



# Hosting and Infrastructure Standards

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Skype Call 01 July 2019

# GP IT Futures Skype Meeting instructions

- Due to the large number of attendees, please can you switch yourself to mute to avoid background noise.
- The webinar is being recorded. The recording will be posted on the pre\_167 Digital Buying Catalogue Registration Pages on Bravo: <https://nhsdigital.bravosolution.co.uk>
- To ask questions during the Skype Meeting, please use the messaging function. To log a question just type your message into the box
  - » **It would be really helpful if attendees could indicate which Supplier they are representing by using the messaging function**
- If there is time, we may try and answer questions at the end of the webinar. Otherwise, all of the questions asked today will be taken away and responses will be shared via the Bravo portal.
- If you have any additional questions after the webinar please submit these to [buying.catalogue@nhs.net](mailto:buying.catalogue@nhs.net)

# Purpose of this Webinar

- Present and Overview of the **Hosting and Infrastructure standards** to assist suppliers during on boarding of their solutions onto the NHS Digital buying catalogue and specifically demonstrating compliance against these standard

# Contents

- Background & Context
- Previous approach under GPSoC and the need for change
- Overview of leading data centres standards, and where BS EN50600 fits in those
  - High level differences between standards
  - Walkthrough of BS EN50600 standard set
- Accreditation position and plans
  - Cloud Services
  - Co located/On premise solutions
- Demonstrating compliance against the Hosting and Infrastructure standards
- Q&A

# Background and Context

GP IT

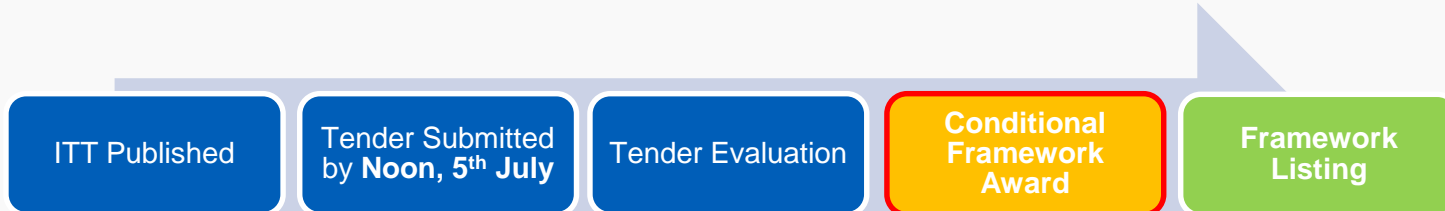
# Context

Catalogue Standards Compliance – subject of today’s webinar



Catalogue – Webinar, Wed 4<sup>th</sup> June

 **Hosting and Infrastructure Standards**



Framework – Webinar, Friday 7<sup>th</sup> June

# Standards evidence - recap

- Each Standard is expressed as a requirement in a Traceability Matrix (TM)
  - Download the TM,
  - Complete it
  - Upload it again to the Catalogue



# Types of Scope of Standards - Recap

- All Solutions are subject to:
  - Overarching Standards – these apply to all Suppliers irrespective of the Capabilities their Solutions support
    - **Hosting and Infrastructure Standards**
      - NHS Cloud Hosting
      - **Co location and Provider Data Centre Hosting & Infrastructure**
  - Some Solutions may be subject to other standards depending on their Capabilities:
    - Interoperability
    - Capability, Context Specific



# Retrospective: The hosting & infrastructure requirements under GPSoC

# Review of GP SoC



# Review of GP SoC Q4 2018

- We found...
- Some duplication across sections
- Lots of detail and that...
- The Majority of requirements are covered in **EN50600/EUCOC/ISO standards**
- With some exceptions. but practically what is the...
- Expectation Verses Actual?

# Review of GP SoC Q4 2018

- Expectation Verses Actual?
- **Certified** TIA 942 and Uptime Institute Tier Topology and Ratings are few and far between in the UK!
- **TIA 942 Certified Sites = 0**
- **Uptime Institute = 14**

# Data Centre Standards – Pre 2010

- Before 2010:
  - Guidance Documents
    - ANSI/BICSI 002
    - EU Code of Conduct for Data Centres (Energy Efficiency)
    - ETSI 105 174-2
  - Proprietary “Certification” Systems
    - Uptime Institute Tier Ratings
    - Design Documents
    - Constructed Facility
- NO NATIONAL, EUROPEAN OR INTERNATIONAL STANDARDS
- NO BROAD AGREEMENT OF DEFINITION OF “DATA CENTRE”

# Data Centre Standards – Pre 2010

- Telecommunications Cabling Standards
- ISO/IEC 24764 (11801-5)
- EN 50173-5
- ANSI/TIA 942
- ISO/IEC 14763-2
- EN 50174-2

# Data Centre Standards – 2010

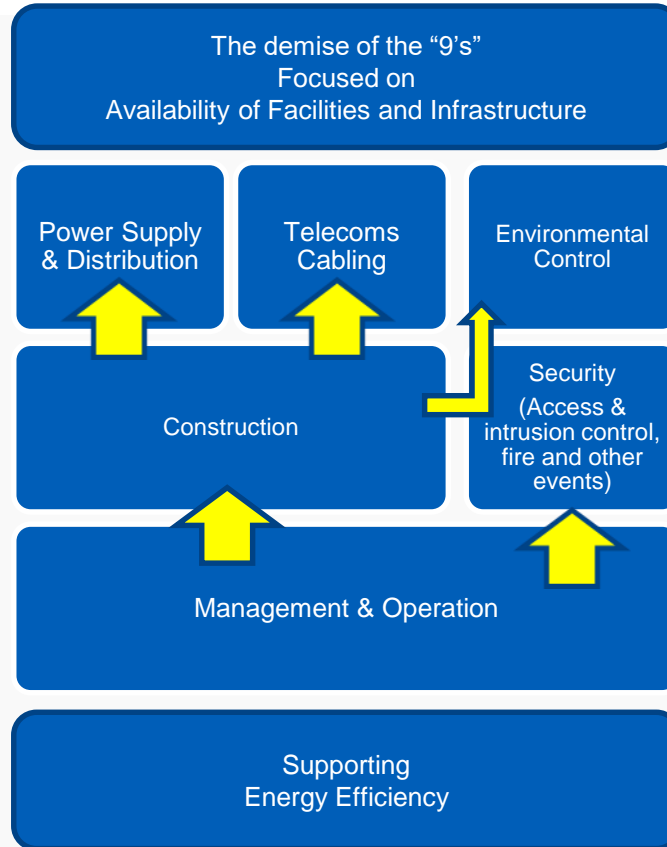
- In 2010:
- European Standardisation begins:
  - 
  - “Data Centre” definition – Part 1
- “A structure, or group of structures, dedicated to the centralized accommodation, interconnection and operation of information technology and network telecommunications equipment providing data storage, processing and transport services”
- Note: A structure can consist of multiple buildings and/or spaces with specific functions to support the primary function.
- Note: the boundaries of the structure or space considered the data centre which includes the information and communication technology equipment and supporting environmental controls can be defined within a larger structure or building.

# Data Centre Standards – 2010

- In 2010:
- European Standardisation begins:
- 
- “Data Centre” definition – Part 2
- “A structure, or group of structures, dedicated to the centralized accommodation, interconnection and operation of information technology and network telecommunications equipment providing data storage, processing and transport **together with all the facilities and infrastructures for power distribution and environmental control together with the necessary levels of resilience and security required to provide the desired service availability**”



# EN 50600 Series



# EN 50600 Series – Data Centre Function

- EN 50600-1:2019 – General Concepts
- EN 50600-2-1:2014 - Building Construction
- EN 50600-2-2:2019 - Power (Supply and) Distribution
- EN 50600-2-3:2019 - Environmental Control
- EN 50600-2-4:2015 - Telecommunications Cabling Infrastructure
- EN 50600-2-5:2016 - Security Systems
- EN 50600-3-1:2016 - Management & Operational Information
  
- TR 50600-99-3 - Guidance to the application of the EN50600 Series

# EN 50600 Series – Resource Management

- EN 50600-4-1:2016 – Overview of, and general requirements for, KPIs
- EN 50600-4-2:2016+A1:2019 - Power Usage Effectiveness (PUE)
- EN 50600-4-3:2016+A1:2019 - Renewable Energy Factor (REF)
- EN 50600-4-4 - ITEEsv \*ISO/IEC 30134-4
- EN 50600-4-5 - ITUEsv \*ISO/IEC 30134-5
- EN 50600-4-6: - Energy Re-Use Factor (ERF)
- EN 50600-4-7 - Cooling Efficiency Ratio (CER)
- EN 50600-4-8 - Carbon Utilisation Effectiveness (CUE)
- EN 50600-4-9 - Water Utilisation Effectiveness (WUE)
  
- TR 50600-99-1 - Recommended practices for energy management
- TR 50600-99-2 - Recommended practices for environmental sustainability

# ISO/IEC 30134 & EN 50600 &.....

- Confusion due to ISO Committee overlap
- IST46 and TCT73, NOW MERGED!
- All ISO/IEC 30134 standards will become EN50600-4-X
- But ALL Data Centre Standards Globally will end up as
- ISO/IEC 22237-X

	50600-x	TIA0942A	ANSI/BICSI 002	Commercial Experts
Area of Application	All DC Installations and infrastructures	Cabling Only	All DC Installations and infrastructures	Mainly power and environmental conditions
European Standard	✓	✗	✗	✗
Regional Applicability	Europe/Internationally (with ISO/IEC standards as references)	USA	USA	International
Degree of Energy Efficiency	✓	✗	✗	✗
Management & Operation	✓	✗	?	?
Applying Global KPIs (ISO/IEC 30134-x)	✓	✗	✗	?
Commercially Neutral	✓	✓	✓	✗
Independent Assessment	✓	✓ (Cabling Only)	?	✗
Business Approach (Design V Costs)	✓	✗	✗	✓

# Overview of the NHS Digital standards for the hosting of solutions

# UK Government Policy

- UK Govt Policy is:
  - Cloud First (NHS Public Cloud)
- *“Whilst UK government promotes a Cloud First policy it is recognised that many solutions are hosted in traditional co located or on premise facilities”*

# Compliance - EN50600

- UK Govt Policy is:
  - Cloud First (NHS Public Cloud)
- However Colocation/On Premise should demonstrate compliance against EN50600.



# Compliance - EN50600

- It is a...
- *“Suppliers responsibility to ensure they fully understand industry standards & best practice and cannot rely on the Authority explicitly defining requirements at a point in time. .”*

# GPIT-F

- The GP IT Futures Technology Strategy has a fundamental principle of delivery of services via cloud provision and specifically the architecting of Solutions to be cloud native using generic industry standards which are independent of any commercial frameworks and are not specific to primary care or indeed healthcare more generally.
- NHS Digital recognises that cloud hosting may not be appropriate for some services e.g. based on the sensitive and scale of data or the manner in which the service is architected.

# GPIT-F - Options

- 1 Cloud – (Public or Private) - strongly preferred
- 2 Co-lo - Your equipment in a Colo provider's DC - preferred
- 3 Your own DC - less preferred
- 4 The final option of local hosting in GP practices – is not a recommended option - .

# GPIT-F - Options

- The Authority does **not** recommend option **3 or 4** - is that suppliers hosting services themselves. This is due to the cost and complexity of **providing data centre capabilities** that meet the necessary **standards**.
- Previously the GPSoC framework provided a set of requirements for local hosting of services. Given the security and service risks of this form of infrastructure the GPIT catalogue and frameworks, the **AUTHORITY will not formally assure local hosting of services**. Buyers purchasing services which are locally hosted will be required to **satisfy themselves** that the **security and service risks** are mitigated and managed appropriately.

# GPIT-F – Hosting & Infrastructure

- Refer to
- Confluence
- <https://gpitbjss.atlassian.net/wiki/spaces/GPITF/pages/1391135052/Co+location+and+Provider+Data+Centre+Hosting+Infrastructure+Requirements>

## GPIT-F – Co-location and Provider

### Data Centre Hosting & Infrastructure Requirements – External Standards

Requirement ID	Standard	Name	Description	Level	Evidence
ES1.0	NHS and social care data: off-shoring and the use of public cloud services guidance	NHS and social care data: off-shoring and the use of public cloud services guidance	<p>The geographical location (or specific range of locations) of the clinical data at rest and service management activities at any given time are to be known and communicated to NHS Digital. Operating the Solution or elements of the Solution outside of England will be with the permission of NHS Digital, the data controllers and their representative organisations..</p> <p>Note: There are no absolute barriers to the off-shoring of data or services, although the requirements of UK Government IA policy must be able to be met in the overseas location. See Data Protection Act and Offshoring for statements on the offshoring of information.</p>	MUST	Provide formal confirmation of compliance to requirement

# GPIT-F – Co-location and Provider Data Centre Hosting & Infrastructure Requirements – External Standards

Requirement ID	Standard	Name	Description	Level	Evidence
ES2.0	Sanctions, embargoes and restrictions	Sanctions, embargoes and restrictions	The supplier will require approval from NHS Digital of any part of the Solution that is hosted or communicates with services outside of England. The communication between systems will not be made to those countries or states prohibited by Government Policy.	MUST	Provide formal confirmation of compliance to requirement

# GPIT-F – Co-location and Provider Data Centre Hosting & Infrastructure Requirements – External Standards

Requirement ID	Standard	Name	Description	Level	Evidence
ES3.0	Cyber Essentials Plus	Certified cyber security	Protect your organisation against cyber attack Cyber Essentials helps you to guard against the most common cyber threats and demonstrate your commitment to cyber security	MUST	Valid Cyber Essentials Plus Certificate



# GPIT-F – Co-location and Provider

## Data Centre Hosting & Infrastructure Requirements – External Standards

Requirement ID	Standard	Name	Description	Level	Evidence
ES4.0	ISO 27001 - IT Security Management Systems	ISO/IEC 27001:2013	ISO/IEC 27001:2013 specifies the requirements for establishing, implementing, maintaining and continually improving an information security management system within the context of the organisation. It also includes requirements for the assessment and treatment of information security risks tailored to the needs of the organisation. The requirements set out in ISO/IEC 27001:2013 are generic and are intended to be applicable to all organisations, regardless of type, size or nature.	MUST	Valid ISO Certificate required from UKAS registered accreditation organisation.

# GPIT-F – Co-location and Provider

## Data Centre Hosting & Infrastructure Requirements – External Standards

Requirement ID	Standard	Name	Description	Level	Evidence
ES5.0	ISO 9001 - Quality management systems	ISO 9001:2015	<p>ISO 9001:2015 specifies requirements for a quality management system when an organisation:</p> <ul style="list-style-type: none"><li>a) needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, and</li><li>b) aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.</li></ul> <p>All the requirements of ISO 9001:2015 are generic and are intended to be applicable to any organisation, regardless of its type or size, or the products and services it provides.</p>	MUST	Valid ISO Certificate required from UKAS registered accreditation organisation.

## GPIT-F – Co-location and Provider

### Data Centre Hosting & Infrastructure Requirements – External Standards

Requirement ID	Standard	Name	Description	Level	Evidence
ES6.0	ISO 20000 Information technology -- Service management	ISO 20000-X:2018	<p>This document specifies requirements for an organisation to establish, implement, maintain and continually improve a service management system (SMS). The requirements specified in this document include the planning, design, transition, delivery and improvement of services to meet the service requirements and deliver value. This document can be used by:</p> <ul style="list-style-type: none"><li>a) a customer seeking services and requiring assurance regarding the quality of those services;</li><li>b) a customer requiring a consistent approach to the service lifecycle by all its service providers, including those in a supply chain;</li><li>c) an organisation to demonstrate its capability for the planning, design, transition, delivery and improvement of services;</li></ul>	MUST	Valid ISO Certificate required from UKAS registered accreditation organisation.

# GPIT-F – Co-location and Provider

## Data Centre Hosting & Infrastructure Requirements – External Standards

Requirement ID	Standard	Name	Description	Level	Evidence
ES6.0	ISO 20000 Information technology -- Service management	ISO 20000-X:2018	<p>d) an organisation to monitor, measure and review its SMS and the services;</p> <p>e) an organisation to improve the planning, design, transition, delivery and improvement of services through effective implementation and operation of an SMS;</p> <p>f) an organisation or other party performing conformity assessments against the requirements specified in this document;</p> <p>g) a provider of training or advice in service management.</p>	MUST	Valid ISO Certificate required from UKAS registered accreditation organisation.

## GPIT-F – Co-location and Provider

### Data Centre Hosting & Infrastructure Requirements – External Standards

Requirement ID	Standard	Name	Description	Level	Evidence
ES6.0	ISO 20000 Information technology -- Service management	ISO 20000-X:2018	The term "service" as used in this document refers to the service or services in the scope of the SMS. The term "organisation " as used in this document refers to the organisation in the scope of the SMS that manages and delivers services to customers. The organisation in the scope of the SMS can be part of a larger organisation , for example, a department of a large corporation. An organisation or part of an organisation that manages and delivers a service or services to internal or external customers can also be known as a service provider. Any use of the terms "service" or "organisation " with a different intent is distinguished clearly in this document.	MUST	Valid ISO Certificate required from UKAS registered accreditation organisation.

# GPIT-F – Co-location and Provider

## Data Centre Hosting & Infrastructure Requirements – External Standards

Requirement ID	Standard	Name	Description	Level	Evidence
ES7.0	ISO 14001 Environmental management systems	ISO 14001:2015	<p>ISO 14001:2015 specifies the requirements for an environmental management system that an organisation can use to enhance its environmental performance. ISO 14001:2015 is intended for use by an organisation seeking to manage its environmental responsibilities in a systematic manner that contributes to the environmental pillar of sustainability.</p> <p>ISO 14001:2015 helps an organisation achieve the intended outcomes of its environmental management system, which provide value for the environment, the organisation itself and interested parties. Consistent with the organisation 's environmental policy, the intended outcomes of an environmental management system include:</p> <ul style="list-style-type: none"><li>· enhancement of environmental performance;</li><li>· fulfilment of compliance obligations;</li><li>· achievement of environmental objectives.</li></ul>	MUST	Valid ISO Certificate required from UKAS registered accreditation organisation.

## GPIT-F – Co-location and Provider

### Data Centre Hosting & Infrastructure Requirements – External Standards

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ES7.0	ISO 14001 Environmental management systems	ISO 14001:2015	<p>ISO 14001:2015 is applicable to any organisation , regardless of size, type and nature, and applies to the environmental aspects of its activities, products and services that the organisation determines it can either control or influence considering a life cycle perspective.</p> <p>ISO14001:2015 does not state specific environmental performance criteria. ISO 14001:2015 can be used in whole or in part to systematically improve environmental management. Claims of conformity to ISO 14001:2015, however, are not acceptable unless all its requirements are incorporated into an organisation 's environmental management system and fulfilled without exclusion.</p>	MUST	Valid ISO Certificate required from UKAS registered accreditation organisation.

## **GPIT-F – Co-location and Provider**

### **Data Centre Hosting & Infrastructure Requirements – External Standards**

- Suppliers should adhere to:
- ES8.0 ISO50001 Energy Management Systems
- Note SECR requirements (1<sup>st</sup> April 2019)



## GPIT-F – Co-location and Provider

### Data Centre Hosting & Infrastructure Requirements – External Standards

- SECR Requirements
- Turnover £36 million or more
- • Balance sheet total £18 million or more
- • Number of employees 250 or more
- 
- <https://www.gov.uk/government/publications/environmental-reporting-guidelines-including-mandatory-greenhouse-gas-emissions-reporting-guidance>

## **GPIT-F – Co-location and Provider**

### **Data Centre Hosting & Infrastructure Requirements – External Standards**

- Suppliers should adhere to:
- ES9.0 BS 6701 Telecommunications Cabling
- Note: Within DCs use EN50600-2-4

## GPIT-F – Co-location and Provider

### Data Centre Hosting & Infrastructure Requirements – External Standards

- Suppliers should adhere to:
- ES10.0 EU Code of Conduct for Data Centres (Energy Efficiency)
- <https://e3p.jrc.ec.europa.eu/communities/data-centres-code-conduct>
- Note: EN50600 TR 99-1
- But formal “participation” is preferred!

## **GPIT-F – Co-location and Provider**

### **Data Centre Hosting & Infrastructure Requirements – External Standards**

- Suppliers should adhere to:
- ES11.0 GPDR

## **GPIT-F – Co-location and Provider**

### **Data Centre Hosting & Infrastructure Requirements – External Standards**

- Suppliers should adhere to:
- ES12.0 – 21.0 EN 50600
- @ Minimum Availability Class 3

# EN 50600 Series – Data Centre Function

- EN 50600-1:2019 – General Concepts
- EN 50600-2-1:2014 - Building Construction
- EN 50600-2-2:2019 - Power (Supply and) Distribution
- EN 50600-2-3:2019 - Environmental Control
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- EN 50600-4-6: - Energy Re-Use Factor (ERF)
- EN 50600-4-7 - Cooling Efficiency Ratio (CER)
- EN 50600-4-8 - Carbon Utilisation Effectiveness (CUE)
- EN 50600-4-9 - Water Utilisation Effectiveness (WUE)
  
- TR 50600-99-1 - Recommended practices for energy management
- TR 50600-99-2 - Recommended practices for environmental sustainability

## **GPIT-F – Co-location and Provider**

### **Data Centre Hosting & Infrastructure Requirements – Physical Aspects 1**

- Suppliers WILL provide:
  - Address of DC's
  - Age of DC's
  - Anti Tail-Gating Measures
- Suppliers should ensure
  - Perimeter – Protected by IDS
  - Compliant to BS EN 50131-1:2006



## GPIT-F – Co-location and Provider

### Data Centre Hosting & Infrastructure Requirements – Physical Aspects 2

- Suppliers WILL provide:
- Minimum of Two Sites
- Permanent 24/7 Access
  - 24Hrs Notice for Normal Maintenance
  - 1 Hr Notice for Emergency Access
- Note: If the hosting provider is a 3rd party / sub-contractor to the supplier and escorted access is the policy enforced then permanent access to the Data Centre will still be provided.

## **GPIT-F – Co-location and Provider Data Centre Hosting & Infrastructure Requirements – Power**

- Suppliers WILL ensure:
- Refuelling of tanks for generators will be possible with the generators in use.

## **GPIT-F – Co-location and Provider**

### **Data Centre Hosting & Infrastructure Requirements – Not DC related**

- IT Infrastructure
- Servers
- Network
- Management of Services & Infrastructure
- Asset Management
- Service Monitoring
- Device Management
- Data Storage
- Reporting and Documentation

## **GPIT-F – Co-location and Provider**

### **Data Centre Hosting & Infrastructure Requirements – Not DC related**

- Security
  - Refer to
  - Co location and Provider Data Centre Hosting and Infrastructure Requirements - Security

# Roadmap for Accreditation to BS EN 50600

# Accreditation to EN50600

- Is NOT currently available in UK
- But “Certificates of Conformance” and certification from non UK bodies is available, BUT should only be offered as “evidence” if you are planning to use an overseas DC/Cloud Provider.
- **NHSD will require UKAS approved Assessors!**

# Accreditation to EN50600

- However...
- **Data Centre Alliance Certification covers EN50600**
- Discussions with a UKAS approved auditing firm underway.
- Timescale Q3/4 2019

# Data Centre Alliance Certification - Current

- Gap Analysis/Report from Assessor Firm
- DCA Approved Auditor Review
- DCA Provide Certificate/Plaque
- Recert every 3yrs



# Data Centre Alliance Certification - Future

- Gap Analysis/Report from Assessor Firm
- \*UKAS Approved Auditor Review\*
- DCA Provide Certificate/Plaque
- Recert every 3yrs/Surveillance Audit Annually

# Accreditation to ISO/IEC 22237

- ISO/IEC TS 22237 series is expected to be certifiable
- By 2021

# Guidance around demonstrating your compliance

# Demonstrating Compliance

- 1. Self Assessed
- 2. External Assessment from External Consultancy
- 3. Data Centre Alliance Certification
  - Authorised Auditing Firms

# Demonstrating Compliance - Legacy

- Compliance Pack comprising:
- Original Design Brief + Any Changes
- Original Design/Current Drawings
- Operation and Maintenance Manuals
- Any Certificates of Conformance
- ISO/IEC Certificates
- External Reports
- NHSD Assessor Reports

# Demonstrating Compliance - Legacy

- Original Design Brief+ Any Changes
- This should include Tier/Class level
- Original Specification
- Changes/Amendments

# Demonstrating Compliance - Legacy

- Original Design/Current Drawings
- Line Diagrams to Support Tier/Class level

# Demonstrating Compliance - Legacy

- Operations & Maintenance Manuals
- Providing information on systems, especially in failure modes.



# Demonstrating Compliance - Legacy

- Certificates of Conformance
- From Designer/Builder
- Recognised External Sources

# Demonstrating Compliance - Legacy

- ISO/IEC Certificates
- UKAS Registered Auditors

# Demonstrating Compliance - Legacy

- External Reports
- Assessment Services from Recognised DC Design/Build Companies

# Demonstrating Compliance - Legacy

- NHSD Assessors
- Assessment Reports from NHSD

# Demonstrating Compliance - Colocation

- Request Information as required from Colocation Provider
- Some information may be available on website or other portals

# Demonstrating Compliance - Cloud

- Request Information as required from Cloud Provider
- Some info may be available from Website

# Questions and Next Steps

# Question and Answers

- To ask questions, please use the messaging function. To log a question just type your message into the box
  - It would be really helpful if attendees could indicate which organisation they are representing when asking a question via the messaging function
- If you have any additional questions after the webinar please submit these to [buying.catalogue@nhs.net](mailto:buying.catalogue@nhs.net)





# Next Steps

- NHSD will host a limited number of 1:1 workshops.
- If you want to be considered for a workshop please submit a request to [buying.catalogue@nhs.net](mailto:buying.catalogue@nhs.net) indicating any specific aspects you wish to discuss

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