Building Resilience: AAI's Non-IT Infrastructure for DR Site in Hyderabad

1 Airports Authority of India

AAI is designated as a Schedule 'A' Enterprise of the Government of India, signifying its importance and strategic role in the aviation sector. The organization has been recognized for its excellence and achievements, receiving accolades and awards for its contributions to the development of civil aviation infrastructure in India. AAI is designated as a Schedule 'A' Enterprise of the Government of India, signifying its importance and strategic role in the aviation sector. The organization has been recognized for its excellence and achievements, receiving accolades and awards for its contributions to the development of civil aviation infrastructure in India. Over the years, AAI has undertaken numerous initiatives and projects to modernize and expand India's airport infrastructure. These include the development of new airports, expansion of existing airports, implementation of state-of-the-art technologies for air navigation and surveillance, and enhancement of passenger amenities and services.

2 About Nikom

Nikom Infrasolution, established in 2000, has emerged as a leading player in the infrastructure data centre industry, specializing in designing and building state-of-the-art data centers, energy management solutions, and comprehensive information technology services, including cybersecurity, on a turnkey basis for large and medium enterprises. The company has garnered recognition for its excellence, receiving the prestigious 'Best in Class' Award for the Asia Pacific Japan Region for its innovative Green Data Center and Energy Management solutions. Additionally, Nikom Infrasolution has been acknowledged by NASSCOM as one of the 'Major Players in the Datacenter Ecosystem' in India and has been honored as a Runner's Up in the ASSOCHAM Excellence Award for Best MSME. With a rich legacy of 24 years in the industry, Nikom Infrasolution has designed and built nearly 300 data centers, including 16 data centers for Airport Operation Control Centers (AOCC), 12 data centres for ONGC, and 6 data centres for the National Supercomputing Mission (NSM), demonstrating its expertise and commitment to delivering world-class infrastructure solutions. The company's involvement in prestigious projects such as the Aditya L1 mission further underscores its capabilities and contribution to the advancement of critical infrastructure projects in India.

3 Design Consideration and Consultancy

Site survey, solution design and engineering in terms of space utilization, HVAC, power redundancy, minimum down-time, speed of deployment, reduced MTTR, flexible and predictable monitoring, high DC efficiency, low PUE, scalability, customizability and functionality, compliance to Rated 3 / Tier 3 standards.

4 Highlights

This project stands as a significant milestone in the aviation sector, representing the largest Disaster Recovery data center constructed by a Government of India PSU, boasting 28 racks (24 server racks and 4 network racks). Nikom played a pivotal role in meticulously crafting the civil structure design, aligning it with the client's specifications and "Uptime Tier III" standards, ensuring optimal performance and reliability upon project conclusion on 19th August 2021. Our team deployed innovative smart rack solutions, seamlessly integrating biometric access control systems to enhance data security and achieve substantial cost savings, showcasing our commitment to innovation, data security, and cost-efficiency. Furthermore, Nikom implemented advanced Power Distribution Units (PDUs) with DCIM interfaces, optimizing energy consumption and driving cost savings throughout the project duration. Additionally, our installation of safety-focused IP20-certified LT panels prioritized safety, featuring transparent glass fronts to ensure circuit breaker visibility and promote a secure working environment for professionals.

Fig. 1. *IP20-Certified LT Panels as installed at DR-site*

5 Project Overview

The project entails the comprehensive design, supply, installation, testing, and commissioning of essential infrastructure components, including Integrated Racks, UPS systems, Precision Air-Conditioning Systems, Power Distribution Units, CCTV systems, Access Control systems, Rodent Management solutions, Fire Detection and Suppression Systems, as well as Power and Network Cabling. Additionally, civil and electrical works was carried out as required. Training was provided for authorized personnel to ensure proficient operation. All the equipments were covered by a five-year warranty, and operation and maintenance services were provided.

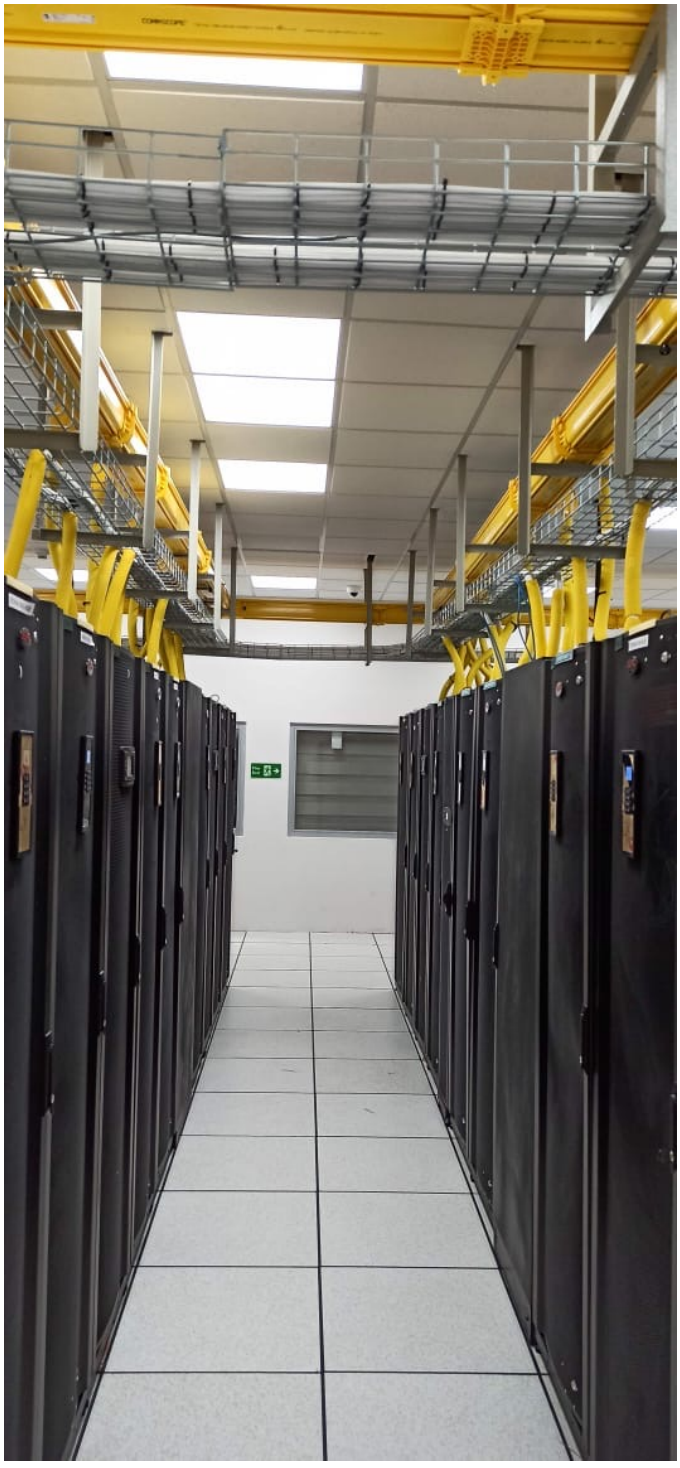

Fig. 2. *Integrated rack access control & structured cabling during execution phase*

6 Scope of Work

The scope of work includes supply, installation, testing, commissioning, training, operation & maintenance and a 5-year warranty. The detailed design is in adherence to Tier 3 guidelines and is composed of redundant power and cooling systems with N+1 topology.

6.1 Civil work

Fire retardant door, false flooring, false ceiling, partitions, glass door, blinds, painting and pop and furniture. The entire data centre with anti-static vinyl flooring.

6.2 Electrical Work

Laying of electrical cable for raw power input, laying of Network cables (copper & optical fibre cables), floor-mounted power distribution units, battery bank installation, cooling outdoor unit installation and copper piping, passive cabling, cable tray installation and earthing.

6.3 HVAC system

Total six 9TR PACs in N+1 configuration to maintain rack temperature at approximately 22 degree Celsius in the cold aisle. Cooling system variable capacity with automatic adjustment of cooling as per IT equipment load.

6.4 Power Engineering

Two 500 KVA silent type diesel generator. Two 100 KW modular UPS for critical load and two 80 KVA conventional UPS for non-critical load. Uses floor mounted power distribution units(PDUs).

6.5 Integrated Rack Infrastructure & DCIM

Consists of an Integrated Access Control System for each rack. Data Centre Infrastructure Monitoring System(DCIM) for IP-based monitoring of fire alarm system(FAS), fire suppression system(FSS), access control system(ACS), CCTV, Rodent Repellent System(RRS) and Water Leak Detection(WLD).

6.6 Protective Earthing

Copper strip laid up to server room through Raceway/shaft/wall with proper clamping arrangement and all Earth pits has covered with RCC cover.

6.7 Uptime Tier 3 Certification

This entails the meticulous adherence to stringent design parameters outlined by organizations like the Uptime Institute. Essential elements include the implementation of redundant power and cooling systems, the integration of dual-powered equipment, and the establishment of multiple distribution paths for vital infrastructure. Moreover, the facility must incorporate fault-tolerant features, such as concurrent maintainability and N+1 redundancy across all critical components, to mitigate the risk of downtime. The certification process demands rigorous testing and commissioning procedures to validate the performance and resilience of the data center's systems. Compliance necessitates exhaustive documentation and comprehensive reporting, demonstrating consistent adherence to prescribed standards throughout the design, construction, and operational phases. Post-certification, continual monitoring and maintenance protocols are imperative to uphold Tier 3 status, ensuring sustained high availability and reliability for mission-critical operations.

7 AAI's Intelligent DR Solution

Airports Authority of India has implemented one of the most intelligent, efficient and secure disaster recovery (DR) sites responsible for ensuring backup, redundancy, and continued operations from more than 135 airports across India. Nikom has designed and executed and is now maintaining the operations to ensure that critical data is stored safely alongside facilitating minimized downtime and ameliorating the risk of data loss