



DELHI INTERNATIONAL
AIRPORT LTD.
TERMINAL 3 & MAIN
RECEIVING SUBSTATION

CASE STUDY
JULY 2019

Delhi International Airport is the first campus project to become PEER Platinum certified under the PEER v2 rating system in India.

“We are proud to achieve the PEER Platinum rating by USGBC/GBCI. Right from the inception of Terminal 3 design and construction, DIAL had adopted various proactive approach towards environment friendliness. Our primary focus is developing reliable and resilient infrastructure, adopting energy efficiency and exploring an alternative solution for generating green energy. Achievement of PEER Platinum rating as the first Airport globally is a testimony to our commitment of ensuring Sustainable Development objectives at Delhi Airport.”

- Mr. Videh Kumar Jaipuria, CEO, DIAL

The Indira Gandhi International Airport (IGIA), New Delhi, India is the busiest airport in the country, handling more than 70 million passengers a year. Opened in 2010, Terminal 3 (T3), the 5.4 million sq. feet terminal of IGIA is reported to be the eighth largest terminal in the world. This new terminal is connected to Delhi by an eight-lane Delhi Gurgaon Expressway and the Delhi Metro.

IGIA is managed by Delhi International Airport Ltd. (DIAL), a consortium led by the GMR group. DIAL has marked itself as a leader in airport energy management, reliability and sustainability efforts. DIAL (T3) has already earned LEED Gold to showcase their leadership in environment management and sustainability development. To further enhance their power systems and to evaluate the electricity infrastructure to global standards, DIAL T3 pursued PEER certification and achieved Platinum rating after undergoing a rigorous certification and review process.



Figure 1. Terminal 3 of Indira Gandhi International Airport

Key Highlights of Delhi International Airport (T3 & MRSS)

- Annual energy savings of 2.3 million units
- Cost savings of INR 70 million
- Adopted “Carbon Neutrality” under ACI’s Airport Carbon Accreditation Program

CARBON NEUTRAL AIRPORT AND A RELIABLE POWER SYSTEM

Civil aviation is one of the world's fastest growing transport businesses today. In India, the aviation sector is also seen as a major economic driver. By 2020, India will be the third largest aviation market in the world, and this growth will certainly impact the environment. As such, it is important to curb and control the industry's carbon emissions. Aviation currently accounts for 2% of total global emissions from



Figure 2. 7.8MW Solar Power Plant at IGIA

human activity as reported by IPCC, 2007. Considering this, DIAL has proactively taken steps towards carbon emission reduction by adopting airport carbon accreditation, procuring offsite renewable power and installing onsite solar PV. After achieving all required safety clearances, the 7.8 MW on-site solar power plant (non-reflective solar panels) was installed in a bid to reduce glare effect at the Airside of the IGIA Airport of the solar power plant has saved INR 50 million for DIAL.

With these measures, IGIA has achieved carbon neutrality, setting a new benchmark for their peers. Mitigating carbon emissions is one of the key criteria under the PEER rating system, and DIAL has successfully met those requirements. Since the inception of DIAL, sustainability pillars have been part of their core business strategy, including:

- ▶ Establishment of safe operations
- ▶ Adoption of renewables
- ▶ Environmental conservation
- ▶ Social well-being

In pursuit of this, DIAL has developed a reliable power infrastructure for its 680 customers, and this is possible only through the implementation of redundant distribution systems and automated power restoration techniques. 76% of the project's loads are provided with an alternate source of power supply from Terminal 2 (T2) in addition to the main feeder, Main Receiving Substation (MRSS). If both the main feeder and T2 face a power cut, the standby emergency Diesel Generator (DG) sets of total 42 MVA capacity comes online to supply power seamlessly to the essential loads. With these available DG sets, DIAL can supply uninterrupted power to all its essential loads for about nine days – demonstrating their emergency preparedness to meet any natural and man-made disasters. In addition to these steps, all the power cables are undergrounded, preventing their exposure to nature's disturbances.



Figure 3. DG Bank at MRSS, IGIA

DIAL not only focuses on reliable power but also maintains provision of good quality power to its customers. With the installation of advanced meters at all of its utility connection points, they assess the quality of the power received and mitigate poor power quality events through the Auto Power Factor Control (APFC) panel and capacitor banks at MRSS.

Through evaluation of PEER it is found that the SAIDI and SAIFI score of DIAL T3 was seven minutes and 0.25 respectively, which helps to plan and improve their reliable power availability for the future. PEER has also helped DIAL T3 in quantifying their percentage of project load with alternate power supply, as this showcases their preparedness during a catastrophic event or emergency situation. PEER certification validates DIAL's accomplishments to date and demonstrates their commitment to sustainability.

EXCELLENT OPERATIONAL PERFORMANCE & SAFETY MEASURES



Figure 4. DIAL Lighting Control & Monitoring

To enhance the grid performance and customers' ability to manage their energy usage, DIAL has incorporated advanced metering infrastructure (AMI) in all their buildings, monitored through MRSS SCADA. DIAL has also installed a building management system (BMS) to monitor its lights and cooling loads. The Lighting Control and Monitoring System (LCMS) provides flexible, efficient control of T3's lighting installations. PEER emphasizes implementing comprehensive energy efficiency programs under

the Demand Side Management (DSM) credit to achieve permanent reductions in energy demand and consumption through load management and conservation. DIAL has achieved a savings of INR 20 million through the replacement of fluorescent lamps with LEDs and by optimizing the operation of their 13 baggage handling systems (BHS).

In order to guarantee safe operation of their electrical systems, DIAL has incorporated Legatrix, a highly customizable, IT-enabled legal support system for tracking, managing and reporting on electrical systems. Legatrix also maintains a centralized repository of all evidence and history of risk events. With this implementation, DIAL provides real time reports on risk management and mitigation to its electrical network personnel.

PEER CERTIFICATION

PEER, or Performance Excellence in Electricity Renewal, is the first certification program, to measure and improve the power system performance. PEER is scalable to any power system or electrical infrastructure, and PEER certified projects have a competitive advantage by differentiating their performance, documenting the value produced and demonstrating meaningful outcomes. The PEER Rating System consists of six credit categories:

- ▶ Reliability and Resiliency (RR)
- ▶ Energy Efficiency and Environment (EE)
- ▶ Operations, Management and Safety (OP)
- ▶ Grid Services (GS)
- ▶ Innovations (IN)
- ▶ Regional Priority (RP)

Out of a possible 110 points, DIAL’s T3 and MRSS earned **84 points**, achieving PEER **PLATINUM** rating under version 2 of the rating system as a Campus project. Additionally, DIAL’s T3 and MRSS have met all the prerequisites, including reliability performance monitoring, environmental performance disclosure, system energy efficiency coefficient disclosure, triple-bottom-line analysis, and load survey. Achieving PEER Platinum certification showcases DIAL’s commitment towards environment, safety and reliability.

As part of the process, PEER has helped DIAL in identification of opportunities for continuous improvement, through increasing the renewable energy mix, assessing and reducing their interruption, demonstrating their ability to supply alternate source of power & bring transparency to their customers by providing feedback on energy usage through a secure online platform with quantitative and qualitative information. These strategies have the potential to help DIAL further reduce and effectively manage their overall energy demand and help customers manage their energy responsibly.

PEER Certification for Campus Projects	
Certified July 2019	
Total Points Achieved	84
Reliability and Resiliency	25
Energy Efficiency & Environment	17
Operations, Management & Safety	23
Grid Services	11
Innovations & Regional Priority	08
Total Possible Points	110