQUIPMENT

3. WIRELINE

4. COILED TUBING

5. SNUBBING

6. PROCEDURES TO OPERATE UNDER SAFE CONDITIONS

7. WELL CONTROL PROCEDURES IN CASE OF A KICK

- APPENDIX A: PRESSURES AND GAS BEHAVIOUR

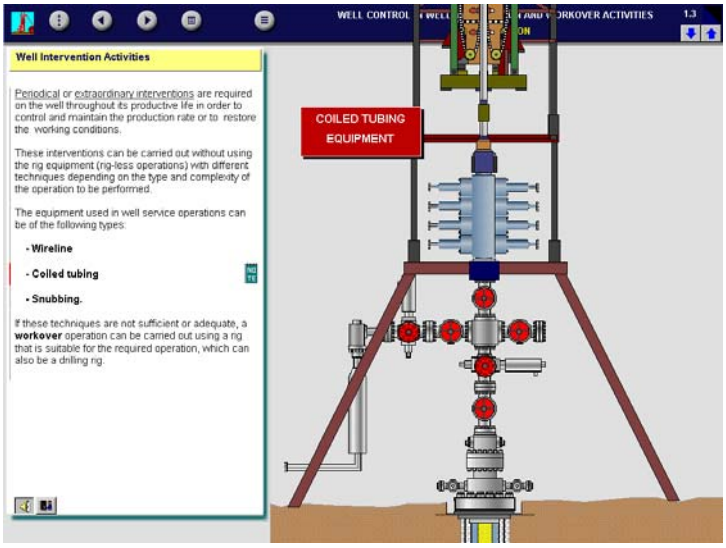
- APPENDIX B: WIRELINE AND COILED TUBING EQUIPMENT

1. INTRODUCTION

1.1 WELL INTERVENTION ACTIVITIES
- Wireline
- Coiled tubing
- Snubbing

1.2 WELL COMPLETION
- Completion Equipment
- Types of completion
- Fluids and pressures in the well
- Completion fluid
- Packer fluid

1.3 WELL SAFETY AND BARRIERS
- Hydraulic and mechanical barriers
- Temporary and permanent barriers
- Barriers in different operating situations



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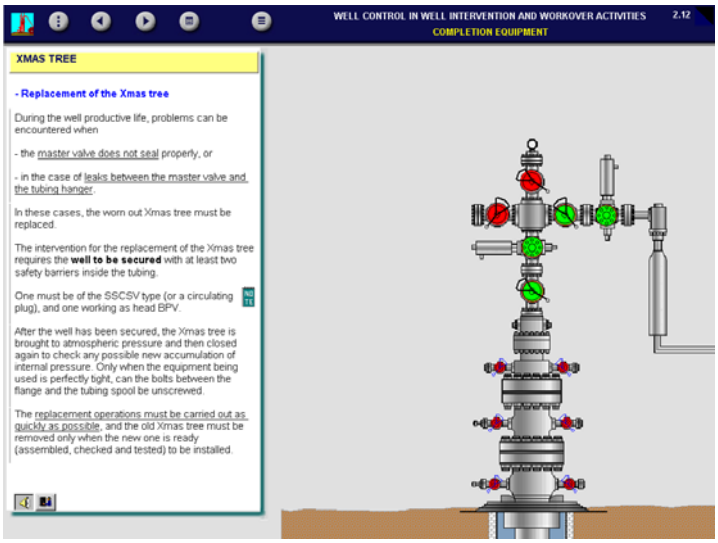
2. COMPLETION EQUIPMENT



2.1 FLANGING OF THE WELL HEAD
- Tubing Spool
- Tubing Hanger

2.2 XMAS TREE
- Components
- Replacement of the Xmas Tree
- Checks and Tests

2.3 VALVES AND ACTUATORS
- Expanding Gate Seal Valve
- Floating Seal Valve
- Actuators
- ESD Control Unit

2.4 TUBING AND PACKER
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- Typology
- Setting and testing
- Stresses on the Packer

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- Introduction
- SSCSV: Sub-surface Controlled Safety Valves
- SCSSV: Surface Controlled Sub-Surface Safety Valves

2.6 CIRCULATION/COMMUNICATION DEVICES
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- Ported Nipple

2.7 LANDING NIPPLES
- Generality
- Typology

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- Hydrotrip, Catcher Sub
- Blast Joint (or Blast Nipple)
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- Gas Lift Valve
- Telescopic (swivel) joint

2.9 EQUIPMENT USED IN DRILLING
- Blow Out Preventer
- Top Drive

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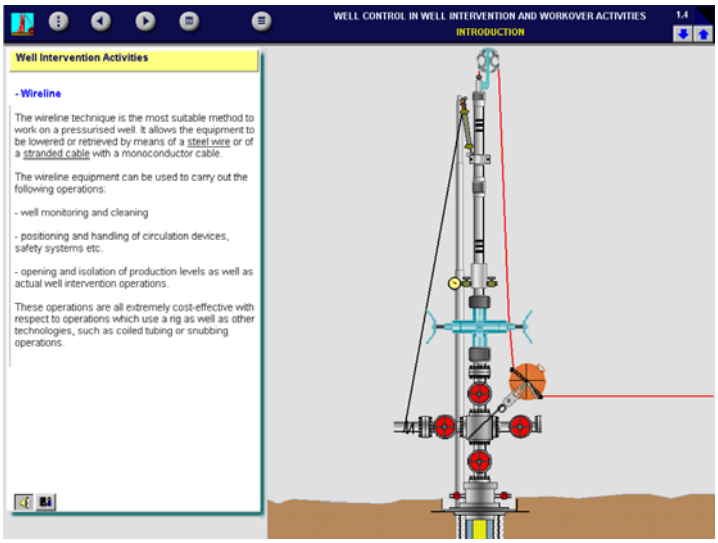
3. WIRELINE



3.1 GENERALITY
- Slickline
- Electric Wireline
- Wireline Operations
- Light Duty and Heavy Duty Operations
- Wireline Equipment

3.2 SURFACE EQUIPMENT
- Lifting Equipment
- Adapter Flange
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- Lubricator Riser
- Stuffing Box
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- Control Panel
- Wire line
- Reel and Counter Wheels

3.4 WORKING TOOLSTRING
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- Stem
- Wireline Jars
- Knuckle Joints
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3.5 EQUIPMENT FOR WIRELINE OPERATIONS
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- Equipment for Operations in the Tubing
- Equipment for Operations in the Casing

3.6 INSTALLATION AND TEST
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- Hydraulic Test and Operating Test

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- Rupture of the Wire at the Surface
- Rupture of the Wire in the Well
- Toolstring Blocked during Operations
- Rupture or Unscrewing of the Toolstring

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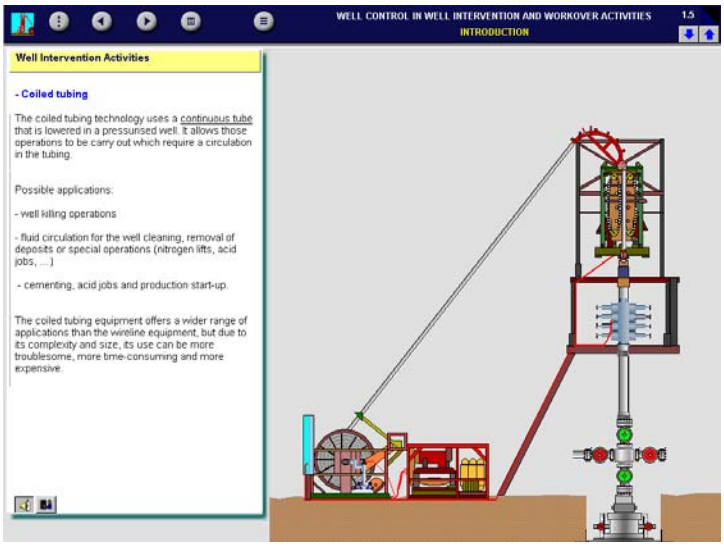
4. COILED TUBING



4.1 GENERALITY

4.2 COMPONENTS
- Power Unit and Control Unit
- Reel
- Coiled Tubing
- Injector head
- Pressurised Equipment
- Stripper (Stuffing Box)
- Stack BOP
- Adapter Flange and Lubricators
- Optional Equipment for Fluids
- Optional Equipment for Nitrogen

4.3 BOTTOM HOLE STRING AND EQUIPMENT
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- Check Valve and Circulating Sub
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- Jarring Assembly
- Centralisers, Knuckle Joints
- Jetting Tool, Rotating Nozzle and Drill Bit
- Pulling Running and Fishing Tools
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- Tubing End Locator, Tubing Cutter

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- Equipment Installation
- Pressure Test
- Operating Test

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- Gas Lifting, Clean-up and Production Start-up
- Washing, Sand Washing and Bottomhole Cleaning
- Removal of Paraffin, Saline or Asph. Deposits
- Cleaning with Downhole Motor
- Acid Jobs
- Cementing
- Logging and Perforating

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- Rupture of the Coiled Tubing
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- Failure of the Check Valve

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5.2 COMPONENTS
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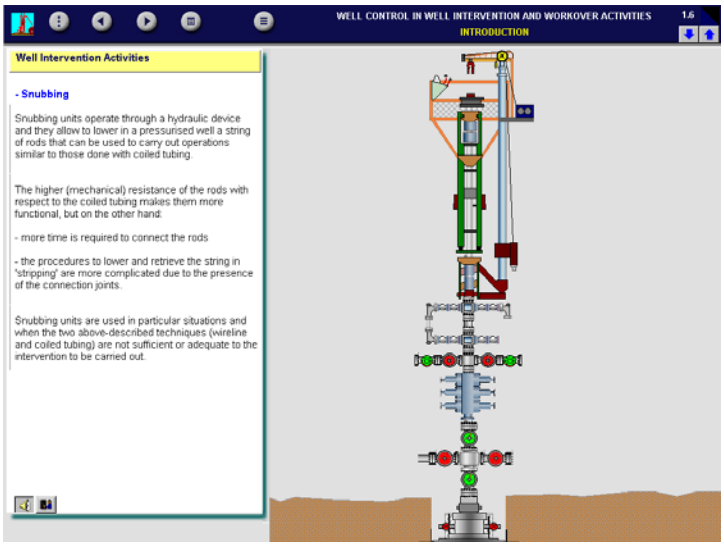
- Strippers
- Lifting System
- Rotation Head
- Control Panels

5.3 FUNCTIONING
- Stripping Procedure

5.4 INSTALLATION AND TEST

5.5 OPERATIONS WITH SNUBBING UNIT



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6. PROCEDURES TO OPERATE UNDER SAFE CONDITIONS

6.1 INFORMATION ON THE WELL
- Well Data
- Situation of the Well
- Preliminary Operations and Check

6.2 WELL KILLING PROCEDURES
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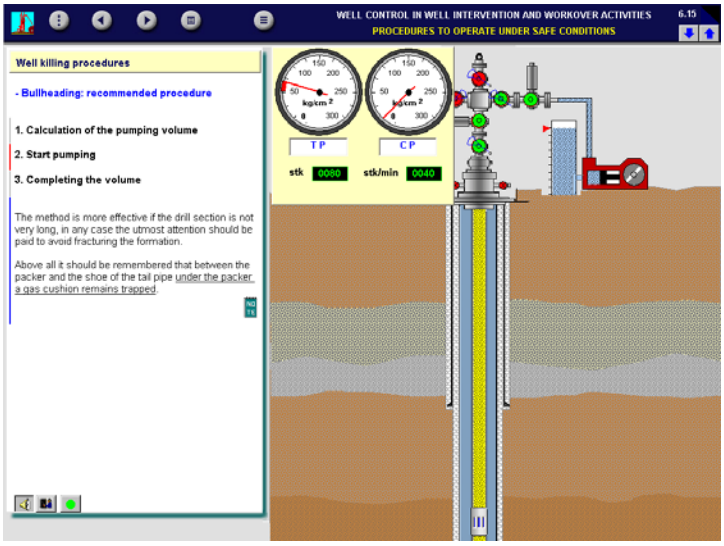
- Bullheading
- Lubricate and Bleed

6.3 EXPULSION OF THE CUSHION BELOW PACKER
- Reverse circulation

6.4 PULLING OUT OF THE HOLE
- Single completion
- Dual completion

6.5 ABANDONING THE WELL
- Temporary abandoning
- Final abandonment
- Pressurised annulus



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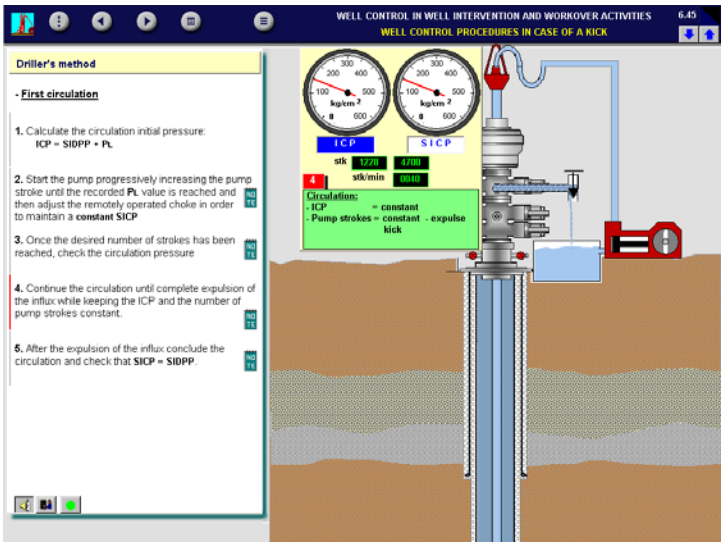
7. WELL CONTROL PROCEDURES IN CASE OF A KICK

7.1 SHUT-IN PROCEDURES
- Kick during workover operations
- Single completion
- Dual completion

7.2 WELL CONTROL METHODS
- Driller's method
- Wait and weight method
- Volumetric method
- Lubricate and bleed

7.3 OPERATIVE COMPLICATIONS
- Total circulation loss
- Washout during circulation
- Trapped pressures
- Pressure on casing
- Hydrogen sulphide



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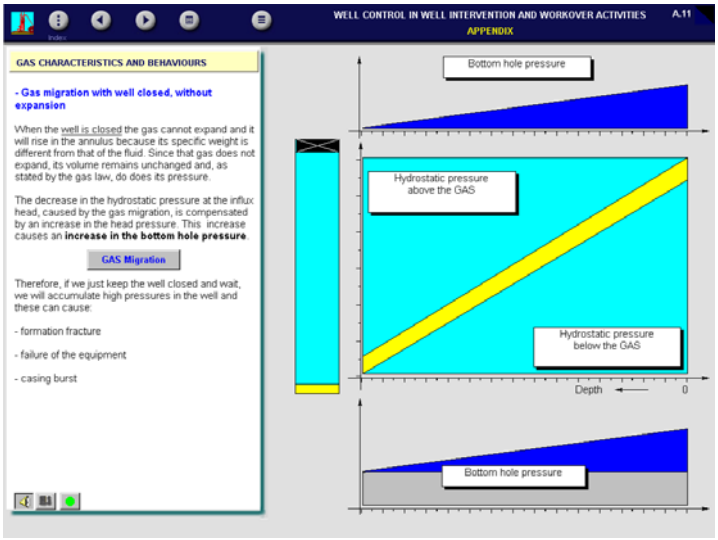
APPENDIX A: PRESSURES AND GAS BEHAVIOUR

A1. FUNDAMENTAL PRESSURES

- Hydrostatic Pressure
- Pressure losses in the annulus
- Bottom Hole Pressure
- Formation Pressure
- Fracture Pressure
- Shut In Pressures

A2. GAS CHARACTERISTICS AND BEHAVIOUR

- Gas law
- Gas migration without expansion
- Gas migration with uncontrolled expansion
- Gas migration with controlled expansion
- Gas solubility: properties of oil fluid



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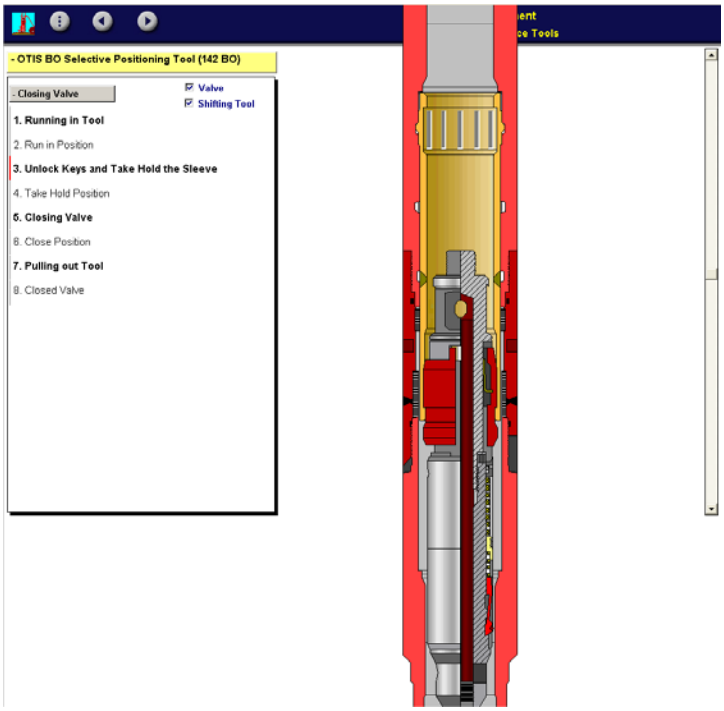
APPENDIX B: WIRELINE AND COILED TUBING EQUIPMENT

B1. WIRELINE EQUIPMENT

- Pulling tools
- Tubing lock mandrel
- Sliding Sleeves Service Tools
- Bottom Hole Tools for Pressure Control
- Tubing Safety Valve (SSCSV)
- Surface Controlled Subsurface Safety Valve (SCSSV)
- Flowing Level Change with Slick Line
- Completion Assistance
- Artificial Lift
- Securing the Well at End of Completion

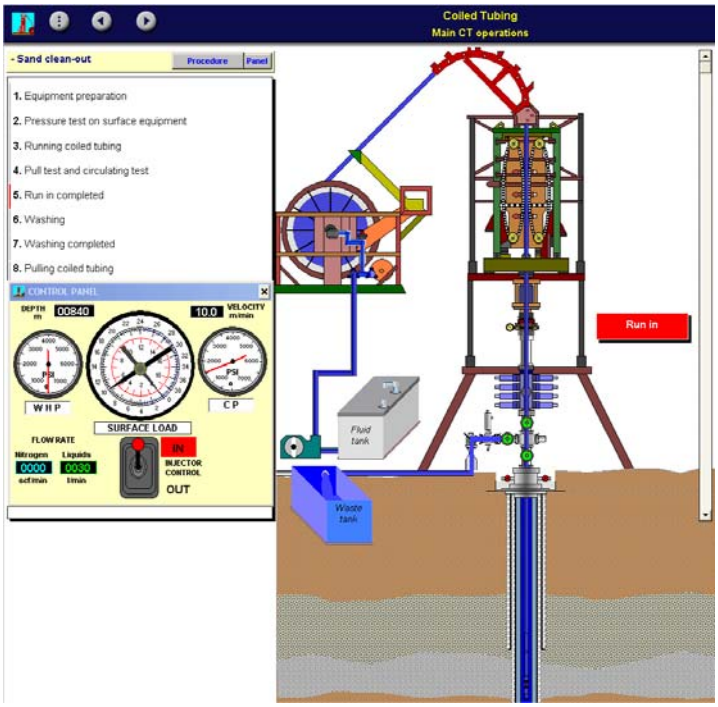


B2. WIRELINE OPERATION

- Wireline Techniques
- Wireline string
- Tubing Gauging
- Tubing Cleaning

B3. COILED TUBING OPERATION

- Gas lift
- Sand clean-out
- Mechanical scale removal
- Opening circulation valve
- Flow Activated Shifting Tool



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