



Certified Data Centre Specialist (CDCS)

CDCS is the advance level for Data Centre Professionals and this course will further increase attendees to a level being a compatible sparring partner with suppliers and they will be able to verify offers provided by vendors for correctness, effectiveness and efficiency.

CDCS is the second training in the EPI Design and Build training track under the EPI Data Centre Training Framework. Participants must hold a valid CDCP certificate in order to be able to register for the CDCS class. CDCS itself is a pre-requisite for persons wishing to achieve the CDCE status.

**Please note, the price of the exam is not included in the price of the course. Your Account Manager can provide you with the exam pricing upon request.

Audience

The primary audience for this course is an IT, Facilities or Data Centre Operations professional working in and around the data centre (representing both end-customers and/or service provider/facilitators) and having responsibility to achieve and improve hi-availability and manage ability of the Data Centre, such as: Data centre managers, Operations/Floor/Facility managers, data centre engineers, network/system engineers/data centre sales/consultants.

Pre-Requisites

Participants must hold a valid CDCP® certificate in order to be able to register for the CDCS® class.

Topics Covered

Data Centre Design/Life Cycle Overview

- Overview of the phases of a data centre life cycle
- Planning, re-alignment and continuous improvement

Standards and Rating Level Definitions

- Rating level history

- Difference between Uptime and TIA-942
- Rating level definitions
- Redundancy options (N+1), 2N, 2(N+1)
- Concurrent Maintainability/Compartmentalisation
- Example configurations
- Substation and feed requirements
- Maintenance options
- Operational processes guidelines/standards
- Skill development

Building Considerations

- Building location considerations
- Floor and hanging loads requirements
- Fire rating for walls and glass
- Blast protection
- Bullet proofing
- Forced entry protection

Advanced Raised Floor & Suspended Ceiling

- Raised floor installation guidelines
- Techniques to install a proper and leveled raised access floor
- Common mistakes
- Choosing the right tiles and their locations
- Seismic-mitigating floor constructions
- Choosing the correct suspended ceiling

Advanced Power

- Power infrastructure layout;
- Formulas which you should know for the data centre
- Single Line Electrical diagrams; how to read to ensure key components are present for protection
- Over current protection devices (MCB/MCCB/VCB/ACB/Fuses) definitions and what to use where
- Earth Leakage devices (RCB/RCD/ELCB/GFCI/ALCI/RCBO), definitions and what to use where
- Sizing of protective components
- Lightning strikes and surge protection devices (TVSS/SPD), how they operate, where to use and how to install
- Power cabling and cable run considerations
- PDU/DB setup and minimum requirements
- Generators;
- Generator types: Standby/Prime/Continuous
- Component make up and functions
- Fuel storage and calculation
- Paralleling of gen-sets
- Generator room/area requirements
- UPS Systems;

- Required specifications for UPS systems
- How to read data sheets and select the correct UPS
- Requirements for parallel configurations and avoid pitfalls such as single point of failures
- How parallel installation should be done, classic mistakes made by installers and how to avoid these
- Harmonic Filters;
- Active/Passive filters and their application
- Battery Banks;
- Battery bank terminology
- Designing battery banks, how to calculate, and double check the battery bank to be installed
- Battery charging pitfalls and ensuring the right charger is being installed and used
- Using parallel battery banks; how to properly install them, limitations and risks when using batteries in parallel
- How to test batteries correctly and make decisions on cell/block or string replacement
- Battery casing choices; ABS, V0, V1, V2
- Alternative energy storage; flywheel, re-usable cell, compressed air UPS, etc.

Advanced Electro Magnetic Fields

- Sources of EMF
- Difference between single, three phase and bus-bar EMF
- Options available to measure EMF and how to interpret the results from single-axes and composite measurements
- Guidance on safe distance for equipment and humans
- Calculation of EMF attenuation factor for shielding material permeability and saturation factors

Advanced Cooling

- Important definitions; dry-bulb, wet-bulb, dew-point, RH, sensible and latent heat
- Psychrometric chart and ASHRAE recommendations
- Environmental class definitions and thermal specifications
- Temperature/humidity measurements guideline
- Heat dissipation methods
- Altitude impact on temperature intake to ICT equipment
- Floor plan setup for effective cooling
- Differences in tile surface and supporting structure and the air-flow performance impact
- Rack door construction and the flow performance impact
- Equipment Delta-T and its impact
- Optimising airflow
- Thermal units conversions
- Calculations for air volume displacement (CFM/CMH)
- Cooling capacity calculations
- Air-conditioning selection
- De-/humidifying options
- Air conditioning efficiency
- SHR impact on cost saving
- Efficiency indicator
- New cooling principle and techniques (Submerged, VSD/VRF/ECF/water- and air side economisers)
- Redundancy guidelines for air-conditioners avoiding classic misconceptions and mistakes for meeting

ANSI/TIA-942 compliant designs

- Installation requirements
- Connections to fire panel and EPO
- Commissioning of air conditioners
- Set points and calibration
- CFD (Computational Fluid Dynamics)

Advanced Fire Protection

- The fire triangle and elements to stop a fire
- Detection systems in detail (VESDA, VIEW, smoke sensors)
- Considerations for installation of sensors
- Proper testing of smoke sensors
- Water based systems i.e. deluge, wet-pipe, dry-pipe, pre-action and why most of them don't work and how to detect this
- Details on Inert and Halocarbon systems and how to select the correct system for your data centre
- How to calculate the gas content ensuring the appropriate level is installed to suppress the fire including safety considerations
- Other requirements for gas systems such as release times, hold times, pipe install requirements and other important factors
- Requirements for the fire detection panel
- Installation verification, methods, what to check and how
- New advanced fire suppression technologies

Design and Install Scalable Networking Cabling System

- ANSI/TIA942 cabling structure topology
- ToR, EoR Design
- Intelligent patching systems
- Installation best practice such as routing, bending radius, separation from power, containment fill ratio, fiber link loss calculator, bonding and grounding requirement
- Standard for telecommunications labeling and administration

Environmental Specifications and Contamination Control

- Acoustic noise effects, regulations, specifications and limits
- Data centre contaminations and classifications
- Measurements, standards and limits
- Preventive measures and avoidance

Data Centre Efficiency

- Business drivers to go Green
- High-availability or Green?
- Green guidelines and standards
- How to measure it and what are acceptable numbers compared to the general industry
- PUE classes defined by Green Grid and issues with PUE
- Techniques for saving energy in all parts of the data centre i.e. application/system level, cooling, power distribution