

DSCR Communications Room Standards



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Design Performance
Standard

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Introduction –

This standard sets out BAA's design and installation requirements for a DSCR Communications Rooms

It covers:

- Facility
- Elements
- Fittings / Special
- Mechanical Services
- Public Health and Domestic Services
- Lighting
- Power
- Communications
- Services General
- Fire Requirements
- Health and Safety

It excludes:

- Communications Room Access Process/Policy
- Specific details supporting CI Compliance

The objective of this standard is to create a set of minimum requirements for the construction of a DSCR Communications Room

This standard may be referenced in specifications, design guidelines and briefs but should not be used in place of specific, procurement, user, or system requirement specifications for purchasing purposes.

Requirement statements in this standard shall define, but not be limited to, the following performance attributes:

- 1. Safety**
- 2. Functional requirements**
- 3. External interfaces**
- 4. Environmental conditions**
- 5. Reliability**
- 6. Maintainability**
- 7. Verification & Validation**

The design philosophy shall try and reflect that of the European Code of Conduct for Data Centres/Server Rooms/Communications Rooms which include the following principles:

1. Communications Rooms are designed so as to minimise the energy consumption whilst not impacting the business performance.
2. Communication Room equipment is designed to allow the optimisation of energy efficiency while meeting the operational or service targets anticipated.
3. Facilities are designed to allow regular and periodic energy monitoring.
4. Energy consumption of Communications Rooms are monitored; where PCR's, SCR's and DSCR's are part of larger facilities or buildings, the monitoring of the specific room consumption may entail the use of additional energy and power metering equipment.
5. Communications Rooms and their equipment are designed, specified and procured on the basis of optimising the TCO within the requirements for reliability, availability and serviceability.
6. Communications Rooms should be designed to minimise the energy used, if any, to remove heat from the facility.
7. Supports CI Policy

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Section 1a – Statutory Compliance

The following compliance documents, but not limited to, have been identified as statutory prerequisites to this standard. The latest edition and relevant amendments shall be complied with:

Legislation

Health and Safety at Work Act
Construction (Design and Management) Regulations 2007 - SI 320
Lifting Operations & Lifting Equipment Regulations 1998 – LOLER
Provision & Use of Work Equipment Regulations 1998 – PUWER
The Machinery Directive - 91/368/EEC
Supply of Machinery (safety) Regulations 1992 – SI 3073
Supply of Machinery (safety) Regulations 2008 – SI 1597 [*comes into force on 29th December 2009*]
Air Navigation Order 2005 - SI 1970
Civil Aviation Authority Regulations 1991 - SI 1672
Electromagnetic Compatibility (EMC) Directive - 89/336/EEC

Building Regulations

Sustainability and environmental protection (See BAA Corporate Responsibility Policies)

Environmentally Sensitive Materials Strategy
Noise
Waste reduction
Energy Efficiency and Energy Metering

Mandated Standards and Approved Codes of Practice

| | |
|-------------------------------|--|
| Network Rack Standards | Physical Infrastructure Standards 17-11-08 V1.0 |
| Server Rack Standards | Racking Solutions Standards - Data Centre v1.0 |
| BS EN 12464-1:2002 | Light and Lighting. Lighting of work places. Indoor work places |
| BS 5266-10:2008 | Guide to the design and provision of emergency lighting to reduce the risks from hazards in the event of failure of the normal lighting supply |
| BS 5499-10:2006 | Safety signs, including fire safety signs. Code of practice for the use of safety signs, including fire safety signs |
| IS 3217:2008 | Emergency Lighting |
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Section 1b –BAA Policy & Procedures Compliance

The following, but not limited to, have been identified as meeting BAA policy and are prerequisites to this standard.
The latest edition shall be complied with:

1b. 1 BAA Policy

| BAA Corporate Responsibility Policies | |
|---------------------------------------|---|
| | <p>These documents explain BAA’s interpretation of the statutory regulations and explore the issues most important to us as a business. They help us to monitor, measure and report performance. They are also useful to inform projects of latest policy statements and requirements. They can be found on our website:</p> <p>(www.baa.com/corporateresponsibility).</p> |
| BAA Health and Safety Standards | |
| | <p>BAA’s Health and Safety team are responsible for ensuring BAA operate and grow our business responsibly, safely and securely.</p> |
| BAA Supply Chain Policies | |
| | <p>BAA’s Supply Chain is responsible for ensuring BAA deliver a positive impact upon the money the company spends. Information on latest agreements and objectives can be found on the Supply Chain intranet site.</p> |

BAA Design and Implementation Standards

- BAA Electronic Communications Approvals Process (ECAP)
- BAA Design Performance Standards / Specifications
 - Airside Engineering
 - Building Management Systems
 - Common language for asset coding
 - Electrical Distribution
 - Energy efficiency buildings
 - Fire alarm and public address systems
 - Lighting
 - Airport Sign System
 - Structural Design Criteria

These documents discuss in more detail, aspects of systems relevant to the specific area covered. They can be found on BAA's Intranet site.




Section 2a – Requirement Section

This section describes the critical performance criteria required by BAA to meet identified business needs. The designer shall demonstrate full compliance with the following criteria.

2a. 1 Key Requirements

| | Requirement | Reason / Consequence | | | | | | | | | | | | | | | | | | |
|--|--|----------------------|--------------|--------------------------------|---------------------|-----------------|-------------------------|--|---------------|--------------|---|------------|---------------------------------------|-----------------|-------------------------------------|--------------|-----------|-------------------|--|---|
| 2a. 1 | QUICK REFERENCE | | | | | | | | | | | | | | | | | | | |
| 2a. 2 | <p style="text-align: center;">DSCR - Network Devices/IT Servers 12U or less</p> <table border="0"> <tr> <td>Network Type</td> <td>Distribution</td> </tr> <tr> <td>Cooling (Dry Bulb Temp)</td> <td>Between 15 to 30 °C</td> </tr> <tr> <td>Humidity</td> <td>20 - 80% non condensing</td> </tr> <tr> <td>Maximum Rate of Change per hour</td> <td>5°C and 10%RH</td> </tr> <tr> <td>Power</td> <td>2x PDU in Rack, Cabinets fed from 2x32amp Commando Socket</td> </tr> <tr> <td>UPS</td> <td>Conditional dependent on life systems</td> </tr> <tr> <td>Security</td> <td>Single stage door, MAID swipe entry</td> </tr> <tr> <td>Racks</td> <td>Prism/APC</td> </tr> <tr> <td>Monitoring</td> <td>Heat, Humidity and Access (Room/Server) Leak Detection (where applicable)</td> </tr> </table> | Network Type | Distribution | Cooling (Dry Bulb Temp) | Between 15 to 30 °C | Humidity | 20 - 80% non condensing | Maximum Rate of Change per hour | 5°C and 10%RH | Power | 2x PDU in Rack, Cabinets fed from 2x32amp Commando Socket | UPS | Conditional dependent on life systems | Security | Single stage door, MAID swipe entry | Racks | Prism/APC | Monitoring | Heat, Humidity and Access (Room/Server) Leak Detection (where applicable) | <p>IF a distributed UPS system is to be used it should provide multiple SNMP connectivity to attached servers for controlled shut down services</p> |
| Network Type | Distribution | | | | | | | | | | | | | | | | | | | |
| Cooling (Dry Bulb Temp) | Between 15 to 30 °C | | | | | | | | | | | | | | | | | | | |
| Humidity | 20 - 80% non condensing | | | | | | | | | | | | | | | | | | | |
| Maximum Rate of Change per hour | 5°C and 10%RH | | | | | | | | | | | | | | | | | | | |
| Power | 2x PDU in Rack, Cabinets fed from 2x32amp Commando Socket | | | | | | | | | | | | | | | | | | | |
| UPS | Conditional dependent on life systems | | | | | | | | | | | | | | | | | | | |
| Security | Single stage door, MAID swipe entry | | | | | | | | | | | | | | | | | | | |
| Racks | Prism/APC | | | | | | | | | | | | | | | | | | | |
| Monitoring | Heat, Humidity and Access (Room/Server) Leak Detection (where applicable) | | | | | | | | | | | | | | | | | | | |

| | Requirement | Reason / Consequence |
|---------------|---|--|
| 2a. 3 | FACILITY | |
| 2a. 4 | Distribution Secondary Communications Room (DSCR) is to house Distribution switches and provide an aggregation point for the distributed fibre backbone. Each DSCR also acts as an SCR facility for its local area. | |
| 2a. 5 | A DSCR should be utilised as pairs, ideally one pair on a landside corridor and one pair on the airside corridor. | |
| 2a. 6 | Each DSCR should be connected using diverse primary containment routes to each of the main PCR's to provide backbone resilience | |
| 2a. 7 | There shall be a minimum of 3.5m headroom | |
| 2a. 8 | Room size shall be adequate for the application | |
| 2a. 9 | Occupancy is low (occasional occupancy) | BAA Rating 2 (Where 1 is low and 5 is high) |
| 2a. 10 | Security is High | Authorisation to work obtained from BAA IT |
| 2a. 11 | ELEMENTS | |
| 2a. 12 | Floor Type will be Raised with maximum 800mm plenum zone and a minimum of 450mm | Floor depths above 800mm will impair cold air distribution back to the top of the cabinets |
| 2a. 13 | Floor Loading is Medium – Uniformly distributed >8.0kn/m² | |
| 2a. 14 | Walls shall be Sealed with a Dust proof finish | |
| 2a. 15 | A false ceiling is NOT required | |
| 2a. 16 | Windows and Glazing shall be NONE | |

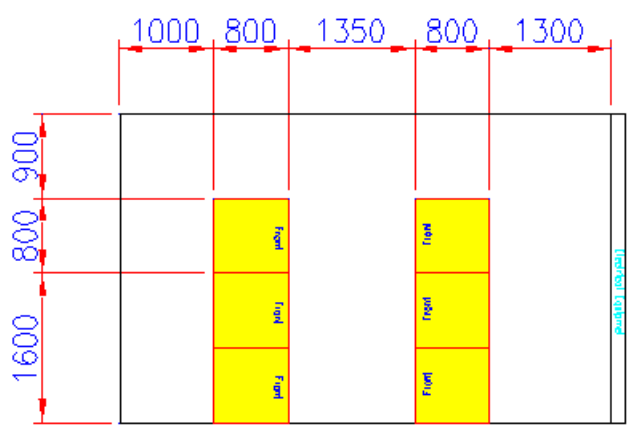
| | Requirement | Reason / Consequence |
|---------------|---|---|
| 2a. 17 | Doors shall be a minimum of 2, No. 2 leaf, High Security and self-closing | |
| 2a. 18 | Emergency signage must be in the format of the European Signs Directive - BS 5499-10:2006 |  |
| 2a. 19 | FITTING /SPECIAL | |
| 2a. 20 | Furniture – To be advised by BAA IT | |
| 2a. 21 | IT Server Racks will be BAA specification APC Netshelter SX racks | Please refer to Racking Solutions Standards- BAA Server V1.0 for a complete IT Server rack standard |
| 2a. 22 | Network Cabinets will be BAA Specification 1, 2, 4 or 5 dependent on application | Please refer to Physical Infrastructure Standards 17-11-08 V1.0 for complete Network Cabinet standards |
| 2a. 23 | Each cabinet shall be individually earthed with a 16 mm (Sq) earth from the earth point in the cabinet back to the nearest building earth bar, which will be connected to the main earth system in accordance with BS 7671 | |
| 2a. 24 | All cabinet electrical supplies shall be properly protected and segregated so that they comply with the current IEE wiring regulations. | |
| 2a. 25 | Daisy chaining of earth connections from one cabinet to another is not permitted. | |
| 2a. 26 | The electrical supply needed to each cabinet shall be 2 x 32 amp Commando presentations for all cabinets to provide power diversity and the supply should be from the same phase. The distribution panel shall be fitted with a dedicated circuit breaker and properly labelled. | The PDU must be properly labelled to show which distribution panel or circuit breaker is feeding the cabinet. |

| | Requirement | Reason / Consequence |
|---------------|---|----------------------|
| 2a. 27 | MECHANICAL SERVICES | |
| 2a. 28 | Air Conditioning shall be able to support the entire load of the facility. A sensible load of 300 W/m² should be achieved as a minimum | |
| 2a. 29 | Dry Bulb temperature shall be between 15-30°C | |
| 2a. 30 | Relative Humidity shall be between 20-80% Non-condensing | |
| 2a. 31 | The maximum rate of change per hour shall be 5°C and 10%RH | |
| 2a. 32 | The minimum Fresh Air rate shall meet statutory and pressurisation requirements | |
| 2a. 33 | Positive pressurisation is required in the facility | |
| 2a. 34 | Noise levels shall not exceed NR.65 | |
| 2a. 35 | Emergency Actuation Devices are not required except for large plant and unless for statutory requirement | |
| 2a. 36 | PUBLIC HEALTH AND DOMESTIC SERVICES | |
| 2a. 37 | Cold Water is NOT required | |
| 2a. 38 | Hot Water is NOT required | |
| 2a. 39 | Drinking Water is NOT required | |
| 2a. 40 | Gas is NOT required | |
| 2a. 41 | Soil is NOT required | |

| | Requirement | Reason / Consequence |
|---------------|--|---|
| 2a. 42 | LIGHTING | |
| 2a. 43 | Levels shall be 500 lux at 1m from the finished floor and should be above the aisle rather than the cabinets | |
| 2a. 44 | Fittings shall be batten fluorescent with trough reflectors | |
| 2a. 45 | Switching shall be Manual | |
| 2a. 46 | Emergency lighting is required in accordance with IS 3217:2008 | |
| 2a. 47 | POWER | |
| 2a. 48 | Single Phase 13 amp wall mounted outlets are required | Cleaning purposes |
| 2a. 49 | Single Phase 32 amp is required | Cabinet supplies via 2 No. Dedicated PDU's each fed from a different distribution panel |
| 2a. 50 | Three Phase may be required – TBC confirmed by IT, dependent on application | IT Servers will require Three Phase for certain applications |
| 2a. 51 | Emergency generator power is NOT required | |
| 2a. 52 | A local UPS may be required and installed within owner's equipment cabinet | |
| 2a. 53 | Power requirement shall be based on 300 W/m² unless IT Servers are present where the total load should be calculated based on the equipment to be housed in the facility | |
| 2a. 54 | Power shall be distributed at high level to equipment cabinets and should allow sufficient room (300 - 600mm) between the top of the cabinet and the fittings for working | |

| | Requirement | Reason / Consequence |
|---------------|--|--|
| 2a. 55 | Power bars shall ideally be situated centrally above the racks and commando sockets should be offset to indicate the orientation of the supply | This will easily identify which Commando is fed from which supply – see 2a. 49 |
| 2a. 56 | COMMUNICATIONS | |
| 2a. 57 | Fixed Voice Services (e.g. Telephone or intercom) IS required | Phone type shall be Cisco 7911, located on wall by entrance |
| 2a. 58 | Fixed Data Services (e.g. Printer, PC, Modem) IS required | |
| 2a. 59 | Public Address / Voice Alarm IS required | |
| 2a. 60 | CCTV is NOT required | |
| 2a. 61 | Television is NOT required | |
| 2a. 62 | Alarm System / Intruder Detection / Panic Alarm is NOT required | |
| 2a. 63 | Master Clock System is NOT required | |
| 2a. 64 | Security System / Access Control should be via MAID | |
| 2a. 65 | Radio Systems and Mobile Telephony coverage IS required | |
| 2a. 66 | Airport Information Systems (Inc. FIDS) is NOT required | |
| 2a. 67 | SERVICES GENERAL | |
| 2a. 68 | No water pipes should enter or pass through the DSCR/SCR facility | To avoid flooding of the facility |
| 2a. 69 | FIRE REQUIREMENTS | |
| 2a. 70 | A VESDA system will be required | |

| | Requirement | Reason / Consequence |
|--------|---|----------------------|
| 2a. 71 | VESDA systems will conform to BS 5839-1:2002, Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance. | |
| 2a. 72 | A Fire Alarm shall be fitted in accordance with BAA guidelines | |
| 2a. 73 | Fire Alarm break glass panels shall be fitted both inside and outside the facility | |
| 2a. 74 | Automatic Fire Suppression is NOT required | |
| 2a. 75 | Manual suppression WILL be required via portable extinguishers in the room | |
| 2a. 76 | If required by Fire Authorities a Smoke Extraction system should be fitted | |
| 2a. 77 | Sprinklers and Hose Reels are NOT required unless it is to satisfy Insurance or Property Protection | |
| 2a. 78 | Compartmentation shall be for 30 minutes dependent on location | |
| 2a. 79 | Dependent on the size and shape of the facility it may be necessary to have at least 2 Entrance and Exit points in the facility for Fire Safety purposes | |
| 2a. 80 | Health & Safety | |

| | Requirement | Reason / Consequence |
|--------|--|----------------------|
| 2a. 81 | <p>Cabinet clearances shall adhere to the following for Health & Safety (Top Down View)</p>  | |

2b

DSCR Communications Room Standards



Recommendation
Section

Section 2b – Recommendation Section

In support of Section 2a - Requirements, the designer should take note of the following performance and best practice recommendations. Any departure from these recommendations should be highlighted and the reason for the deviation explained.

2b.1 General Design

| | Recommendation | Reason / Consequence |
|-------|---|--|
| 2b. 1 | Hot Aisle Containment cooling solutions are recommended over the traditional HVAC and CRAC units and is the BAA Standard for Data Centre solutions as of April 2009 | Close coupled, dynamic modular cooling gives greater efficiency over traditional cooling and can support IT loads in excess of 25kW per rack. As the server architecture dictates that we use Blade Chassis and virtualisation traditional cooling cannot support more than 1 Blade Chassis per rack |
| 2b. 2 | APC HACS is the preferred solution for close coupled dynamic cooling | As our standard racking solution for servers is APC the cooling solution can be easily incorporated into existing racks as well as new racks, it provides a modular solution that can be expanded or collapsed dependant on the application |
| 2b. 3 | HACS will be sized accordingly for the application at the time of installation, however all pipe work and infrastructure to support future requirements should be installed during initial installation | Reduces disruption in the Data Centre once it is operational |
| 2b. 4 | Where possible a Zero Footprint HACS will be used to maximise rack space in the Data Centre | Maximises rack space |
| 2b. 5 | Containment for Network and Power should all be fed from above the rack | Easier access for network and removes the need for a raised floor if used with in-line cooling architectures |
| 2b. 6 | Recommended minimum size for an DSCR is 3m x 9m (27m ²) | |

3

Supporting information

3.1 Glossary of terms