The Art of Virtual Reality & Simulation-Based Training
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Energy Technology Institute (ETI) is a privately-held and dynamic entity established for benefiting the vast accumulative experience, knowledge and practices INSPECTA has gained on co-operating with its clients over the last 25 years, and it is the prime objective of the ETI to utilize such learning and experience momentum to develop a distinct specialized training services for Oil & Gas, Petrochemicals and Power Generation industries in the Middle East and African Countries.

Contrasting from conventional classroom training, the ETI Education and Training capabilities are supported by our powerful and well established infrastructure comprising state of the art training material designed using 3D-Modeling, Interactive Training, Visualization and Simulations techniques and top-notch instructors, in addition to associations’ relationships with highly regarded international consulting firms. Our proposition is to blend our expertise with clients’ strategic intent for personnel development, and hence the scope of training services will not be confined to scheduled courses, it can further include field study to analyze the client competency assurance targets, present competency gap analysis, and hence providing custom made programs based on client actual needs.

Like any other business aspects, training is a continuously developing process, we are confident that through mutual feedback from you, we can steadily enhance our training service to achieve our ultimate goals that satisfy our customers.
**Energy Technology Institute (ETI)** offers specialized technical training services for employees of several industries. Technical courses recently available for Oil & Gas, Petrochemicals and Power Generation industries in the Middle East and African Countries.

Energy Technology Institute is launching a new era in petroleum training by using state-of-the-art training labs that provides a realistic work approach in a safe work environment. During the last 15 years we have worked together with our clients to become a world leader in technical training in the field of inspection and welding technology.

**Training Methodology**

**Energy Technology Institute** is using Virtual Reality and Simulation Technology-based training as one of the most effective interactive training methods to simplify complicated process operations for different industrial plants and equipment. This type of interactive training applications allows plant personnel to observe the consequences of their actions without any direct impact on actual plant operations.

**Training Labs**

ETI is proud to introduce new means of technical training for Middle East and African countries through establishing uniquely designed training facilities equipped with state of the art training simulators. The currently used training simulators and training labs covers:

- Drilling and Well Control Simulator
- Process Training Simulation
- Non Destructive Testing Lab

**ETI Approach**

The purpose of ETI is to provide training services focusing on health, safety, environment, technology and related fields for personnel involved in petroleum and power industries. The range of courses we provide is designed to meet the requirements of your company needs. ETI ensures that all delegates have equal blend of theory and practical training, leading to develop skills and competency. We are confident that courses we provide will satisfy your training needs.
To be the leading Technical Training Institute that provides realistic training using 3-D Modeling, Visualization, Virtual Reality and Simulation for different process plants, industrial facilities, and process equipment. We will achieve this by providing professional instructors with the necessary interactive training tools and facilities that enhance trainees skills, thus ensuring a reliable and safe work environment.

To empower professionals and green hand trainees in petroleum and power industries from the four corners of the world with the highest quality operating standards and skills, allowing them to stand out in the world as the most competent operation personnel.

Our values serve as a compass for our actions and describe how we behave in the world.

- **Leadership:** The courage to shape a better future
- **Commitment:** Commitment to innovation and excellence as a core value
- **Collaboration:** Leverage collective genius
- **Integrity:** Be real
- **Quality:** What we do, we do well
ETI management believe that we have responsibility not only for the co-workers, but to the community and to the environment, not only locally, but we extend this commitment to become globally. Whether we are serving our communities, locally or globally, protecting the environment ETI is encouraged to impact the lives of others and make a difference in our world.

**Community**

ETI obligation is to act to benefit society at large to maintain the balance between economy and sustainable development through the improvement of local content and capacity building that directly advance social goals.

ETI delivers quality and effective training that benefits the community building skilled workforce using new and advanced training approaches.

**Environment**

ETI commitment for preserving environment is to build social awareness to implement functions as a built-in, self-regulating mechanism whereby a business monitors and ensures its active compliance with the spirit of the law, ethical standards, and international norms.

**Workplace**

To build the world’s greatest workforce, we believe we need a team of individuals who are motivated and passionate about their work. We continuously strive to create an environment where our team has every opportunity to develop skills and drive innovation to the next level.
ETI Training Labs Virtual Reality & Simulation Based Training
Simulation is a technique for practice and learning that can be applied to many different disciplines and trainees. It is a technique (not a technology) to replace and amplify real experiences with guided ones, often “immersive” in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion.

Simulation-based learning can be the way to develop professionals' knowledge, skills, and attitudes, whilst protecting trainees from unnecessary risks. Simulation-based training is a platform which provides a valuable tool in learning to mitigate ethical tensions and resolve practical dilemmas.

Simulation-based training techniques, tools, and strategies can be applied in designing structured learning experiences, as well as be used as a measurement tool linked to targeted teamwork competencies and learning objectives. It has been widely applied in fields such aviation and the military.

Teamwork training conducted in the simulated environment may offer an additive benefit to the traditional didactic instruction, enhance performance, and possibly also help reduce errors.
ETI Drilling Simulator LAB utilizes fully visualized, fully functional, totally integrated and entirely interactive drilling system used for drilling operations and well control training. Training instructors and trainees will experiment, explore and interact virtually with different rig tools, equipment and components as if they are at the actual well drilling site identical to the real world drilling equipment.

Drilling Simulator Lab site arrangement showing the cyber driller chair in the middle of the stage and instructor station to the back.

System Description:

Virtual Drilling Simulator is an integrated hardware components with several software applications to form one fully functional and fully operated training system. The core unit of the system is the driller chair that allow system user to control all drilling and well control operations. Driller cyber chair is connected to a set of computers that operate and run several computer applications communicated to each other over a local area network, different displays are used to show the interpretation and the interaction between different system components.

Drill Mode screen of Driller Application Program on the touch screen to the right hand side of the driller chair.
Instructor Station:

Instructor Station is used to perform the several functions such as System Administration, Reporting, Tracking Trainees Activities, Editing Exercises, Display Open Hole, Mud Logging and many other features.

- Tasks assignment
- Rock layer editor
- Drilling and mud logging
- Previewing Kill Sheet Data

Drilling Simulator System Structure

Virtual Drilling Simulator Lab is one of the unique Energy Technology Institute training Simulators. The basic system is build using single driller cyber chair. This advanced drilling simulator is used to provide realistic training for newly haired or experiences trainees. The figure below provides detailed system structure that consists of 6 computers connected using LAN for integrating the different system components.
**ETI Virtual Process Simulators** is an innovative training system used to provide unmatched and realistic operational scenarios for process equipment used in oil, gas, petrochemical and power industries. ETI process training simulator system structure consists of two large smart boards, one board to the left is used to display control room operations through monitoring and controlling all field equipment operational conditions, the board to the right is used to move freely and navigating between different field equipment and interact with different equipment instrumentations and control elements such as control valves on/off switches and so forth.

The figure show an Oil Production Plant Training Simulator Lab is equipped with two Large Screens; one for field view and another one for identical control room DCS or SCADA operation, Instructor Station, in the back of the lab, is used to allow training instructor to interact with the Virtual Simulation system and dealing with trainees activities.

- DCS / SCADA Screen Design
- Easy Navigation Between Screens
- Plant PFD
- Short Alarm Window
- Equipment Tag Numbers
- Display Any Equipment Virtual View
- Display Equipment Description
- Display Equipment Specifications
- Display Equipment Statuses

- Free Field Navigation
- Unlimited View Angles
- Reading Measuring Instruments
- Monitoring Control Elements
- Equipment Operating Conditions
- Starting/Stopping Motors & Pumps
- Open/Close Bypass Valves
- Equipment Construction
- Equipment Sectionalized Views
Virtual Interactive Labs is an amazing and valuable library of best practicing 3D interactive models covering most rotating and static equipment used in oil and gas industries as well as petrochemical & power industries. This innovative training approach allows presenters and trainees to explore 3D models freely in the free space by rotating, zoom in, zoom out, providing sectionalized views, disassembling and reassembling model components.

Virtual Interactive Equipment Lab are characterized by its extremely easy to use navigation and interaction techniques that allow system users of performing the following application functionality features:

- **3D – Models**: Realistic models for most common static and rotating equipment that can be used as if you have real labs.
- **Sectionalized Views**: Sectionalized view of any type of equipment is achieved by two ways through application “Control Panel”.
- **Zoom In and Out**: By scrolling mouse scroll wheel forward or backward, you can zoom the object in the middle of the screen in or out.
- **Rotation in all Directions**: Hold the left mouse button and moving it to any direction, a response will be reflected and make the object rotate in all directions freely.
- **Assembling and Disassembling**: Complete assembling and disassembling of any type of equipment is achieved through “Control Panel”.
- **Exploding**: Exploding 3D objects can allow focusing on different object components from all view angles.
- **Operation Description**: Description of any process or equipment operation is extremely powerful and unmatched feature.
- **Animation**: Animated objects for complicated mechanisms become an easy option to understand the mechanism or operation.
ETI Training Programs
ETI Training Programs

Drilling & Well Engineering
- Basic Drilling Operations
- Basic Well Control
- IWCF Drilling Well Control
- IWCF Well Intervention Certification
- IADC Wellcap
- Well Technology-Basic I
- Well Technology-Basic II
- Well Technology-Advanced I

Master Class Group
- Engineering, Procurement, Construction (EPC) Contracts Masterclass
- API 580/581: Risk Based Inspection

Geology, Geoscience & Petrophysics
- Basic Petroleum Geology
- Advance Petroleum Geology
- Introduction to 3D Seismic
- Basic Log Interpretation

Reservoir Engineering
- Well Test
- Basic Reservoir Engineering
- Reservoir Modeling and Simulation
- Field Development Work Shop

Electrical Engineering & Maintenance
- Power Generation Systems
- Electrical Motors, Protection, Testing & Maintenance
- Advanced Electrical Protection Relays & Systems

Instrumentation Engineering & Maintenance
- Applied Instrumentation Technology
- Advanced Process Control, Loops, Analysis & Troubleshooting
- Industrial Process Measurement
- Advanced Process Measurements
- Programmable Logic Controller; Architecture & Basic Programming PLC
- Control Valves Engineering
- Field Bus System; Driving Total Productivity Management
- Safety Instruments Systems; New Emergency Shutdown Approach
- Fire & Gas System; Detectors Guard Safety Controller
- New Approaches in DCS & SCADA Systems
- Safety Relief Devices
- Gas Measurement & Flow Metering Station
- Instrumentation Systems Maintenance & Troubleshooting (Practical)
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### Programmable Logic Controller; Advanced Programming (Practical)
- Valves Types and Technology (Practical)
- Applying Standard Instrumentation & Control Documentations
- Instrumentation Installation in Hazardous Areas
- Installing, Calibrating, & Maintaining Electronic Instruments

### Mechanical Engineering & Maintenance
- Bearing Identification, Fitting and Servicing
- Root Cause Failure Analysis
- Mechanical Shaft to Shaft Alignment
- Pumps Installation, Troubleshooting & Maintenance
- Global Maintenance
- Gas Turbine Operation, Maintenance & Troubleshooting
- Gas Compressors Operation, Maintenance & Troubleshooting
- Reciprocating Compressors
- Mechanical Seals and Coupling
- Reciprocating Engines for Engineers
- Vibration Analysis
- Heat Exchangers Design, Construction, & Maintenance
- The Art of Maintenance
- Pressure Vessels; Codes Materials and Design
- Gas Engines Technology
- Diesel Engines
- Fluid Film Bearings and Lubrication

### Piping Engineering & Pipeline
- Piping Design (Specification & Sizing)
- Pipeline Construction
- Pipeline Integrity Management
- Offshore Deepwater Development & Subsea Installation
- Pipeline Inspection, Maintenance, Repair
- Pigging and Smart Pigging

### Process Technologies & Operations
- HAZOP Applications in Petroleum Industry (LEVEL I)
- Natural Gas Processing Technology
- Oil Refining Technology
- Water Treatment & Water Injection
- LPG Technology
- Oil Treatment
- Fired Heater & Heat Transfer Equipments
- Process Calculation Simulation
- Planned Shutdown & Critical Activities and Start-up
- Water Treatment Chemicals
- Laboratory Information Management Systems (LIMS)
- Waste Water Treatment Systems
- Corrosion & Corrosion Control Fundamentals in Oil & Gas Field
ETI Training Programs

- Chemical Treatment in Oil and Gas Field
- Flare System, Operations and Design
- HAZOP Applications in Petroleum Industry (Level II)
- Environmental Impact Assessment (EIA)
- Hazardous Wastes in Petroleum Industry
- Pollution Prevention in Petroleum Industry
- Process Operations (for Technicians)
- Chemical laboratory in Petroleum Industry
- Overview of Oil, Gas and Petrochemicals
- Cathodic Protection Principles & Applications
- Corrosion Management
- Burner Management System (BMS)
- Design & Installation of Safety Devices for surface Production Facilities
- Facilities Engineering for Non-Facilities Engineers (Part 1)
- Facilities Engineering for Non-Facilities Engineers (Part 2)
- Hydrocarbon Storage, Shipping and Utilization.
- LPG, NGL & LNG Production and Handling
- Process Panel Operator Assessment (Software)

Projects, Engineering Studies & Economics

- Project Management Essentials
- Risk Management Professional (PMI-RMP®) (Certified)
- Project Economics
- Project Quality Management
- PMP® Exam Preparation Course

- Contracts Management for Projects
- How to build a Successful PMO
- Construction Project Management
- Project Document Control
- Project Management for IT Specialists

Welding & Inspection Engineering

- Inspection Qualification & Certification Level I (RT)
- Inspection Qualification & Certification Level I (UT)
- Inspection Qualification & Certification Level I (MT)
- Inspection Qualification & Certification Level I (PT)
- Inspection Qualification & Certification Level II (RT)
- Inspection Qualification & Certification Level II (UT)
- Inspection Qualification & Certification Level II (MT)
- Inspection Qualification & Certification Level II (PT)
- Welding Engineering
- Certified Welding Inspector (CWI) Preparatory Course
- Inspection Qualification & Certification Level II (VT)
- Welding Metallurgy
- Material Selection
- Electrodes Selection
- Codes and Standards
  - AWSD1.1 Code
  - ASME VIII
  - ASME B31.1
  - ASME B31.3

Health, Safety & Environment (HSE)

- First Aid Practice & Basic Life Support
- HACCP (Hazard Analysis and Critical Control Points)
- HAZOP Principals
- Risk Assessment & Hazard Identification
- Incident Investigation
ETI Training Programs

- Behavioural Based Safety (BBS)
- Scaffolding Review & Inspection
- Crane Safe Lifting Operations & Maintenance
- OHSAS 18001 Occupational Health and Safety
- Management Systems (Lead Auditor) (IRCA Accredited)
  - ISO 14001 Environmental Management Systems
- EMS (Lead Auditor) (IRCA Accredited)
- Fire Fighting; Practical Fire Workshop
- Work Permit System
- IOSH Managing Safely
- IOSH Working Safely
- Safety Audit Site Inspection
- Confined Space Entry Program
- Working at Heights and Fall Prevention
- Hazardous Area Classification & Equipment Selection
- Petroleum Storage Tanks - Safe Cleaning
- Maintenance Work Safety Problems
- Gas Testing
- Radiation Protection
- Oil Spill Response
- BOSIET; Basic Offshore Safety Induction & Emergency Training (OPITO Accredited)
- H.U.E.T EBS; Offshore Helicopter Underwater Escape Training (OPITO Accredited)
- Power Plant Inspection and Check Lists

**Finance, Economics & Contracts**

- Contracting Fundamentals and Drafting Contracts
- Risk Management and Insurance in the Oil Industry
- Cost Accounting in Oil & Gas Companies
- Budget Forecasting and Planning Process
- Petroleum Finance and Accounting Principles
- Petroleum Finance for Non-Financials
- Petroleum Accounting Best Practice
- Internal Audit Process
- Financing Petroleum Projects – Basic
- Financing Petroleum Projects – Advanced
- Managerial Accounting and Decision Making for Petroleum Corporate
- Financial Economics Evaluation and Feasibility Study for Petroleum Projects
- Petroleum Investment Management
- Business Financial & Accounting Skills
- Effective Procurement Management
- Petroleum Finance and Accounting Principles – PFA
- Strategic Finance and Accounting for Oil and Gas Companies
- Fundamentals of Economics for Egyptian Industry of Petroleum, Gas and Petrochemical
- Computer Using for Petroleum Corporate Financial Planning & Financial Analysis
- Cash Management for Petroleum Corporate
- Financial Statement & Evaluation of Financial Performance for Petroleum Corporate

**Administration, PR, Security & Materials**

- Camp Service and Food Hygiene
ETI Training Programs

Human Resources (HR) & Training Development
- Hiring for Success, Behavioural Interviewing Techniques
- HR Strategic Planning
- Train-the-Trainer
- The Balanced Score Card
- Training ROI (Return On Investment)

Management Development
- Basic Management Skills
- Strategic Management
- Strategic Leadership Workshop
- Crisis Management
- Business Planning
- Human Resources Management
- Business Management Performance
- Corporate Governance
- Inventory Management
- Total Quality Management
- Organizational Behavior
- Six Sigma; Introduction to Orange Belt
- Filing and Archiving
- Integrated Business Computer Applications
- ISO 9001 Quality Management Systems (Lead Auditor) (IRCA Accredited)
- Supply Chain Management
- Change Management
- CSR "Corporate Social Responsibility" & Business Ethics

Soft Skills
- Time and Stress Management
- Presentation Skills
- Negotiation Skills
- Communication & Interpersonal Skills
- Creative Thinking Workshop
- Meeting Management
- Team Building Workshop
- Report Writing
- Critical Thinking; How to Sharpen your Way of Thinking
- Problem Solving and Decision Making
- Executive Secretary
- Coaching & Management Development
- Motivating and Influencing People
- How to Deal With Your Manager
- Business Etiquette
- Emotional Intelligence

Non Destructive Testing - NDT
- Liquid Penetrant Testing (2 Levels)
- Magnetic Particle Testing (2 Levels)
- Radiographic Equipment Operating and Emergency Instructions Course
- Basic Radiographic Physics Course
- Radiographic Technique Course
- Film Quality and Manufacturing Processes Course
- Radiographic Evaluation and Interpretation Course
- Basic Ultrasonic
- Ultrasonic Technique
- Ultrasonic Evaluation
- Visual Testing (2 Levels)
Oil & Gas
Production & Processing Facilities
Simulation Based Training Programs

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### Gas PRODUCTION & PROCESSING FACILITIES

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<th>Topic</th>
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| 1    | Introduction to gas production and processing facilities | - Phase Envelopes behavior  
- General law of gases  
- Physical properties of gases |
| 2    | Gas definition & terms | - Sales gas specification Principle of vapor – liquid  
- Equilibrium  
- Gas / Liquid separation process |
| 3    | Gas Dehydration process | - Hydrate formation curve  
- Dew point calculation  
- Hydrate inhibition & remediation |
| 4    | Glycol Absorption Process | - Advantage & disadvantage of process  
- Explanation of Flow scheme for process  
- Simulator training |
| 5    | Gas Dehydration process | - Type of solid desiccant used in industry  
- Advantage & disadvantage of process  
- Explanation of Flow scheme for process  
- Simulator training |
| 6    | Gas sweetening process | - H2S & CO2 percent and harms  
- Methods for Sweetening processes  
- Explanation of Amine Sweetening flow scheme  
- Simulator training |
| 7    | Gas refrigeration process | - Cryogenic phenomena  
- Applied methods used for refrigeration  
- Explanation of propane refrigeration flow scheme  
- Simulator training |
| 8    | Gas Compressors | - Types of compressors & their applications  
- Characterization curve  
- Explanation of compression flow scheme  
- Compressor troubleshooting & solutions  
- Simulator training |
| 9    | Gas export and meter | - Types of process flow meters used  
- Pipe line export gas design & protection system  
- Pigging operation |
| 10   | Relief & Flare Systems | - Process protective layers  
- Causes of overpressure  
- Types of relief valves & sizing; Flare system components |
Day 1
- Introduction to oil production & processing facilities
- Reservoir Traps, Rocks & Drive Mechanisms; Porosity & Permeability Drive Mechanisms
- Phase Envelopes & Reservoir Fluid Classification; Phase behavior of different reservoirs
- Well Inflow Performance; Inflow performance curve
- Oil wells productivity , Types and selection methods
- Oil, Gas & Water
  - Composition & Properties
  - Calculation of properties needed for equipment sizing
  
Day 2
- Emulsions
  - Definition, classification, causes & operating factors
  - Methods of treating
  - Process troubleshooting
  
Day 3
- Gas – Liquid Separation
  - Classification of equipment used
  - Parameters affecting on separation
  - Separators internals devices & types
  - Methods of separation process
  
Day 4
- Gas – Liquid Separation (cont’d)
  - Residence time & droplet settling theory
  - Separator design calculation
  - Measuring and protective devices
  - Separation troubleshooting & solution
  - Simulator training
  
Day 5
- Crude Oil Treating
  - Oil treating methods
  - Heat input requirements
  - Chemical additives
  
Day 6
- Crude Oil Stabilization & Sweetening
  - Crude oil vapor pressure & H2S specifications
  - H2S percent and harms
  - Stabilization process
  - Sweetening processes
  - Simulator training
  
- Oil Desalting
  - Crude oil specifications
  - Salts problems in crude oil
  - Overview of desalting, processes, sizing & selection
  - Simulator training
OIL PRODUCTION & PROCESSING FACILITIES TRACK

Day 7

- Oil Storage & Vapor Recovery
  - Reid vapor pressure Types of storage tanks & their applications
  - How vapor recovery systems work & where they are used
  - Protective system used on tanks
  - Simulator training

Day 8

- Liquid Pumps
  - Types of pumps & their applications
  - Calculation of head requirements, NPSHA/NPSHR and specific speeds
  - Pump internals
  - Pump troubleshooting and solutions
  - Simulator training

Day 9

- Water Injection & treating Systems
  - Typical flow diagrams and equipment
  - Source water quality & injection water quality
  - Produced Water Treating
  - Treating equipment oETions & performance
  - Typical discharge / disposal specifications

Day 10

- Relief & Flare Systems
  - Process protective layers
  - Causes of overpressure
  - Types of relief valves & sizing; Flare system components