

European Data Centre Infrastructure Standards – EN 50600 series

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Scope Presentation

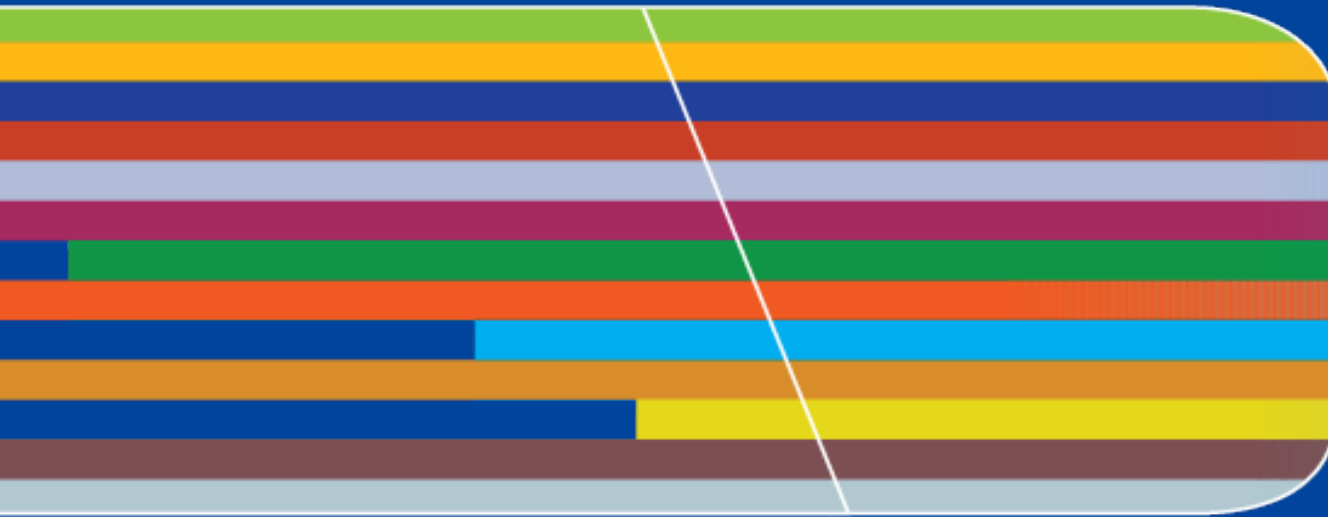
Nexans explains the recent standardization process for data centre infrastructure (building, power distribution, environmental control, cabling, security etc) and provides an overview of the requirements of the new standards .

Nexans also compares and contrasts with US centric data centre standards to show the advantages of compliance to a European standard.

Finally Nexans highlights future developments in the EN 50600 series covering aspects such as management systems and KPIs.

Biography Speaker

Rob Cardigan has been Senior Product Manager at Nexans Cabling Solutions since 2007. Rob has more than 20 years experience in connector and cabling design, having worked in R&D and Product Management roles with Amphenol, MOD-TAP and Molex, prior to joining Nexans. He is Chairman of TCT/7 - UK National Committee mirroring work in ISO JTC1/SC25 and CENELEC TC215 and is also Chairman of TCT/7/-/3 the UK mirror committee for Data Centre standards in CLC TC215 WG3. Here, he is actively working on EN 50600 series of standards.



Series EN 50600: Data Centre Facilities and Infrastructures

Rob Cardigan Project Editor TC 215 WG3

Content

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- The EN 50600-x series for Data Centre Design
- Target Customers & Purpose
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General Concepts

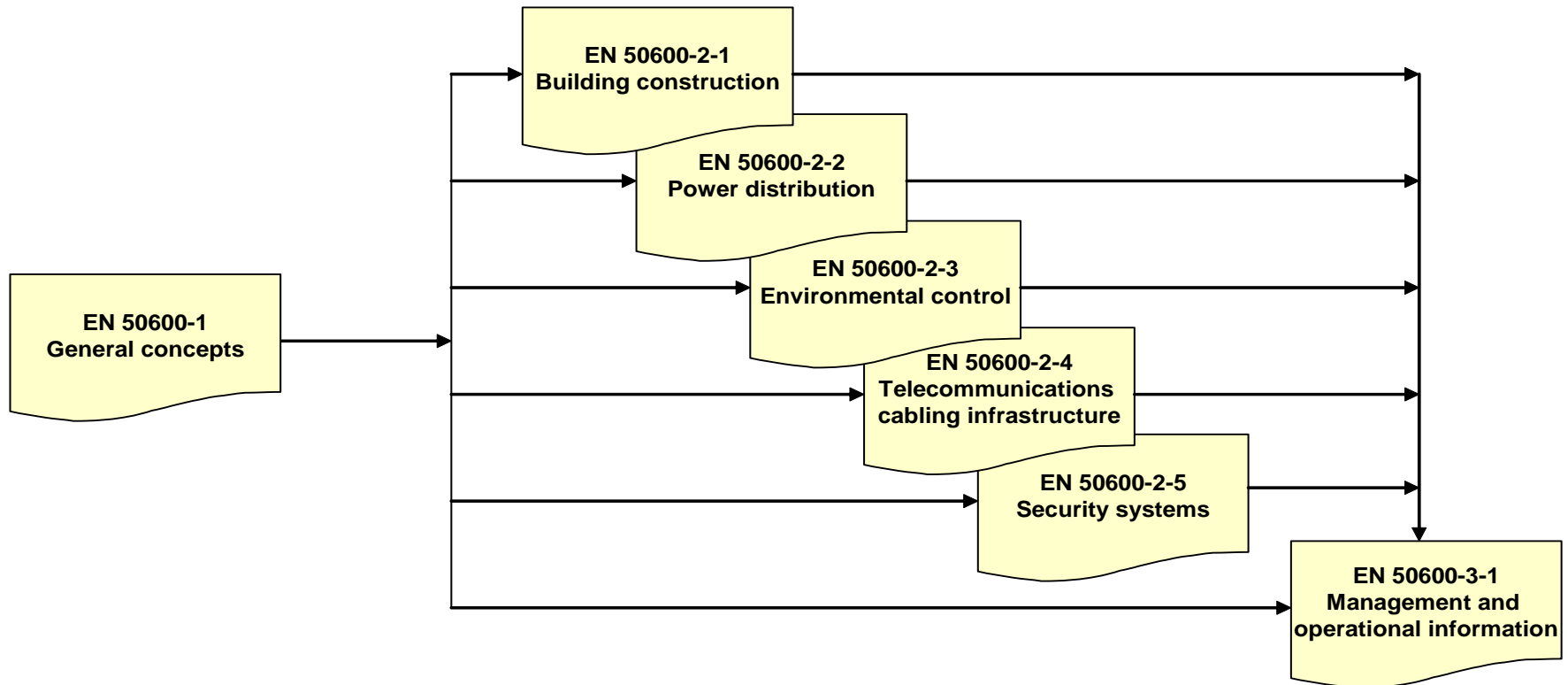
Key Benefits

EN 50600-x's position in the global DC Design Landscape

Summary

The EN 50600-x Series

A modular and holistic approach for DC Design



Target Customers & Purpose



This series of European Standards

specifies requirements and recommendations to support the various parties involved in the design, planning, procurement, integration, installation, operation and maintenance of facilities and infrastructures within data centres. These parties include:

- owners, facility managers, ICT managers, project managers, main contractors;
- consultants, architects, building designers and builders, system and installation designers;
- suppliers of equipment;
- installers, maintainers.

Scope

This European Standard:

- details the issues to be addressed in a business risk and operating cost analysis enabling application of an appropriate classification of the data centre;
- defines the common aspects of data centres including terminology, parameters and reference models (functional elements and their accommodation) addressing both the size and complexity of their intended purpose;
- describes general aspects of the facilities and infrastructures required to support effective operation of telecommunications within data centres;
- specifies a classification system, based upon the key criteria of “availability”, “security” and “energy-efficiency” over the planned lifetime of the data centre, for the provision of effective facilities and infrastructure;
- describes the general design principles for data centres upon which the requirements of the EN 50600 series are based including symbols, labels, coding in drawings, quality assurance and education;

Rationale for the Development



EN 50600-x series has been developed to address European demands regarding DC Design

- A European DC design standard was required with **European applicable requirements**
- Demand for a universally applicable DC design standard series which adopts a **holistic approach** covering all aspects of the design of DC facilities & infrastructures including management and operational information
- Support of European Commission's **Code of Conduct on Data Centres Energy Efficiency**
- Existing design schemes were driven by design resilience concepts rather than offering a **business oriented assessment approach** using a design vs. cost perspective

Status



Published
2012

EN 50600-1
General concepts

Published
2014

EN 50600-2-1
Building construction

EN 50600-2-2
Power distribution

EN 50600-2-3
Environmental control

Published
2015

EN 50600-2-4
Telecommunications
cabling
infrastructure

Published
2016

EN 50600-2-5
Security systems

EN 50600-3-1
Management and
operational
information

General Concepts

Overall Approach

- Comprehensive European suite of design standards for all facilities and infrastructures of a data centre
- Developed by CENELEC, a non-profit standardization body
- Using a business oriented design approach
- Covers availability, physical security and energy efficiency enablement

EN 50600-1: General Concepts

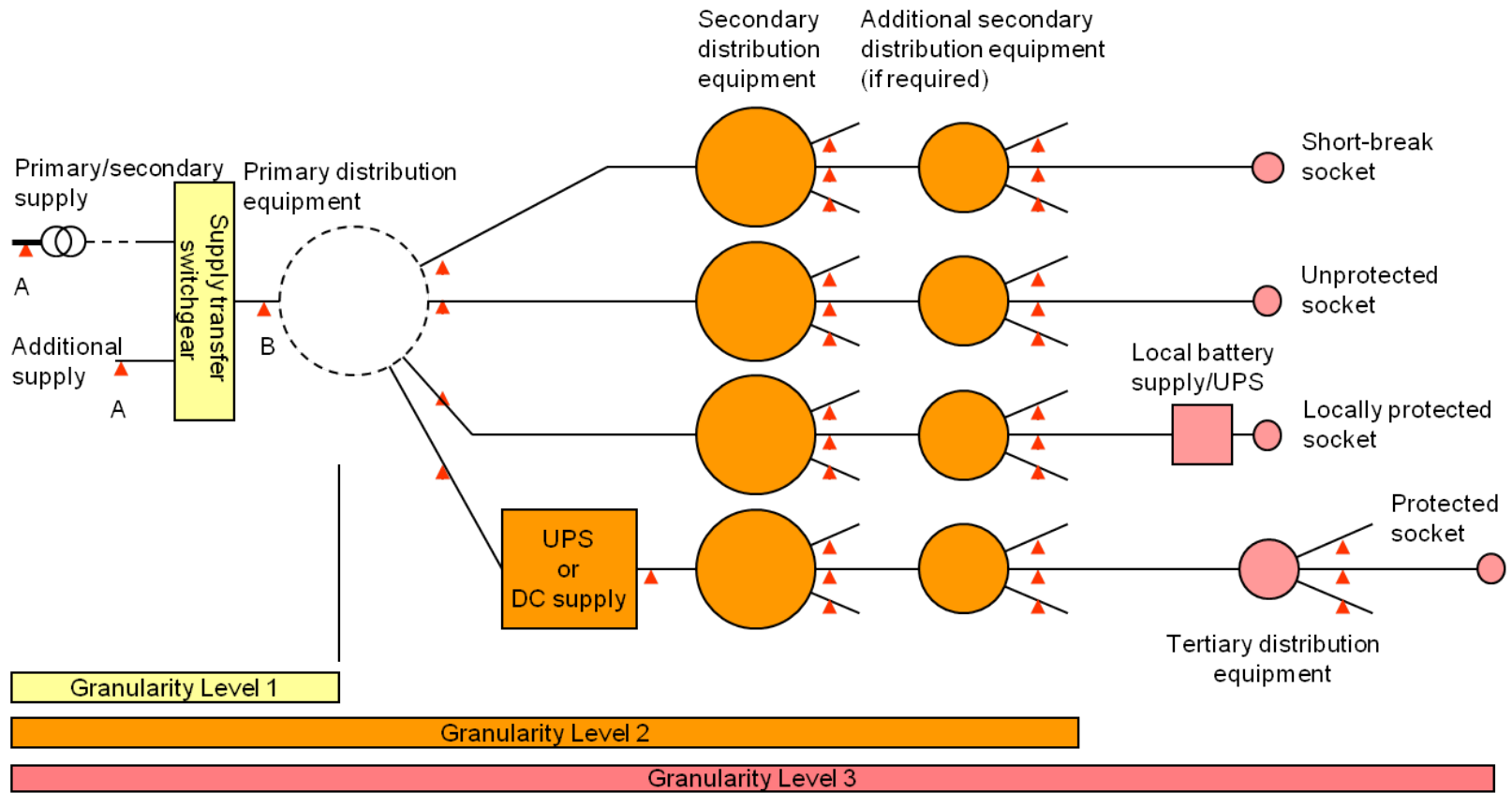
- Design Approach from the Business Perspective
 - Perform a Business Risk Analysis
 - Risk Analysis
 - Downtime Cost Analysis
 - Perform an Operation Cost Analysis
 - Apply local rules & regulations or energy efficiency initiatives
- -> Resulting Design Parameters for the entire DC
 - Availability Class
 - Protection Classes
 - Energy Efficiency Enablement Level
- -> Guideline for the design of all facilities & infrastructures

Availability



Infrastructure Element	Availability of overall set of facilities and infrastructures			
	Low	Medium	High	Very High
	Availability Class 1	Availability Class 2	Availability Class 3	Availability Class 4
Power Supply and Distribution EN 50600-2-2	Single-path (no redundancy of components)	Single-path (resilience provided by redundancy of components)	Multi-path (Active/Passive)	Multi-path (fault tolerant except during maintenance – active/active)
Environmental Control EN 50600-2-3	Single-path (no redundancy of components)	Single-path (resilience provided by redundancy of components)	Multi-path (Active/Passive)	Multi-path (fault tolerant except during maintenance – active/active)
Telecommunications Cabling EN 50600-2-4	Single-path (using direct connections or fixed infrastructure with single access network connection)	Single-path (using fixed infrastructure with multiple access network connections)	Multi-path (using fixed infrastructure with diverse pathways with multiple access network connections)	Multi-path (using fixed infrastructure with diverse pathways, redundant distribution zones and multiple access network connections)

Energy Efficiency Enablement



Protection Classes



Type of protection	Protection Class 1	Protection Class 2	Protection Class 3	Protection Class 4
Protection against unauthorised access	Public or semi-public area	Area that is accessible to all authorised personnel (employees and visitors)	Area restricted to specified employees and visitors (other personnel with access to Protection Class 2 have to be accompanied by personnel authorised to access Protection Class 3 areas)	Area restricted to specified employees who have an identified need to have access (other personnel with access to Class 2 or Class 3 areas have to be accompanied by personnel authorised to access Class 4 areas)

Type of protection	Protection Class 1	Protection Class 2	Protection Class 3	Protection Class 4
Protection against internal fire	No special protection applied	The area requires to be protected against fire by a detection and suppression system, which maintains the function of that area during a fire in that area or one in a Class 1 area.	The area requires to be protected against fire by a detection and suppression system, which maintains the function of that area during a fire in that area or one in a Class 1 or Class 2 area.	The area requires to be protected against fire by a detection and suppression system, which enables critical data centre function to be secured during a fire in that area or one elsewhere in the data centre.
Protection against other internal events	No special protection applied	Mitigation applied	Mitigation applied	Mitigation applied
Protection against external environmental events	No special protection applied	Mitigation applied	Mitigation applied	Mitigation applied

Key Benefits

Key Benefit for a DC Owner

The **DC Owner/Manager/Operator** can use EN 50600-x series to translate business demands via risk assessment in terms of infrastructure availability vs. cost in order to

- identify & select appropriate outline design requirements to provide the desired availability
- apply concepts which are standards-based, business oriented and product/technology agnostic

Important Benefits for a DC Owner

- EN 50600-1 defines straight forward "Availability" Classification across power, environmental control and telecommunications cabling using standard-based references for security systems (Access Control & Fire Management)
- EN 50600-2-x gives clear conformance requirements for data centre design and audits, no 'licenced" assessment by profit-oriented organisations
- EN 50600-2-2 and -2-3 define a measurement regimes to enable the assessment of energy efficiency (measure, control & monitor)
- EN 50600-3-1 (management & operational information) covers operational faults as well as prevents/covers administrative faults in order to maintain the design objectives
- EN 50600-x series defines a common "topology" with definitions of terms/spaces/rooms

Key Benefit for a DC Consultant

For **DC Consultants**, EN 50600-x series is a normative reference for the assessment of an appropriate DC design including defined design processes and design principles for all data centre facilities and infrastructures

Important Benefits for a DC Consultant

- EN 50600-x is a European, single go-to standard series for DC Design, not a collection of best practices
- EN 50600-x defines a common "topology" with definitions of terms/spaces/rooms
- EN 50600-1 offers a straightforward design classification system to which the consultant can show conformance
- EN 50600-3-1 (management & operational information) offers guidelines for the definition of processes for management and operating of data centres. These specifications can be used by the consultant to define operational processes to deliver the expected level of resilience, availability, security and energy efficiency

Key Benefit for Architects/Engineers

Architects & engineers get a suite of integrated standards for the design of data centre facilities & infrastructures including defined design processes and design principles

Important Benefits for Architects/Engineers

- EN 50600-x provides architects with an awareness of the complexity of the data centre infrastructures, their interrelationship and their needs for accommodation
- EN 50600-x defines a common "topology" with definitions of terms/spaces/rooms
- EN 50600-2-x provides engineers with system requirements according the chosen overall data centre infrastructure classifications

EN 50600-x's position in the global DC Design Standardization Landscape

Comparison



	50600-x	TIA-942A	ANSI/BICSI 002	Commercial Assessors
Scope	All DC facilities & infrastructures	Cabling only	All DC facilities & infrastructures	Mainly Power & Environmental Control
European Standard	✓	✗	✗	✗
Regional Application	Europe / internationally applicable by using ISO/IEC standards as references	United States	United States	International
Energy Efficiency Enablement	✓	✗	✗	✗
Management & Operation	✓	✗	?	?
Inclusion of global KPIs (ISO 30134-x)	✓	✗	✗	?
Commercially neutral	✓	✓	✓	✗
Independent Assessment	✓	✓ (Cabling only)	?	✗
Business Approach (design vs. cost)	✓	✗	✗	✓

Availability Classification EN 50600-1

Infrastructure Component	Impact of Short Failure	Administrative Risk	Class 1		Class 2	Class 3	Class 4
Power Supply and Distribution EN 50600-2-2	High	Medium	No UPS	No Resilience (Single Path)	$\geq N+1$	Concurrently Maintainable (Active/Passive)	Fault Tolerant (Active/Active)
Environmental Control EN 50600-2-3	Low	Medium	No ECS	No Resilience (Single Path)	$\geq N+1$	Concurrently Maintainable (Active/Passive)	Fault Tolerant (Active/Active)
Telecoms Cabling EN 50600-2-4	Medium	High	No Resilience (Point to Point Cabling)		No Resilience (Fixed Cabling)	Concurrently Maintainable (Multi-Path)	Concurrently Maintainable (Diverse Routed)

Straight Forward Classification

Other Availability Classifications

Infrastructure Component	Impact of Short Failure	Administrative Risk	Tier 1		Tier 2		Tier 3		Tier 4	
			Class 0	Class 1	Class 2	Class 3	Class 4			
Power Supply and Distribution EN 50600-2-2	High	Medium	No UPS	No Resilience (Single Path)	$\geq N+1$	Concurrently Maintainable (Active/Passive)	Fault Tolerant (Active/Active)			
Environmental Control EN 50600-2-3	Low	Medium	No ECS	No Resilience (Single Path)	$\geq N+1$	Concurrently Maintainable (Active/Passive)	Fault Tolerant (Active/Active)			
Telecoms Cabling EN 50600-2-4	Medium	High	No Resilience (Point to Point Cabling)	No Resilience (Fixed Cabling)		Concurrently Maintainable (Multi-Path)	Concurrently Maintainable (Diverse Routed)			

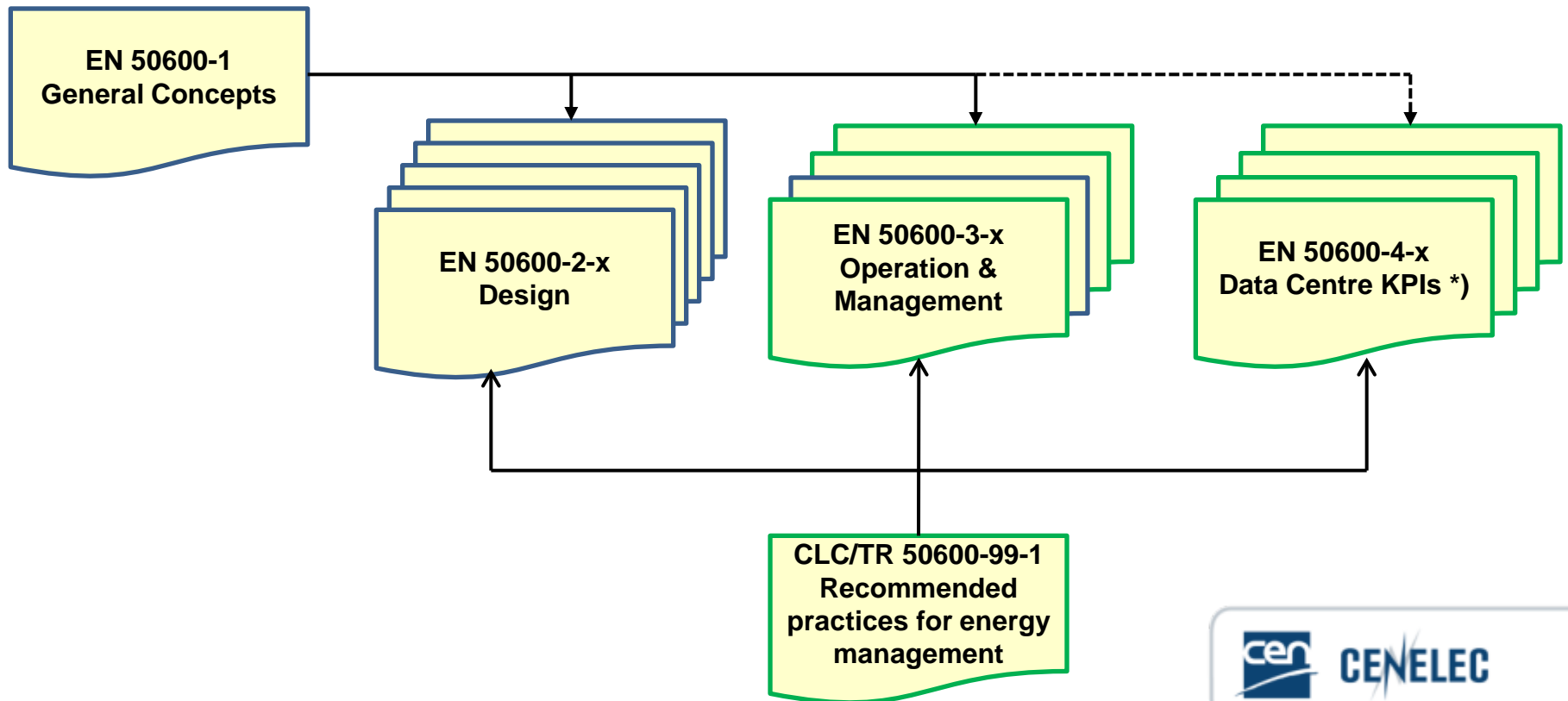
Tier 4 Uptime Institute

Category D Bitkom

Class 4 ANSI/BICSI



Future Evolution



*) publication expected mid/end of 2016

Summary

EN 50600-x Series Advantages

- CENELEC is an independent, non-profit European standardization organization
- EN 50600-x is a European standard series that
 - offers independent and comprehensive definitions & requirements for DC design and operation for all facilities & infrastructures
 - is internationally applicable for international DC owners/manager/operators by
 - replacing the European normative references with international counter parts
 - replacing European security standards by local counter parts
 - is commercially neutral without inherent assessment system
 - focusses on concepts, rather than design solutions
 - availability classification is driven by availability impact
 - protection classification is driven by availability impact

EN 50600-x Series Advantages

- EN 50600-x
 - offers as sole DC design standard an energy efficiency enablement approach that provides a basis for all energy efficiency KPI concepts, available or currently in development
 - gives guidance about the selection process for the required overall data centre design parameters
 - provides design principles for DC designer and DC owners
 - defines non-profit oriented certification criterias
- EN 50600-3-1 specifies processes for DC management and operations
- The modularity of the EN 50600 standard series enables the future integration of additional standards about management and operation resp. data centre KPIs

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About Nexans

Nexans brings energy to life through an extensive range of cables and cabling solutions that deliver increased performance for our customers worldwide. Nexans' teams are committed to a partnership approach that supports customers in four main business areas: Power transmission and distribution (submarine and land), Energy resources (Oil & Gas, Mining and Renewables), Transportation (Road, Rail, Air, Sea) and Building (Commercial, Residential and Data Centers). Nexans' strategy is founded on continuous innovation in products, solutions and services, employee development, customer training and the introduction of safe, low-environmental-impact industrial processes.

In 2013, Nexans became the first cable player to create a Foundation to introduce sustained initiatives for access to energy for disadvantaged communities worldwide.

Nexans is an active member of Europacable, the European Association of Wire & Cable Manufacturers, and a signatory of the Europacable Industry Charter. The Charter expresses its members' commitment to the principles and objectives of developing ethical, sustainable and high-quality cables.

We have an industrial presence in 40 countries and commercial activities worldwide, employing close to 26,000 people and generating sales in 2015 of 6.2 billion euros. Nexans is listed on NYSE Euronext Paris, compartment A.

In the field of **LAN Cabling Systems, Nexans Cabling Solutions** offer a complete range of products and value added services providing improved reliability and reduced cost of ownership for Network Managers, together with faster installation times for installers.

In addition to LANmark brand cabling systems and LANactive brand FTTO systems, Nexans also specialises in LANSense Intelligent Infrastructure Management (IIM) products including Environmental Monitoring and Access Control (EMAC) devices. Nexans offers an unrivalled choice of LAN infrastructure solutions to a global customer based through an extensive network of regional offices and Key Account Management team.

For more information, please consult <http://www.nexans.com/LANsystems>

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