



## CERTIFIED DATA CENTRE SPECIALIST

### Introduction

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 high-availability and efficiency in mind. However, the fact is most data centres do not meet the full availability, capacity, safety or efficiency requirements that are often demanded.

The Certified Data Centre Specialist is a three-day course designed to bring participants to the level of a suitable sparring partner with suppliers. They will be able to verify offers provided by vendors for correctness, effectiveness and efficiency. CDCS<sup>®</sup> is a must-have certification for professional data centre managers and personnel. CDCS<sup>®</sup> is a pre-requisite for individuals wishing to achieve the elite CDCE<sup>®</sup> (Certified Data Centre Expert) status.

### Roadmap



### 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 high-availability and manageability of the data centre.

### Prerequisites

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

### Global Accreditation & Recognition



### Course Benefits

After completion of the course the participant will be able to:

- Understand the design life cycle of data centres and the stages involved
- Discuss the data centre requirements in great level of detail with vendors, suppliers and contractors to ensure that these requirements are met
- Validate design plans, quotes and offers proposed by vendors/contractors
- Understand redundancy levels for both the data centre design/setup and maintenance
- Understand the various building considerations such as bullet proofing, mitigation of seismic activity, fire ratings and thermal stability
- Understand how to install a raised floor that meets requirements, avoiding misalignment, level differences and leakage
- Understand how to read a Single Line Electrical Diagram to identify and avoid the most common design issues
- Choose the correct UPS and parallel configuration, learn and avoid classic parallel installation mistakes
- Understand how to calculate battery banks, validate offered configurations to ensure they meet 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 fire suppression options, how to calculate gas content and verify installations
- Understand how to measure data centre energy efficiency and how to improve it

- **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
- **Mock Exam**
- **EXAM: Certified Data Centre Specialist**



## Delivery structure

EPI courses are lectured by certified trainers. CDCS® is an instructor-led course that uses a combination of lectures and question-and-answer sessions, to discuss participants' specific needs and issues experienced in their own environment. Participants are able to tap into the trainer's extensive experience to enable them to solve practical problems in their current environment, thus adding tremendous value.

## Examination

Certification exams are administered at the end of the last training day by an authorised training partner, either using paper-based or online format, depending on the country in which the course is delivered. The exam is a 90-minute closed book exam, with 60 multiple-choice questions. The candidate requires a minimum of 45 correct answers to pass the exam. Online exam results are known immediately and paper-based exam results will be known within one week.

## Certification

Candidates who successfully pass the exam will receive the official 'Certified Data Centre Specialist' certificate. The certification is valid for three years after which the student needs to re-certify. More information is available on the EPI corporate website at [www.epi-ap.com](http://www.epi-ap.com).

## Global Accreditation & Recognition

EXIN, is a global, independent and not-for-profit examination provider. EXIN's mission is to improve the quality of the IT and data centre sectors, the proficiency of IT and data centre professionals and the IT users, by means of independent testing and certification. EXIN offers candidates the opportunity to take examinations at a time and place of their choice. Every day, EXIN examinations are taken in more than 125 countries on six continents, and in more than 15 languages.

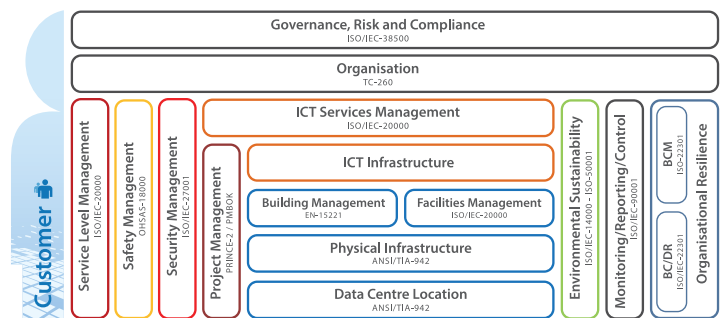
## Recommended next course

Candidates with a desire to become a data centre expert are recommended to take the CDCE® course. CDCE® prepares participants to manage a project which covers scope, plan, design, implement, and retire or move a mission critical data centre up to the highest redundancy level. CDCE® builds upon knowledge gained in CDCP® and CDCS® courses. Participants who pass the exam will join the industries' elite data centre project design experts. Participants must possess a valid CDCS® certificate for admission to the CDCE® course. Data centre professionals who desire to pursue additional specialisations on data centre competencies are recommended to refer to the EPI Data Centre Training Framework® on the EPI website at [www.epi-ap.com](http://www.epi-ap.com).

## Course schedule

Our courses are available in over 50 countries across all continents. For a comprehensive course schedule, visit the EPI corporate website at [www.epi-ap.com](http://www.epi-ap.com) or contact your local authorised reseller/partner.

## EPI Data Centre Framework®



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The EPI Data Centre Framework® provides data centre investors/owners/operators with a data centre ecosystem addressing all disciplines of a structured and fully managed data centre. The EPI Data Centre Framework® addresses not only the site selection, design and outfitting of its physical facilities but it also includes the governance and all processes required to organise and operate a data centre which meets the business requirements of its customers. For more information visit [www.epi-ap.com](http://www.epi-ap.com).



Global Headquarters:

Enterprise Products Integration Pte Ltd

37th Floor, Singapore Land Tower, 50 Raffles Place, Singapore 048623.

Tel: + (65) 6733-5900 Fax: + (65) 6735-6400 E-mail: [sales@epi-ap.com](mailto:sales@epi-ap.com) Website: [www.epi-ap.com](http://www.epi-ap.com)  
Local offices in : India, Japan, Malaysia, Middle East, Pakistan, Singapore, South Africa, The Netherlands, USA

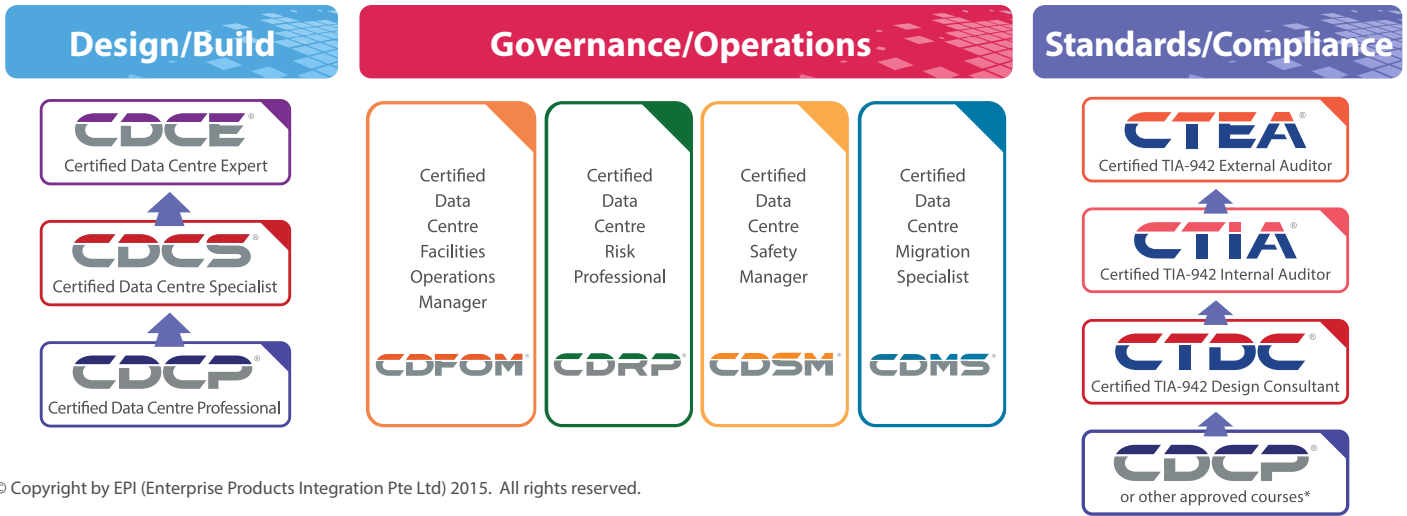
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Authorised Reseller/Partner:





## EPI Data Centre Training Framework®



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The EPI Data Centre Training Framework® provides a structured course curriculum for individuals working in and around data centre facilities and data centre operational management. It addresses the various disciplines required to design and manage a high-availability, efficient data centre. EPI's data centre course curriculum is not only the first in the world, it is also by far the largest in the industry. Many companies have specified these courses as prerequisites for their staff working in and around the data centre and use them as part of their career planning initiatives. Recognised globally, these certifications add value to both companies and individuals.

## The Company

EPI is a company of European origin operating world-wide in over 50 countries through direct operations and a large partner network. EPI offers an extensive range of data centre services on consultancy, auditing, certification and training. EPI's focus is on mission-critical, high-availability environments. Established in 1987, EPI has developed an international reputation for delivering high quality technical expertise, with flexible and innovative solutions, techniques and methodologies.

All our services are aimed at helping our customers to:

- Increase **Availability** of their mission-critical infrastructure
- Improve **Efficiency, Effectiveness and Manageability**
- **Minimise risk** of business interruption

Our Clients share a common need to protect their valuable data, run their mission-critical infrastructure efficiently and to be protected on a 24 x 7 basis. By protecting the interests of our customers, EPI is committed to an intensive program of comprehensive services development backed by engineering and support excellence.

Quality Systems and Procedures have always been at the heart of every stage of our service delivery to ensure consistent and high quality services. We are known for our thoroughness, flexibility and responsiveness in our project management. We focus on providing solutions that fit each organisation and each project with a drive to deliver quality on time, every time.

*Let us put our expertise to work for you!*

## Data Centre Services

### Consultation

- Data Centre Design Validation
- Data Centre Design Evaluation
- Data Centre Review/  
Independent Second Opinion

### Audit and Certification

- ANSI/TIA-942
- SS507
- ISO/IEC-27001
- ISO/IEC-20000

### Survey and Assessment

- Power Quality
- Cooling
- EMF
- Thermo Scanning
- Physical Security
- Customised Surveys

