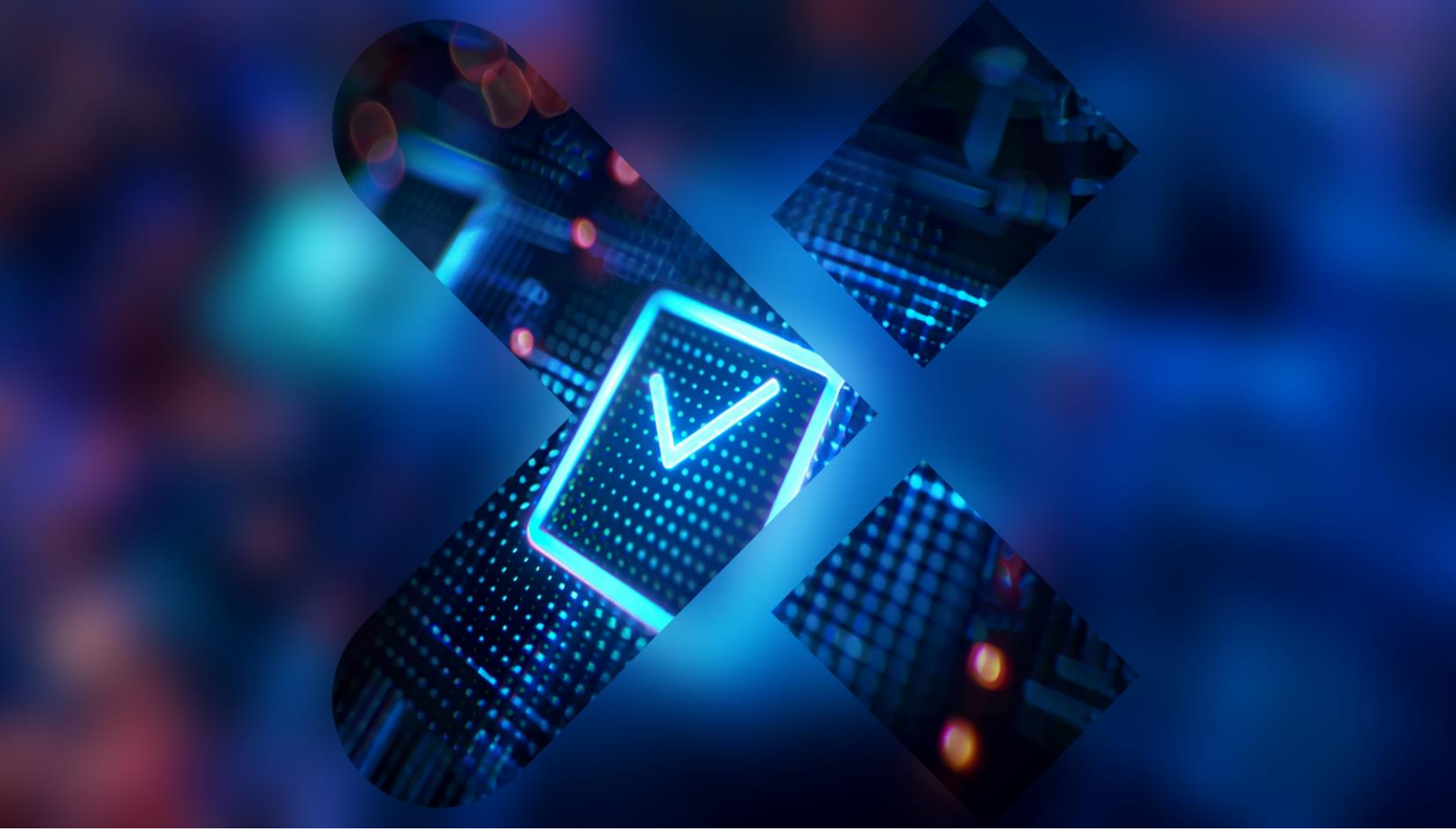

GRID SOFTWARE UNIVERSITY

Gridscale X Dynamic Security Assessment – DSA

Course Catalogue

Document: GSW-U-DSA

SIEMENS

Contents

1. Gridscale X DSA Training

1.1 Introduction

Employee development is a key factor in mastering the energy transformation and digitalization challenge. Siemens understands the importance of having adequately trained personnel for reliable and safe network management and operation.

Siemens has developed a broad set of courses specifically to train our customer on Gridscale X DSA (named DSA in the following). Our training program utilizes a hands-on approach integrating a role-based methodology throughout the curricula.
Ideally the training is conducted at the customer site with the software already being implemented to the customer IT. Alternatively, the software can be installed on a laptop which works as a server and all participants can log-in to that laptop with their own office laptop to use Gridscale X DSA software. If the training is conducted at customer site, all necessary courses for the relevant stakeholders can be held in approx. 5 days.
When the training is conducted at a Siemens location, a hands on setup will be provided as well so that every trainee will be able to work with the software. For best training results, it might be beneficial to work with the customer network and power system data. This can be arranged, if the training is booked as a customer dedicated training course. If trainees from multiple customers are participating, a generic network model will be used for the training.

1.2 Training Program

Gridscale X DSA Training Courses are arranged into categories based on common roles and responsibilities of the typical electrical power utility business. This structure is offered as a guideline to assist customers in developing the best training plan with the support of Siemens for their employees, thereby providing a value-added approach.

Overview Courses – Provides a high-level overview of the system, software architecture and hardware requirements of the DSA system; it is primarily for Project Managers, Senior Management, and administrative support personnel who require a comprehensive high-level overview or introduction of the DSA system.
Operators Courses– Operator training typically planned in coordination with the project teams for those who need to learn to operate the system.
Offline Usage and Backoffice Courses – Technical classes that teach how to use the DSA system for operational planning and for deep dive analyses from the backoffice.
System Administration Courses – Technical instruction focused on the administrative duties required for the DSA applications and the configuration, user management and server management.
Power System Operational Security Courses – These courses focus on the theoretical background of power system phenomena that are relevant to operational staff.
DSA Related Modelling of Power System Equipment – This course focusses on the models necessary for the DSA software to provide most meaningful results.
Workshops – Workshops span a variety of topics and are developed based on customer specific requirements. Workshops are not part of the standard Gridscale X DSA courses. They require special scheduling arrangements and are priced based on requirements and necessary preparation.

1.3 Language

Our courses are available in English or German. You can see the available languages in the general information section of each specific course. For classes in any other language, a translator might be necessary, and course customization charges might apply. Customers with language translation requirements should contact Siemens Training Department.

1.4 Delivery Methods

Our courses are available via multiple delivery methods:

Classroom	Instructor-led training session at a formal classroom setting at Siemens
Remote	Live, Instructor-led training session given via online conferencing tools
On-Site	Instructor-led training session provided at the customer facility in a training environment supplied by the customer
eLearning	Pre-recorded training session provided on demand
On-The Job	Execute tasks and get hands-on experience, under the supervision of a trainer

You can see the suggested roles in the target audience section of each specific course.

1.5 Training Material

Training materials are specifically developed for Gridscale X DSA training courses. Siemens shall provide all necessary training materials, including course manuals and reference material in hard copy and/or PDF (Portable Document Format) files. Each trainee shall receive individual copies of the training materials. The contents of Gridscale X DSA training materials are confidential and proprietary, and usage is protected by Siemens copyright and to be used for internal use only.

1.6 Course registration and Contact information

Registration requests should be submitted to the Training Center no later than 15 business days prior to the scheduled begin date of any class. To ensure adequate access to the laboratory equipment, enrollment in many of the classes is limited. Seating for classes is reserved in the order that requests are received.

For registration, or if you want to get more information about our courses or have special training requests, please reach out to your local Siemens sales partner, or contact us directly at gridsoftware-training@siemens.com

1.7 Cancellation Policy

Siemens may cancel classes with less than the minimum of five (5) registered students, no less than two weeks prior to the scheduled start of that class. Any enrolled students would be notified of the cancellation and optionally rescheduled for a later offering.

Customer cancellation of student enrollments received less than two weeks prior to the start of the class will be subject to a cancellation fee equal to 50% of the tuition. If an enrolled student fails to appear for a scheduled class, a cancellation fee equal to 100% of the tuition will be charged

2. Gridscale X DSA - Overview Courses

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2.1 Gridscale X DSA – Overview

Objectives

In this course you will get an overview of the main features of DSA and the possible use cases and applications. You will learn, what are the necessary skills of the users and what is the necessary data to be entered into the system in order to get the most benefits out of the software.

General Information

Course Code	GSW-U-DSA-OV
Delivery Method	Classroom, Remote, On-Site
Duration	1 Day
Language	English, German

Target Audience

This course is designed as an introduction to Gridscale X DSA.

Roles: Managers, Supervisors, System Administrators, Head of Operations, Head of IT

Prerequisites

- Operational processes
- Operational security
- SCADA systems
- Power equipment (generators, lines, substations...)

Content

Introduction to:

- N-1 / N-2 Security
- Power system stability
- Operational boundaries
- Challenges in stability assessment
- Software structure
- Contingencies
- Use cases / Results

3. Gridscale X DSA - Operators Courses

3.1 Gridscale X DSA - Operators Training

Objectives

This course will focus on workflows of operators. You will learn how to create contingencies, start DSA assessment and interpret the results in order to take the best decision.

General Information

Course Code	GSW-U-DSA-OP
Delivery Method	Classroom, Remote, On-Site
Duration	2 Days
Language	English, German

Target Audience

This course is designed to train the users of Gridscale X DSA for their daily work with it.

Roles: Operators/Dispatchers, Operations Engineers

Prerequisites

- Operational processes
- State estimator
- Load flow
- Operational limits

Content

Introduction to:

- Static & dynamic security / stability
- Creation of contingencies
- Creation of simulation jobs
- Stability indices
- Transient stability (TSA)
- Voltage stability (VSA)
- Small Signal Stability (SSSA)
- Static contingency analysis (CA)

4. Gridscale X DSA - Offline Usage and Backoffice Courses

4.1 Gridscale X DSA – Offline and Backoffice Use Case

Objectives

Gridscale X DSA can also be used for operational planning with an offline use case. This course addresses the workflows for operational planning.

General Information

Course Code	GSW-U-DSA-OFF
Delivery Method	Classroom, Remote, On-Site
Duration	2 days
Language	English, German

Target Audience

Roles: Reliability engineer, outage planner, operational forecasting engineer

Prerequisites

- Operational processes
- State estimator
- Load flow
- Operational limits

Content

Introduction to:

- Static & dynamic security / stability
- Creation of contingencies
- Creation of simulation jobs (offline)
- Stability indices
- Transient stability (TSA)
- Voltage stability (VSA)
- Small Signal Stability (SSSA)
- Static contingency analysis (CA)

5. Gridscale X DSA - System Administration Courses

5.1 Gridscale X DSA - Administration

Objectives

In this course you will learn how to setup and maintain the Gridscale X DSA solution. It addresses the fundamental software architecture, backup procedures, update processes, data maintenance and user management. Troubleshooting is a further topic of this course.

General Information

Course Code	GSW-U-DSA-ADM
Delivery Method	Classroom, Remote, On-Site
Duration	1 day
Language	English, German

Target Audience

Roles: System Administrators, IT staff, data engineer

Prerequisites

- Servermanagement
- Virtual environments
- Dockerization
- File shares
- Cyber security

Content

Introduction to:

- Software parts and services
- Key Cloak functionalities for user management
- Data (-locations) to backup
- Procedures for updating / patching
- Troubleshooting
- Logfiles
- Debugging files to exchange with Siemens

6. Gridscale X DSA - Technical Background Courses

6.1 Gridscale X DSA - Power System Operational Security Course

Objectives

The physical phenomena in electric power systems are very divers. The trainee will get advanced knowledge on how violations of operational boundaries can lead to stability problems all the way to a blackout. All different kinds of stability phenomena like voltage stability, transient stability, frequency stability and small signal stability are covered.

General Information

Course Code	GSW-U-DSA-PSO
Delivery Method	Classroom, Remote, On-Site
Duration	2 days
Language	English, German

Target Audience

Roles: Power system engineers, Operator/Dispatcher, Operational planner, Head of Operation

Prerequisites

- Basics in power systems
- Load flow

Content

Introduction to:

- Static vs. dynamic power system behaviour
- Dynamics
- Active power imbalances / frequency stability
- Defense schemes against instabilities
- Reactive power imbalances / voltage stability
- Role of inertia in power system operations
- Role of protection devices
- Small signal instability

Note

Power system security / stability is a complex topic, that requires the understanding of the physical phenomena in electric systems. These physical phenomena do not follow the rules of the market or other constraints an operator is confronted with. This course allows the trainees to get profound knowledge about those phenomena.

6.2 Gridscale X DSA - DSA Related Modelling of Power Systems Course

Objectives

Gridscale X DSA is a model and simulation based tool to provide operators with valuable information about the current and future stability of the system. Such a tool relies on high quality power system model. You will learn the minimum requirements for models in DSA and how to get those models. Since it is not always possible to get exact models for all equipment, you will also learn what would be the best estimates.

General Information

Course Code	GSW-U-DSA-MOD
Delivery Method	Classroom, Remote, On-Site
Duration	2 days
Language	English, German

Target Audience

Roles: Power system engineers, data engineer, reliability engineer

Prerequisites

- Basics in power systems
- Load flow

Content

Introduction to:

- Static vs. dynamic power system behaviour
- Dynamics
- What are active power system devices
- Machine behaviour
- Behaviour of power electronics
- Testing model with PSSE
- Providing models and parameters to DSA

Note

Power system security / stability is a complex topic, that requires the understanding of the physical phenomena in electric systems. These physical phenomena do not follow the rules of the market or other constraints an operator is confronted with. This course allows the trainees to get profound knowledge about those phenomena.

7. Gridscale X DSA - Customized Workshops

7.1 Gridscale X DSA - Customer Workshop

Objectives

After Gridscale X DSA is implemented into a customers' operational environment including testing and training, it may be beneficial to organize a workshop with some stakeholders on customer side together with Siemens DSA team. This is especially useful since DSA and dynamic analyses are relatively new in the operational context. Those workshops can be used to re-adjust the settings in the software or to discuss the scenarios to be simulated.

General Information

Course Code	GSW-U-DSA-WKSHP
Delivery Method	Classroom, Remote, On-Site
Duration	1-2 days
Language	English, German

Target Audience

Roles: all stakeholders

Prerequisites

- Participation in other DSA trainings
- Familiar with DSA UIs and results
- Cases / Scenarios of interest from the customer system

Content

Contents with will customized the following are just examples:

- Re-cap of previous training contents
- Index concept of DSA
- Discussion of results
- Review of the models
- Improvement proposals

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