

## **SECTION 6 - SUBSECTION C3**

### **PUBLIC ADDRESS (PA) SYSTEM**

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## 1. General

1.1 This chapter describes the planning, supply, installation and operation of PA system, and its integration with other systems.

1.2 Work Content

1.2.1 Detailed planning of the PA system ( Indoor,Outdoor ,Racks etc.)

1.2.2 Cable infrastructure dedicated PA network as planned by designer (1Ghz Cat. 7 and Fiber optic MM cables to connect between buildings ).

1.2.3 Coordination and integration with other systems (TELEPHONE, FIRE etc.)

System installation

1.2.4 Acceptance tests and operation

1.2.5 Delivery and documentation

1.2.6 Training

1.2.7 One year warranty including service and maintenance

1.3 Important Points

- The PA system will include all peripheral equipment, amplifiers and electrical installations of all system components. The system will be installed as a complete unit and will operate as specified below.
- The PA system will be a standard product of a reputable manufacturer. The manufacturer will assure parts availability and on-site technical assistance for at least 5 years after delivery.
- The PA system (scheme design, rack plan, equipment etc.) shall be approved by the customer.
- The PA system will season requirement of Israeli Fire authority and the police specification for PA systems.

## 2. Description

## 2.1 PA System

- 2.1.1 The PA system will cover the entire buildings and the entire Inspection site.
- 2.1.2 The coverage will be divided into separate zones.
- 2.1.3 Public address will be operated in one of the following forms:
  - a. Individually, in each separate zone.
  - b. Simultaneously, in a number of selected zones.
  - c. Total operation in all zones.
- 2.1.4 The PA will be operated from fixed operation centers and from telephones.
- 2.1.5 Priority order will be set for the various operation centers. Operating a PA center will disable all the lower priority calls.
- 2.1.6 PA operation will be accompanied by a “gong” to attract attention.

## 3. System Basics

### 3.1 General

- 3.1.1 The system will comprise amplifier and equipment units in a 19” rack.
- 3.1.2 The main 19” rack will be installed in the **radiography building**. Secondary racks in other buildings / per site final design.
- 3.1.3 PA zone outputs will be electronically protected so that short circuit on a feed to one of the zones will not disable the entire center.

### 3.2 Power System

- 3.2.1 The active components will be powered from a 220V source (the system will be powered from a UPS) and from a stand alone 24V charger/battery. Change from 220V to 24V emergency voltage will be automatic.

3.2.2 The power system will consist of 2 sets of stationary or maintenance- free batteries connected in parallel with total 3 hour work capacity with no charging.

3.2.3 The charger system will employ the n+1 technique, that is when a charger fails additional charger kicks in. Charger failure will activate a sound/visual alarm in the control center.

### 3.3 Equipment Rack

3.3.1 The main rack will be of 24 PU height and 19" width, equipped with a front and back sealed doors with a locks. In other buildings will be installed a 10 PU floor secondary racks.

3.3.2 A power distribution panel with DC and AC switches for the rack equipment and indication lights will be mounted in the top part of the rack.

3.3.3 DC distribution units and AC sockets for equipment and maintenance will be mounted on the rack back side.

3.3.4 A fan mounted in the top part of the rack will enable amplifier operation when the air conditioning system is inactive.

3.3.5 Amplifiers, switching units, controls, receiver, signal generators, internal supplies etc. will be mounted on the rack.

3.3.6 All unit cable connections will be on the back panel and will include reserve for unit connection/disconnection.

3.3.7 The cable will be connected with suitable connectors or cable lugs.

3.3.8 Loudspeaker and operating unit cable connections will be on terminal panels using cable lugs.

### 3.4 Loudspeakers

3.4.1 Horn speaker

- a. Horn speakers (35 W RMS) will be installed outdoors on suitable consoles or on building walls.
- b. Maximum speaker volume will be 123 dB at 1 meter distance.
- c. Thrust heads and transformers will be built in the speaker.
- d. The transformer will deliver three output power levels differing by at least 3 dB.
- e. Speakers will be distributed in the energy rooms and outside areas with the minimum of reverberation and overlap effects.
- f. The speakers will be made of aluminum or ABS plastic.

#### 3.4.2 Cone speaker

- a. 8" diameter, 10W RMS (or other selected model) cone speakers will be installed inside the buildings in decorative cases/ceiling mounted.
- b. Transformers will be built in the wooden cases or as part of the speaker. The transformer will deliver three output power levels differing by at least 3 dB.

#### 3.4.3 Speaker Monitor

- 3.4.4 A Speaker Monitor will be planned with 10 channel inputs, DC 24v function, Built in monitor speaker with volume control , Led display input level.

### 3.5 PA Operating System

- 3.5.1 Two PA unit types will be planned – one mounted on a 19" rack and the other free standing to be placed on a table ( see 3.5).
- 3.5.2 The units will be mobile and easily connected/disconnected.

3.5.3 The operating units will be totally encased in metal and will include the following parts:

- a. Selector pushbutton switches for PA routing to the different zones – an ON/Off switch for each zone.
- b. On/Off switch for simultaneous PA routing to all zones.
- c. Dynamic directional microphone.

3.5.4 Mobile microphone jack.

3.5.5 Mobile microphone with built in PTT push button.

### 3.6 Amplifiers

3.6.1 The amplifier output (app. 360W RMS X 4 units) to be designed at detailed planning stage.

3.6.2 General specifications:

- a. Amplifier, 60 dB min.
- b. Distortion – less than 2%.
- c. Signal-to-noise ratio 85 dB.
- d. Fixed voltage operation at 70/100V.
- e. 230 VAC 50 Hz or 24DC (both options are required).
- f. Recording output.
- g. 19” standard width.
- h. Audio Distributor amplifier unit will be installed.

### 3.7 Pre-amplifiers

- a. Each PA operation unit will be facing a pre-amplifier.

b. The pre-amplifiers will be installed in the mixer pack and will enable loudness of the system.

c. The pre-amplifier characteristics will be compatible with the amplifier. The pre-amplifier will not produce noise or degrade loudspeaker performance.

### 3.8 Gong

A gong signal generator is incorporated in the PA system to attract attention when one of the operating units is about to announce/transmit a message (not required for alarm/all clear). On opening the microphone circuit this signal is automatically transmitted for 2 seconds.

### 3.9 Modularity

The system will be built from modular replaceable units enabling future extensions and changes to the operation zones and centers.

### 3.10 Lightning Protection

The principal elements of the equipment, amplifiers, mixer etc will be lightning protected by means of units connected on all power lines to loudspeakers and outdoor operation units.

## **4. PA Zones (X3)**

4.1 Radiography Building: Offices X-ray, Technical area, Scanning Tunnel

4.2 Outside Area site (Parking, Check-in/out)

## **5. PA Operating Centers (Dynamic Mic.)**

5.1 Radiography Building: TBD (System supervisor).

## **6. Installation, Operation and Training**

6.1 Installation

The installation will be professional, expert and efficient using standard and safe materials and tools complying with Israeli Standards and work practices.

## 6.2 Acceptance Tests

6.2.1 The supplier will attach acceptance test notes or specifications.

6.2.2 The tests will be conducted by the supplier in the presence of customer's representative. Once tests are completed, the supplier will prepare a summary report. The supplier and the customer's representative will append their signatures as mark of approval of the tests and their results.

6.3 All approvals will be under the responsibility of the supplier.

## 6.4 Maintenance Commitment

The supplier will be committed to stocking necessary spare parts for a minimum period of 7 years.

## 6.5 Training

Once the system is operating, the supplier will train the customer's employees in system operation, features and capabilities. The training will be based on documentation provided to the customer. The customer will be able to order refresher courses and additional training for a period of 6 month from exchange start-up date, at no additional cost.

# 7. Service and Maintenance

## 7.1 Service

7.1.1 Supplier's service center will be ready to provide telephone diagnostic and troubleshooting support. To this end, a professional will be available to respond to queries within 10 minutes from the call for service, or for telephone support.

7.1.2 Response time required for urgent failures -Technician arrival within 2 to 4 hours

### 7.1.3 Ordinary failure response times -

a. For failure message received before 11:00 the technician will arrive the same working day before 15:00. For failure message received after 11:00 the technician will arrive until 11:00 the next working day.

b. The supplier will make sure the customer is available and the faulty equipment is accessible. No technician visit will take place without prior coordination.

## 7.2 Maintenance

7.2.1 The supplier will visit the site once in three months. The periodic inspection will include system, peripheral units, ambient conditions etc. Visit report will be submitted to the customer or as pre-assigned.

7.2.2 The supplier will keep a maintenance and event log.

## 8. Documentation

8.1 While installing the system the supplier will attach the following documentation in Hebrew. He will be responsible for providing documentation and technical literature as follows:

a. Technical documentation – all equipment user instructions and specifications. This documentation will be forwarded to communication manager on special request within 24 hours.

b. Operating documentation – equipment operating instructions, troubleshooting etc. This documentation will be forwarded to communication manager.

c. End user documentation – peripheral equipment operating instructions (operator's stands, auxiliary devices). Required amount of the documentation will be provided.

- 8.2 The supplier will provide the customer with **4** documentation sets including:
- a. Technical specifications of system and interfaces
  - b. System layout with connection and interface points
  - c. Detailed user guide for operator and system manager allowing optimal system operation
  - d. Operating instructions for end users
- 8.2.1 Any other information and documentation pertaining to optimal operation
- 8.3 The documentation will have a clear and good-looking graphic layout, incorporating advanced graphic features that facilitate reader's comprehension. Documentation samples will be submitted on customer's request.
- 8.4 The documentation will be submitted in a bound book format and, where possible, in Microsoft Word compatible CD-ROM format.