

IADC COILED TUBING COURSE OUTLINE

<u>IADC WELLSHARP WELLSERVICE COILED TUBING</u>		
<u>COURSE OUTLINE</u>		
<u>DAY1</u>		
<i>TIME</i>	<i>Subject</i>	<i>Lesson plan</i>
8:00 - 9:00	Risk Awareness and Management :Potential Impacts of a Well Control Event Live/Dead Well , Risk Management Systematic risk ,Pre-job Communication , Handover for Tour and Hitch Change ,Safety Margin Selection , Bridging Documents , Emergency Equipment , Requirements procedures (MAASP)	Lesson plan -1
9:00 - 10:30	Installation of rings, flanges and connections , Load Bearing Considerations(requires lifting certifications , environmental factors) , Pressure Fundamentals (Types of pressure a. Hydrostatic pressure , b. Applied Pressures 1. Surface pressure a. SITP b. Annulus Pressure	Lesson plan -2
10:30 - 10:45	BREAK	
10:45 - 11:00	2. Pump Pressure 3. ECDs (Equivalent Circulating Densities) 4. Trapped Pressure 5. Swab/surge c. Formation pressure d. Differential pressure e. Fracture pressure	Lesson plan -3
11:00-12:00	f. Bottom hole pressure 1. Balanced 2. Underbalanced 3. Overbalanced, (MASP) , Kill Mud Weight , <u>ECD and calculation</u> , <u>U-tubing</u> , <u>Buoyancy and calculation</u> , <u>Volume , strokes and rates /Displacement calculations</u> , Principles(Tubing Collapse and Casing Burst , <u>von Mises equivalent (VME) form.</u>) , Given well data, complete a well data question form (wellbore profile , deviation)	Lesson plan -4
12:00-12:30	Launch Time	
12:30-02:00	pre-recorded information (Well configuration " Top and bottom of perforations , Packer/tool locations) <u>Coiled Tubing String Properties(fatigue cycling)</u> , <u>Maximum allowable working pressure(well head , casing)</u> ,the well (Wellhead / Well Control Stack / Christmas tree valves – function test) Barriers : Philosophy and Operation of Barrier Systems(Barriers and barrier envelope ,Purpose of barriers) Types of Barriers (fluid , mechanical)	Lesson plan -5
02:00-02:45	Levels of Barriers (Hierarchy , primary ,secondary and tertiary) Barrier Management (test criteria , monitoring and detecting failure) Influx : Detention , Causes , Influx detection (signs and indicators)	Lesson plan -6

IADC COILED TUBING COURSE OUTLINE

02:45: 03:00	BREAK	
03:00-03:45	Importance of Influx Management in Open Hole Operations (Managing Risk , Consequences of not Managing influx "pollution" Pressure and Volume Relationship (Boyles Law) " Gas Volume/Pressure .	Lesson plan -7
03:45: 05:00	Completion and Workover Fluids (purpose, corrosion) Brine requirements . Fluid properties (Density , viscosity ,PH, saturation ,Crystallization Fluid Flow Behavior (friction pressure loss , geometry) Fluid Types (Gas , oil , water) <u>Measuring Techniques (density and viscosity)</u>	Lesson plan -8
05:05	END OF TRAINING DAY	
<u>DAY 2</u>		
08:00-09:45	Surface and Subsurface Wellbore Equipment Christmas Tree , BOP component stack (function, component , HCR & manual valve , Annular , Blind/shear , shear or cutter ram) <u>Accumulator(function ,min. system pressure , Drawdown test . closing time , regulators , panel) , Chokes and Choke Manifolds , Fluid Measuring (strokes, rates)</u>	Lesson plan -9
09:45-10:00	BREAK	
10:00-11:00	Workstring and Production Tubing integrity(burst , collapse ,torsion) Completion Equipment Surface & sub-surface Controlled Sub-Surface Safety Valve (SCSSV) . Packers , SSD , Gas lift mandrill	Lesson plan -10
11:00-12:00	Procedures: <u>Set/Check Alarm Limits(PIT LEVEL &FLOW RETURN) , Shut-in (procedures , Non-sharable) , Monitoring and Recording During Shut-in (visual check , accumulator) , Securing the Well (tube in/out well , verify valves , consequences , monitoring and Record keeping a. Coiled Tubing, annulus and casing pressures</u> 1. At initiation of operations 2. At regular intervals	Lesson plan -11
12:00-12:30	LAUNCH TIME	
12:30-02:45	Contingency Procedures (API 16ST) : <u>Stripper assembly failure</u> <u>Leaking Coiled Tubing between gooseneck and the reel</u> <u>Leaking Coiled Tubing between the gooseneck and the stripper assembly or BOP</u> <u>Parted Coiled Tubing between the stripper assembly and the injector</u> <u>Buckled Coiled Tubing between injector and stripper assembly</u>	Lesson plan -12

IADC COILED TUBING COURSE OUTLINE

02:45 : 03:00	BREAK	
03:00-05:00	Parted Coiled Tubing between the gooseneck and the reel Leak between tree and Well Control Stack pressure-sealing rams	Lesson plan -13 SIMULATOR
05:00	END OF TRAINING DAY	
	<u>DAY 3</u>	
08:00-09:30	Coiled Tubing Surface Equipment Failure (<u>power unit</u> , <u>circulation system</u> , <u>swivel</u> , <u>power pack</u>) General muster alarm Rigging Up (Calculate MASP, connections , Adapters)	Lesson plan -14
09:30-09:45	BREAK	
09:45-10:45	Pressure Control Equipment Barriers : Barrier Envelope (lubricator/riser , fluid inlet " flow tree with isolation valve " , kill line , Primary Barrier A-stripper (<u>purpose</u> , <u>types</u> , <u>limitation</u>)	Lesson plan -15
10:45-12:00	B-Check valves Secondary Barrier (quad BOP) Tertiary Barrier (quad BOP , shear seal , X-tree)	Lesson plan -16
12:00-12:30	LAUNCH TIME	
12:30-02:00	Explain use of well control equipment components commonly used to maintain pressure isolation (i.e., CT , stripper , check- valve(s)). Hoses , Fittings and Connections	Lesson plan -17
02:00-02:15	BREAK	
02:15-03:45	Operational Considerations: Operational Limitations (pressure, forces) , Coiled Tubing Limitations (material strength , bend-cycle fatigue) , Well Kill in Preparation of Well Interventions : Live vs. Dead Well intervention (without killing the well , Bull heading , circulation	Lesson plan -18
03:45-05:00	Parted Coiled Tubing between the gooseneck and the reel Leak between tree and Well Control Stack pressure-sealing rams	Lesson plan -19 SIMULATOR
05:05	END OF TRAINING DAY	

IADC COILED TUBING COURSE OUTLINE

<u>DAY 4</u>		
08:00-09:30	Special Situations: Blockages and Trapped Pressure in Tubing / Wellbore , Hydrates , H2S consideration (detention , necessary equipment) , Describe and discuss conditions where pressure calculations exceed MASP, <u>Operations with Specific Well Control Concerns(acid, frac , Perf.)</u> , <u>CO₂ Influx</u> , <u>Safety Systems and Emergency Shutdown Devices (ESDs)</u>	Lesson plan -20
09:30-09:45	BREAK	
09:45 :11:00	Coiled Tubing Service Complications and Solutions <u>Collapsed Coiled Tubing (Differential pressure , mechanical)</u>	Lesson plan -21
11:00-12:00	Organizing a Well Control Operation : personnel -Roles and Responsibilities , Plan Responses to Anticipated Well Control Scenarios	Lesson plan -22
12:00-12:30	LAUNCH TIME	
12:30-03:00	Testing : Pressure and Function Tests (purpose , Maximum safe working pressures of well control equipment , low & high pressure test) , BOP Testing (specific equipment , pressure test value) Testing of Completion Equipment (Packers , deep set plug , documentation	Lesson plan -23
03:15-03:30	BREAK	
03:30-05:00	Government, Industry and Company Rules, Order and Policies : API and ISO recommended practices, standards and bulletins pertaining to well control , Company/operator specific requirements Ancillary Considerations: Gas detector , fluid gas separator , <u>Choke Drills</u> , Wellhead Control Panel	Lesson plan -24
05:00	END OF LAST TRAINING DAY	