



ANSI/TIA-942-C What's New?

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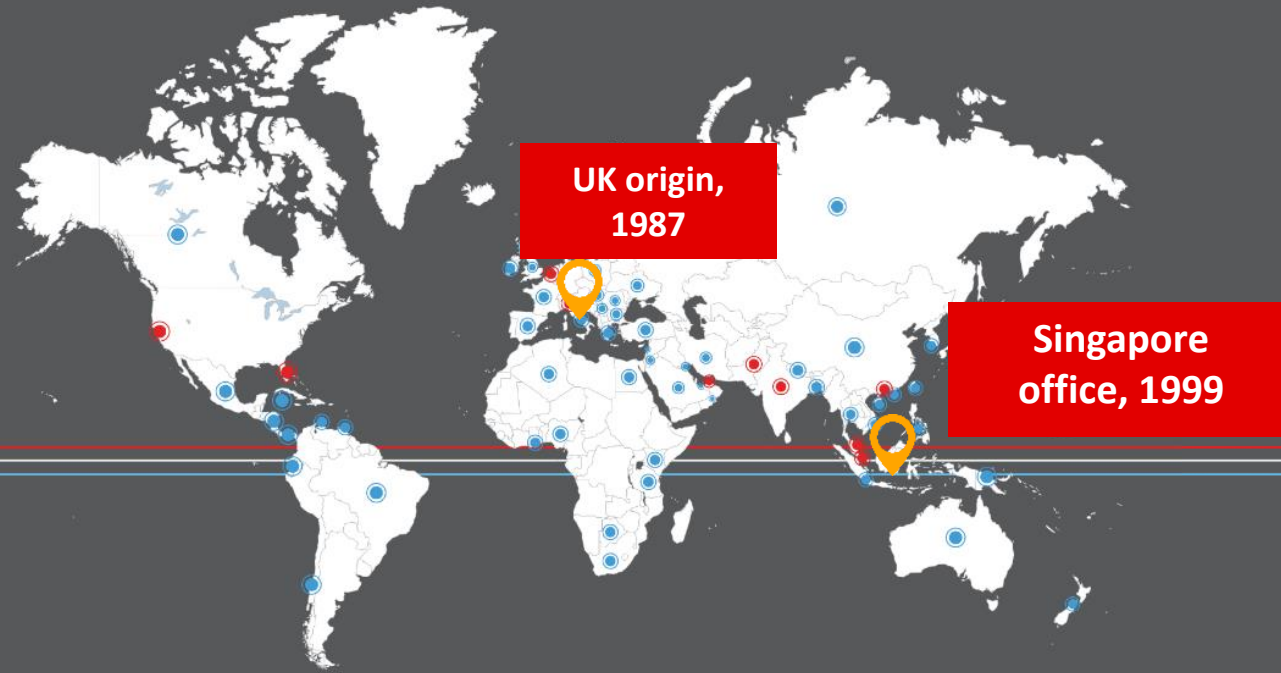
Agenda



- 1 About EPI**
- 2 ANSI/TIA-942 – Data center standard**
- 3 ANSI/TIA-942-C changes update**
- 4 ANSI/TIA-942 Certification**



History & Global Locations



11 EPI offices
worldwide

Global partner network spanning
60+ countries, 130+ cities

ANSI/TIA-942-C Updates

Global Certification Body for Data Center



ANSI/TIA-942-C Updates

Services



FACILITIES

Audit &
Certification



OPERATIONS

Audit &
Certification



PEOPLE

Training &
Certification

Awards & Achievements

ANSI/TIA-942-C Updates



TIA Gold Leader



TIA Star Awards



Top APAC Business Leaders, W.Media



Official Training Partner, AFCOM



CEO of the Month, CIO Outlook



CEO of the Month, CIO Review



20 Most Innovative Company to Watch



Official Training Partner, DCW



20 Most Promising Data center Solution Provider, CIO Review



20 Most Promising Data center Solution Provider, Insight Success



Quoted in many publications



ANSI/TIA-942

**Data center standard for
design and build**

ANSI/TIA-942 standard



- The ANSI/TIA-942 “Telecommunications Infrastructure Standard for Data Centers”
 - Published by TIA (Telecommunication Industry Association) under American National Standard (ANSI)
 - It specifies the minimum requirements for data center infrastructures to connect the adaptability to risk assessment.
- The first version was published in 2005
- The subsequent versions were A (2012/2014), B (2017)
- The latest is C (2024)

ANSI/TIA-942 coverage areas

- Network architecture (and data cabling system)
- Electrical design
- Mechanical systems
- System redundancy for electrical, mechanical and telecommunication
- Fire safety
- Physical security
- Efficiency

ANSI/TIA-942 Rated/Rating



- Rated/ Rating levels for data centers provides levels of businesses availability through the redundancy levels of infrastructures

Level	Expected outcome
Rated-1	Base line availability
Rated-2	Improved availability due to addition of redundant components to critical parts of the infrastructure
Rated-3	Concurrent Maintainable; data center can undergo any form of maintenance without the need to shutdown (concurrently maintainable) which supports 24x7 operations
Rated-4	Fault Tolerant; allows concurrent maintainability and one (1) fault anywhere in the installation without causing downtime (Fault Tolerant)



ANSI/TIA-942-C

Changes Update

Some of the key changes: **General**



- Adaptability to local conditions based on risk assessment



Some of the key changes: **General**



- Micro edge data centers (μ EDCs) are now part of the normative section (Annex E)
- Includes full description and reference table with all requirements



Some of the key changes: **General**



- Two type definitions
 - Type A μ EDCs rely on other μ EDCs to provide high availability. Availability can be provided by virtualization of functions in multiple μ EDCs with automatic transparent transfer of a functionality to an alternative μ EDC.
 - Type B μ EDCs rely on a combination of measures internal to the μ EDC as well as by external networking with other μ EDCs to provide high availability.

Some of the key changes: **General**



- More sustainability related considerations
 - Energy efficiency
 - Energy re-use
 - Updated temperature and humidity guidelines as per ASHRAE TC 9.9 (5th edition) including addition of new High Density H1-Class
- Energy efficiency (PUE) is now also referencing ISO/IEC 30134 (Information Technology – data centers – Key performance indicators)



Telecommunications Changes

Some of the key changes: **Telecom**



- Added single balanced twisted-pair cable as a recognized type of cable for horizontal cabling as per TIA-568.5
- Where balanced twisted-pair cabling is used for wireless access points two category 6A or higher performing cabling runs as a minimum requirement

Some of the key changes: **Telecom**



- Optical fiber connectors may be any TIA-568.3 compliant connector outside the equipment outlet (EO)
- LC and MPO connectors are still the required optical fiber connectors at the EO
- Added recommendation for a minimum of two optical fibers for horizontal and backbone cabling

Some of the key changes: **Telecom**



- Racks in MDA, IDA and HDA shall be at least 800 mm wide (changed from 600mm) to provide adequate cable management
- Cable fire rating requirements include now reference to plenum-rated or LSZH (Low Smoke Zero Halogen) depending on the application
- Include recommendation for Ultra-Low latency networks



Architectural Changes

Some of the key changes: **Architectural**



- Data center site selection is now more specific relating to risk evaluation
 - Flight path distance has been removed
 - Flooding hazard area risk, proximity to coastal or navigable inland waterways as well as highways and rail lines has expanded to allow for 'other appropriate risk mitigating solutions' to allow for more location's flexibility
 - Bullet proofing from required to 'as per local threat assessment'

Some of the key changes: **Architectural**



- Addition for consideration of favourable locations that promote sustainability, reduce impact to climate change and encourage net-zero carbon inventory
- Minimum floor loading lowered for computer rooms that are less than 20 m² (220 ft²): 5 kPA (100 lbf/ft²)
- Importance factors for architectural design removed considering cost implications and local code requirements

Some of the key changes: **Architectural**



- Building construction type for R-3 and R-4 expanded to allow for Type 1A, 1B, IIA, IIIA and VA
- Fire resistive requirements table simplified
 - Rated-4 fire rating for exterior walls reduced from 4 hours down to 2 hours
 - Rated-4 fire rating for interior walls reduced from 2 hours down to 1 hours

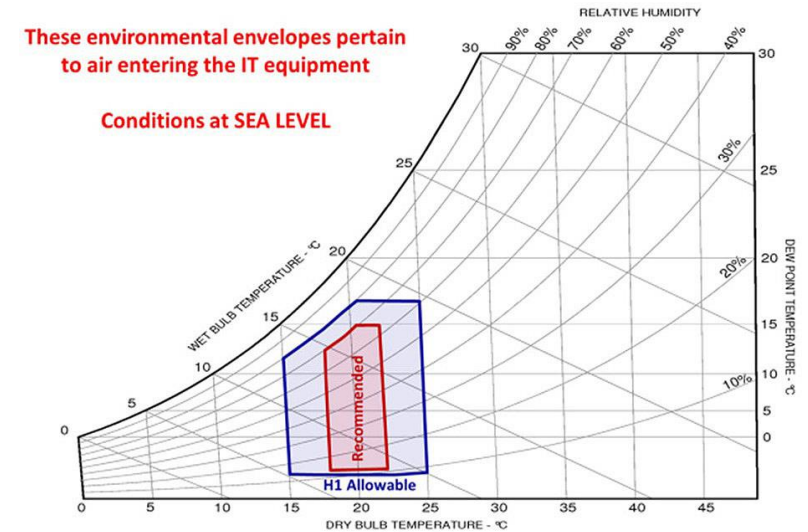


Mechanical Changes

Some of the key changes: Mechanical



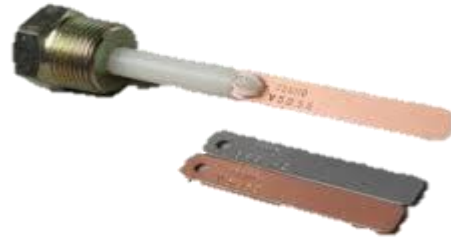
- Updated temperature and humidity guidelines as per ASHRAE TC 9.9 (5th edition) including addition of new High Density H1-Class
- Operational temperature and humidity classes changed from Class A1 or A2 now widened to Class A1 up to A4
 - Operating outside is allowed for immersion cooled environment of where equipment designed for other conditions



Some of the key changes: **Mechanical**



- Semi-annual corrosion testing should be performed



- Indoor air conditioning units (if deployed) no longer requires a 5-8 redundancy ratio.
 - Any ratio is fine with proof for CM and FT
- The term 'sprinklers' have been replaced by 'sprinklers and discharge nozzles'

Some of the key changes: **Mechanical**



- Environmental design now support liquid cooled systems in addition to air cooled systems
- Addition of Immersion cooling (informative) table



Some of the key changes: **Mechanical**



- Fuel supply system requirements changed
 - R-1; Belly tank with 80% => 12 Hrs
 - R-2; 24 Hrs => 12 Hrs
 - R-3; 72 Hrs => 24 Hrs
 - R-4; 96 Hrs => 24 Hrs
- All subject to allowance by local AHJ
- R-3 and R-4 require bulk fuel supply agreement with 6-Hr response from at least 2 providers



Electrical Changes

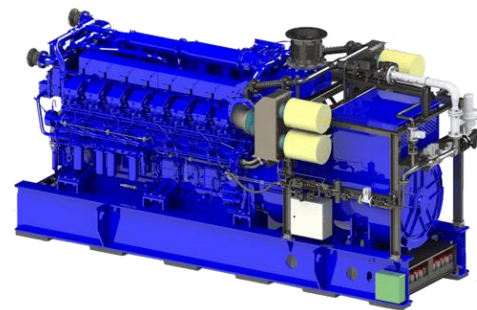
Some of the key changes: **Electrical**



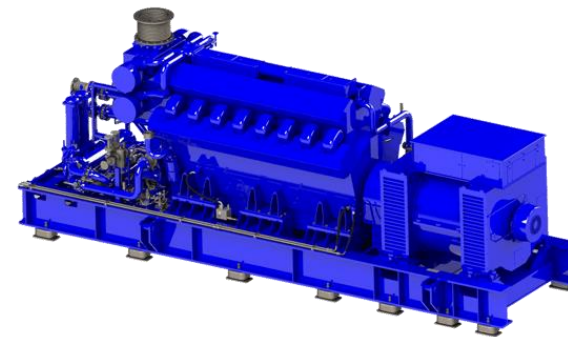
- Standby Generator is renamed to 'backup power system' to allow the back power also to come from not only from generators but also other energy storage systems including fuel cells, gas turbines, microgrids etc.



Hydrogen Fuel Cell
Toshiba



Gas Generator
Mitsubishi



Diesel Generator
Mitsubishi

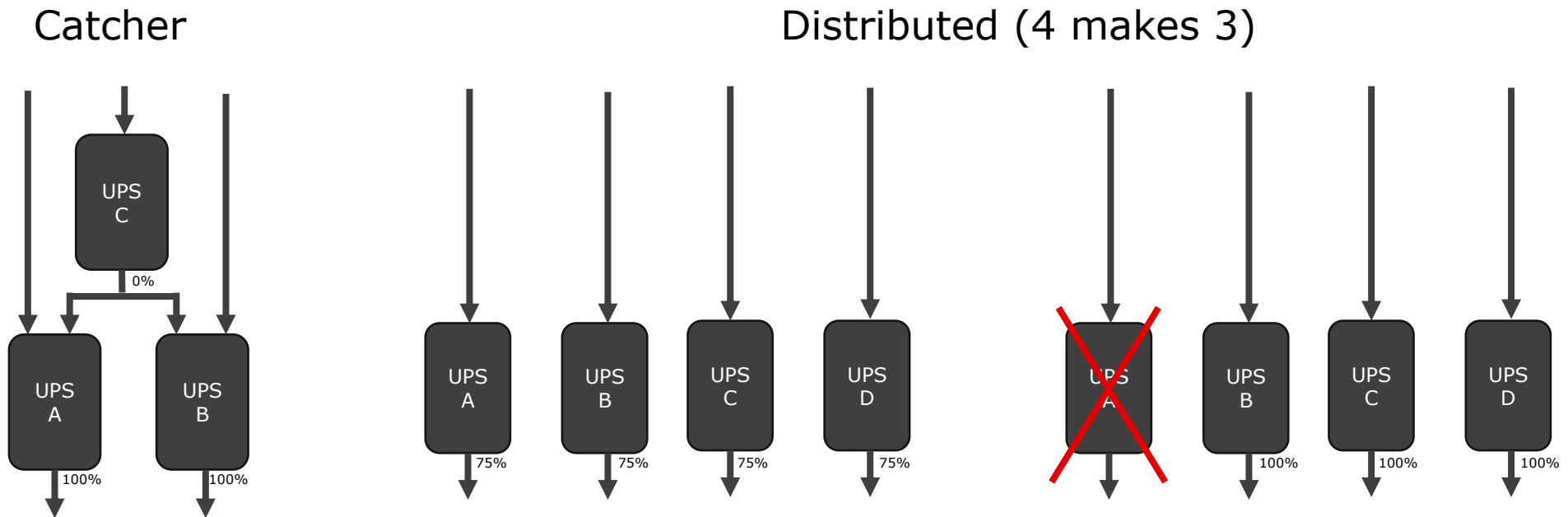


BESS: Battery Energy Storage System
Energy Vault Nevada

Some of the key changes: **Electrical**



- Redundancy definitions now also include
 - $2N(+C)$ allowing for catcher redundancy
 - $(N+1)/N$ commonly known as '4 Makes 3' distributed redundancy



Some of the key changes: **Electrical**



- Battery minimum back up time no longer states time in minutes but specifies it should be able to handle the time it takes for the standby power system to come online
- Battery design life changed from 5 or 10 year to a minimum of 5 years
- Monitoring changed from string to bank level for R2 – R4



ANSI/TIA-942

Certification

Audit & Certification

ANSI/TIA-942-C Updates



DCDV / DCCC



TIA-942 Ready



Modular DC



Product

Certificates of ANSI/TIA-942

ANSI/TIA-942-C Updates

DCDV	Design Documents
DCCC	Constructed Facilities
TIA-942 Ready	Container / Prefabricated Structures
Modular	Micro-Modular Data Centers (Containment Solutions)
Product	Product Certification (UPS, Generators, etc)



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