

Module Title : **Course CDCS : Certified Data Centre Specialist**
Duration : **3 days**

Course Description

With few exceptions, enterprises today rely on IT for the delivery of business-critical services - often directly to the end consumer. It is therefore vital that the mission critical data centre is designed, maintained and operated with hi-availability and efficiency in mind. Fact is however that most data centre's do not meet the full availability, capacity, safety or efficiency requirements often demanded.

CDCS® 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 a must have certification for professional data centre managers and personnel. CDCS® is a pre-requisite for individuals wishing to achieve the CDCE® status.

Audience

The primary audience for this course is an IT, facilities or Data Centre Operations professional working in and around the data centre and having the responsibility to achieve and improve hi-availability and manageability of the Data Centre.

Prerequisites

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

At Course Completion

After completing this course, you will be able to:

- Understand the design life cycle of data centres and the stages involved
- Discuss in great level of detail requirements with vendors, suppliers and contractors to ensure they meet the customers' requirement
- Verify on the technical level design plans, quotes and offers proposed by vendors/contractors
- Understand Tier-levels for both the data centre design/setup as well as maintenance tier levels
- Understand the various building considerations such as bullet proofing, mitigation of seismic activity, fire ratings and thermal stability
- Understand how to build up a raised floor meeting requirements to avoid misalignment, level differences and leakage

- Understand how to read a Single Line Electrical Diagram being able to identify the most common design issues made
- Choose the correct UPS and parallel configuration, learn how to avoid classic mistakes when installing systems in parallel
- Understand how to calculate battery banks enabling you to double check offered configurations to ensure it meets the customers' requirements
- Understand what distance to keep to avoid EMF issues for human safety and equipment disturbances
- Understand the fundamental cooling setup, CFM, Delta-T and other important factors
- Understand contamination factors and limitations
- Understand full details of -re suppression options, how to calculate gas content and verify installations
- Understand how to measure data centre energy efficiency and how to improve it.

Course Outline

Data Centre Design / Life Cycle Overview

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

Tier Levels

- History of 'tier level' definitions
- Tier level definitions, categories and measure points
- Redundancy options
- Tiered Infrastructure Maintenance Standards (TIMS)

Building Considerations & Standards

- Floor loading requirements
- Fire rating for walls and glass
- Blast protection
- Bullet proofing
- Forced entry protection

Advanced Raised Floor & Suspended Ceiling

- Raised floor installation guidelines to ensure contractors install a proper closed and levelled raised access floor
- 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
- 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;

- Component make up
- Choosing the required device
- Calculate required fuel storage tank capacity
- Paralleling of gen-sets
- Regulatory 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;

- Type of filters available and which one to select depending on the application

Battery Banks;

- 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 risk 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-useable cell etc.

Advanced Electro Magnetic Fields

- Differences between single, three phase and bus-bar EMF
- Options available to measure EMF and how to interpret the results from single axe 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

- Environmental class definitions and thermal specifications
- Equipment airflow and Delta-T definitions and limits
- Planning for floor, rack and cooling equipment
- CFM requirement calculations and conversions
- Air-conditioner specifications and how to select the correct air-conditioner with the required capacity and flow
- Techniques for optimization of air flow
- Redundancy guidelines for air-conditioners avoiding classic misconceptions
- Liquid cooling guidelines for data centres

Advanced Fire Protection

- Fire triangle and elements to stop a fire
- Detection systems in detail (VESDA, VIEW, Smoke sensors)
- Considerations for installation of sensors
- Difference in water based systems i.e. dry-pipe, pre-action and why most of them don't work and how to detect this
- Details on Inert, Halocarbon, fluorinated systems and how to select the correct gas for your data centre
- How to calculate the gas content ensuring the appropriate level is installed to suppress the fire
- Other requirements for gas systems (release times, hold times, pipe install requirements and other important factors)
- Requirements for the fire panel
- Installation verification, what to check and how
- New fire suppression techniques which prevents fires from igniting

Cable Management

- In rack power and network cabling
- Labelling based on TIA-606

Environmental Specifications

- Acoustic noise regulations, specifications, effects and limits
- Data centre contaminations and classifications
- Measurements, standards and limits
- Preventive measures and avoidance
- Electro Static Discharge (ESD)

Data Centre Efficiency

- Power efficiency indicators
- How to measure it and what are acceptable numbers compared to the general industry
- How to achieve power savings in the data centre; various techniques to save energy in all parts of the data centre i.e. application/system level, cooling, power distribution

Mock Exam

EXAM: Certified Data Centre Specialist

Examination

Certification exam papers can be taken in paper based format at the end of the last day of the course, or online via an authorised training partner, depending on the country in which the course is delivered. The exam is a one and a half hour, 60 questions, multiple choice and closed book exam. The attendee needs to have 45 out of 60 questions correct in order to pass the exam. Results of the exam will be communicated to the attendee within four weeks following the examination.

Certification

Attendees who successfully pass the exam will receive the official 'Certified Data Centre Specialist' certificate. Certification is valid for a three years period after which the student needs to re-certify. More information on re-certification and verification of the current status of certification can be found on the EPI corporate website, <http://www.epi-ap.com>.