INDIRA GANDHI INTERNATIONAL AIRPORT
NEW DELHI

Honeywell HBS delivered one of the largest integrated BMS (Building Management Solution) platforms for the new Terminal 3 building and implemented a modern Airfield Ground Lighting (AGL) portfolio for the Indira Gandhi International Airport (IGIA) in New Delhi. The integrated systems span four major buildings across the Airport Operation Control Center (AOCC), manage precise automated billing for the utilization of land and airside services and the AGL components increase the safety and productivity of the airside airport operations.

Case Study

Honeywell

OVERVIEW

The Indira Gandhi International Airport (IGIA), New Delhi, is the primary international airport for the National Capital Region of Delhi, India. Previously operated by the Indian Air Force, its management was transferred to the Airport Authority of India and further to Delhi International Airport Limited (DIAL) in May 2006, a joint venture led by the GMR Group, which also has the responsibility for the airport's ongoing expansion and modernization.

In 2010-11, the airport handled 29.94 million passengers annually and the planned expansion will support a capacity to handle 100 million passengers by 2030. The development of Terminal 3 was the first phase of this expansion which, in itself, would allow the airport to handle an additional 34 million passengers annually.

Terminal 3 was officially inaugurated on July 3, 2010 and occupies an area close to 5.4 million sq.ft. Currently ranked as the eighth largest passenger terminal in the world, the building is an extensive display of contemporary technology and an impressive showcase power of great planning.

THE CHALLENGE

DIAL needed a showcase landmark to befit the role of being the host of the 2010 Commonwealth Games in Delhi. The project had an extremely challenging deadline to complete within three years–a process that normally would take five years.

The development plans included the best combination of leading technologies in the market but, to ensure the inter-connectedness and effectiveness of the systems, DIAL needed a BMS platform which would operate on Open Protocol and which would accept the plethora of industry standards.

IN THE TERMINAL

The platform was also required to act as a Master Supervisory Monitoring system for all the facilities across the airport, and to operate on the networked building. Data integrity was also an important criteria, in order to manage the disparate buildings and various uses of the site. To address this, it was imperative that the Monitoring System had sufficient power to collect precise and accurate data simultaneously on the preferred OPC protocol, with negligible data loss and maximum reliability and availability.

A single, centralized Network Access Controller would monitor all available systems and services more efficiently, including capturing data from field devices and presenting it in both graphical and text formats. It also needed to integrate multiple sub-netted BACnet® devices over the single platform.

Productivity gains were a key motivator for this project; to ensure maximum output for services rendered, automated and accurate billing were required.

Improved monitoring and deployment of resources were highlighted as a need to reduce operational manpower.

ON THE AIRSIDE

The customer wanted DIAL to be a world-class, modern airport which required building up the AGL components to be CAT IIIB-compliant and sophisticated enough to interface with SCADA (Supervisory Control And Data Acquisition), MET (meteorological data interface, BMS (Building Management System), VDGS (Visual Docking Guidance System), and ASMG (Advanced Surface Movement Guidance & Control System). Enhanced safety features such as sensor loop, stop bars and dedicated secured routes were required to bolster overall safety.

THE SOLUTION

Honeywell leveraged the power of Enterprise Buildings Integrator (EBI) – a worldwide-proven platform that integrates almost every industry standard protocol including OPC (OLE Process Control), BACnet®, Modbus, over a single SCADA.

The solution included:

- EBI that supported an integrated SCADA.
- DDC controllers for precise recording of the flight docking-undocking times for billing purpose.
- 14 servers acting as BMS for monitoring of services installed in the respective buildings.
- DSA licences for effective communication between all BMS Servers.
- 14 workstations for monitoring and operations.
- Printers installed with all servers and workstations for report generation, archiving and future analysis.
- Utilizing EBI installation on a standalone server as NAC (Network Area Controller) to meet customer expectation.
- Integration of BACnet® devices provided by various third party vendors using complex BBMD (BACnet® Broadcast Message Device) concepts. This was achieved by joint collaboration and efforts between Project Team, TSG (Technical Support Group) and TAC (Technical Assistance Centre).
- Redundant EBI machines on windows platform with RAID-5 configuration for maximum reliability and availability.
- Integration of many services with EBI using OPC protocol.

Customized solution for the terminal building included:

- In-house development of an adaptor for transferring billing information from distributed BMS servers to AODB (Airport Operational Database)/ AMDB (Airport Management Database).
- In-house development of an Ext-IP3 adaptor which made EBI compatible with VDGS GOS (Gate Operating System) server.
- EBI scripting and database customization in client-defined formats for accurate GPU-PCA (Ground Power Unit, Pre-conditioned Air) billing.
- Development of extensive and exhaustive GUIs (Graphical User Interface) at site.
- Development of necessary scripts to give enhanced features to EBI to meet the customer's requirements.

Airside, the AGL systems solution included:

- CAT IIIB precision approach operations on both runways 11 and 29.
- Optimal operations in varied visual conditions down to an RVR (Runway Visual Range) of not less than 50 metres.
- Custom-built airport lighting applications suitable for tropical environments including mitigation against severe storms and rainfalls.
- A wide portfolio of offerings including: Approach Lighting; Runway Lighting; Taxi-way and Taxi-lane Lighting; Stop Bar and Runway Guard Lights; Precision Approach Path Indicators (PAPI); Movement Area Guidance Signs (MAGS); Illuminated Wind Direction Indicators (IWDI); Cabling and Reticulation System; Constant Current Regulator (CCR's).
- Custom-designed AGL Control and Monitoring System (CMS) and user interface meeting the customer's requirement.

KEY BENEFITS

Customized Solution to address customer's needs

Globally this is the first time that GPU and PCA systems are integrated with IT-BMS for automated billing. Flight parking information and stand availabilities are also monitored and managed from the system. The implementation of this system led to marked improvements in speedy issue identification, maintenance of non-IT services and reductions in manpower cost. The customized solution provided a rich portfolio of technical and managerial documentation for the customer.

A custom-designed user interface for the AGL Control & Monitoring System was built according to feedback from the stakeholders, including both the Airport and the Airport Authority of India, DGCA.

Reliable Delivery

Honeywell's discipline and processes provided a unique project execution strategy that ensured successful project completion meeting stringent time line. Honeywell played an active role right from its design stage.

More Green

Honeywell's centralized monitoring and control system helped the customer achieve the Green Building certification. Energy measures are a result of good planning and usage – for example, the precise docking and undocking times of the aircraft enables managers to have more transparent data, which helps better calculate energy usage.

The provision of individual lamps and control for the AGL system allows operators to be more flexible when switching circuits on and off as required, at any particular time. This helps reduce cost and overall power consumption by only using the lights when required.

Coupled with technology, Honeywell's strong technical delivery capabilities and domain expertise made the perfect combination to offer a competitive financial and technical solution to the customer.

TERMINAL 3 BENEFITS

The One-stop Solution
Honeywell's EBI effectively integrates different technologies and protocols. The delivery team also provided technical assistance to other third party vendors in the process. The successful implementation of this milestone project has led the customer to consider four new interfaces to be integrated on the BMS servers and discussions on a new billing system to be implemented are nearing completion.

Reduced Costs
The centralized system allowed for better allocation of resources thereby reducing the overall wastage of unused labour.

More Productive
The integrated system allowed for data from various touch points to be collated through the automated processes and backed with historical data. Issues could then be easier and quicker to address.

AIRSIDE BENEFITS

Better Visibility and Control
The custom-build for the CMS implementation allowed for better monitoring and diagnosis of faults remotely, so potential incidents could be identified and rectified more efficiently.

Long-term Service Partner
The continuous monitoring facilitates preventative maintenance measures so resources can be better utilized. The serviceability of the runway is currently maintained above 99.5% with the AGL system helping to improve air traffic management in all weather conditions.

Honeywell also provided training on the advanced CMS, thereby ensuring the continuity and support over a longer term period.

More Secure
Additional components, such as Stop Bars and Secured Routes, help to increase the reliability and safety of the aircrafts navigating on the airfield runways.

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