GMR AERO

Your caring gateway to a connected world

ARFF READINESS IN THE BUSIEST AIRPORTS

WHAT GIVES THE BEST AN EDGE

DELHI
INDIRA GANDHI
INTERNATIONAL AIRPORT

GMR AERO

MR. SELVARAJ ARUMUGAM
VP & HEAD-ARFF
DELHI INTERNATIONAL AIRPORT, INDIA

Our Vision, Values & Beliefs

The GMR Group is driven by its vision and deep-rooted beliefs

"GMR Group is an Institution in perpetuity that will build Entrepreneurial Organizations, making a difference to Society through creation of Value"

Humility

We value intellectual modesty and detest false pride and arrogance

Entrepreneurship

We seek opportunities - they are everywhere

Teamwork & Respect for Individual

Nurturing a relationship of trust, collaboration and mutual respect

Deliver the promise

We value a deep sense of responsibility and self-discipline, to meet and surpass commitments made

Learning & Inner Excellence

We cherish the lifelong commitment to deepen our self awareness, explore, experiment and improve our potential

Social responsibility

Anticipating and meeting relevant and emerging needs of society

Financial Prudence - Frugality

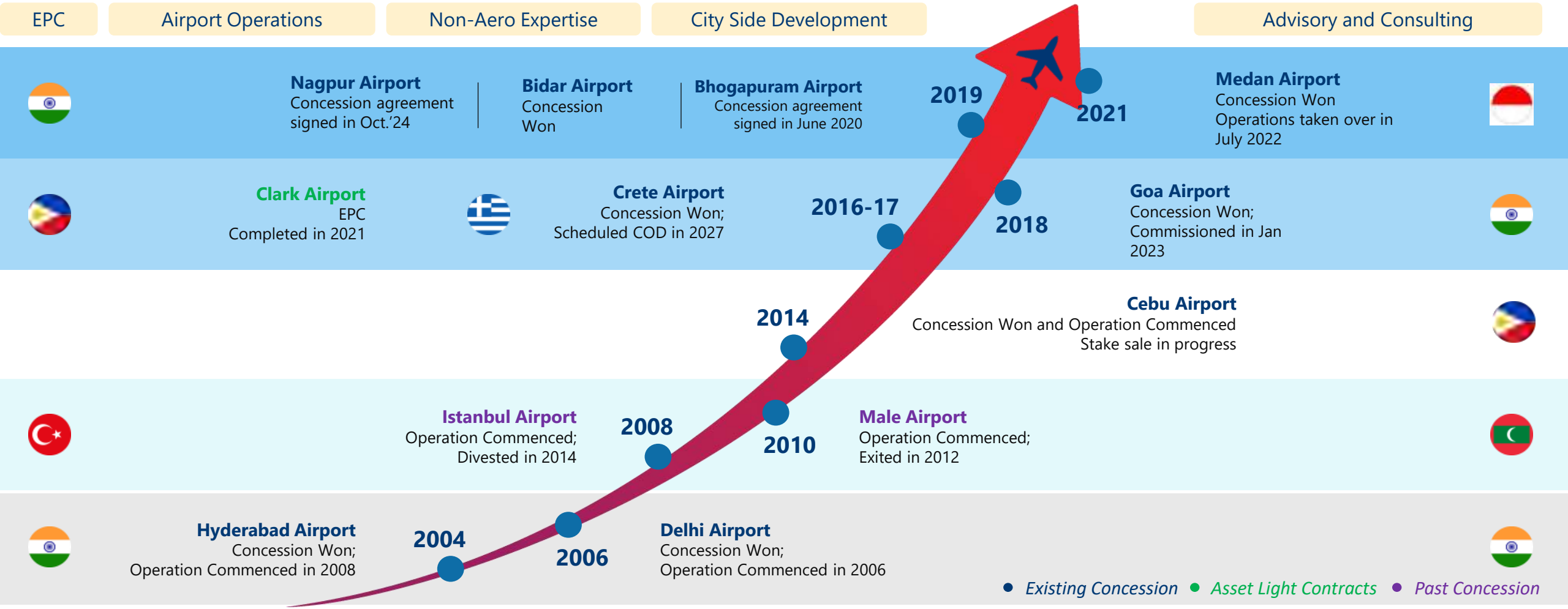
We spend wisely and judiciously

World's 2nd Largest Private Airport Developer

DELHI INDIRA GANDHI INTERNATIONAL AIRPORT | GMR AERO

How We Got Here: A journey of constantly expanding our capability set across multiple geographies and Airports

EPC | Airport Operations | Non-Aero Expertise | City Side Development | Advisory and Consulting



Hyderabad Airport
Concession Won;
Operation Commenced in 2008

Delhi Airport
Concession Won;
Operation Commenced in 2006

Istanbul Airport
Operation Commenced;
Divested in 2014

Male Airport
Operation Commenced;
Exited in 2012

Cebu Airport
Concession Won and Operation Commenced
Stake sale in progress

Crete Airport
Concession Won;
Scheduled COD in 2027

Goa Airport
Concession Won;
Commissioned in Jan 2023

Clark Airport
EPC
Completed in 2021

Nagpur Airport
Concession agreement signed in Oct.'24

Bidar Airport
Concession Won

Bhogapuram Airport
Concession agreement signed in June 2020

Medan Airport
Concession Won
Operations taken over in July 2022

● *Existing Concession* ● *Asset Light Contracts* ● *Past Concession*

GMR Airports portfolio

We have 6 Indian & 3 International Airport projects







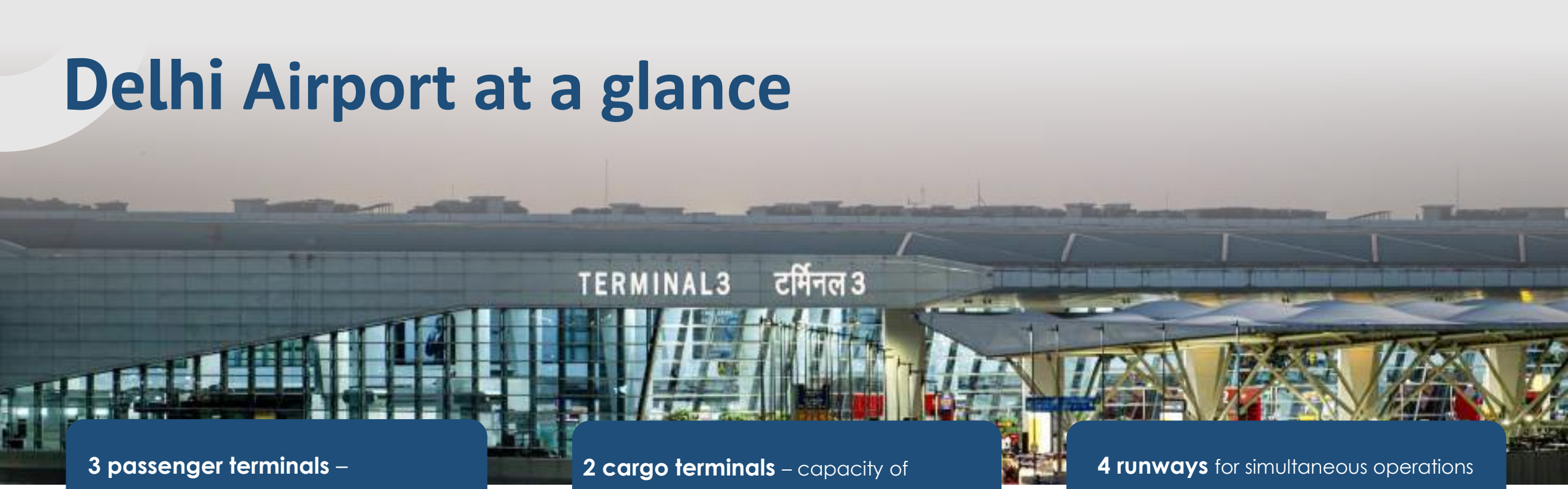

Airport / % GAL stake	DIAL (64%)	GHIAL (74%)	MOPA (100%)	Mactan Cebu (33%)	Medan (49%)	Bidar (64%)[1]	Nagpur (100%)	Bhogapuram (100%)	Crete (21.6%)
Base city	Delhi	Hyderabad	Goa	Cebu	Medan	Bidar	Nagpur	Bhogapuram	Kastelli
CY23 Pax	72.2	24.2	3.7	11.4	7.4	n/a	2.7	n/a	n/a
Concession awarded year	2006	2008	2016	2014	2021	2020	Oct.'24	2020	2017
Remaining life (assuming renewal of concession)	42y	44y	52y	12y	22y	9y	30 + 30y	40 + 20y	35y
Existing/ Max capacity (mn pax)	100/ 140	34/ 100	4.4/ 33	12/ 28	10/ 65	n/a	-	40	15
Land available	230 acres	1,500 acres	232 acres	11 acres	n/a	n/a	247 Acres	294 acres	10 acres
% revenue sharing / concession fee	45.99%	4.0%	36.99%; **2-year moratorium**	Upfront fees of US$320m + VAT	19% gross revenue share + 2.5% of aero revenue + US$207m over 8 years	Cost plus	**14.49%**	FY35 domestic - INR303 / pax; FY35 international - INR606 / pax; **10-year moratorium**	n/a

Our extensive greenfield and brownfield experience is unmatched across the world

Note
1. Contracted by GHIAL

Brownfield projects Greenfield projects

Delhi Airport at a glance



3 passenger terminals – capacity of 109 Mn

2 cargo terminals – capacity of 1.8 MMT, expandable to 2.3 MMT

4 runways for simultaneous operations

~ 78M passengers

Economic impact of DEL $32 billion by 2025-26

Gateway to India – 30% of total foreign tourists served

DIAL – Key Highlights 2024

Inauguration of Terminal 1 making **IGIA joining the elite club of airports having capacity of 100 million+ pax**

Becomes India's first airport to **connect 150 destinations**

APOC Moving from reactive towards **predictive** operations

Simplifying the immigration process for passengers with Trusted Traveller Program and Biometric kiosks

Cuts per-passenger power use by 57% since 2010, **achieved Net Zero** in Aug 2024

DELHI AIRPORT: A STRATEGIC AVIATION HUB

DELHI INDIRA GANDHI INTERNATIONAL AIRPORT | GMR AERO

Global Standing

Ranked among top 10 busiest airports globally by passenger traffic and aircraft movements

National Gateway

Primary hub for India's air travel, handling over 84 million passengers annually

Operational Scale

Hosts 70+ airlines connecting to 150+ destinations worldwide

ARFF (Airport Rescue and Firefighting) serves as the backbone of airport safety operations, ensuring rapid emergency response while maintaining strict ICAO and DGCA compliance standards.

MASSIVE OPERATIONAL SCALE

DELHI INDIRA GANDHI INTERNATIONAL AIRPORT | GMR AERO

1,400

Daily Aircraft Movements

Commercial, cargo, and charter flights

84M

Annual Passengers

Continuous flow of domestic and international travelers

9

Global Ranking

Among world's busiest airports

GLOBAL CONNECTIVITY NETWORK

150+

Destinations Worldwide

Delhi Airport functions as a strategic aviation hub, serving as the central node for both domestic and international air traffic. This extensive connectivity brings diverse operational exposure and a wide range of aviation environments and associated risks that ARFF teams must be prepared to handle.

DELHI AIRPORT: ARFF RESPONSE CHALLENGES

India's busiest airport presents unique operational complexities for Airport Rescue and Firefighting teams

Complex Runway Configuration

Four runways create a multi-directional challenge requiring coordinated ARFF positioning and rapid deployment across varied approach vectors.

Vast Operational Area

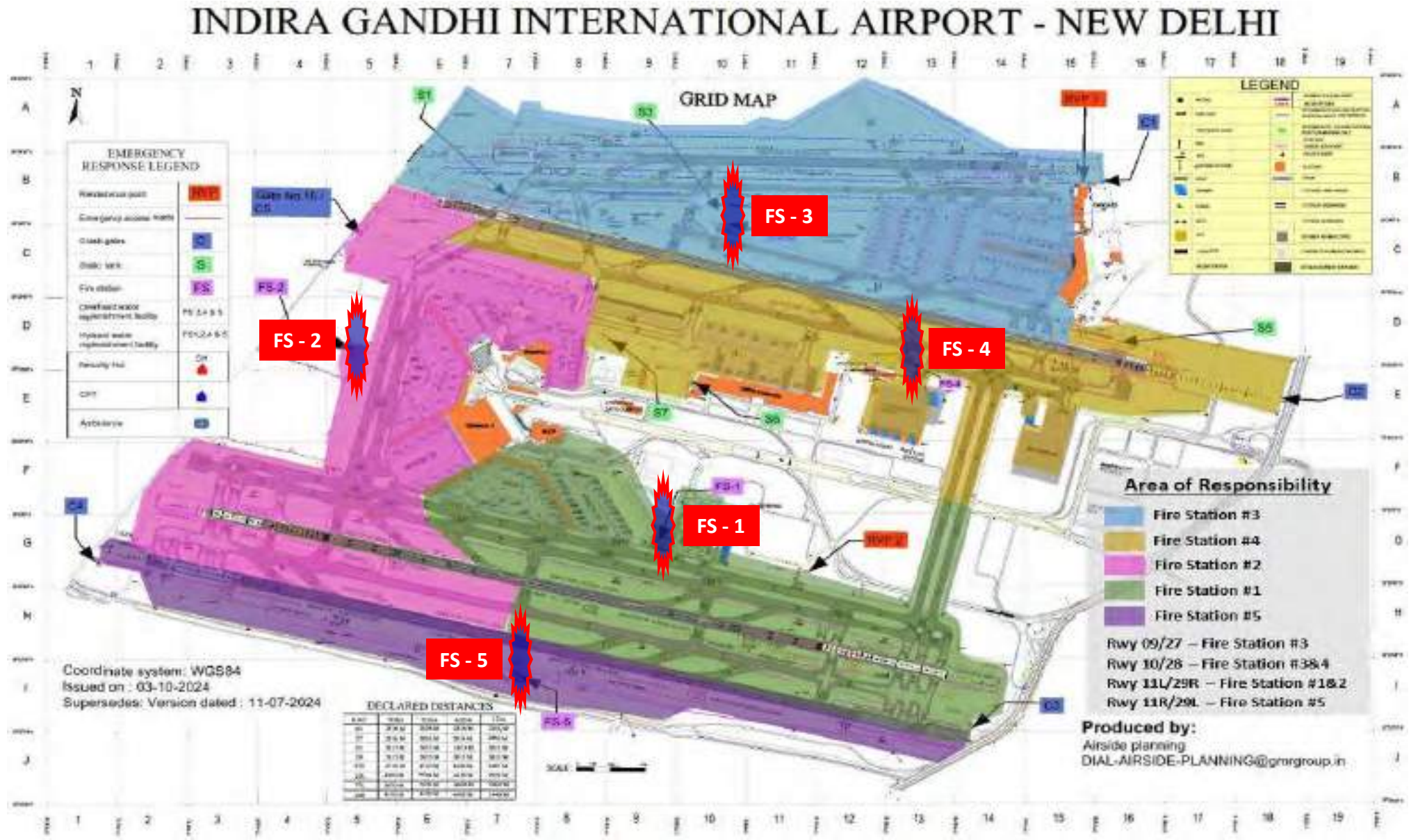
Extended distances across the large airfield create response time pressures.

Fire Station Network

Five ARFF stations positioned throughout the airfield maintain seamless communication and coordination during simultaneous emergency scenarios.

Critical Challenge: Maintaining ICAO-mandated 2-3 minute response times across all critical areas while managing operational complexity and traffic density.

ARFF Stations – Area of Response



ENVIRONMENTAL CHALLENGES

Winter Fog

Severe visibility reduction during December-January, impacting flight schedules and emergency response capabilities

Extreme Heat

Summer temperatures exceed 45°C, affecting runway integrity and ARFF equipment performance

Dust Storms

Pre-monsoon conditions reduce visibility and increase wear on firefighting machinery

Monsoon Rains

Waterlogging risks and reduced traction for emergency vehicles during heavy rainfall

AIRCRAFT DIVERSITY

Wide-Body Aircraft

Long-haul international flights requiring specialized ARFF response protocols

Narrow-Body Fleet

Domestic and regional operations with high frequency movements

Ultra-Large Aircraft

Capability to handle A380 and other massive aircraft requiring enhanced ARFF resources

Cargo Operations

Freight aircraft with unique fire suppression and rescue challenges

VIP SERVICES

General Aviation Terminal

- Manages VVIP and non-scheduled flight operations
- Implements heightened security and safety protocols
- Requires specialized handling and coordination procedures
- Demands enhanced ARFF readiness and discrete response capabilities

The General Aviation Terminal presents unique challenges requiring tailored emergency response protocols while maintaining the highest standards of safety and security.

TERMINAL INFRASTRUCTURE SCALE

The massive scale of terminal infrastructure requires comprehensive ARFF coverage with strategically positioned response teams and specialized equipment for rapid deployment across all facilities.

Terminal 1

Area: 206,000 sqm

Daily Footfall: >69,000 passengers

Terminal 2

Area: 45,000 sqm

Daily Footfall: >51,000 passengers

Terminal 3

Area: 631,740 sqm

Daily Footfall: >130,000 passengers

TERMINAL FIRE RISK ASSESSMENT

Terminal	Floor Area (m^2) (m^2)	F&B Area (m^2) (m^2)	F&B Ratio	Fire Load (MJ)
T1	2,06,000	8,300	0.04	22,410,000
T2	45,000	2,000	0.04	5,400,000
T3	6,31,740	29,600	0.04	79,920,000

Comprehensive fire risk analysis enables targeted ARFF resource deployment and strategic positioning of firefighting equipment across all terminal facilities.

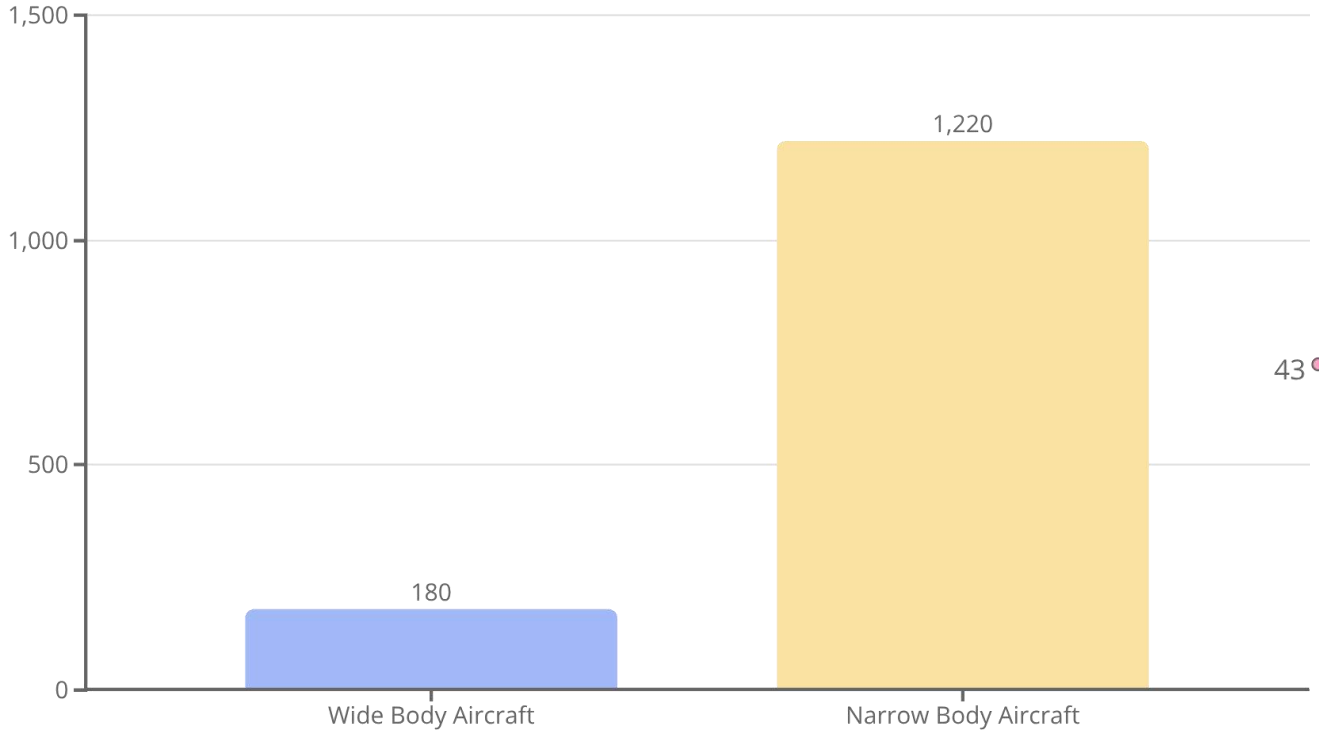
DECARBONIZING GROUND OPERATIONS

Electric Vehicle Integration

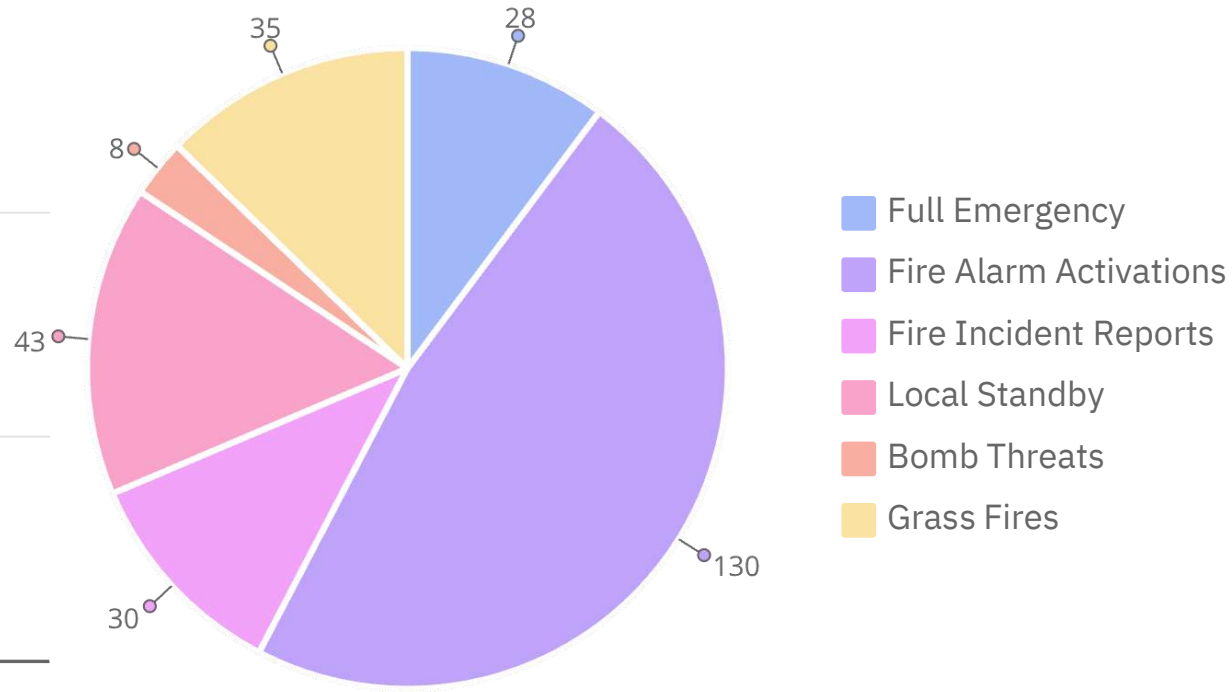
- Zero-Carbon Operations
- Specialized ARFF Response
- Integrated Safety Framework
- Advanced Lithium Battery Training
- Equipment Modernization
- Protocol Integration

ANNUAL RESPONSE DATA

Aircraft Movements per day



Response Data



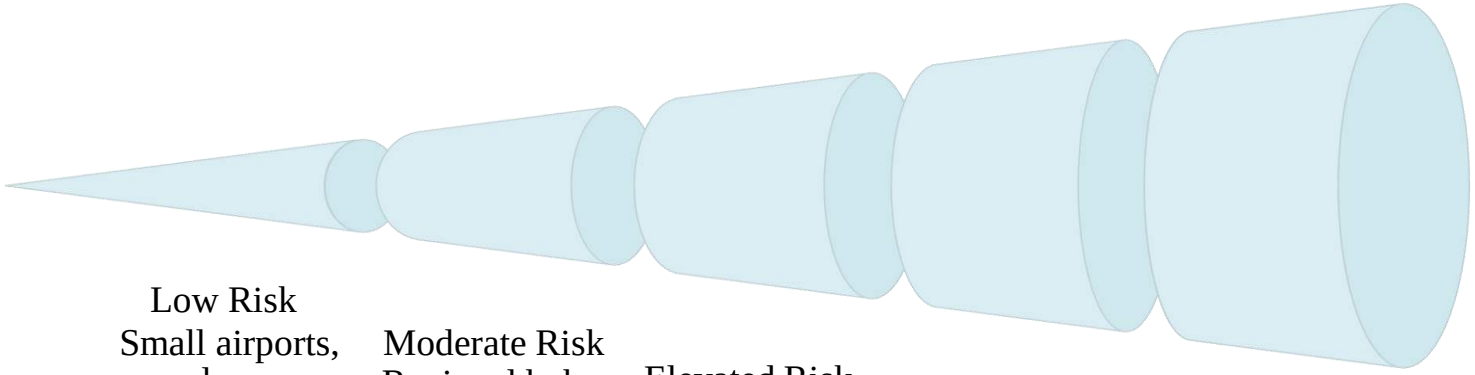
RISK-BASED PLANNING

Risk Index Methodology

- Calculated using aircraft size and traffic volume
- Supports evidence-based ARFF resource allocation
- Higher index demands greater operational readiness
- Enables proactive safety planning and deployment

Risk index calculations directly influence ARFF station positioning, equipment deployment, and response time requirements across the airport complex.

RISK-BASED PLANNING



Risk-based planning enables strategic deployment of ARFF resources, ensuring optimal coverage during peak operational periods.

COMPREHENSIVE MITIGATION STRATEGY

Risk Assessment

Equipment Deployment

Response & Improvement

Training Protocols

Our comprehensive preparedness strategy integrates risk-based planning with multi-layered safety and response mechanisms, ensuring robust emergency readiness across all airport operations and scenarios.

ADVERSE WEATHER PROCEDURES & TRAINING

DELHI INDIRA GANDHI INTERNATIONAL AIRPORT | GMR AERO

Risk Assessment

Established SOPs

Seasonal Inspections

Cross-Department Drills

Specialized Visibility Training

Proactive Weather Monitoring

Critical Supply Management

Continuous Training Program

Measurable Outcome

Our comprehensive, multi-layered procedures consistently ensure uninterrupted operational readiness and ICAO-compliant emergency response times during all challenging weather conditions.

ARFF RESPONSIBILITY AT LANDSIDE OF DELHI AIRPORT

DELHI INDIRA GANDHI INTERNATIONAL AIRPORT | GMR AERO

Critical First Line

ARFF teams: critical first line of defense for emergency response

Operational Focus

Focus on Delhi International Airport's landside operations

Comprehensive Coverage

Covers extensive responsibilities, coverage areas, and operational protocols

Safety Assurance

Ensures passenger safety and business continuity

OVERVIEW OF LANDSIDE FACILITIES

DELHI INDIRA GANDHI INTERNATIONAL AIRPORT | GMR AERO

Parking Infrastructure

- Accommodates 6,600 vehicles.
- 193 strategically distributed parking bays.
- Multi-level structures for optimal traffic flow of emergency vehicle access.

Traffic Management

- Advanced traffic control systems and safety protocols are in place.
- Manages continuous flow of passengers, staff, and service vehicles.
- Maintains clear emergency response corridor

Landside Coverage Area

- Spans approximately 2,000 acres.
- Encompasses passenger terminals, commercial complexes, and access roads.
- Includes critical support infrastructure requiring comprehensive ARFF coverage.

ROUTINE & TACTICAL TRAINING FOR ARFF TEAMS

Building operational excellence through comprehensive training programs designed to maintain peak readiness and tactical proficiency for Delhi Airport's elite ARFF teams.

COMPREHENSIVE ARFF COVERAGE AND RESPONSE

DELHI INDIRA GANDHI INTERNATIONAL AIRPORT | GMR AERO

Operational Excellence

Critical Response Times:

- Maintains passenger and staff safety at all times
- Supports uninterrupted airport functions and minimizes operational disruptions
- Protects critical transportation infrastructure assets
- Specialized equipment positioned strategically for rapid deployment

Infrastructure Protection

Coordinated Preparedness

Emergency Response

EXCELLENCE IN TRAINING

01

Golden Standards

Ongoing programs conducted locally and internationally ensuring golden standards

02

Live Fire Drills

Realistic fire simulation exercises to enhance operational readiness and response times.

03

Continuous Upgrades

Regular skill enhancement aligned with ICAO and DGCA regulatory requirements

STRENGTH THROUGH DIVERSITY

Competent Workforce

397 trained ARFF professionals from diverse cultural and regional backgrounds, certified under ICAO and DGCA standards

Advanced Fleet

State-of-the-art crash tenders, advanced support vehicles, and specialized rescue equipment for comprehensive emergency response

Cultural Unity

Multilingual protocols and inclusive leadership practices enhance team synergy and operational effectiveness

CORE TRAINING COMPONENTS

Daily Readiness Drills

Regular operational drills conducted daily to maintain peak readiness levels. Teams practice equipment checks, vehicle positioning, and rapid response protocols.

Tactical Emergency Simulations

Controlled aircraft emergency scenarios testing standard operating procedures. Teams rehearse passenger evacuation coordination and incident command structure.

Hot Fire Drill & Foam Application Practice

Monthly live fire training sessions focusing on turret handling techniques, foam application accuracy, and suppression agent effectiveness.

Airport Navigation Mastery

Comprehensive familiarization with Delhi Airport's complex terrain and grid reference systems for rapid response deployment.

ADVANCED TRAINING MODELS

Tabletop Exercises

Strategic discussions analyze complex emergency scenarios. Teams develop decision trees, resource allocation, and communication protocols.

Quick Response Drills

Rapid deployment training for fires, accidents, and structural emergencies. Focuses on confined space rescue, medical support, and crowd control.

Advanced Simulator Training

State-of-the-art aircraft mockups and digital simulators provide realistic training. Specialized focus on Boeing 777 and Airbus A380 operations.

Night Operations Familiarization

Low-visibility response training uses thermal imaging and GPS navigation. Teams master grid-reference coordination in challenging darkness.

TRAINING MODERNIZATION INITIATIVE

Comprehensive training program leverages cutting-edge technology and international standards. Strategic investment in human capital enhances safety outcomes across all operations.

NFPA Standards Implementation

UL FSRI Research Integration

Advanced Simulation Technologies

> Technology-driven approach reduced training costs and improved decision-making capabilities under pressure.

AIRPORT EMERGENCY PLAN EXCELLENCE

World-Class Standards

- Robust AEP fully aligned with ICAO international standards
- Recognized as industry benchmark and best practice model
- Regular updates ensuring continuous resilience and adaptation
- Comprehensive integration across all airport stakeholders

> Our Airport Emergency Plan serves as both operational framework and industry standard, demonstrating Delhi Airport's commitment to safety excellence.

OPERATIONAL CONTINUITY

Disabled Aircraft Recovery Kit (DARK)

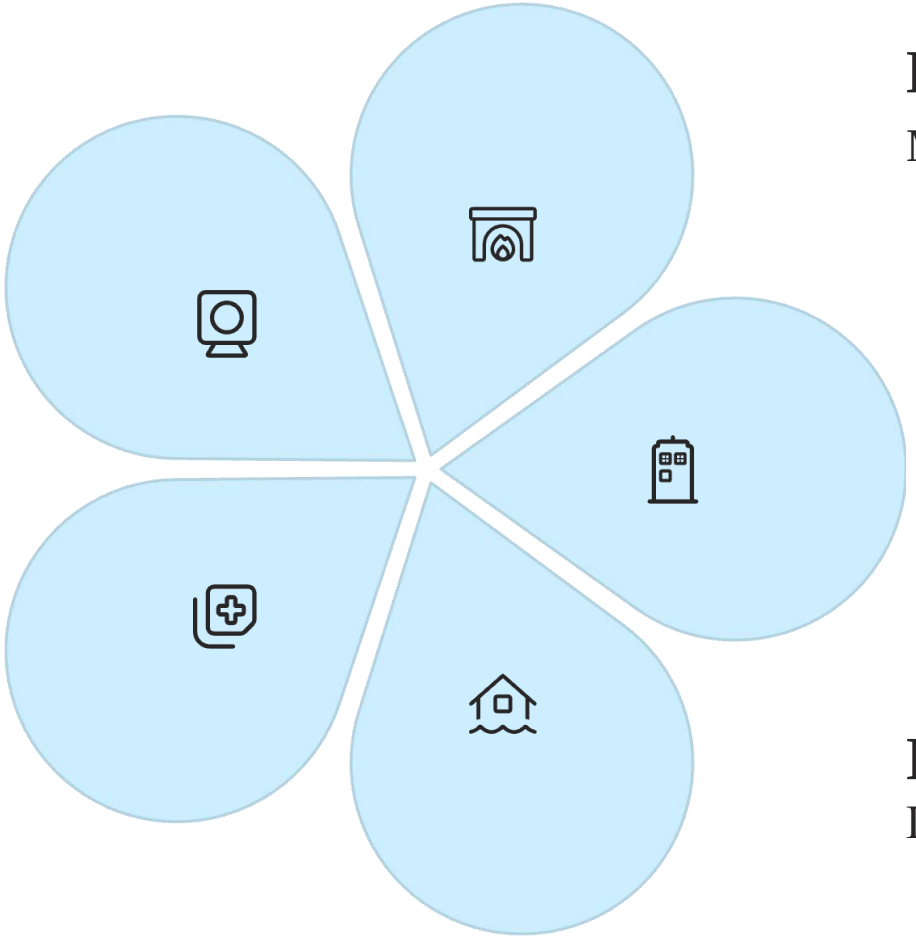
- Specialized equipment enabling rapid removal of disabled aircraft
- Minimizes runway closure duration and operational disruption
- Ensures continuity of critical airport operations
- Reduces economic impact of emergency incidents

DARK capabilities are essential for maintaining operational resilience at one of the world's busiest airports, ensuring minimal disruption to global air traffic networks.

SEAMLESS INTEROPERABILITY

CISF
Airport security coordination

Medical Services
Emergency healthcare response



Delhi Fire Service
Municipal fire support

Delhi Police
Law enforcement integration

NDMA
Disaster management coordination

Mutual aid agreements enable rapid resource mobilization and enhanced response effectiveness through coordinated multi-agency operations during major emergencies.

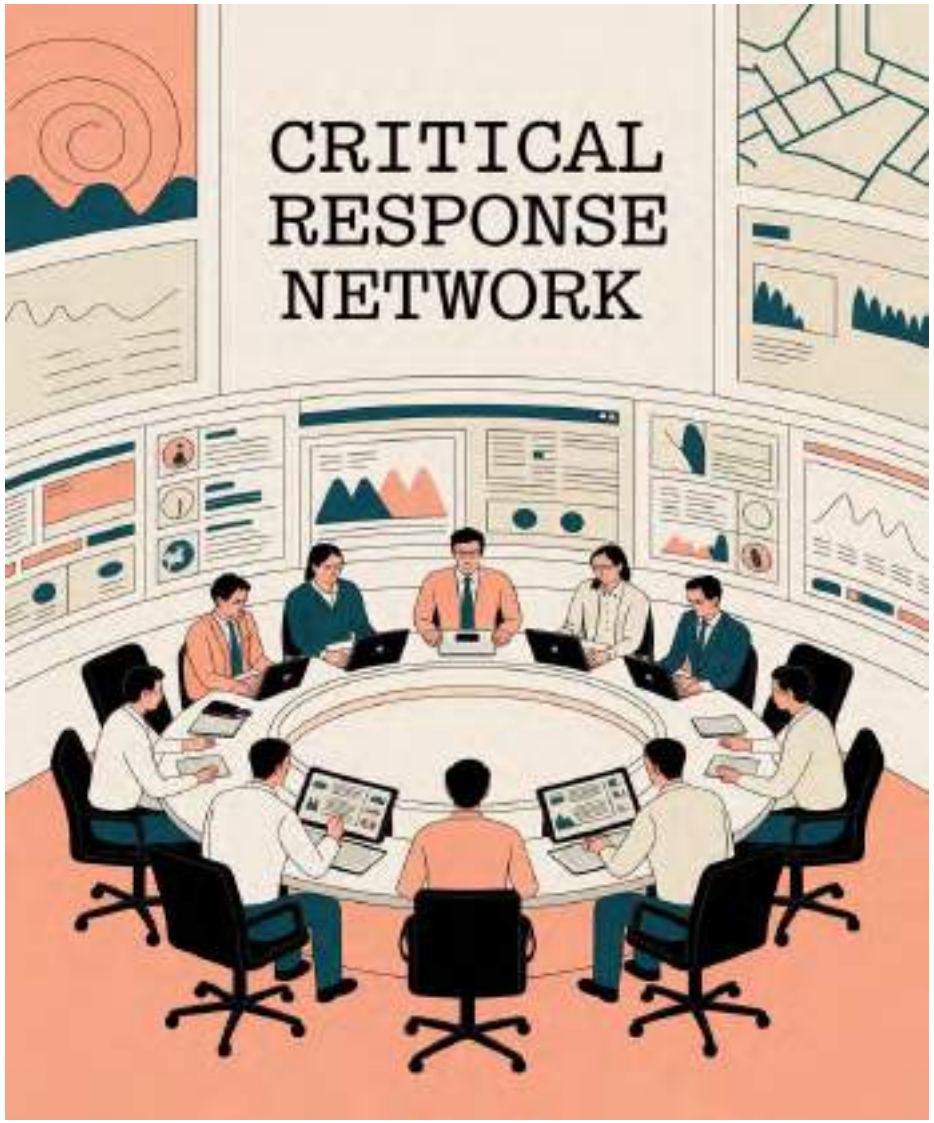
LOCAL GOVERNMENT SUPPORT

Comprehensive support from government agencies is critical for airport emergency preparedness. Local government partners provide essential policy framework and operational backing.

Policy & Regulatory Commitments

Multi-Agency Partnerships

Integrated Emergency Operations



SAFETY EXCELLENCE

ARFF Preparedness

The Backbone of Aviation Safety

Unique Challenges

Delhi Airport's complex operational environment demands proactive, innovative safety measures

Global Standards

Unwavering commitment to international safety excellence and best practices

Operational Resilience

Ensuring safety, reliability, and continuity in one of aviation's most demanding environments

EMPLOYEE ENGAGEMENT & COMPETENCY DEVELOPEMENT

Multi-Level Development

Fostering continuous learning and growth.

Annual Sports & Fire Games

Promoting teamwork and physical well-being.

ARFF Day & Family Events

Building community and celebrating achievements.

PERFORMANCE MANAGEMENT & KNOWLEDGE-DRIVEN OPERATIONS

Innovation Through Accountability

Project-Based Evaluations

Assess leadership through real-world challenges.

Knowledge-Sharing Forums

Foster continuous improvement with collective wisdom.

Case Study Reviews

Learn from global ARFF incidents.

KEY OUTCOMES & ROADMAP AHEAD

Measurable Success

Increased Morale & Retention
Higher confidence, stronger commitment, and reduced attrition.

Enhanced Decision-Making
Faster, more confident decisions in emergencies.

Regional Recognition
Delhi ARFF recognized as a benchmark for excellence.

Strategic Roadmap

1. **National Fire Games**
Elevating ARFF capabilities nationwide.

2. **Digital Learning Platform**
Advanced e-learning for continuous skill development.

3. **Advanced Technology Integration**
Integrating simulation and VR training technologies.

DELHI ARFF AS A GLOBAL MODEL

DELHI INDIRA GANDHI INTERNATIONAL AIRPORT | GMR AERO

Empowerment + Engagement = **Excellence at Scale**

Culture-Driven Innovation	Employee-Centered Approach	Golden Standards
Cultivating a mindset of continuous improvement.	Prioritizing staff engagement and development.	Upholding and exceeding international benchmarks.

CONCLUSION

A Fire Chief who develop a competent and confident team can relax when his team is in action

Thank You!