COURSE OVERVIEW EE1139
Performance Analysis in the Power Sector

Course Title
Performance Analysis in the Power Sector

Course Date/Venue
August 04-08, 2025/Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

3.0 CEUs (30 PDHs) AWARD

H-STK© INCLUDED

Course Reference
EE1139

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 Performance Analysis in the Power Sector. It covers the key performance indicators (KPIs) in power systems and performance measurement frameworks; the power system components and impact on performance; the regulatory compliance and performance monitoring, data acquisition and integration in power systems; the data quality and validation techniques and statistical analysis for performance trends; the root cause analysis (RCA), reliability-centered maintenance (RCM), performance baselines and target setting; and the asset health and performance indexing, transformer and substation performance analysis and energy loss analysis in power networks.

During this interactive course, participants will learn the thermal performance and load profiles, economic performance indicators and system availability and downtime analysis; the SCADA and DMS systems for monitoring as well as advanced analytics and AI for power systems; the data visualization and dashboarding tools, integrated performance management systems (IPMS) and cloud and IoT in performance analytics; the performance reporting and communication, performance audits and gap analysis and performance improvement planning; and the reliability and performance benchmarking including risk-based performance management.

Course Objectives

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

- Apply and gain an in-depth knowledge on performance analysis in the power sector
- Carryout key performance indicators (KPIs) in power systems and performance measurement frameworks
- Recognize power system components and impact on performance including regulatory compliance and performance monitoring
- Apply data acquisition and integration in power systems, data quality and validation techniques and statistical analysis for performance trends
- Employ root cause analysis (RCA), reliability-centered maintenance (RCM), performance baselines and target setting
- Illustrate asset health and performance indexing, transformer and substation performance analysis and energy loss analysis in power networks
- Identify thermal performance and load profiles, economic performance indicators and system availability and downtime analysis
- Apply SCADA and DMS systems for monitoring as well as advanced analytics and AI for power systems
- Recognize data visualization and dashboarding tools, integrated performance management systems (IPMS) and cloud and IoT in performance analytics
- Carryout performance reporting and communication, performance audits and gap analysis and performance improvement planning
- Apply reliability and performance benchmarking including risk-based performance management

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 performance analysis in the power sector for power plant engineers and operators, electrical and mechanical engineers, performance analysts and energy managers, utility managers and supervisors, maintenance and reliability engineers, project engineers and technical consultants and other technical staff.

Accommodation

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

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

Haward's Certificates are accredited by the following international accreditation organizations:

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

- 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 Continuing 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 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 Instructor(s)

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

Mr. Pan Marave, PE, MSc, BEng, is a **Senior Electrical & Instrumentation Engineer** with over **30 years** of extensive experience in **Oil**, **Gas**, **Petrochemical**, **Refinery** & **Power** industries. His expertise includes Safety Instrumented Systems (**SIS**), Safety Integrity Level (**SIL**), Emergency Shutdown (**ESD**); **DCS**, **SCADA** & **PLC**; **Measurement** (**Flow**, **Temperature**, **Pressure**); **Process Analyzers** & **Analytical Instrumentation**; **Process Control**, **Instrumentation** & **Safeguarding**; **Process Controller**, **Control Loop & Valve Tuning**; Industrial **Distribution Systems**; Industrial **Control & Control Systems**, Power Systems **Protection & Relaying**; **Earthing**, **Bonding**, **Grounding**, **Lightning & Surge Protection**; Electric Power **Substation** & **Systems**; Electrical Engineering Principles; **Motor Control Circuit**; **Electrical Fault Analysis**; Electrical Networks & Distribution **Cables**; **Circuit Breakers**, **Switchgears**, **Transformers**, **Hazardous Areas Classification** and **Detailed Engineering Drawings**, **Codes** & **Standards**. Furthermore, he is also well-versed in Microprocessors Structure, Lead Auditor (**ISO 9000:2000**), **ISO 9002**, Quality Assurance, and Projects & Contracts Management.

Presently, Mr. Marave is the **Technical Advisor** of **Chamber of Industry & Commerce** in Greece. Prior to this, he gained his thorough practical experience through several positions as the **Technical Instructor**, **Engineering Manager**, **Electronics & Instruments Head**, **Electrical**, **Electronics & Instruments Maintenance Superintendent**, **Assistant General Technical Manager** and **Engineering Supervisor** of various international companies such as the **Alumil** Mylonas, **Athens Papermill**, **Astropol** and the **Science Technical Education**.

Mr. Marave is a **Registered Professional Engineer** and has **Master's** and **Bachelor's** degrees in **Electrical Engineering** from the **Polytechnic Institute of New York** and **Pratt Institute of New York** (**USA**) respectively. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and an active member of the **Technical Chamber** and the Institute of Electrical and Electronics Engineer (**IEEE**) in Greece. He has presented and delivered **numerous international** courses, conferences, trainings and workshops worldwide.

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.

Course Program

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

Day 1: ***Monday, 04th of August 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Performance Analysis in Power Systems*** *Importance of Performance Monitoring • Objectives and Key Drivers • Roles and Responsibilities • Link to Regulatory and Operational KPIs*
0930 – 0945	*Break*
0945 – 1030	***Key Performance Indicators (KPIs) in Power Systems*** *Technical KPIs (Availability, Reliability) • Financial KPIs (Cost/Unit, ROI) • Environmental KPIs (Emissions, Losses) • Safety & Compliance KPIs*
1030 – 1130	***Performance Measurement Frameworks*** *Balanced Scorecard for Utilities • SMART KPIs • KPI Hierarchy: Corporate to Asset-Level • KPI Benchmarking and Standardization*
1130 – 1215	***Overview of Power System Components & Impact on Performance*** *Transmission Lines • Substations and Transformers • Circuit Breakers and Switchgear • Protection and Control Systems*
1215 – 1230	*Break*
1230 – 1330	***Regulatory Compliance & Performance Monitoring*** *Regulatory Authorities and Mandates • Grid Code and Reliability Standards • System Availability Reporting • Regulatory Penalties and Incentives*
1330 – 1420	***Data Acquisition & Integration in Power Systems*** *SCADA and Telemetry Systems • Data Loggers and Historians • Asset Management Systems (AMS) • Cybersecurity and Data Integrity*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2: ***Tuesday, 05th of August 2025***

0730 – 0830	***Data Quality & Validation Techniques*** *Missing Data Handling • Outlier Detection • Data Cleansing Workflows • Sensor Calibration & Verification*
0830 – 0930	***Statistical Analysis for Performance Trends*** *Descriptive Statistics • Time-Series Analysis • Regression & Correlation Methods • Trend Prediction Techniques*
0930 – 0945	*Break*
0945 – 1100	***Root Cause Analysis (RCA) in Power Systems*** *RCA Tools: 5 Whys, Ishikawa • Common Causes of Underperformance • RCA Case Studies (Transformers, Cables) • Preventive Action Planning*
1100 – 1215	***Reliability-Centered Maintenance (RCM) Principles*** *Failure Mode Effects Analysis (FMEA) • Condition Monitoring Data • Maintenance Strategy Optimization • Predictive Maintenance Applications*
1215 – 1230	*Break*

1230 – 1330	***Performance Baselines & Target Setting*** *Establishing Performance Benchmarks • Setting Realistic Improvement Targets • Scenario-Based Performance Planning • Risk-Based Target Adjustments*
1330 – 1420	***Digital Twins & Simulation Tools*** *Introduction to Digital Twins • Simulation Models for Grid Behavior • Performance Forecasting • Integration with Real-Time Data*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3: Wednesday, 06th of August 2025

0730 – 0830	***Asset Health & Performance Indexing*** *Asset Health Indices (AHI) • Performance Degradation Models • Risk Ranking and Prioritization • Health Monitoring Dashboards*
0830 – 0930	***Transformer & Substation Performance Analysis*** *Load and Temperature Profiles • Oil & Gas Analysis Metrics • Downtime Analysis • Condition versus Performance*
0930 – 0945	*Break*
0945 – 1100	***Energy Loss Analysis in Power Networks*** *Technical versus Non-Technical Losses • Loss Modeling and Segmentation • Feeder-Level Analysis • Loss Minimization Strategies*
1100 – 1215	***Thermal Performance & Load Profiles*** *Impact of Thermal Limits • Load Curve Analytics • Transformer Derating and Overloads • Thermal Imagery Interpretation*
1215 – 1230	*Break*
1230 – 1330	***Economic Performance Indicators*** *Cost-Benefit Analysis of Upgrades • Economic Dispatch Analysis • Life-Cycle Costing (LCC) • ROI of Reliability Improvements*
1330 – 1420	***System Availability & Downtime Analysis*** *MTTR, MTBF and Reliability Curves • Fault Logging and Event Classification • Downtime Root Cause Logs • Alarm Rationalization*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4: Thursday, 07th of August 2025

0730 – 0830	***SCADA & DMS Systems for Monitoring*** *Real-Time Data Visualization • SCADA-Based Alarm Management • Event and Trend Reporting • DMS Integration Benefits*
0830 – 0930	***Advanced Analytics & AI for Power Systems*** *Machine Learning Applications • Anomaly Detection Models • Forecasting with AI • Intelligent Alert Systems*
0930 – 0945	*Break*
0945 – 1100	***Power System Simulation Tools Overview*** *DIgSILENT PowerFactory Basics • ETAP and PSS®E Functions • Transient & Steady-State Simulations • Grid Impact Studies*

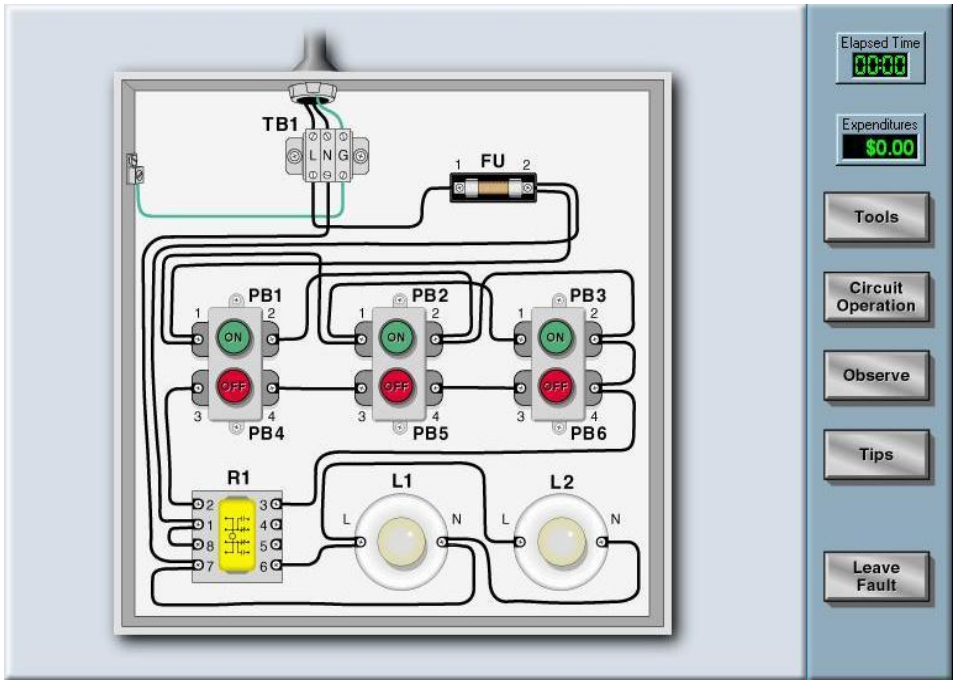
1100 – 1215	***Data Visualization & Dashboarding Tools*** *Power BI, Tableau and Excel for Dashboards • Interactive Visualization Methods • Custom Dashboards for KPIs • Real-Time versus Historical Views*
1215 – 1230	*Break*
1230 – 1330	***Integrated Performance Management Systems (IPMS)*** *Features of IPMS • Interfacing with ERP, EAM Systems • Alarm & Performance Event Workflows • Change Management*
1330 – 1420	***Cloud & IoT in Performance Analytics*** *Remote Asset Performance Monitoring • IoT Sensors and Edge Computing • Cloud Storage and Analytics Platforms • Data Latency and Cybersecurity*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

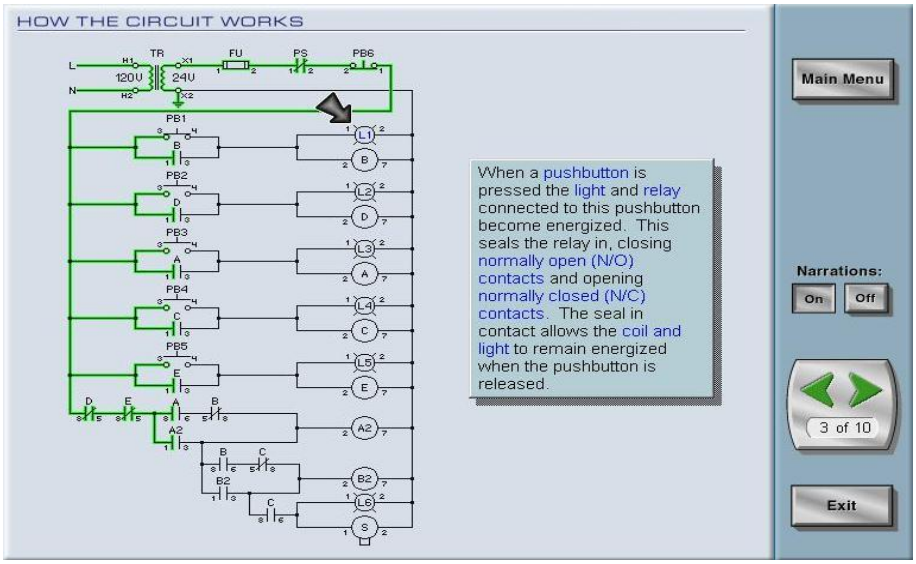
Day 5: Friday, 08th of August 2025

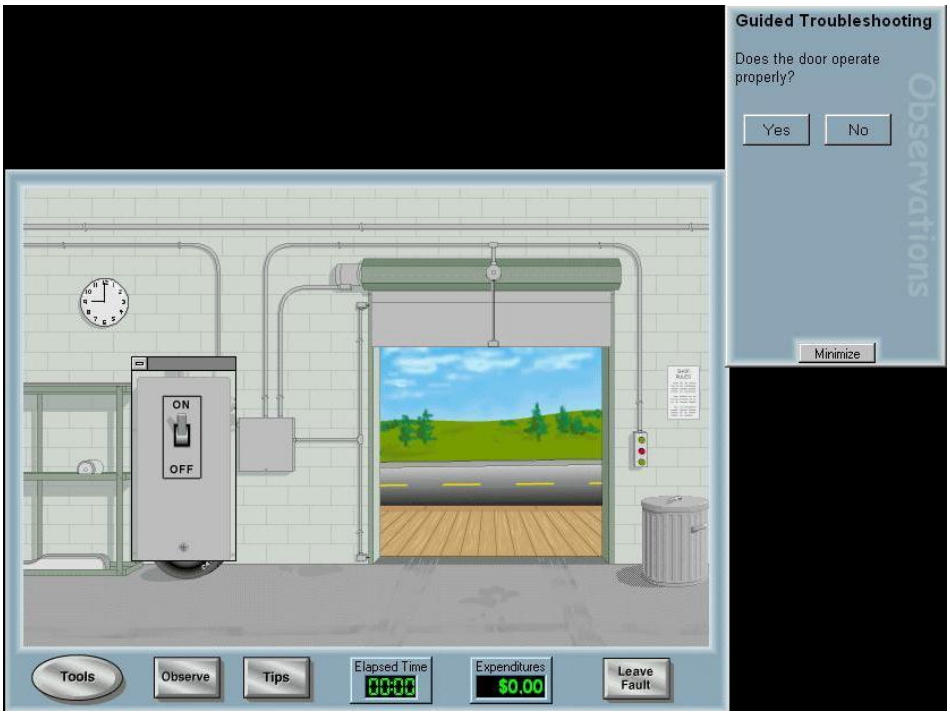
0730 – 0830	***Performance Reporting & Communication*** *Structured Reporting Templates • Executive Summaries and Dashboards • Frequency of Reporting (Daily, Monthly, Annual) • Action Tracking and Accountability*
0830 – 0930	***Performance Audits & Gap Analysis*** *Audit Objectives and Scope • Audit Checklists and Methodology • Audit Trail and Evidence Gathering • Post-Audit Improvement Plans*
0930 – 0945	*Break*
0945 – 1100	***Performance Audits & Gap Analysis*** *Audit Objectives and Scope • Audit Checklists and Methodology • Audit Trail and Evidence Gathering • Post-Audit Improvement Plans*
1100 – 1215	***Reliability & Performance Benchmarking*** *Internal versus External Benchmarking • IEEE, CIGRE, IEC Standards Comparison • Global Utility Performance Indicators • Lessons Learned Documentation*
1215 – 1230	*Break*
1230 – 1345	***Risk-Based Performance Management*** *Identifying Critical Performance Risks • Quantifying Impact and Probability • Risk-Mitigation Prioritization • Linking Risk to KPI Review*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about t Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

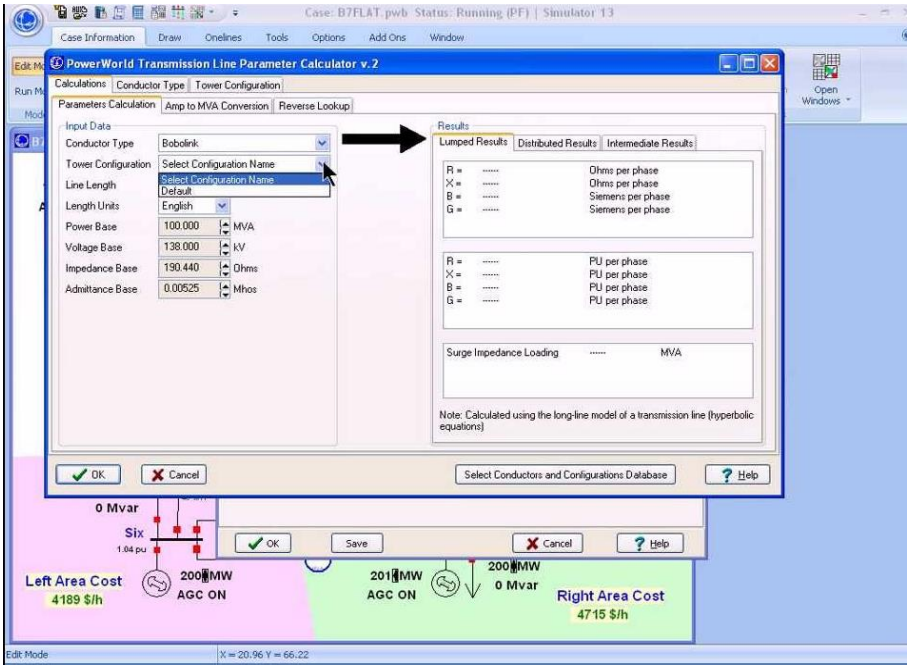
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art simulator "Simutech Troubleshooting Electrical Circuits V4.1", Power World" and "ETAP software".



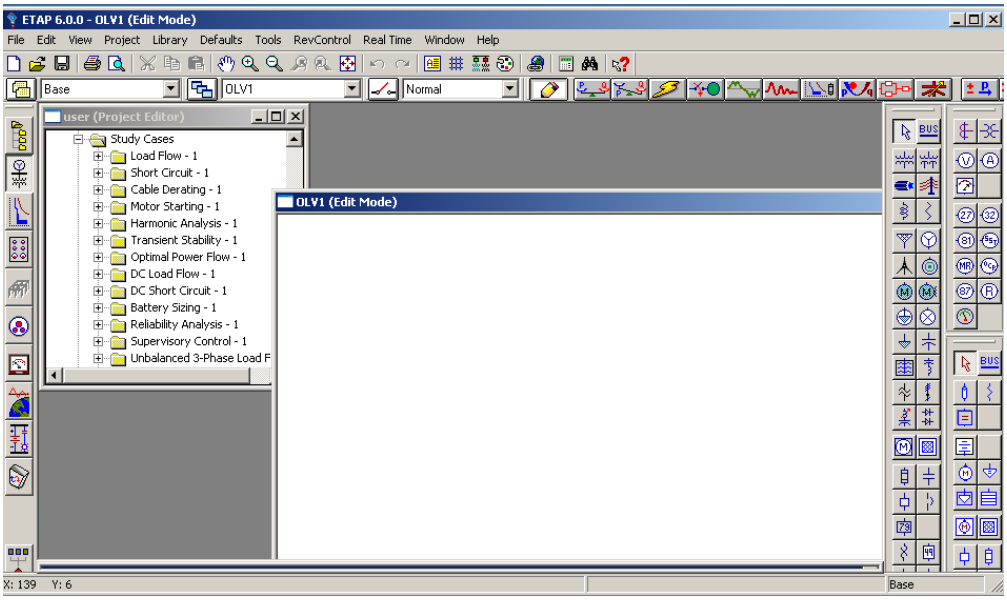




Simutech Troubleshooting Electrical Circuits V4.1



Power World Simulator



ETAP Software Simulator

Course Coordinator

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