Technical Appendix A –

The A-VDGS
System Requirement Definition

Chapter 6
Technology Infrastructure

Amendment Record

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References and Related Documents

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<tbody>
<tr>
<td>IAA_A-VDGS - Appendix A - Technical Requirements - Glossary</td>
<td>Abbreviations and Terms</td>
</tr>
</tbody>
</table>
# Table of Contents

6. INFORMATION TECHNOLOGY & INFRASTRUCTURE REQUIREMENTS ........................................ 3

6.1 GENERAL ................................................................................................................................... 3
6.1.1 General Guidelines .................................................................................................................. 3
6.1.2 System Infrastructure Requirements (IAA’s Supplies) ............................................................... 4

6.2 IT CENTERS ............................................................................................................................... 5

6.3 COMMUNICATIONS REQUIREMENTS ..................................................................................... 6
6.3.1 General ..................................................................................................................................... 6
6.3.2 Network Architecture ................................................................................................................ 7
6.3.3 Fiber Optic (F/O) Infrastructure ................................................................................................. 9
6.3.4 Wireless Communication (EO) .................................................................................................. 12
6.3.5 The A-VDGS system IP Address ............................................................................................. 14
6.3.6 VPN connection ....................................................................................................................... 14
6.3.7 Network Time Synchronization Service - NTP Servers ............................................................ 14

6.4 INFORMATION TECHNOLOGY HARDWARE .......................................................................... 16
6.4.1 General Requirements ............................................................................................................ 16
6.4.2 Servers and Storage HW .......................................................................................................... 17
6.4.3 Working Positions/ Stations & Peripherals .............................................................................. 19

6.5 INFORMATION TECHNOLOGY SOFTWARE AND OS .............................................................. 24
6.5.1 COTS Software ....................................................................................................................... 24
6.5.2 Operating Systems ................................................................................................................... 25
6.5.3 Database .................................................................................................................................. 25
6.5.4 Licenses and Certifications ....................................................................................................... 26
6.5.5 Software Management Design ................................................................................................ 27
6.5.6 Development and Maintenance Environment and Tools .......................................................... 27

6.6 INFORMATION SECURITY REQUIREMENTS ........................................................................... 28
6.6.1 Information Security Concept .................................................................................................. 28
6.6.2 Application Level Security ........................................................................................................ 28
6.6.3 Database security .................................................................................................................... 29
6.6.4 Communications Security ........................................................................................................ 30
6.6.5 Bidder’s Support Center ........................................................................................................... 32
6.6.6 Monitoring Level Security ........................................................................................................ 33

6.7 ENVIRONMENTAL REQUIREMENTS ...................................................................................... 35
6.7.1 General ..................................................................................................................................... 35
6.7.2 Outdoor Conditions .................................................................................................................. 36
6.7.3 Indoor Conditions .................................................................................................................... 36
6.7.4 Electro-Magnetic Interference .................................................................................................. 36
6.7.5 Power Supply ........................................................................................................................... 37
6.7.6 Outdoor Cabinets ...................................................................................................................... 37
6.7.7 Indoor Cabinets and Racks ....................................................................................................... 37

6.8 INSTALLATION REQUIREMENTS ............................................................................................. 38
6.8.1 General Materials, Cables and Workmanship ......................................................................... 38
6.8.2 Mounting Brackets and Connecting Elements ......................................................................... 39
6.8.3 Installation ................................................................................................................................ 40

6.9 SAFETY REQUIREMENTS ......................................................................................................... 40
6.9.1 Safety Earth Connections ......................................................................................................... 41

6.10 INFRASTRUCTURE STANDARDS ............................................................................................. 41
6. Information Technology & Infrastructure Requirements

6.1 General

6.1.1 General Guidelines

1. This chapter describes the Information Technology and infrastructure requirements applicable for the A-VDGS system. (I)

2. The Bidder shall meet the following requirements for the A-VDGS System, and shall describe in full detail how the system components meet these requirements. (Q)

3. The computer hardware, software and other technological infrastructures shall also comply with all the functionality requirements as defined in chapters 3, 4, 5 and elsewhere in the Tender Documents. (Q)

4. The A-VDGS’s proposed components (SW and HW) shall not be announced "end-of-sale" and/or "end-of-support" and/or "end of life". See details in Chapter 8. (P)

5. The Information Technology and Infrastructure requirements refer to the following areas: (I)
   a. IT center
   b. Communications
   c. Information Technology Software and Operating System
   d. Information Technology Hardware
   e. Information Security
   f. System Environment
   g. System Safety

6. The Bidder response shall refer the above aspects per each of the following components: (Q)
   a. A-VDGS Central System
   b. A-VDGS Docking Sub-System (DSS)
   c. Interfaces to external systems (AODB, DCRS, NTP)
   d. All types of Working Positions
   e. Communication networks
6.1.2 System Infrastructure Requirements (IAA's Supplies)

1. The Bidder shall design the required system infrastructure based on information supplied by IAA and on the data collection during the site survey. (PQ)

2. The IAA's responsibility is delimited by the design and implementation of passive communication needs between the end sites and the central sites, including but notwithstanding, cabling, connectors, end points (wall sockets). (I)

3. IAA will allocate the required space for the proposed A-VDGS system including separated Core rooms, poles/facades for the Docking Sub-Systems (DSS), and furniture for the Working positions. (I)

4. IAA will supply the required standard electric power to the A-VDGS elements including the Core rooms, the DSSs, and for the Working positions, according to the Bidder's detailed Site engineering report (for more details about the Site Engineering Report, please refer to Chapter 7) and according to the Israeli power and electricity standards. (I)

5. The Bidder shall take full responsibility for the installation and configuration of A-VDGS's components such as, Servers, working positions, DSS, Servers racks, communication equipment, Connectors and Cables, Operating systems, Applications etc. (P)

6. IAA shall approve the Bidder’s requirements for infrastructures. (I)

7. If IAA shall reject any of the proposed infrastructure elements, the Bidder shall demonstrate alternatives and/or bypass these whilst maintaining compliance with the RFP requirements. (PQ)

8. IAA shall take the final decision for the selected infrastructure alternative. However, the responsibility for the project’s successful implementation is on the Awarded Bidder. (PQ)

9. The Bidder shall describe the entire infrastructure elements required for each component of the system - See table 9-14 in Section 9.8.5 in Chapter 9 for detailed list of IAA's Customer Furnished Equipment (CFE). (Q)

10. The infrastructure description shall include at least the following requirements and any other relevant requirements that will be needed according to the Bidder's best practices: (Q)
a. Overall Power requirements, including the power consumption for each subsystem and component.
b. Floor space
c. Environmental conditions
d. Wall space for wall mounted equipment.
e. Network communications
f. Loads requirement for components.
g. Other

6.2 IT Centers

1. The Bidder shall supply the cabinets and racks that host the system’s computers, servers, LAN switches, routers and other peripherals. (P)

2. All the A-VDGS servers and communications equipment shall be installed in standard communications racks in Core 1 and Core 2 Core 3 separated rooms. The racks shall be supplied by the Supplier and shall be approved by IAA. (P)

3. The Test sub-system shall be installed in different Core room (in concourse E) and shall be connected to both routers in Core 1 and Core 2. The Test systems’ servers are non-redundant. (I)

4. The Bidder shall provide fans, shelves, drawers, special power wiring, ground connections, surge suppression, patch cords, cables, connectors, appurtenances, and adapters to accommodate the system installation. (P)

5. The Bidder shall plan to minimize its racks amount, while leaving some space in racks for possible future expansion. (Q)

6. The Bidder shall detail the number of racks required and racks’ content (e.g. servers, communications equipment etc.). The Bidder is required to describe each element by its model, version etc. (Q)

7. The IAA is responsible for providing the IT center’s infrastructure, such as, power supply, air conditioning, system’s external interfaces and the passive network infrastructure between the sites. (I)

8. IAA will provide a demarcation points for the fiber optical connection to the external interface as well as for the deployed components in the Airport (DSSs, WSs). (I)
9. The Bidder shall design the layout of equipment and communications cables in the racks for easy maintenance, modifications and troubleshooting. (Q)

### 6.3 Communications Requirements

#### 6.3.1 General

1. This section refers to the complete A-VDGS Communications Network. (I)
2. The Bidder shall design the communication network, and shall provide the required A-VDGS’s inter-elements communications characteristics. (Q)
3. The Bidder shall supply, install, configure and commission the A-VDGS communications network, including all active network elements such as LAN SW, Routers, FW, Fiber Optic convertors/elements, KVMs etc. (P)
4. The land-wired communication network shall connect the following sites: (P)
   a. Core1 – The Primary servers, external interfaces and communication room located in concourse B
   b. Core2 – The Secondary servers, external interfaces and communication room located in concourse D
   c. Core3 – The Test Servers. Shall be connected to Core 1 and Core 2 routers. Located in concourse E.
   d. DSS units at each Stand in concourses B C D E and optional Hard/Remote Stands
   e. Technical Building (Building no. 5) – Technical WS for technician
   f. Operational Tower – The operational WS for operators
   g. Other rooms – WSs installed in various rooms in TLV Airport
5. The IAA will be responsible for supplying the **passive** F/O network connectivity between the Core rooms to the DSSs at each Stands, the external interfaces, and to the Work Stations. (I)

6. The IAA retains the right to dictate the preferred type of the communications equipment for the A-VDGS network. Cisco products are already installed in TLV AP facilities, and the Bidder shall take this into consideration in order to facilitate the Level 1 and 2 maintenance responsibility by IAA team. (Q)

7. The AVDGS Communication network shall also support wireless communication to mobile WS (such as tablets [if available]). The communication can be either via Wi-Fi or Cellular. The supplier will take into consideration all security elements required to protect these networks from illegal access or damage. Please refer to 6.3.4 for more details. (EO)

8. The Bidder shall be responsible for the installation and the configuration of the equipment as well as to its maintenance and it shall be done in compliance with the IAA’s communication definitions and requirements. (P)

### 6.3.2 Network Architecture

1. The A-VDGS system shall be designed and implemented as a redundant network. (PQ)

2. The Bidder shall design the network to support the required bandwidth for the servers, DSSs and WSs. The Bidder shall define and clarify all networks’
bandwidth requirements (including inter alia, peak loads, packet size and overall spare margins, delays, physical interfaces etc.), for the proposed A-VDGS system. (Q)

3. Every DSS shall be connected with at least two (2) links via fast Ethernet (100/1000Mbp) auto sensing, full duplex to the Core Rooms. (P)

4. Every DSS shall be connected via redundant links to both A-VSGD Core Rooms.

5. The required topology is a Ring topology where each DSSs group is connected in a ring mode to both Core Rooms. (PQ)

6. The Bidder may offer an alternative topology that enhances the redundancy by connecting 3 links for each DSS. (Q)

7. Servers shall be provided with two (2) Ethernet interfaces. Each server’s LAN interface shall be connected to a separate LAN switch. The connection shall be no less than 1000 Mbps Ethernet interface. (PQ)

8. User’s working positions shall be connected to the LAN switches via 100/1000 Mbps Ethernet. (Q)

9. The Operational WS shall have redundant network cards and shall be connected to different LAN SW (resides in the separated Core rooms) and therefore shall be able to switch over, automatically, between the Servers. (PQ)

10. The Technical WS shall have redundant network card and may be connected to different LAN SW (resides in the separated Core rooms) and therefore shall be able to switch over, automatically, between the Servers. (Q)

11. Some Workstations will be connected via optical LAN converters over fiber optic cables. (P)

12. Each Core room shall consist of Routers and FWs for external interfaces connection. (PQ)

13. The Bidder shall describe the server’s network switchover procedures for common failures of the communication network. (Q)

14. The communication shall be based on a TCP/UDP/IP protocol. The Bidder must explain in details if other nonstandard protocols will be used High layer protocols like Web Service XML, are highly recommended and will get higher score in the technical evaluation. (Q)
15. Wireless communication for mobile WS (such as tablets (if available) for example) shall be implemented with secured connection, as well as on all communication to the core rooms. Details are in 6.3.4. (EO)

16. The Bidder shall describe in details the proposed communication solution. (Q)

17. The following figure is an example of a possible architecture for the new A-VDGS network utilizing the IAA passive f/o network. (I) The scheme is only a pictorial illustration of a generic system.

18. The Bidder may adopt it / amend it / omit it or simply use an absolutely different scheme following its best practices and/or experience and/or proposed solution. (Q)

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**Figure 6.1 - A-VDGS Network Diagram**

### 6.3.3 Fiber Optic (F/O) Infrastructure

1. The IAA will provide the Fiber Optic infrastructure to support the designed A-VDGS network. (I)
2. The F/O infrastructure will connect the new Core rooms to the concourses as well as to the Operational Tower and Technical Building. (I)

3. The infrastructure will support the redundant architecture and it is optimal for Ring topology connection for the DSSs. (I)

4. Other topologies can be supported; however, a Bidder who will propose optimal and redundant network architecture that utilizes the F/O infrastructure will gain higher technical score. (Q)

5. IAA will also provide the F/O connection between the Core rooms for the LAN connection as well for Storage Devices connections if required. See 6.4.2.2 for more details regarding the Core rooms content. (I)

6. Remote workstations shall be connected via F/O cables and active converter devices to RJ45 sockets. IAA will provide the Ethernet cables and sockets for the workstations. (I)

7. All Active network devices shall be supplied and installed by the Supplier. (P)

8. The Operational Workstations at the tower shall be connected in the following way: (Q)
   a. The PC client (Pizza) shall be installed in the tower cabin itself. It shall be connected to the Core rooms as a remote workstation over fiber optic.
   b. The f/o LAN converter shall be installed in the tower communication room. IAA will provide the Ethernet cables with RJ45 sockets in the tower cabin.
   c. IAA may decide to replace the f/o LAN converters with two redundant optical LAN Switches which will be installed in the communication room of the operational tower, and will be connected to the Core rooms. The WS in the tower cabin will be connected via Ethernet CAT6 to these switches in a redundant mode.
   d. Final deployment plan shall be decided at the Design review and Site Engineering review and will be approved by IAA.

9. The following figure describes the F/O infrastructure for the new A-VDGS system. The topology is clearly a ring topology with an option to increase the redundancy level via a 3rd link. (I)

10. F/O infrastructure is based on single-mode (SM) cables. (I)
11. The F/O infrastructure for B C D has two options. IAA shall determine what topology will be implemented at the Design Review:

a. Ring Layout (P)

b. Hybrid Layout (Q)
12. The F/O infrastructure for concourse E is a bit different since no physical ring is available. However, the F/O cables consist of number of fiber pairs in order to support a logical ring topology as well. (I)

13. The Fiber optic cables also include connections between the Test System which is installed in Communication room of Concourse E to Core1 and Cor2 Network switches. (I)

**Figure 6.2 - A-VDGS Fiber Optic Layout in B C D**

![F/O infrastructure for Concourse E](image)

**Figure 6.3 - A-VDGS Fiber Optic Layout in E**

### 6.3.4 Wireless Communication (EO)

1. The Network shall support an optional wireless communication for operational and technical Mobile WS such as tablets and/or laptops.

2. The wireless communication shall be implemented in either of the following communication methods:
a. Wi-Fi

b. Cellular

3. Each Mobile WS (tablet and Laptop) shall be provided with internal Wi-Fi capability.

4. Each Mobile WS shall be provided with cellular communication (Data) via SIM card of 4G and up.

5. Wi-Fi:
   a. The Supplier shall provide Access Points (AP) deployed at the aprons and other areas as will be determined by IAA. At least 2 AP will be installed at each apron.
   b. Each AP shall have a coverage of 100m in radius. The AP must fully meet the Israeli regulation for Wi-Fi devices.
   c. The Wi-Fi network shall be set as private network with the highest secured protocols and shall be configured as a hidden network with strong password.
   d. The Wi-Fi network shall be limited to specific devices that shall use the network.
   e. The AP shall be connected to the Core rooms via the system Router and FW. The Mobile devices shall be separated from other segments in the system. The Supplier shall describe the network connection and IP addressing and protocols to be utilized.
   f. The Bidder shall submit a network design coverage analysis of the Wi-Fi network at each Stand.
   g. The Wi-Fi network shall be installed only after approval of IAA’s Information security team.

6. Cellular:
   a. IAA will provide a cellular APN 4G and up for the wireless WS.
   b. The APN network shall be provided with cellular router that will be installed in the core rooms.
   c. The APN Cellular network shall be set as private network with the highest secured protocols and shall be limited to specific devices that will use the network.
   d. The APN router shall be connected to the Core rooms via the system Router and FW. The Mobile devices shall be separated from other segments in the system.
system. The Supplier shall describe the network connection and IP addressing and protocols to be utilized.

7. The Wireless network (either the Wi-Fi or the Cellular) can be disconnected/disabled in an easy and configurable way.

8. No Unauthorized devices should be allowed to connect to the network.

9. The Tablets shall be hardened and secured to allow them to operate only within the VDGS network and the scope of this project. All unnecessary applications shall be removed

6.3.5 The A-VDGS system IP Address

1. The various A-VDGS devices shall be assigned with unique IP addresses. (Q)

2. The Bidder shall specify if DHCP is required. (Q)

3. The A-VDGS system shall adopt IAA’s IP Addressing Scheme. (P)

4. The Bidder shall cooperate with the IAA’s networking staff in respect to IP address configuration. (P)

5. The A-VDGS network shall support external interfaces with pre-assigned external IP addressing provided by IAA (AODB, NTP) and 3rd parties (DCRS and VPN). (P)

6. It is the Bidder’s responsibility to coordinate between the 3rd Party consolidated interface provider and the IAA supported IT for the purpose of defining service and bandwidth requirements and establishing the interface connection. (PQ)

6.3.6 VPN connection

1. The A-VDGS system shall be connected while in maintenance/diagnostic mode to the Bidder's support center. (I)

2. See Chapter 5 for more details on the VPN interface to the Bidder’s Support center. (I)

6.3.7 Network Time Synchronization Service - NTP Servers

1. To facilitate the interoperability and time synchronization of the A-VDGS solution, the Bidder shall propose a solution in regards to time generation and synchronization between the A-VDGS system entities. (Q)
2. The proposed solution shall utilize external NTP interface provided by IAA and shall serve all A-VDGS components and interfaces with full redundancy. (Q)

3. Detailed description of the NTP interface is in Chapter 5. (I)

4. All A-VDGS components shall be able to sync with each NTP source automatically. (Q)
6.4 Information Technology Hardware

6.4.1 General Requirements

1. Only recognized international manufactured hardware shall be proposed for all A-VDGS components. The Bidder shall elaborate based on the first tier definition for the equipment. (Q)

2. At least Tier 3 (as defined by ANSI TA 942) is excepted for the Central System components: (Q)
   a. Redundant site infrastructure capacity components
   b. Multiple independent distribution paths serving the IT equipment
   c. All IT equipment must be dual-powered and fully compatible with the topology of a site's architecture

3. The hardware shall be Commercial-Off-The-Shelf (COTS), state of the art, well proven industrial quality components available via local dealers. End of Life (EOL) products shall not be proposed. (Q)

4. The hardware and additional technological components shall not be the Bidder’s proprietary (with exception of the DSS components described in Chapter 4), and shall enable integration and operation of elements from other manufacturers. (Q)

5. The System shall enable disconnection of elements (hot swap) for maintenance and other purposes without interrupting of normal system running. This shall include server replacement, storage unit replacement, network device replacement etc. The Bidder shall describe the elements that can be replaced in Hot-Swap mode. (Q)

6. The hardware and other technological infrastructures shall enable easy and straightforward expansion of at least 100% of their capacity for all the physical elements of the system, without any need for any financial investment over and above the purchase and integration of the elements, and without the need to replace existing system elements (hardware casings or software applications). (Q)

7. The hardware and other technological infrastructures shall be simple and modular, and be ready for future upgrades such as: (Q)
   a. Replacement of the CPU by a more powerful and faster processor
   b. Addition of processors (where possible)
c. Memory expansion (addition, not total replacement)

d. Addition of hard disks

e. Addition of cards (free slots)

f. Upgrade to more advanced versions of hardware

g. Upgrade to more advanced peripherals

8. The Bidder shall detail all IT hardware components of the system incorporated in the proposed solution, in the following table: (Q)

<table>
<thead>
<tr>
<th>HW type (Server, WS, DSS etc.)</th>
<th>HW vendor/Model</th>
<th>CPU type and number</th>
<th>Memory type and size</th>
<th>Storage type and size</th>
<th>OS type and version</th>
<th>System/Application used for</th>
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9. The Bidder shall support the maintenance of the HW and shall support HW upgrades and replacing End of Life components during the lifetime of the system. See Chapter 8 for more details. (P)

6.4.2 Servers and Storage HW

6.4.2.1 Servers

1. The Bidder shall provide Commercial-Off-The-Shelf (COTS) industrial quality servers based on Tier 3 (according to ANSI TIA-942 manufacturers, HP, Dell or similar. (Q)

2. The server hardware shall be available via local dealers and from nationally known manufacturer. (Q)

3. Each server shall be implemented with no single point of failure, including (but not limited to) dual power supplies, at least two communication cards (LAN) and system disks in RAID X format. (PQ)
4. The servers shall be installed in standard racks in the Core rooms. (Q)

5. The servers shall support all functionality described in Chapter 3 with the required performance described in Chapter 4. (Q)

6. The servers shall be operated under full system capacity where the CPU, memory and Disk are operating less than 50% load. They shall have the ability to be expanded easily (no need to change the whole server) with doubled performances. (Q)

7. The servers shall be supplied with the highest hot swap configuration possible. For example, hot swap disks, power supplies, fans, etc. (Q)

8. The proposed servers shall support 10/100/1000 Mbps Ethernet copper or F/O. (Q)

9. Copper/Optical watchdog control interface - The proposed servers shall be equipped with additional interface for "keep-alive" signals between servers backing each other up. (Q)

10. The Bidder shall describe the proposed server solution and how they comply with the functionality and redundancy requirements. (Q)

6.4.2.2 Storage

1. The central system shall consist of COTS Storage elements installed in the two separated Core rooms that shall support the system functionality and redundancy. (PQ)

2. The storage shall be redundant and shall support standard Data Base SW (such as Oracle SQL or equivalent). (Q)

3. The Storage shall consist of removable Disk units configured in redundant mode (RAID 5 for example). The Bidder may suggest additional RAID formats for the servers if applicable for the solution. The Bidder shall describe its solution in details. (Q)

4. The Storage capacity shall be designed to hold all database, applications, images, and history as required in Chapter 4. (Q)

5. The Central System shall provide a notification before data override/deletion, to enable the administrator to perform archive procedure to external media (USB, DVD etc.). (Q)
6. IAA will provide dark fiber connectivity between the storage elements in the Core rooms if required. (I)

7. The Bidder shall describe the proposed storage solution and how it complies with the functionality and redundancy requirements. (Q)

6.4.3 Working Positions/ Stations & Peripherals

1. The Bidder shall supply the Working Positions/Stations for the project. (P)

2. The WS hardware shall be Commercial-Off-The-Shelf (COTS) industrial quality components available via local dealers and from nationally known First Tier manufacturer, such as HP, Dell or similar. (Q)

3. The Operational Workstation shall consist the following components and shall be provisioned to meet the following minimum specifications: (Q)
   a. Standard PC
      i. CPU – Intel i5 or better - shall provide sufficient performance for the required functionalities and further extensions.
      ii. RAM – at least 8GB
      iii. Disk – at least 250GB – SSD
      iv. LAN – dual port RJ45 Ethernet cards (100/1000 Mbps) for redundant connection (NIC)
      v. USB – at least 6 (2 at the front)
      vi. Dual Power Supplies. (PQ)
   b. Keyboard (QWERTY Hebrew/English) Mouse/trackball
   c. Graphical card (not shared RAM) with high performance and supporting at least two (2) display monitors, and portrait/landscape modes.
   d. Rack mounted case or USFF/SFF (Ultra/Small Form Factor) configurations.
   e. Monitors
      i. Size 19" to 32" (shall be determine at site survey)
      ii. Resolution at least full HD (1080 X1900)
      iii. Ports VGA, DVI, HDMI
iv. Speaker

v. tilt & swivel functionality

vi. High quality High Bright LCD display adjusted to both day and night work alternating contrast and brightness automatically (using brightness sensor). It shall be suitable for use in high ambient light environment as well as at nighttime. Model reference for the high bright monitor is TCD-361 LED by Easterline (former Barco). The Bidder shall propose an equivalent or a better model with size and aspect ratio that shall be determine by IAA.

(http://www.esterline.com/controlandcommunication/Codis/Products/AirTrafficControlDisplays/TCD361LED.aspx)

vii. The color LCD display shall be a non-glare; non-reflective high-resolution supporting various screen display sizes.

viii. Wide viewing angle for horizontal and vertical views

ix. Controls shall be provided for power, brightness and contrast. Other display-specific maintenance controls (horizontal and vertical size, position, etc.) shall be easily accessible.

4. The Technical Workstation shall consist the following components and shall be provisioned to meet the following minimum specifications: (Q)

a. Standard PC

   i. CPU – Intel i5 or better - shall provide sufficient performance for the required functionalities and further extensions.

   ii. RAM – at least 8GB

   iii. Disk – at least 250GB – SSD

   iv. LAN – dual port RJ45 Ethernet cards (100/1000 Mbps) for redundant connection (NIC)

   v. USB – at least 6 (2 at the front)

b. Keyboard (QWERTY Hebrew/English) Mouse/trackball

c. Graphical card (not shared RAM) with high performance and supporting at least two (2) display monitors

d. USFF/SFF (Ultra/Small Form Factor) configurations.
e. Monitors
   i. Size 19” to 32” (shall be determined at site survey)
   ii. Resolution at least full HD (1080 x 1900)
   iii. Ports VGA, DVI, HDMI
   iv. Speaker
   v. Tilt & swivel functionality
   vi. The color LCD display shall be a non-glare; non-reflective high-resolution supporting various screen display sizes.
   vii. Wide viewing angle for horizontal and vertical views
   viii. Front cover controls shall be provided for power, brightness and contrast. Other display-specific maintenance controls (horizontal and vertical size, position, etc.) shall be easily accessible.

5. Printer:
   a. Some WS shall be provided with a standard color Laser printer. (Q)
   b. The printer shall be capable to operate as a network printer. (Q)

6. USFF/SFF (Ultra/Small Form Factor) or rack mount configurations shall be proposed for both WS types. IAA will choose the final configuration during the detail design stage. (Q)

7. The Bidder shall propose high quality monitors of size 55” and up for wall mounted wide display. (EO)

8. OS (MS-Win 7 and up /UNIX) shall be preinstalled, as well as all applications needed to operate the system. (Q)

9. The final location for the Working Positions (computers) at the Coordination Tower shall be determined following the Site Engineering Survey and the detail design stage of the project, though the distance extension may or may not be implemented for the project. (Q)

10. The Working Position HW shall support the functionality described in Chapter 3 and the system requirements as described in Chapter 4, and shall be able to run all types of Working Positions applications, such as: (Q)
    a. Operational working position
    b. Administrator working position
c. Technical working position

d. If provided, any other Working Position type

11. The Bidder shall describe the proposed WS and laptop and provide the technical specification of each element. The Bidder shall explain and demonstrate the WS capabilities and its performance with the A-VDGS application. (Q)

### 6.4.3.1 Technician Laptop

1. The Bidder shall propose a field laptop for technical usage with the most advanced specifications:

   a. Can be configured as an operational, Technical and/or Maintenance mode of operation. (Q)

   b. Minimum requirements: CPU at least intel i5, 15.6" display, touch screen, Full HD, 8GB RAM, 256GB SSD, LAN, USB, HDMI, VGA (can be via adaptor) (Q)

   c. Shall have Wi-Fi network capabilities.

   d. Shall have Cellular network connection capabilities

   e. Shall be rigid and light to be carried by the technician to the stands (Q)

   f. Carrying case (Q)

2. The laptop’s OS (MS-Win 7 and up/UNIX) shall be preinstalled, as well as all applications needed to support its functionality. (Q)

3. The MTBF for the laptop shall not be less than 50,000 hours. (Q)

### 6.4.3.2 Mobile Workstation (EO)

1. The Bidder shall propose an optional mobile WS (based on a tablet) for technical and operational usage with the most advanced specifications:

   a. Can be configured as an operational, Technical and/or Maintenance mode of operation.

   b. Minimum requirements: 10" display, touch screen, Full HD, 8GB RAM, 32GB SSD, USB, HDMI etc.

   c. Shall have Wi-Fi network capabilities.

   d. Shall have Cellular network connection capabilities with built-in SIM card.
e. Carrying case

2. Tablet OS (Android, Windows or IOS) shall be preinstalled, as well as all applications needed to support its functionality.

3. The Mobile WS shall be able to support the functionality described in Chapter 3.

4. The administrator can configure Mobile WS for various authorizations as defined in chapter 3.

5. The Technical management and/or the administrator can enable/disable the Mobile WS.
6.5 Information Technology Software and OS

6.5.1 COTS Software

1. The Bidder shall deliver all required system and application software for a fully functioning A-VDGS. Each shall be identified by the generic, off-the-shelf name. (Q)

2. The A-VDGS systems shall use industry standard components. The systems shall not contain any proprietary interfaces or components. (Q)

3. The software provided by the Bidder shall be delivered in a ready-to-run form, including all necessary utility programs and documentation. (P)

4. Software shall be built around a compliant operating system as defined in this specification. (P)

5. All new inter-relationships between the application, database, and operating system shall be the responsibility of the bidder. (P)

6. The system shall use industry standard application development software. (Q)

7. The Bidder shall provide a detailed list of all the system’s software (COTS, in-house developed, or open source code) versions, the software roadmap, new release timetables etc. (Q)

8. Following is the IAA’s COTS Software definition; Software can be categorized as COTS software only if it satisfies the following conditions:
   a. It has been developed ready for sale (in stock) prior to receiving the contract.
   b. It is available to the market.
   c. It has an established history of use by multiple customers.
   d. It is a product of a reputable, well-established company.
   e. The vendor maintains it.
   f. The vendor possesses the source.
   g. It is not modified for the contract (customization in the form of setting/tuning parameters is not considered a modification).
9. The Bidder shall specify all prerequisites for the new releases including the installation time, down time for the system and operating system requirements. (Q)

### 6.5.2 Operating Systems

1. Bidder shall implement latest version and service packs as well as all patches of the operating system at time of project notice to proceed. (P)

2. The Bidder shall select a standardized 64-bit Operating System to use across all servers. The proposal shall specify the server operating system along with exceptions. (Q)

3. The system shall support all future Software Packages and other updates issued by the OS vendor. (Q)

4. The supplier must maintain the capability to install critical security updates of the OS if the IAA so requires. (Q)

5. The proposed OS shall be reliable and stable and can be maintained over the lifetime of the System. (Q)

### 6.5.3 Database

1. The provided database(s) shall be based on accepted and recognized industry standards such as Oracle or MS-SQL or equivalent. (Q)

2. If a standard DB is not used in the System, the Bidder shall respond to ALL the DB requirements with respect to the offered Data Structure Mechanism and Storage/Retrieval etc. implemented by the Bidder. (Q)

3. The database shall be capable of supporting real time data warehousing. The database(s) shall use a common relational database to store all data. (P)

4. The Bidder shall provide a database which supports for automatic recovery from system or network failures (i.e., automatically commits or rolls back any in-doubt distributed transactions consistently on all involved nodes when a failure occurs). (PQ)

5. It shall Provide referential integrity for all data such that modifications to current data does not affect historical data. (PQ)
6. Provide capability of online “live” backup of all database objects. (P)

7. The database maintenance system shall be capable of maintaining configuration control. (Q)

8. Third-party database and reporting tools shall support database security functions. (Q)

9. The database shall be able to keep online data, logs and records for the period required in Chapter 3. (P)

10. The system shall consist of archive tools to backup and archive the database beyond the "live" period. (PQ)

6.5.4 Licenses and Certifications

1. Commercial software packages integrated and utilized in the AVDGS system, shall have all registration and licensing documentation filed indicating the IAA as the owner of the software. (P)

2. Software developed for this proposal shall be also licensed to the Owner. (P)

3. A-VDGS system licenses for the Bidders’ and Commercials’ products shall be of the type of a site license. If site license is not available or cost prohibitive, the Bidder shall provide sufficient licenses for the entire system for the maximum required capacity as specified in Chapter 4. (PQ).

4. The Bidder shall identify each type and specific title of application software proposed for the project. The list of application software shall include the following types as a minimum: (Q)
   a. A-VDGS application modules
   b. Operating System for Servers, Workstations and kiosks
   c. Database software
   d. Network Management Software
   e. Administrator tools
   f. System monitoring and Management Application
   g. Anti-Virus Software, both server and workstation
   h. Other software required for the system, but not listed here.
5. The Bidder shall specify all software elements (OS, database, applications etc.) of the system incorporated in the proposed solution that require licenses, in the following table: (Q)

<table>
<thead>
<tr>
<th>SW type (OS, DB App etc.)</th>
<th>SW vendor / revision</th>
<th>Number of licenses supplied</th>
<th>License expansion model</th>
<th>System / Application used for</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

6. The Bidder shall be responsible to provide original copy of software licenses and certifications for each type of SW and HW element in the A-VDGS system for the system life. (P)

7. All licenses, Certifications and updates shall be included in the price proposal and shall be provided during the system life (Warranty and Maintenance periods) as part of the Maintenance price, with no additional cost to IAA. See Chapter 8 and the Contract. (P)

6.5.5 Software Management Design

1. The Bidder shall describe the software and quality design level of the proposed A-VDGS system. (Q)

6.5.6 Development and Maintenance Environment and Tools

1. All the development and maintenance tools shall be standard, widely accepted, and of a recognized international manufacture. (P)

2. These tools shall be usable for the entire duration of the contract allowing version modifications that are transparent to the software developed therein and/or upgrades and migrations. (Q)

3. The Bidder shall describe the development environment integrated in the proposed solution including both software and hardware. (Q)

4. The Bidder shall provide information about various tools used, such as: Database Management, Configuration Management, Software Distribution, DB Interface for Retrieval and Updates, Programming Languages, Batch Tools etc. (Q)
6.6 Information Security Requirements

6.6.1 Information Security Concept

1. Information security shall be included in the A-VDGS system elements, i.e. applications, computing infrastructures and communications. (PQ)

2. The A-VDGS system shall be implemented on a private network with secured interfaces within the system and with external interfaces. (Q)

3. The Bidder shall update system applications, antivirus SW and operating systems whenever a security patch/update is available. (P)

4. The Bidder is required to have an anti-virus software installed on his network which is updated at a minimum, once every week, and all units scanned. (Q)

5. The Bidder shall describe the proposed A-VDGS System information security concept, and the available “out of the box” System Security Tools as detailed in the following sections. (Q)

6.6.2 Application Level Security

6.6.2.1 Authentication

1. The system shall support individual User/password per User. (Q)

2. The system shall support password structure (length, special signs). (Q)

3. The system shall require an authentication for every system logon. (Q)

4. The system shall support security attributes, for example, idle time logout, login lock etc. (Q)

5. The system shall support an audit function for the authentication procedure. (Q)

6.6.2.2 Access Control

1. The system entities shall support at least the following Access Control levels (read only, operator, maintenance, and administrator). (Q)

2. Each User shall be assigned to a specific Access Control Group. (Q)

3. A User shall not be able to read or update information entities that are not related to same Access Control Group. (Q)
4. The system shall support audit functions for add/update/delete operations. (Q)

5. Administrator workstations and shall use a stronger authentication for specific personnel. The Bidder shall offer a mechanism for this requirement, e.g. a smart card. (Q)

6.6.2.3 Classification

1. Every entity in the system (such as applications, files, binaries, directories, devices, etc.) shall be classified. (Q)

2. A User shall not be able to read or update entities of a higher class. (Q)

3. The system shall support an audit function for user’s operations. (Q)

6.6.2.4 Operating System Hardening

1. The Operating Systems supplied for the system shall be of the latest versions with latest security patches. (P)

2. The Operating Systems supplied for the system shall be hardened. This shall include (amongst other hardening features), stopping/erasing redundant processes, running by default on the new-installed “vanilla system”, blocking unnecessary pre-installed operating system applications, blocking USB port at certain WS etc. (Q)

3. The Bidder shall describe the hardening procedures implemented. If any hardening “cookbooks” and/or standards (e.g. CERT hardening standards) are used, the Bidder shall indicate them. (Q)

6.6.2.5 End Point Security

1. The servers, WS and DSS controllers shall be tested periodically for security breaches. An antivirus program shall be implemented in the system components. (P)

2. End Point Security elements - such as Host IPS / Anti X / Personal FW - shall be installed on the system, and be updated by Bidder. (Q)

3. The Bidder shall describe End Point Security elements that are certified for install on each computer/OS of the system. (Q)
6.6.3 Database security

1. Database security shall include the following items: (Q)
   a. Encryption capability for defined data fields within database objects such as tables or views
   b. Prevention of unauthorized database access
   c. Prevention of unauthorized access to schema objects
   d. Control of system resource usage (such as CPU time)
   e. Auditing of user actions and database transactions
   f. Assignment of valid username/password combinations
   g. Assignment and control of resource limits for a user including hardware, database and application resources
   h. Control of user access rights including database, table, record and field level authority
   i. Control of individual system functions that a user can perform

2. The Bidder shall describe its solution for database security. (Q)

6.6.4 Communications Security

6.6.4.1 Network Protection

1. The A-VDGS Network Communications Security will be based on a redundant and private network implementation as described in Section 6.3. (P)

2. Central Fire Walls (FW), installed in the Core rooms, will be used to separate between the various subsystems elements, as shown in the Table 6.2 below, as well as to encrypt the communication stream. (Q)

3. The FW shall also separate between the external interfaces (such as the AODB and the DCRS systems) and the A-VDGS system. (Q)

4. The communications to the Bidder's Support Center shall be secured (please refer to Chapter 5 for more details). (Q)
5. In order to facilitate the correct use of the FW's, the bidder is required to give the IAA a predefined list containing all the IP ports and protocols needed for the correct operation of the client-server, server-server interconnection. (Q)

6. The Bidder’s response shall be in the following table: (Q)

<table>
<thead>
<tr>
<th>Source-Name</th>
<th>Source-IP/port</th>
<th>Destination-Name</th>
<th>Destination-IP/port</th>
<th>Protocol-port</th>
<th>Flow-Direction</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
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<td>3</td>
<td>TBD</td>
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</tr>
</tbody>
</table>

### 6.6.4.2 Communications Equipment

1. The communications equipment (switches, routers etc.) shall be set with access permissions and passwords as per User’s roles. (Q)

2. The communications equipment shall be set with ACLs to prevent unnecessary traffic (As between WSs, DSSs and so on.). (Q)

3. The communications equipment shall support VLANs for network segmentation between the various subsystems. (Q)

4. It is recommended to implement segmentation by the FW in the following way: (Q)
   a. DSS segment
   b. WS segment
   c. Server segment
   d. External interface segments (for each)
   e. VPN connection
6.6.4.3 Protocols

1. The A-VDGS’s communications, which are based on publicly known and approved protocols, shall use the standard protocol’s ports. (Q)

2. The Bidder may use non-standard ports, for standard applications or protocols, only after approval by the IAA.

3. The Bidder shall specify if the A-VDGS’ communications supports/uses secure protocols such as SSH, SFTP, SSL, HTTPS, SNMP V3 etc. (Q)

6.6.4.4 Wireless Communication Security (EO)

1. The wireless communication (Wi-Fi and/or /cellular) to mobile WS shall be secured with highest available protocols and encryption.

2. The Wireless network shall be defined as a separated segment and the system networked shall be protected by means of strong FW and stringent security configuration. The wireless devices shall be separated from other segments of the system.

3. Only authorized and approved mobile devices shall be able to connect the wireless network.

4. The Wireless network shall be configured as a hidden network with strong passwords.

5. The management system shall prompt to change password frequently.

6. The IP addressing shall be approved by IAA.

7. The commissioning of the wireless network shall be after IAA approval.

6.6.5 Bidder’s Support Center

1. The Bidder’s Support Center will be connected to the TLV AVDGS system for diagnostics and monitoring. (I)

2. This connection will be based on a secured VPN connection provided by IAA. (See Chapter 5). (I)

3. The VPN connection shall be disconnected most of the time and will be connected upon request and special occasions. (I)
4. The Bidder is required to describe what activities and measures are implemented to ensure a secured operation when the VPN is connected to TLV A-VDGS system. (Q)

6.6.6 Monitoring Level Security

6.6.6.1 System and Application Events LOG

1. The Systems’ OSs and the A-VDGS Application shall generate LOG files for the following, inter alia, events: (Q)
   a. process status (entry, initiation, completion, deletion, restart, and abort);
   b. System and application configuration change (Server WS and DSS), parameters change, application data load/restore/backup, SW update etc.;
   c. File, volume, and database accesses (open, close, create, delete, rename);
   d. All successful logons and any failed log-on attempts;
   e. Detected security incidents (including IPS events);
   f. System and application status messages (start-up, shutdown, abort, switchover);
   g. Any actions performed with administrative privileges, such as Users and roles change (create, delete, update) etc.

2. For each event, at least the following information shall be written in the logs’ record: (Q)
   a. Date and time;
   b. Unit identification (HW, SW)
   c. User identification;
   d. Nature and type of incident;
   e. The information that was updated;
   f. Entity identification;

6.6.6.2 LOGs Management

1. The LOG files shall be stored in CSV format. (Q)
2. New LOG files shall be generated each day or when previous file has reached a predefined size. (Q)

3. All of the system’s LOGs shall be copied to a central location. (Q)

4. The system shall archive old LOG files (over a predefine time) at different location as backup. (Q)

5. Only privileged Users shall be able to access the LOG files. (Q)

6. The Bidder shall summarize all A-VDGS's log files theirs type of information and format (Q)

7. The Bidder shall describe the Logs management method, name convention, archiving etc. (Q)

6.6.6.3 IAA SIEM/SOC Integration

1. The IAA is running a centralized SIEM (Security Information Event Management) system. (I)

2. The IAA would be interested in installing a listener in the AVDGS network which can collect and collate system messages which can then be displayed on the main IAA SOC center as well as distributed to other entities in the IAA. (Q)

3. The Bidder is requested to describe its support and willing to integrate the AVDGS network with IAA SIEM system. (Q)
6.7 Environmental Requirements

6.7.1 General

1. All A-VDGS elements (active and passive elements) shall be rated for the actual environmental conditions. (PQ)

2. Climate control elements (thermostats, fans, air-condition, heaters etc.) and climate sensor(s), shall be provided within all equipment enclosures where so required. (Q)

3. The system shall be resistant against lightning discharges and shall be fully solid state (electronic semiconductor components) and modular in structure. (PQ)

4. The Bidder shall describe the compliant to environmental standards such as ETL listed, CSA certified, FCC Class A, Underwriters Laboratories (UL). (Q)

5. The Bidder shall describe its level of compliance to the AVDGS BSI standard 50512:2009. See more details in Chapter 2. (I)

6. The Bidder shall specify for each A-VDGS component the following data: (Q)
   a. Power supply requirements (volts, frequency, watts, amps consumption power, etc.).
   b. Life safety, e.g. grounding, isolation etc.
   c. Temperature ranges for storage and operating.
   d. Humidity ranges for storage and operating
   e. Environment protection class
   f. RFI/EMI compliance
   g. Size
   h. Weight
   i. Material(s)
   j. Color and paint quality (where applicable)

7. The following requirements shall be addressed as a minimum requirement set for environmental conditions. Better performances will award a higher Technical score.
6.7.2 Outdoor Conditions

1. All units installed outdoors, such as the DSS cabinet, PDUs, OCUs shall operate under the following conditions: (Q)
   a. Temperature range of -10°C to +55°C (Q)
   b. Relative humidity 0 to 95% (non-condensation) (Q)
   c. The Bidder shall specify the wind load and other parameters (Q)

2. All A-VDGS units shall be structurally resistant against external atmospheric conditions and protected against rain and dust. (P)

3. Protection class of minimum IP54. (Q)

4. All outdoor units (DSS, OCU) shall be equipped with lightning protection. (P)

6.7.3 Indoor Conditions

1. All units installed in-house shall operate under the following conditions: (Q)
   a. Temperature range of 0°C to +45°C (Q)
   b. Relative humidity 0 to 95% (non-condensation) (Q)
   c. Protection class IP45 (Q)

6.7.4 Electro-Magnetic Interference

1. All units shall be designed to prevent interference above the permissible level (interference reduction) and to maintain the required level of resistance to interference for all types of plant, networks, systems, facilities, and equipment relevant for the place of installation. (PQ)

2. The DSS units which are installed outdoor:
   a. Shall operate in Airport environment, with ambient radio signals, magnetic and electro-magnetic interferences. (P)
   b. Shall not radiate electro-magnetic signals that adversely affect any other devices. (P)

3. The Bidder Supplier shall specify test procedures of verifications and standard compliance for RFI/EMI. (Q)
6.7.5 Power Supply

1. All A-VDGS units shall operate with electric power provided by IAA. (P)
2. IAA shall provide single phase 230V 50Hz up to 16Amps circuit breakers: (I)
   a. near the A-VDGS units
   b. The server cabinets in each Core rooms
   c. The DSS units
3. The Power sources provided by IAA will be UPS sources. (I)
4. The Bidder is required to connect the various devices at all sites to the provided IAA’s electrical board, and to use standard electrical cables that comply with UL standards. (P)

6.7.6 Outdoor Cabinets

1. The DSS shall be installed in cabinets conforming to environmental protection standards IP65 or IP54 (or a compatible NEMA standard), and ventilation to be applied as required. (PQ)
2. All internal components shall be protected against dust, rain, ice, humidity lightning, and salt. (P)
3. The DSS cabinet shall also include climate control elements to alert and protect from extreme environmental conditions. See Section 4.6.11 in Chapter 4. (Q)

6.7.7 Indoor Cabinets and Racks

1. The A-VDGS units installed in cabinets in the Core Rooms shall be equipped with temperature and humidity sensors in order to protect the servers. (Q)
2. The cabinets/racks shall be provided with several fans in order to keep the air circulating within the rack even with doors closed. (Q)
3. The sensors shall alert the Technical management system whenever temperature and humidity has reached certain thresholds. (Q)
6.8 Installation Requirements

6.8.1 General Materials, Cables and Workmanship

1. All electrical and electronic work shall comply with local Israeli standards. (P)

2. The construction shall be modular, and plug-in circuit board design shall be employed such that maintenance, modifications and/or additions to the provided facilities may be affected with minimum site work. (Q)

3. All auxiliary wiring within the equipment shall run neatly in plastic trunks, secured properly within the unit and, in the case of instrument circuits, run in separate groups accommodated within the unit. (P)

4. "Live" auxiliary wiring shall be fitted with phase identification. (P)

5. All cables that pass through an enclosure/panel shall be protected by proper grommets and sealing. The cable terminations shall be easily accessible with the cable compartment covers removed. (Q)

6. All equipment for use outdoors shall be equipped with weather tight fittings for all wiring that passes through the weather tight compartments to prevent the entrance of moisture and/or dust. (P)

7. All cables and components within the equipment shall be clearly labeled correspond with the component and wiring layout drawings that are supplied as part of the maintenance manuals. (P)

8. All materials supplied by the Bidder shall be best of breed and shall match the high requirements of the Israeli standard and in its absence, to the highest level as appear in the general specification. (Q)

9. Major materials in use may be Steel, Aluminum, Stainless Steel, Perspex Rubbers, Seals and gaskets. The Bidder is required to provide the quality description of the materials in use. (Q)

10. Affixing, such as paint, silk printing, typography and pictograms, shall conform to the standard requirements and shall have a minimum of 3 years of warranty. (Q)

11. The Bidder shall provide all necessary operating and lubricating instructions, notices, labels, warning signs, number and number plates for the various items of the A-VDGS system. (PQ)
12. The means that are used for laying out the cables and the actual cables themselves must take into account: (Q)
   a. Opening the cabinet for maintenance purposes
   b. Moving mobile elements along tracks
   c. Distinctive markings on the cables
   d. Clear separation of the power cables from the data cables
   e. Shielding as necessary

13. The enclosure shall have a neat, professional appearance and will blend with the installation environment. (Q)

14. All enclosure doors shall be sealed with rubber gaskets. (Q)

15. Front-face and maintenance doors shall be locked with tamper-resistant key. (Q)

16. For outdoor display boards – a sun-hood shall be included. (Q)

6.8.2 **Mounting Brackets and Connecting Elements**

1. The Bidder shall be fully responsible for all connecting elements that are required for achieving full and proper operation of the A-VDGS system, i.e. the Central System and the DSS. (PQ)

2. The proposed installation solution must be approved by IAAs construction engineer and must be coordinated with IAA technical team. (P)

3. The Bidder shall define all the construction work required for the system to enable the Central System and the DSS to comply with safety standards and function in an optimal and efficient manner. (P)

4. The Bidder shall install the cabinets and the DSS units at the allocated locations as described in this tender. (P)

5. The DSS shall be connected to the poles and/or to the terminal/bridge facades at various downwards tilt angles of the PDU according to the height and distance from the centerlines. (P)

6. After installation, the Bidder shall be responsible for verifying compliance of the construction with all requirements. (PQ)

7. The Bidder is requested to elaborate and provide full details about the following proposed elements: Mounting brackets, Hardware to attach to, Installation and De-installation accessories for each DSS at every Stand. (Q)
6.8.3 Installation

1. IAA has put a tremendous effort to enable the installation of the new AVDGS system in parallel to the old one in order to enable a smooth transition between the systems. (I)

2. The provided infrastructure will allow the Awarded Bidder to install and test the system with minimum disruption to the current operational system. (I)

3. The installation of the system components shall be according to the following guidance:
   a. The Supplier is required to install the racks in the allocated positions at each Core room, and allow IAA to provide the Fiber Optic panel to each rack. (P)
   b. The Supplier then shall install the servers and network devices and utilize the allocated fiber optic cables to connect the core rooms as designed. (Q)
   c. At this stage, the system is prepared for testing the Central System. (I)
   d. The new AVDGS Network will be set to be able to connect the new DSS one by one to the new system. (Q)
   e. According to an approval transition plan, the old PDU will be dismounted and the new DSS will be installed. The new DSS will utilize new Fiber Optic and copper cables, while the old cables shall be kept in place. It is important to emphasize that while disconnecting the old PDU, it is crucial to reconnect the old fiber optic ring in order to keep the ring topology connection for the old VDGS system. (P)

4. Please refer to chapter 7.3.12 for detailed installation requirements. (Q)

5. The Bidder shall submit a proposal for a transition plan from the old VDGS system to the new AVDGS system, according to the provided infrastructure and the instructions set forth in Chapter 7. (Q)

6.9 Safety Requirements

1. The Bidder shall provide safety instructions that must be applied before starting any operation or maintenance work on the AVDGS system. (P)
2. The Operational and Technical users of the system must be trained for safety operation of the A-VDGS system. (P)

3. The System shall be provided with safety warnings and cautionary notes that are clearly observed. (PQ)

4. All "Live" connection to main power (230V, 50Hz) shall be labelled clearly. (P)

5. The Bidder shall incorporate practical safety features into the design of the A-VDGS system. (Q)

6. Features that improve safety and identify problems and faults before docking operation shall be given higher consideration. (Q)

### 6.9.1 Safety Earth Connections

1. The AVDGS unit shall be provided with proper safety earth connections at several points. (P)

2. The Bidder shall utilize the safety earth points provided at the power supply input terminal block or other means as instructed by IAA. (P)

### 6.10 Infrastructure Standards

1. The list of relevant standards is detailed in Section 2.5, Chapter 2. The Bidder is requested to describe its level of compliance to the standards in Chapter 2. (Q)