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REVIEW OF PIC ELECTRICAL UPGRADE PLANS

January 25, 2007

This publication was produced by prepared by engineer Ibrahim Farrag for Chemonics International.

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Contact Information: aocj@aocj.org

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**Prepared by Engineer Ibrahim Farrag
for the AOCJ Project**

Introduction

I have received and reviewed the electric “concept of design” for the Prosecution Information Center (PIC), prepared by EEO Consultant Engineers (EEO) and dated December 18, 2006. The concept of design contains an overview of the electrical power supply requirements to upgrade the PIC electrical capacity.

The author of this report recognizes that the concept of design is a preliminary design document and is therefore not intended to include all the details required to finalize the PIC electrical site preparation. The concept of design mentions a proposed drawing for the positioning of sockets and equipment, but such drawings were not attached to the copy received by AOCJ and provided to me. I have reviewed the concept of design as it exists without any diagrams and provide suggested recommendations below regarding matters that could be considered to help ensure the uninterrupted and secure electrical power operation at the PIC in the future.

Recommendations

1) For a more detailed perspective of the electrical requirements of the PIC, the consultant should consider developing a single line diagram of the electric power supply coming into the Qattameya Heights complex and how that supply is distributed, including specifically to the physical area occupied by the PIC. As noted in the introduction, it is possible that such diagrams already exist and have been considered by EEO.

2) In the first section, point five of the concept of design, there is reference to emergency supply for rooms one and two. However, there is no indication of the intended source of this emergency supply. A clarification would be useful. In more detailed future plans, there should be some clarification regarding the switching between the main electrical power supply and the emergency power supply. For example, will the mode of switching be automatic or manual? Also, how much time is expected to switch from the regular supply to the emergency supply?

3) The concept of design does not indicate if there have been any on site measurements of the incoming power supply. To get a complete picture of the quality of the incoming electric power supply to the PIC, there should be on site real measurements at the Qattameya Heights complex. This measurement can be made using a power analyzer instrument. Measurements should include all the standard criteria, including voltage and frequency showing surges and/or variations in the incoming supply. Measurement should also include the quality of the incoming electric supply voltage waveform indicating the percentage magnitude of noise and harmonics if present.

4) In section two of the concept there is extensive discussion of the need for appropriate UPS units. This requirement is vital. In addition to the information noted in the concept of design, it is recommended that EEO consider UPS units with isolation transformers and harmonic reduction filters to help reduce or eliminate power line noise. This determination can be made after on site measurements related to the quality of the incoming electric supply. Careful consideration should be given to peak currents of the

connected equipment so that the UPS units are not overwhelmed at peak usage (i.e. start-up of the equipment). The UPS should be sized to power critical loads for approximately 15 to 20 minutes so they can support a controlled and safe equipment shutdown if needed in the case of a short term power interruption.

5) The concept of design includes the number of sockets and their locations in textual form. The concept of design also refers to a diagram of socket locations but it was not included with the report. A copy of this diagram would be useful to demonstrate positioning of IT equipment and peripherals.

6) Given that the concept of design is merely a preliminary view of the electrical design, it understandably does not include information regarding the specifications of the electric power cables that serve the Qattameya Heights complex of the PIC. The power cable dimensions, material (i.e. copper or aluminum), and routing will of course have an impact on the successful and safe provision of power to the PIC. Therefore, these matters should be fully considered when a more detailed electrical specifications report is developed for the PIC.

7) There is little indication of power distribution in the existing preliminary design document. Ideally, there should be a single dedicated power distribution panel centrally located near the computer equipment and solely used for the computer equipment to reduce power line noise. It is recommended that the distribution panel and protective

devices be physically located as close to the loads as possible. By minimizing power cable lengths, the amount of radiated noise pickup is minimized.

8) In section 1, point 7, the concept of design provides for circuit breaker protection for all sockets. In more detailed future design documents, the precise load to be assigned to each circuit breaker, and therefore the number of required circuit breakers at the PIC, should be designated based on the expected load. Circuit breakers must be able to handle any surges as well as the standard operating current.

9) If possible, it is preferred that the source of power for the computer equipment, servers, and network be separate from the power source for any noise-producing equipment, such as air-conditioning, cleaning equipment, or fluorescent lighting. This will help reduce unwanted noise disturbances.

Engineer Ibrahim Farrag

Date

