



Electro-Mechanical Retrofitting leads to extended life of Power Distribution & Power Quality System and, critical protection from fire hazards using products with contemporary technology.

Location

Dubai Hospital, UAE

Client

Dubai Hospital

Project Brief

Operational since 1983, the Dubai Hospital is a specialized hospital including 26 surgical departments that spans across 14 stories with a 600+ bed space capacity. Noted as amongst the major developments in Dubai since mid-1970s, the key requirement of the project was to retrofit the Power Distribution & Power Quality System to make it more sustainable, comply with current industry standards, and eliminate or reduce critical risk factors ultimately extending the lifespan significantly.

Project Scope

Upgrading the existing Power Distribution & Power Quality System through:

- Replacement of Switch-Fuse Units to new MCCBs in all the PDBs.
- Replacement of existing MCC Panel with new MCC panel.
- Refurbishment of Earthing System & Lightning Protection System.
- Replacement of existing AHU Busriser with new busriser.

This was inclusive of all necessary

- Authority approvals - DEWA and, DHA.
- Cable termination and laying works.
- Civil works.
- Temporary Power Back-up provision.

Problem

Standing tall with a running history of 40 fabulous years of medical service, the hospital's power distribution and power quality system - installed during incorporation - not only consisted of parts that had become obsolete but had run past its advisable lifespan leading to a vulnerable system with worn-out components susceptible especially to malfunction of switchgear devices. Providing interruption free power was a major challenge for the Engineering Team of Dubai Hospital.

Switch-Fuse Units in Power Distribution Units

With the lack of any accurate short circuit and overcurrent protection in the existing switch-fuse units and lack of proper discrimination in the PDUs, there was an increased risk of nuisance tripping, high maintenance requirement and increased chances of power outage in the system.

Earthing System and Lightning Protection

Worn out over the years, the existing Earthing System provided a depleted earth resistance that caused an excessive flow of residual current with low protection for earth fault current; while the lack of an appropriate lightning protection provided little defense in the case of lightning striking the building.

Busbar Trunking System

The aging of the existing Busbar System led to occasional power outages in multiple areas of the system while the non-availability of spare parts made it impossible to rectify the issues, making it an unsustainable system as a whole.

Solution Installed

Very aptly and timely, the Engineering Team of Dubai Hospital devised a plan to retrofit and/or replace the aging system to ensure uninterrupted availability of power to the hospital.

Keeping in mind the client's critical requirement of a sustainable solution in-line with the current industry standards, we designed a solution utilizing the latest technology available.

1. Replacement of Switch-Fuse Units with new MCCBs:

- Ensured accurate overcurrent and short circuit protection, thereby providing right discrimination in the electrical system.
- Installation of MCCBs nullified the need to replace the protective system (then Switch-Fuse Units) every time in the case of an overcurrent or short circuit situation.

2. Replacement of existing main Incomer-cum-MCC Panel with new MCC panel:

- 2500A rated MDB with 25 number of Motor Control Feeders with VFDs and soft starters is the main switchboard feeding all the air conditioning load in the hospital.
- The replacement was done without affecting the power flow in critical loads and by minimal shutdown of the system.

State-of-the-art Power Distribution & Power Quality System installed.

Lifespan extended by 20+ years.

3. **Refurbishment of Earthing System & Lightning Protection System:**
 - For the Earthing System; pure copper rods were installed in place of the existing aluminium rods which positively reduced the earth resistance.
 - The Earthing System now met the required DEWA Standards.
 - For the Lightning Protection System, “early streamer emission air terminals” were installed; replacing the existing Copper Mesh System leading to early detection & protection.
4. **Replacement of existing AHU Busriser with new busriser**
 - Installed advanced epoxy insulated Busbar Trunking System without affecting the existing busway system and hospital operations.
 - Power was transferred from the existing to the new busbar system with extreme precaution at various stages.

Challenges Faced

Given the nature of the property, it was critical to carry out the project without any conflict with the ongoing hospital operations. Keeping this in mind, the project was carried out by providing a back-up power at all stages through temporary switchgear arrangements, detailed coordination with the engineering team at Dubai Hospital and numerous mock set-ups. These steps were essential to succeed in the critical retrofitting works for the project. It was ensured that power was available at all times to the critical loads in the hospital.

Another challenge experienced was space. As the hospital structure was built with consideration of systems of the past, the existing electrical room wasn't structured to accommodate new systems. In order to tackle this and to ensure scope for future upgrades, civil modifications were made to create adequate space wherever essential.

We thank the Engineering Team of Dubai Hospital for their tireless support and collaborative working throughout the course of the project.

About GAMA Engineering

Established in 2001, we are one of the leading companies in UAE offering customized Electrical & Automation solutions covering LV & MV Switchgears, Energy Management Solutions, BMS, GRMS, Lighting Control Systems, Home Automation, ELV Systems, Busbar Trunking Systems, 3rd Party Testing & Commissioning, HVAC TAB Works, and Electro-Mechanical Services. While we play a crucial role in development in the greenfield, our holistic package of solutions and specialized expertise in retrofitting of Electrical & Automation Solutions and AMCs additionally make us pioneers in bringing sustainability to the brownfield.

With offices across the UAE and Oman and ardent believers in the power of technology, we are constantly investing in cutting-edge machinery, equipment and training processes at our advanced 7000 sq. meter manufacturing facility in Sharjah and even more so in those behind the solutions.

As an authorized partner of Schneider Electric for various Electrical & Automation solutions including Low Voltage Switchgears, Busbar Trunking System, Intelligent Lighting Control, Home Automation, Building Management Systems, Access Control, Structured Cabling Systems and Power Quality solutions of Schneider Electric, and BMS Solutions partner of Schneider Electric, and Johnson Control amongst tech partners with other leading MNCs, our solutions cover an entire optimization array with numerous prestigious and critical projects across various industries as testament.