**COURSE OVERVIEW FE0046**
# Optimizing Pipeline Energy Efficiency

**Course Title**
Optimizing Pipeline Energy Efficiency

**Course Reference**
FE0046

**Course Date/Venue**
Session 1: July 20-24, 2025/Boardroom 1,
Elite Byblos Hotel Al Barsha,
Sheikh Zayed Road, Dubai, UAE
Session 2: December 22-26, 2025/Fujairah
Meeting Room, Grand Millennium
Al Wahda Hotel, Abu Dhabi, UAE

**Course Duration/Credits**
Five days/3.0 CEUs/30 PDHs

**Course Description**

*This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.*

This course is designed to provide participants with a detailed and up-to-date overview of Oil & Gas Pipeline Optimization. It covers the oil and gas pipeline systems; the flow mechanics in pipelines and pipeline design parameters; the hydraulic analysis of pipelines and the commonly used simulation tools; the basic functionalities and applications; the advanced methods for hydraulic modelling, handling complex pipeline networks, surge analysis and mitigation techniques; the pipeline system optimization techniques, pipeline monitoring and control systems, detecting and preventing leaks and maintaining pipeline integrity; and the pipeline maintenance strategies, maintenance scheduling and execution, and solutions and mitigation strategies.

During this interactive course, participants will learn the role of pumping and compression stations in optimization; the safety protocols, risk management strategies, and regulatory compliance and best practices; the cost-benefit analysis of pipeline optimization, environmental impact assessment, sustainable pipeline operations and lifecycle cost analysis; the latest advancements in pipeline technology including digital twins and its application in pipeline optimization; the role of big data in optimizing pipeline operations; the data analytics tools and techniques; and the predictive analytics for maintenance and optimization.

## Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on oil & gas pipeline optimization

- Discuss the oil and gas pipeline systems including the flow mechanics in pipelines and pipeline design parameters

- Carryout hydraulic analysis of pipelines and identify the commonly used simulation tools including the basic functionalities and applications

- Employ advanced methods for hydraulic modelling, handling complex pipeline networks, surge analysis and mitigation techniques

- Apply pipeline system optimization techniques, pipeline monitoring and control systems, detecting and preventing leaks and maintaining pipeline integrity

- Carryout pipeline maintenance strategies, maintenance scheduling and execution, and solutions and mitigation strategies

- Define the role of pumping and compression stations in optimization as well as implement safety protocols, risk management strategies, regulatory compliance and best practices

- Apply cost-benefit analysis of pipeline optimization, environmental impact assessment, sustainable pipeline operations and lifecycle cost analysis

- Discuss the latest advancements in pipeline technology including digital twins and its application in pipeline optimization

- Discuss the role of big data in optimizing pipeline operations and apply data analytics tools and techniques

- Carryout predictive analytics for maintenance and optimization

## Exclusive Smart Training Kit - H-STK®



*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

## Who Should Attend

This course provides an overview of all significant aspects and considerations of oil & gas pipeline optimization for oil & gas pipeline engineers, pipeline maintenance engineers, environmental engineers, maintenance staff, inspectors who are responsible for the integrity, maintenance, repair and operation of pipelines systems and other technical staff.

## Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

## Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- **BAC** British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- **IACET ACCREDITED PROVIDER** The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for ontinuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

## Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

**Mr. Marian Copilet** is a **Senior Pipeline Engineer** and an **International Expert** in **Process Piping Design** with almost **40 years** of experience within the **Oil & Gas, Petrochemical** and **Refinery** industries. His expertise widely covers in the areas of **Oil & Gas Pipelines**, **Piping & Pipeline** Design, **Piping Design & Layout** Development, Piping & Instrumentation Diagrams (**P&IDs**), **Stress** Analysis, **Piping Inspection & Fabrication**, **Piping** Maintenance & Estimation, **Piping** Installation & Maintenance, **Pipe & Fitting** Techniques, **Piping** System & Process Equipment, **Piping** System Stress Analysis, **Process Piping** Design, **Pipeline** Repair, Hot-Tapping, In-line Inspection Technologies, **Pipeline Pigging**, **Pipeline Design** & Integrity Engineering, **Pipeline** Hydraulic Engineering, **Pipeline** Operation & Maintenance, **Pipeline** Design & Construction, **Pipeline** System Design, Onshore **Pipeline Repair Methods** & Equipment, **Pipelines** Defect Identification & **Corrosion** Risk Assessment, Basic **Pipeline Engineering**, **Pipeline Inspection & Integrity Assessment**, **Risk Based Inspection** & Integrity Management, **Pressure & Leak** Testing, Pipeline Integrity Management System (**PIMS**), **Facility & Pipeline Integrity Assessment**, Risk-Based-Inspection (**RBI**), Fitness-for-Service (**FFS**) & Repair Practices of Pipelines, **Vessels & Tanks**, **Pigging** Technology, **Pigging** Procedures, **Subsea Umbilicals**, **Welding Technology**, **NDT Inspection**, Upstream & Downstream Oil & Gas Industries, Evaluation & Repair of **Process Plant Equipment**, Onshore & Offshore **Pipeline Systems** and **Pipeline** & **Piping Codes** including ISO 13628-5, DNV Series (OS-F101, OS-F201, RP-F109), ASME B series (B31.3, B31.4 & B31.8, B31.G, B31.8S), BS 8010 Part 3 and Pressure Vessel Codes (PD 5500, ASME VIII Div. 1& Div. 2).

Mr. Copilet has worked with major international clients in UK, Europe, Middle East, North Africa and Asia with major international clients including **ADMA-OPCO,** Aker Kvaerner, AMEC, **Bechtel**, **BP**, **British Gas**, **China Petroleum**, **Chevron**, **EnQuest**, **ExxonMobil**, **ENPPI**, **Fluor Daniel**, **FMC**, **Foster Wheeler**, Framo, Kala, **Marathon Oil**, **National Iranian Gas**, **PD Oman**, **Petrojet**, **Petronas**, **Qatar Petroleum**, QGPC, **RasGas**, **Saudi Aramco**, **Shell**, **Single Buoy Moorings**, **Saipem**, Snamprogetti, Sonatrach, Statoil, Subsea 7, TAQA, Technip, Total, Woodside, etc.

Mr. Copilet is currently the **Technical Solutions Manager** at the **Oceaneering International Services** in Rosyth. Prior to joining Oceaneering, Mr. Copilet worked as **Technical Account Manager** for **STATS**, a specialist engineering company based in Aberdeen, Scotland, which provides a full-service capability for repair and shutdown services, reducing system or plant downtime and extending the operational life for **onshore, topsides and subsea locations**, including **piping and pipeline isolation** and **hot tap intervention**. Before joining STATS, Mr. Copilet was one of the **Directors** of **Durham Pipeline Technology** (DPT), a British company developing innovative technical solutions for pipeline access, inspection and cleaning based on patented bristle tractor technology. He also worked in a variety of technical and managerial positions for **GD Engineering**, the **world leader in the supply of pipeline pigging equipment and technology**, including **Bandlock 2**, the world's safest quick opening closures, pig signallers, scraper launchers and receivers, automated pig and sphere launching and receiving systems.

## Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30%    Lectures
20%    Practical Workshops & Work Presentations
30%    Hands-on Practical Exercises & Case Studies
20%    Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

## Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

## Course Fee

**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

## Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

*Day 1*

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|---|---|
| 0730 – 0800 | *Registration & Coffee* |
| 0800 – 0815 | *Welcome & Introduction* |
| 0815 – 0830 | **PRE-TEST** |
| 0830 – 0930 | **Oil & Gas of Pipeline Systems** *Types of Pipelines (e.g., Crude Oil, Natural Gas, Refined Products) • Key Components of Pipeline Systems* |
| 0930 – 0945 | *Break* |
| 0945 - 1115 | **Flow Mechanics in Pipelines** *Basic Principles of Fluid Dynamics • Laminar & Turbulent Flow • Reynolds Number & Its Significance* |
| 1115 – 1230 | **Pipeline Design Parameters** *Factors Influencing Pipeline Design • Pipeline Diameter, Wall Thickness, & Material Selection* |
| 1230 – 1245 | *Break* |
| 1245 – 1330 | **Hydraulic Analysis of Pipelines** *Pressure Drop Calculation • Pipeline Capacity Analysis* |
| 1330 – 1420 | **Pipeline Simulation Software** *Overview of Commonly Used Simulation Tools • Basic Functionalities & Applications* |
| 1420 – 1430 | **Recap** |
| 1430 | *Lunch & End of Day One* |

*Day 2*

| 0730 – 0830 | **Detailed Hydraulic Modeling**<br>*Advanced Methods for Hydraulic Modelling • Handling Complex Pipeline Networks* |
|---|---|
| 0830 – 0930 | **Transient Flow Analysis**<br>*Understanding Transient Flow Phenomena • Surge Analysis & Mitigation Techniques* |
| 0930 – 0945 | *Break* |
| 0945 – 1100 | **Simulation Software Workshop**<br>*Hands-On Session with Pipeline Simulation Software • Building & Analyzing Pipeline Models* |
| 1100 – 1230 | **Pipeline System Optimization Techniques**<br>*Methods to Optimize Pipeline Operation • Flow Rate Optimization & Energy Savings* |
| 1230 – 1245 | *Break* |
| 1245 – 1330 | **Case Studies: Successful Pipeline Optimizations**<br>*Real-World Examples of Pipeline Optimization • Lessons Learned & Best Practices* |
| 1330 – 1420 | **Interactive Q&A Session**<br>*Addressing Participant Questions & Challenges* |
| 1420 – 1430 | **Recap** |
| 1430 | *Lunch & End of Day Two* |

*Day 3*

| 0730 – 0830 | **Pipeline Monitoring & Control Systems**<br>*SCADA Systems in Pipeline Operations • Real-Time Monitoring Techniques* |
|---|---|
| 0830 – 0930 | **Leak Detection & Prevention**<br>*Techniques for Detecting & Preventing Leaks • Importance of Maintaining Pipeline Integrity* |
| 0930 – 0945 | *Break* |
| 0945 – 1100 | **Pipeline Maintenance Strategies**<br>*Preventive Vs. Predictive Maintenance • Maintenance Scheduling & Execution* |
| 1100 – 1230 | **Operational Challenges & Solutions**<br>*Common Operational Issues in Pipelines • Solutions & Mitigation Strategies* |
| 1230 – 1245 | *Break* |
| 1245 – 1330 | **Optimization of Pumping & Compression Stations**<br>*Role of Pumping & Compression Stations in Optimization • Energy Efficiency Improvements* |
| 1330 – 1420 | **Pipeline Safety & Risk Management**<br>*Safety Protocols & Risk Management Strategies • Regulatory Compliance & Best Practices* |
| 1420 – 1430 | **Recap** |
| 1430 | *Lunch & End of Day Three* |

*Day 4*

| 0730 – 0830 | **Cost-Benefit Analysis of Pipeline Optimization**<br>*Economic Impacts of Optimization • Cost Savings & Return on Investment* |
|---|---|
| 0830 – 0930 | **Environmental Impact Assessment**<br>*Assessing & Mitigating Environmental Impacts • Regulatory Requirements & Compliance* |
| 0930 – 0945 | *Break* |

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|---|---|
| 0945 – 1100 | **Sustainable Pipeline Operations**<br>*Incorporating Sustainability into Pipeline Operations • Reducing Carbon Footprint & Energy Consumption* |
| 1100 – 1230 | **Lifecycle Cost Analysis**<br>*Understanding the Total Cost of Ownership • Optimizing Pipeline Lifecycle Costs* |
| 1230 – 1245 | *Break* |
| 1245 – 1330 | **Economic Case Studies**<br>*Real-World Examples of Economic Impacts • Lessons Learned from Industry Projects* |
| 1330 – 1420 | **Interactive Workshop: Economic Modeling**<br>*Hands-On Session with Economic Modeling Tools • Building & Analyzing Economic Models* |
| 1420 – 1430 | **Recap** |
| 1430 | *Lunch & End of Day Four* |

*Day 5*

| | |
|---|---|
| 0730 – 0830 | **Innovations in Pipeline Technology**<br>*Latest Advancements in Pipeline Technology* |
| 0830 – 0930 | **Digital Twins & Their Application**<br>*Understanding Digital Twins • Application in Pipeline Optimization* |
| 0930 – 0945 | *Break* |
| 0945 – 1015 | **Big Data & Analytics in Pipeline Optimization**<br>*Role of Big Data in Optimizing Pipeline Operations • Data Analytics Tools & Techniques* |
| 1015 – 1230 | **Machine Learning & AI in Pipeline Management**<br>*Applications of AI & Machine Learning • Predictive Analytics for Maintenance & Optimization* |
| 1230 – 1245 | *Break* |
| 1245 – 1330 | **Future Trends in Pipeline Optimization**<br>*Emerging Trends & Technologies • Preparing for Future Challenges & Opportunities* |
| 1330 – 1345 | **Course Review & Final Assessment**<br>*Review of Key Concepts & Learnings • Final Assessment & Feedback Session* |
| 1345 – 1400 | **Course Conclusion** |
| 1400 – 1415 | **POST-TEST** |
| 1415 – 1430 | *Presentation of Course Certificates* |
| 1430 | *Lunch & End of Course* |

## Simulator (Hands-on Practical Sessions)

Practical session will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the state-of-the-art simulators. "RiskWISE", "PV-Elite" and "IntegriWISE™".



**RiskWISE Simulator**



**PV-Elite Simulator**
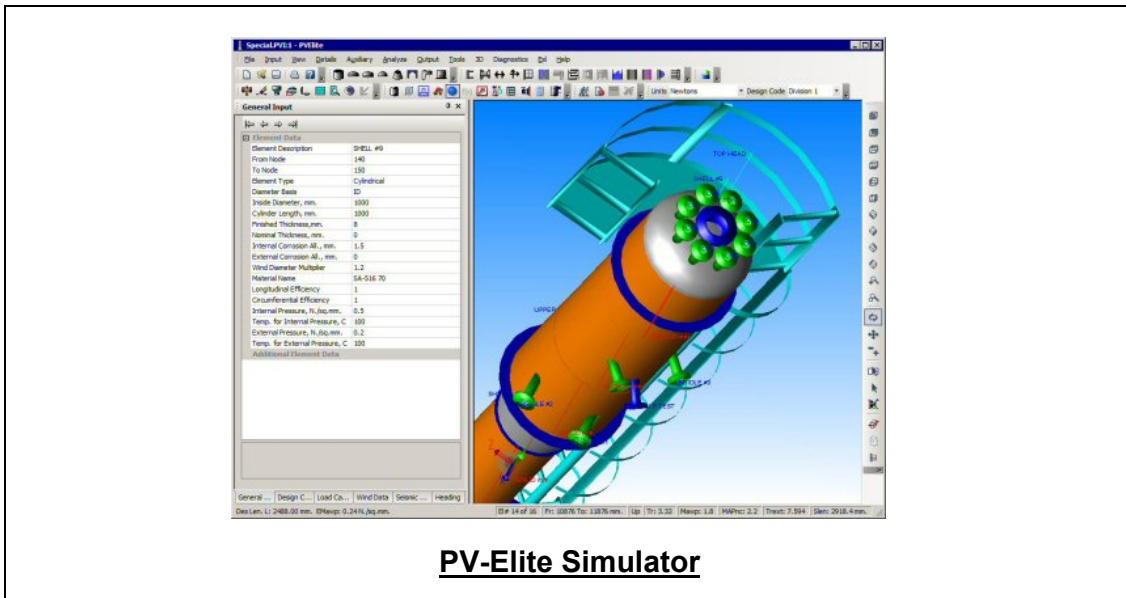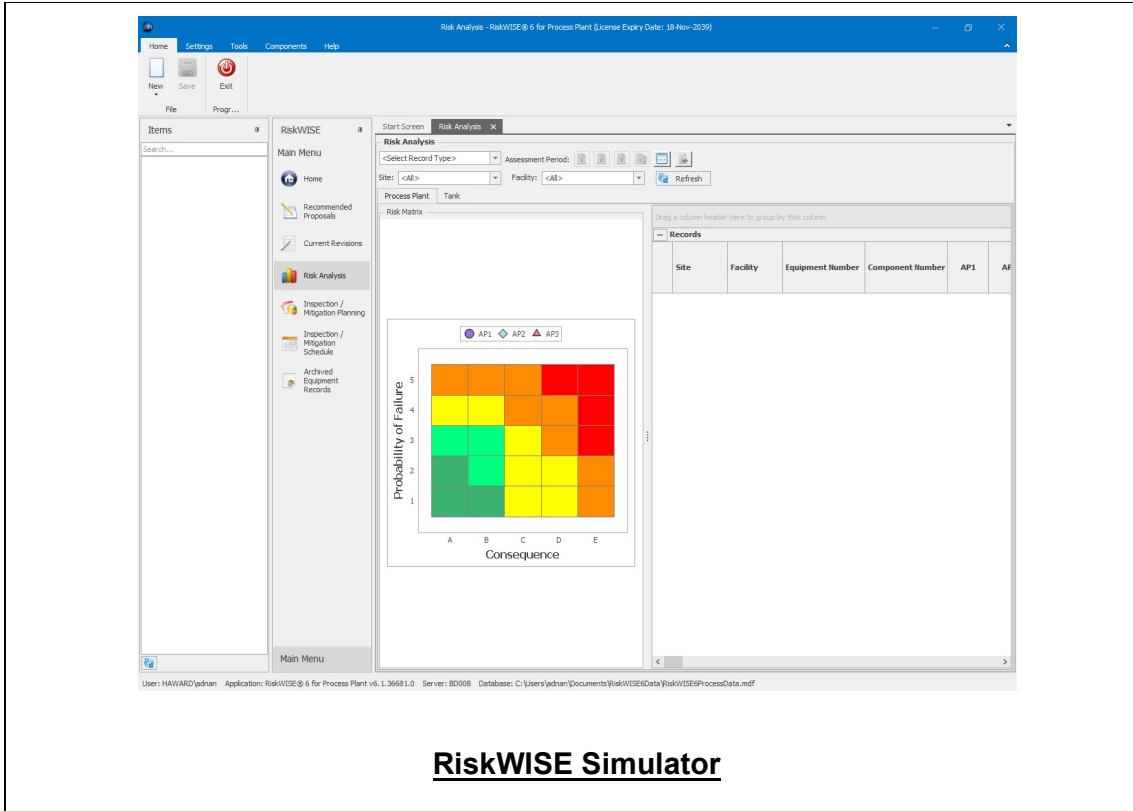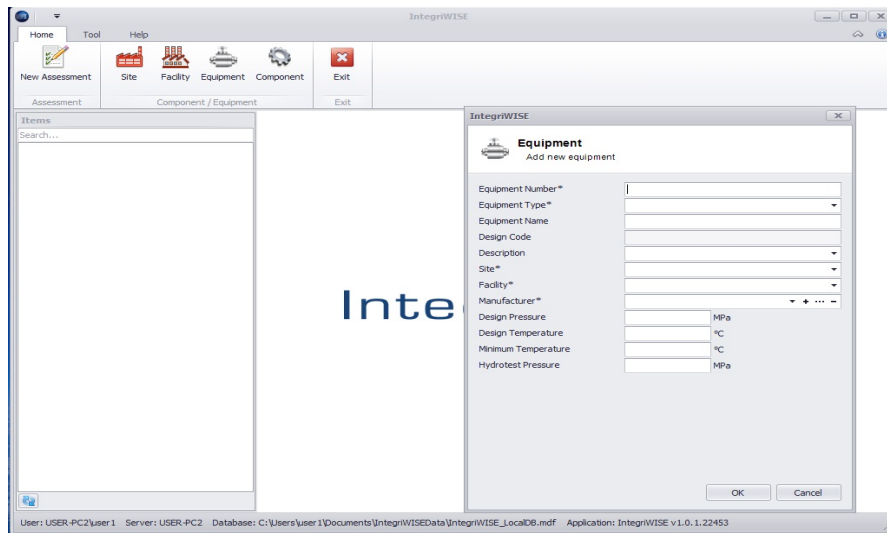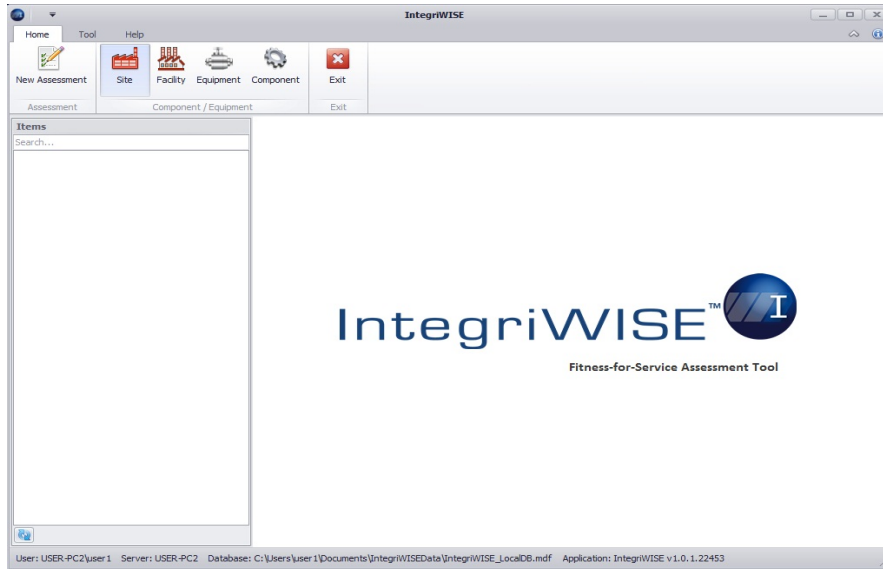
**IntegriWISE™**

## Course Coordinator
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