



THE EUROPEAN CODE OF CONDUCT, EN50600 AND THE DATA CENTRE STANDARDS LANDSCAPE

Mark Acton

Critical Service Director

CBRE Data Centre Solutions

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EUROPEAN CODE OF CONDUCT

- The first government led set of data centre specific best practices published worldwide
- Offers a free to use set of tried and tested Data Centre Best Practices available to use on a voluntary basis
- Aims to inform and support data centre operators and owners in reducing energy consumption (Endorsers and Participants)
- Parties signing up are expected to follow the intent of the Code of Conduct and abide by a set of agreed voluntary commitments
- The 2016 revision has just been released (V7.1.2 - February 2016)



EU CODE OF CONDUCT FOR DATA CENTRES

The Code is:

- **Free** to access and download
- Led by European Commission **Joint Research Centre**
- Flexible mechanism to initiate and develop policy
- Forum for industry, experts and Member States
- Open and continuous dialogue on market and product performance
- Identify and focus on key issues and agree solutions
- Set ambitious **voluntary** standards and commitments
- A set of proven **Best Practices** and a reporting **Scheme**



WHAT IS THE SCOPE OF THE CODE?

- The Code of Conduct covers:
 - “Data Centres” of all sizes – server rooms to dedicated buildings
 - Both existing and new
 - IT power and Facility power
 - Equipment procurement and system design
- The Code of Conduct is intended for:
 - **Participants**: Data centre owners and operators
 - **Endorsers**: Vendors, consultants, industry associations



THE FOUR BASIC OPERATIONAL SCENARIOS

Benefitting from international Expert Review the Code covers four basic operational situations:

- Day to day operations (energy management)
- Normal replacement cycle or adding new servers
- Retrofit / dedicated energy efficiency programme
- Designing and building new data centres

Contributions and reviews from:

- EU, UK, Japan, USA
- The Green Grid
- Vendor specialists
- Facility operators
- Professional industry bodies
- Equipment manufacturers



THE BEST PRACTICES EXPLAINED

Best Practice Structure:

- Reviewed and updated annually
- Focussed on goals and processes
- Structured to allow the addition of new technologies
- Neither a prescriptive nor exhaustive list of specific technologies

| Category | Description |
|--------------------------------|---|
| Entire Data Centre | Expected to be applied to all existing IT, Mechanical and Electrical equipment within the data centre |
| New Software | Expected during any new software install or upgrade |
| New IT Equipment | Expected for new or replacement IT equipment |
| Build or retrofit 2010 onwards | Expected for any data centre built or undergoing a significant refit of the M&E equipment from 2010 onwards |

WARNING – LEGISLATION WILL INCREASE.....

If we do not demonstrate that we are improving and managing our energy consumption there is a significant danger the legislation will be imposed on our sector.



Used and administered properly the Code can offer proof to potential legislators that we are responding to the requirement to improve energy efficiency across the sector.

CENELEC AND EMERGING EUROPEAN STANDARDS

- CENELEC is the European Committee for Electrotechnical Standardization and is responsible for European standardization in the field of electro-technical engineering.
- Designated as a European Standards Organization by the European Commission.
- CENELEC TC 215 WG3 (EN 50600 series), is responsible for the development of EN50600 series of standards.
- CENELEC are a member of the CEN / CENELEC / ETSI Coordination Group: Green Data Centres (GDC).
<http://www.cencenelec.eu/standards/Sectors/ICT/Pages/GreenDataCentres.aspx>

THE EMERGENCE OF EN 50600

- EN 50600 (Information technology - Data centre facilities and infrastructures)
- Currently being drafted by local ISO country representative organisations (BSI in the UK).
- Includes sections for building construction, power distribution, environmental control, telecoms cabling, security systems, management and operations
- Incorporated into ISO/IEC JTC 1 Study Group on Energy Efficiency of Data Centers (SD-EEDC).



EN 50600 SERIES OF STANDARDS

- EN 50600-1:** *Information technology - Data centre facilities and infrastructures – Part 1: General concepts*
- EN 50600-2-1:** *Building construction*
- EN 50600-2-2:** *Power distribution*
- EN 50600-2-3:** *Environmental control*
- EN 50600-2-4:** *Telecommunications cabling infrastructure*
- EN 50600-2-5:** *Physical security*
- EN 50600-3-1:** *Management and operational information*
- EN 50600-4-1:** *KPIs - Overview and general requirements*
- EN 50600-4-2:** *KPIs - Power Usage Effectiveness (PUE)*
- EN 50600-4-3:** *KPIs - Renewable Energy Factor (REF)*
- EN 50600-4-4:** *KPIs - IT Equipment Energy Efficiency for Servers*
- EN 50600-4-5:** *KPIs - IT Equipment Energy Utilisation for Servers*

EN 50600 AND EU CODE OF CONDUCT

- The Code of Conduct best Practices have been incorporated into CLC/TR 50600-99-1
- This includes all the 2016 CoC revisions
- The resulting Technical Report which supports the EN 50600 series is in final vote and due for publication in Q2 2016
- The TR will be translated into at **least** French and German in addition to English
- The TR will be independent of the EU CoC Participant and Endorser schemes however audits may well become available



IMPORTANT FOR IRELAND.....

- There is currently no Irish National representation for the development of the EN50600 series of data centre standards (CEN/CENELEC TC215 WG3)
- The national body for Irish involvement in European standards development is NSAI – National Standards Authority of Ireland - www.nsai.ie
- There is a Permanent Delegate of the Irish National Committee (NSAI) to the CENELEC Technical Board:

Permanent Delegates

Mr Justin TALLON

✉ Manager Standards Production and Promotion
NSAI National Standards Authority of Ireland
1 Swift Square - Northwood - Santry
IE - Dublin 9

☎ + 353 18 07 38 74
📄 + 353 18 07 38 38
✉ justin.tallon@nsai.ie

INTERNATIONAL STANDARDS INSTITUTE (ISO)

- ISO is an independent, non-governmental membership organization and the world's largest developer of voluntary International Standards.
- Members are the national standards bodies of the 163 member countries around the world. Based in Geneva, Switzerland.
- Works alongside International Electrotechnical Commission (IEC), in the development of emerging international data centre standards.
- ISO/IEC JCT1 SC39 WG1 are responsible for the development of the ISO/IEC 30134 series of standards (data centre resource efficiency KPIs).
- Development of PUE / DCiE from The Green Grid now falls under ISO/IEC JCT1 SC39 (ISO/IEC 30134-2).

UPTIME INSTITUTE TIERS

Uptime Institute:
Tier Standard: Topology



Last update published:
August 2012

UPTIME INSTITUTE, LLC

**Data Center Site Infrastructure
Tier Standard: Topology**

Prepared by Uptime Institute Professional Services, LLC



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Uptime Institute, LLC

UPTIME INSTITUTE TIER TOPOLOGY

Tier I: Basic Capacity

- Computer room, UPS, engine generator, computer cooling
- Single distribution path and 'N' capacity
- Susceptible to all maintenance- and fault-related shutdowns

Tier II: Redundant Capacity

- Single distribution path and $N + R$ components
- Shutdown MAY be required for maintenance on redundant components
- Susceptible to shutdowns for maintenance on distribution paths
- Susceptible to fault

Uptime Institute™

UPTIME INSTITUTE TIER TOPOLOGY

Tier III: Concurrent Maintenance

- Maintenance or replacement of each and every distribution and capacity components
- No shut down for planned equipment work or replacement
- Susceptible to fault

Tier IV: Fault Tolerance

- Multiple, active, Compartmentalized capacity components and distribution paths autonomously
- 'N' after any failure
- No shut down for planned equipment work or replacement
- No shut down for single fault

Uptime Institute™

TIA-942

- Telecommunications Infrastructure Standard for Data Centers
- Had an infrastructure appendix based on original Uptime Institute Tiers which led to confusion – Now removed due to legal ruling
- Primarily a cabling standard
- US Centric and very prescriptive
- Last updated in 2012
- No certifications offered by TIA nor do TIA certify others to offer certification – however certifications are offered by some....



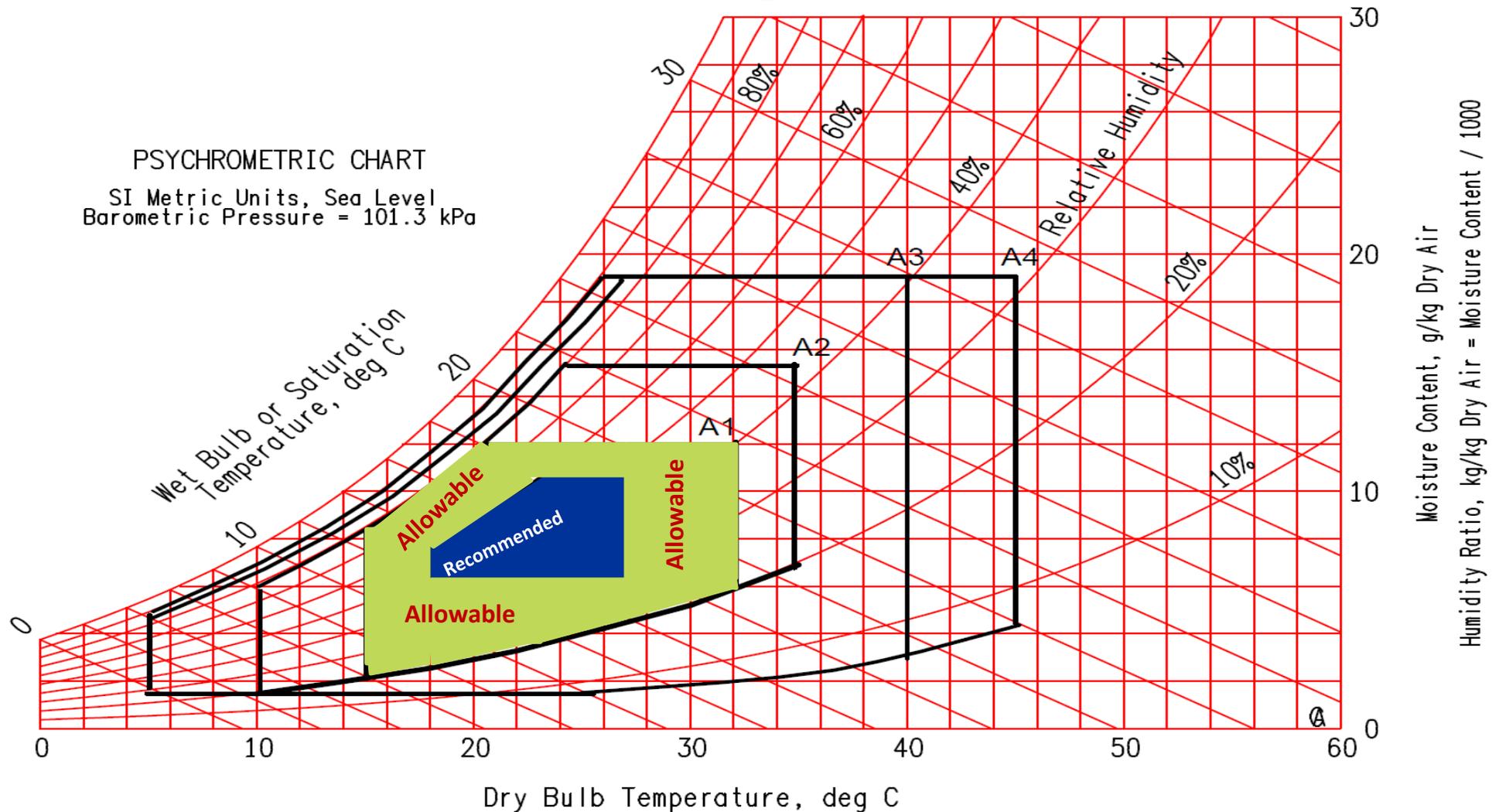
American Society of Heating, Refrigerating and Air Conditioning Engineers



- Why is a US standard so important?
- Provides the environmental metrics agreed to by the IT equipment manufacturing industry
- Defines what OEMs will warrant against and therefore data centre design and operation parameters
- Revised in 2011
- Thermal Guidelines Whitepaper which re-names/defines both recommended and allowable temperature ranges for IT equipment

ASHRAE - TC 9.9 2011

Thermal Guidelines for Data Processing Environments



Recommended
Allowable (A1)
Allowable (A2)

18-27°C at server inlet (5.5dew point - 60% RH)
15-32°C at server inlet (20-80% RH)
10-35°C at server inlet (20-80% RH)

Q & A?

Mark Acton

Critical Services Director

CBRE Data Centre Solutions

Mark.Acton@cbre.com

Skype: actonmark

Twitter: @MFActon