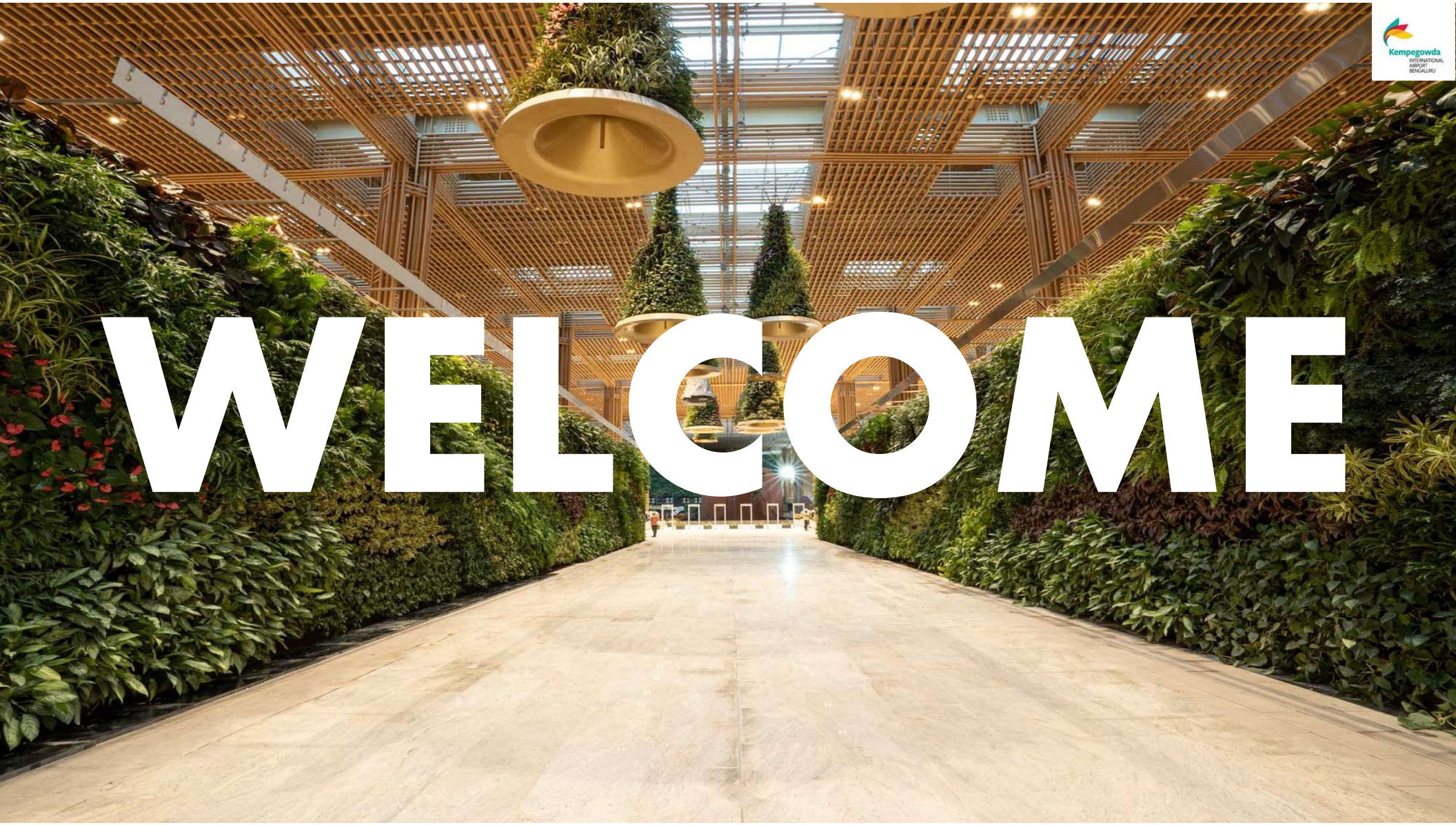
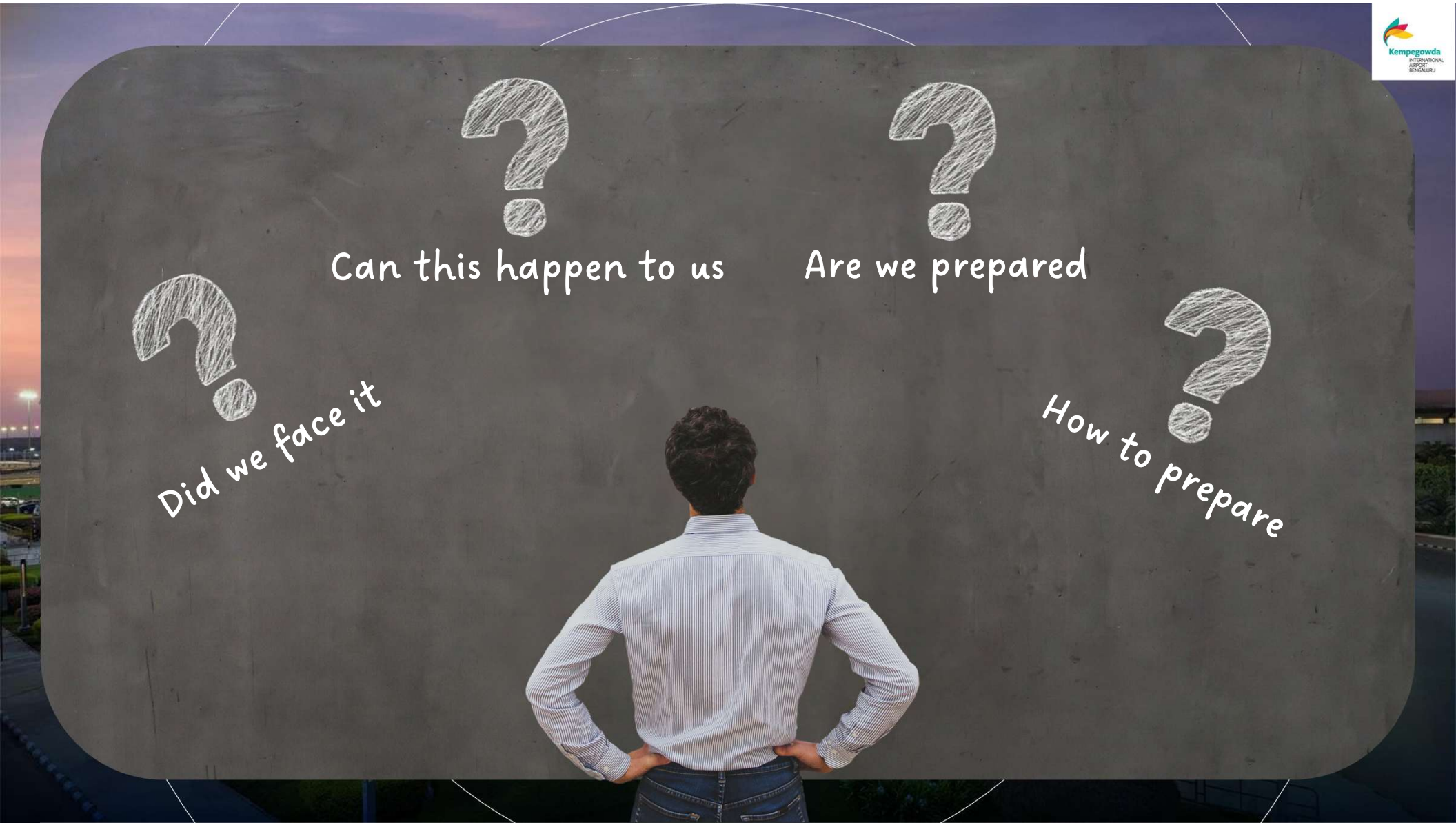

WELCOME

Data-Driven Safety Transformation in Ground Support Equipment : BIAL

ICAO APAC Workshop: Innovation and Emerging Technologies in Aviation

GSE INCIDENT INSIGHTS

Kempegowda
INTERNATIONAL
AIRPORT
BENGALURU
TV
diGo CarGo

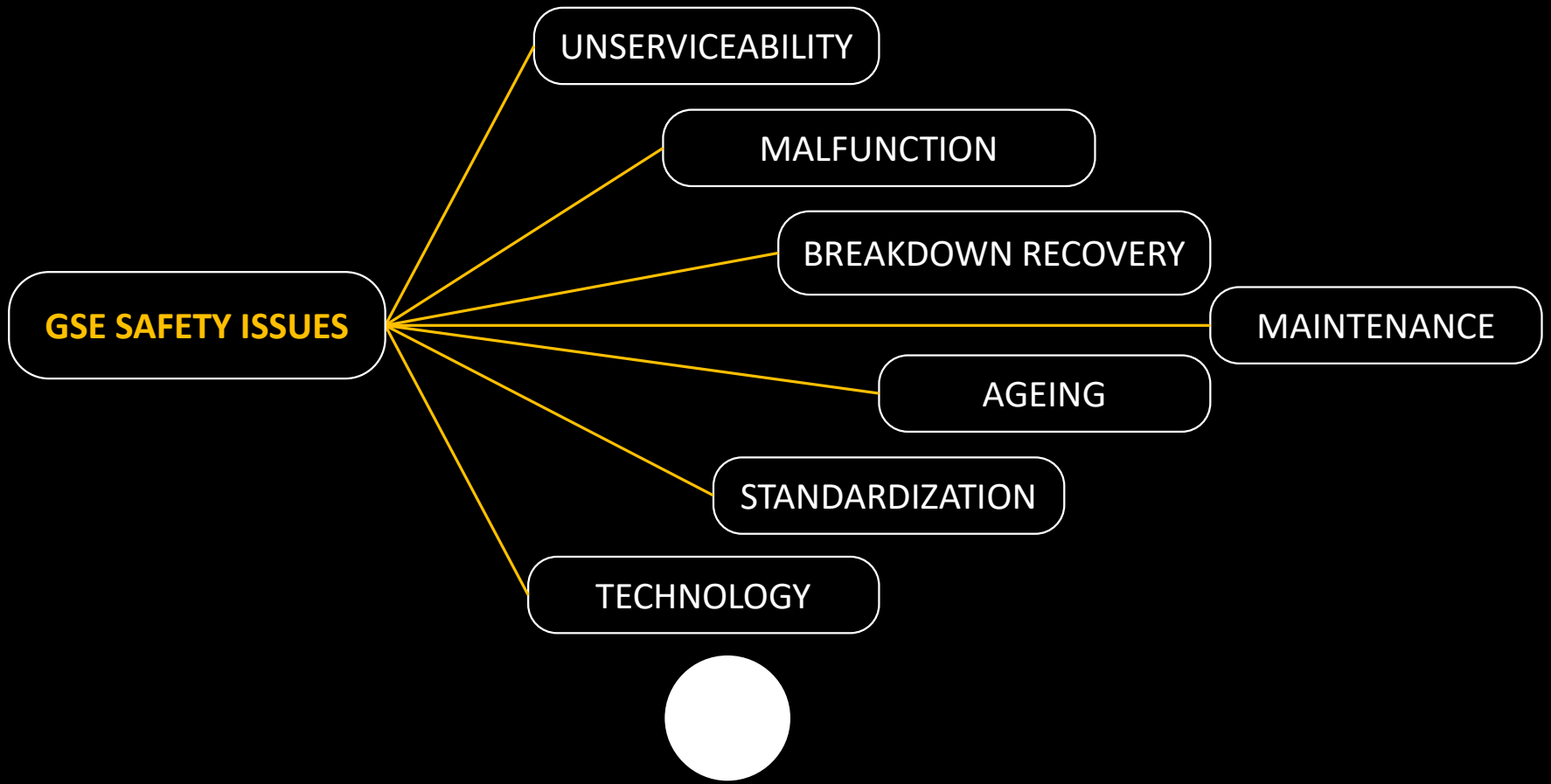

Kempegowda
INTERNATIONAL
AIRPORT
BENGALURU
Can this happen to us
Are we prepared
Did we face it
How to prepare

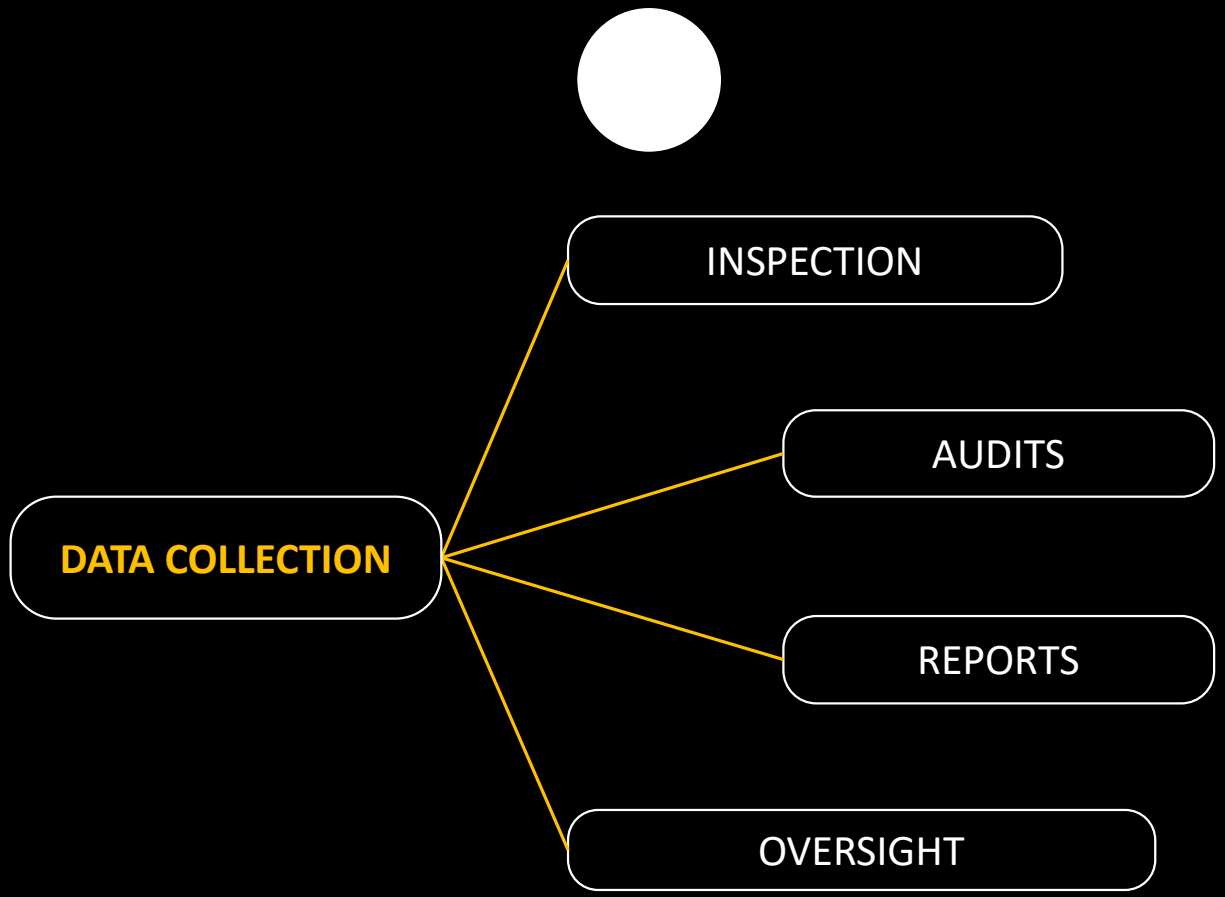
How did we do it?

Structured Approach

Kempegowda INTERNATIONAL AIRPORT BENGALURU

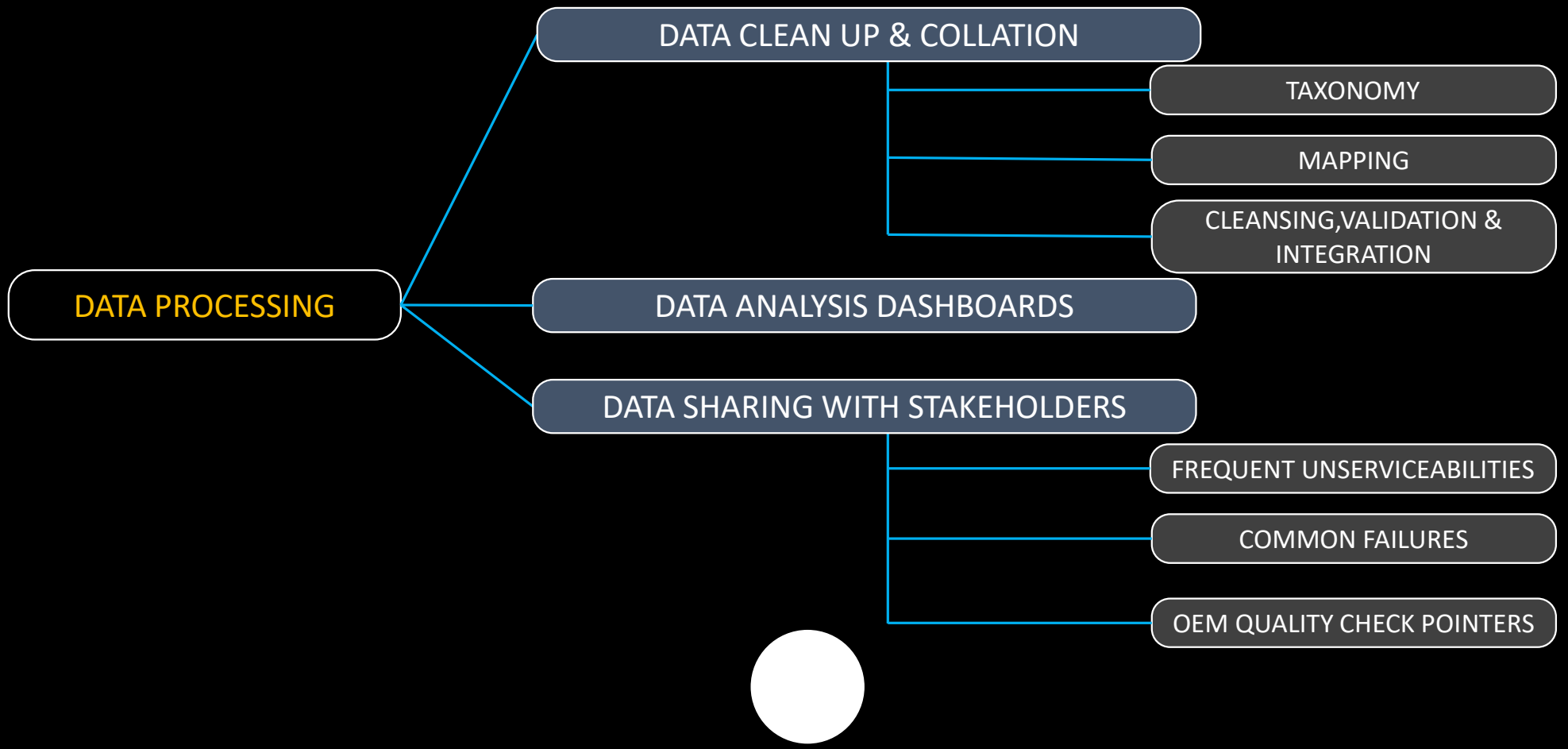
IDENTIFYING KEY AREAS

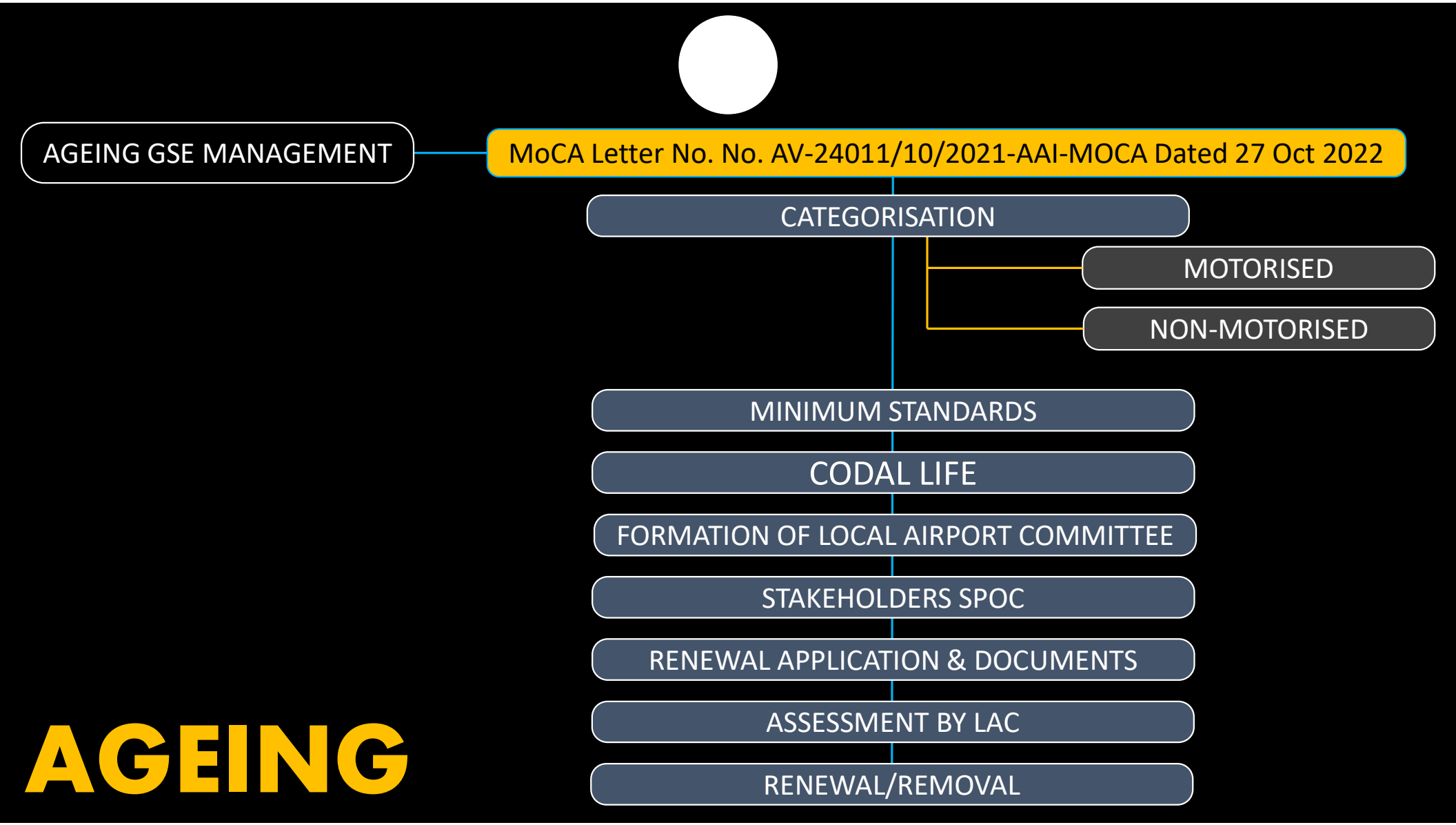




KEY STRATEGIES

SAFETY AS ENABLER




AGEING GSE MANAGEMENT
MoCA Letter No. No. AV-24011/10/2021-AAI-MOCA Dated 27 Oct 2022
CATEGORISATION
MOTORISED
NON-MOTORISED
MINIMUM STANDARDS
CODAL LIFE
FORMATION OF LOCAL AIRPORT COMMITTEE
STAKEHOLDERS SPOC
RENEWAL APPLICATION & DOCUMENTS
ASSESSMENT BY LAC
RENEWAL/REMOVAL
AGEING

PENALTY POINT SYSTEM

PROCESS DEVELOPMENT

NON-MONETARY PENALTY POINT SYSTEM

IDEATION WITH DATA

STAKEHOLDER TRUST BUILDING

PILOT PROJECT FOR TRIAL

MANAGEMENT CONFIDENCE

FULL SCALE IMPLEMENTATION

BONUS POINT

Key Aspects of Non-Monetary Penalty Points System at KIAB

Distinct categories for infraction:
Vehicles & Equipment

Distinct nature of violations:

No-Go: Seizure of Permit
Major: 04 Penalty Points (PP)
Minor: 02 Penalty Points (PP)

No Go: ***Causing Aircraft Damage***

Major:
- *Vehicle Breakdown in Active Area*
- *Fire /smoke in vehicle*

Minor :
- *Unserviceable Seat-belt*
- *Safety buffer damaged/*

Cumulative Penalty Points:
10 PP: **07 Days** Suspension
12 PP: **15 Days** Suspension
14 PP : **30 Days** Suspension

Bonus Point:
02 points issued for every **04 month** if no offence committed during the period

Fair and Equal to all

SOP FORMULATION & ENHANCEMENT

- MEETING AHM STANDARDS
- SOP FOR VEHICLE RECOVERY
- MAINTENANCE SOPs
- HYD OIL/FUEL LEAKAGE INSPECTION
- SOPs ON AGEING GSE MANAGEMENT

SAFETY AS ENABLER

EQUIPMENT
Step Ladder
Conveyor Belt
Baggage Trolley
Pallet Dollies
Water Cart
Toilet Cart
Towbar
Trestle
Air Starter Unit
Air Conditioning Unit
GPU
CO2 Trolley
Nitrogen Trolley
Tail Stanchion

VEHICLE
AMB, Telescopic Step
Airport Passenger Bus
Battery Operated Tractor
Self-Propelled Conveyor Belt
Highlift
Ambulift
LDL, MDL
Nose Gear Towbar Tractor
Nose Gear Towbar Less Tractor
Tractor
Potable Water Vehicle
Lavotary Service Vehicle
Petrol and Diesel Refueler
Cargo Pallet Transporter
Crew Transport

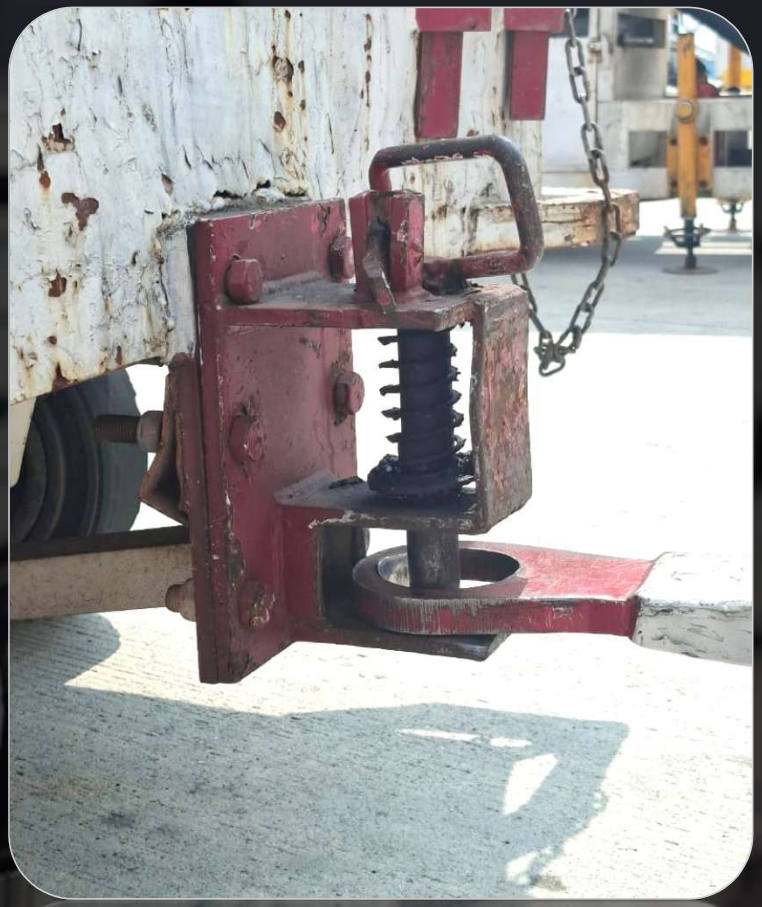
AHM Based Checklists

Vehicle Recovery Kit & QRT

SAFETY AS ENABLER

CHANGE MANAGEMENT

- SPOC TRAINING ON PENALTY POINT SYSTEM
- COLLABORATIVE WORK GROUP
- STANDARDIZATION OF GSE
  - TOW HITCH VARIANTS
  - BATTERY VARIANTS
  - TROLLEY DOOR VARIANTS
  - CONTROL PANELS



TOW HITCH LOCK VARIANTS

BATTERY VARIANTS

CONTROL PANEL VARIANTS

KEY MILESTONES

Kempegowda INTERNATIONAL AIRPORT BENGALURU

- 100% Process Adoption within 06 Months
- Nearly 1200 Observation Logged & Addressed
- >95% Closure Rate on Observation
- Reduced Vehicle Unserviceability
- OEM Analytics & Reviews
- Addressing Seasonal GSE Trends

DATA >> INTELLIGENCE

OBSERVATIONS	OPEN	CLOSED	STATUS	AGENCY	PERIOD
1230	70	1160	All	All	All

Kempegowda International Airport Bengaluru

TOP 5 DEFECTS

Nature of Defect	Reports
SAFETY_LAPSE	539
LIGHTING	153
MECHANICAL	126
OIL_FUEL_LEAK_SPILL	108
WHEEL_ASSEMBLY	108
Total	**1034**

TOP 10 CATEGORIES

Main Head	Number
ACCESSORIES	120
SAFETY_BUFFER	106
EQUIPMENT_PASS	98
OBS_LIGHT	90
HYDRAULIC_OIL	87
TYRE	60
BRAKE_LIGHT	44
SEAT_BELT	43
BATTERY	41
EXHAUST	41
Total	**730**

SUB-CATEGORIES

Sub Head	N
UNSERVICEABLE LIGHT	
PIPE LINE DAMAGE	
SIDE VIEW MIRROR N/A	
MISSING BUFFER	
MISSING PASS	
UNSERVICEABLE	
EXCESSIVE/THICK BLACK SMOKE	
DAMAGED BUFFER	
FADED PASS	
CHOCK CHAIN BROKEN	
WORN OUT	
WINDSHIELD N/A	
DAMAGED	
LOW CHARGE	
NOT LOCKING	
BALD TYRE/NO TREAD	
DISLODGED	
MALFUNCTION	
NOT RETRACTING	
NOT INSTALLED	
EXPIRED PASS	
Total	

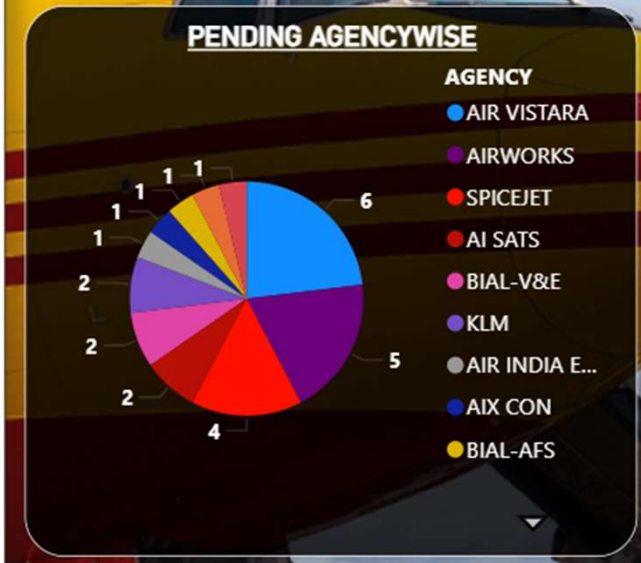
VEH/EQPT DETAILS

Veh/Eqpt No.	Number
BET-45	8
BTE-29	8
KA43A0128	8
TWT-11	8
BTE-35	7
CPT-4	7
AMB-2	6
BTE-25	6
KA05MU8773	6
KA431703	6
LDL-1	6
MFL-9	6
KA03MX1277	5
KA433580	5
KA43A0126	5
KA43A2768	5
KA43M9805	5
KA50B4236	5
KA593325	5
LDL-4	5
Total	**1230**

ENTRY TYPE

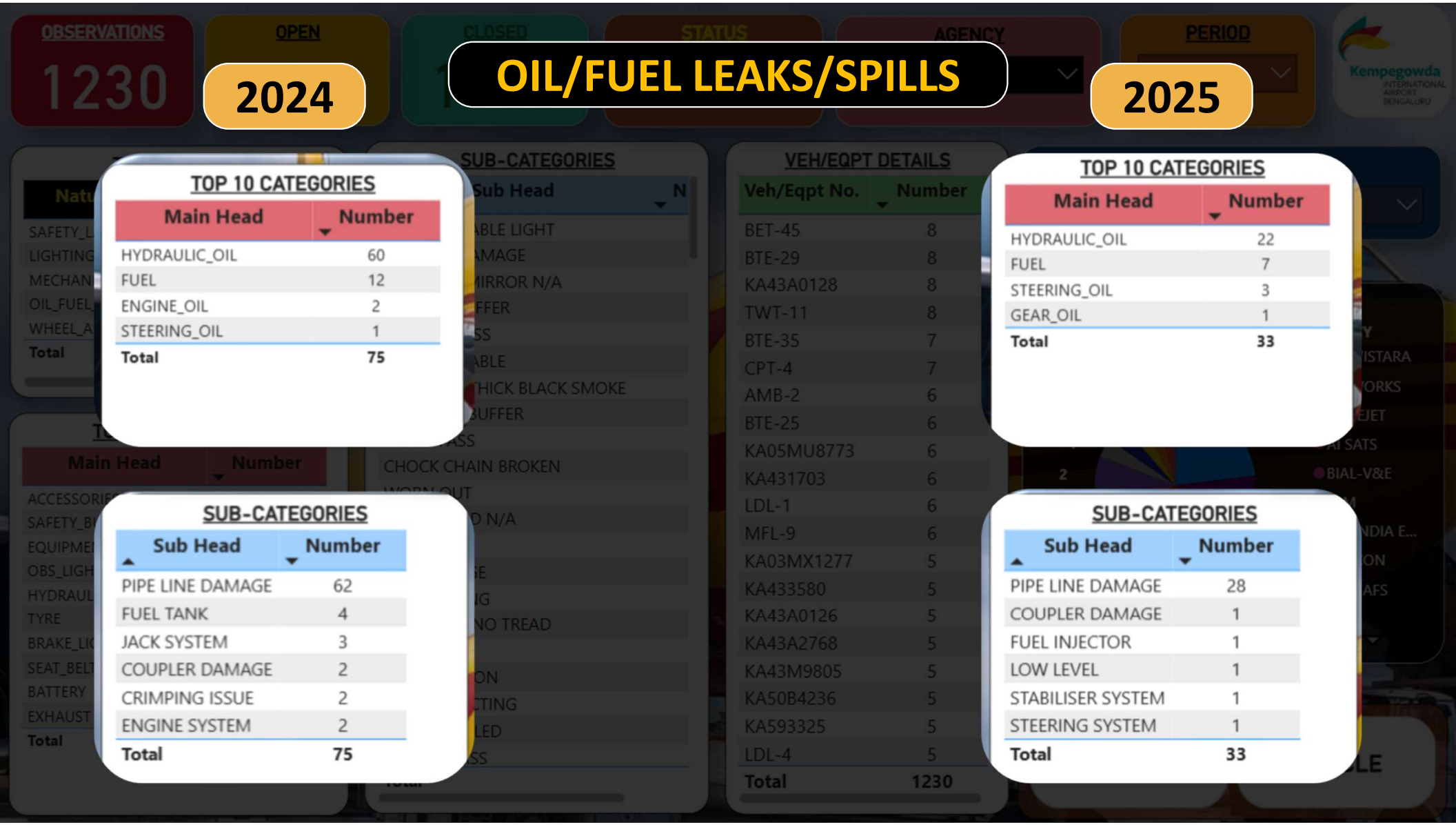
All

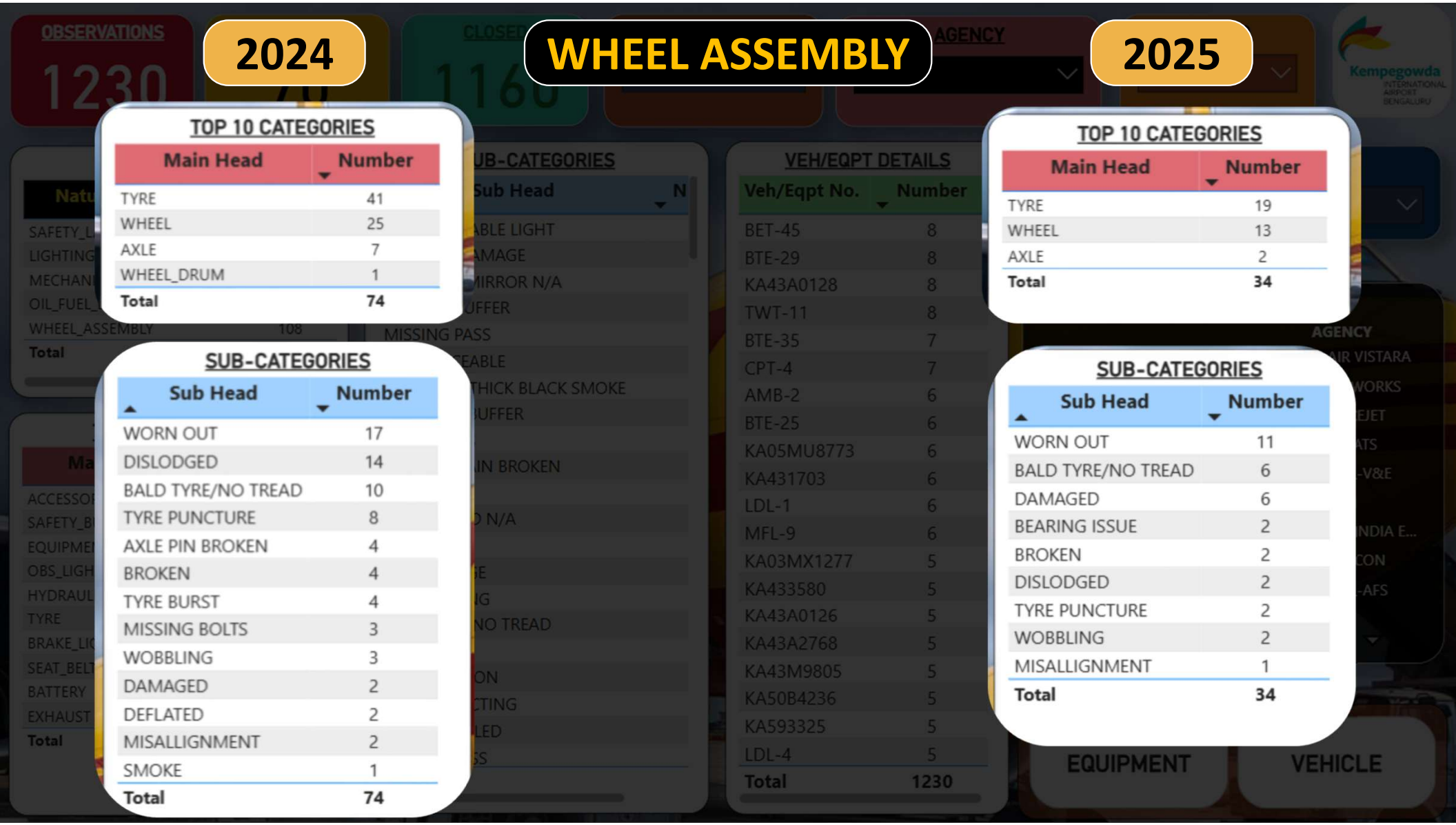
PENDING AGENCYWISE



EQUIPMENT

VEHICLE


OBSERVATIONS
1230
OPEN
CLOSED
STATUS
AGENCY
PERIOD
2024
OIL/FUEL LEAKS/SPILLS
2025
Kempegowda
INTERNATIONAL AIRPORT BENGALURU
TOP 10 CATEGORIES
Main Head | Number
HYDRAULIC_OIL | 60
FUEL | 12
ENGINE_OIL | 2
STEERING_OIL | 1
Total | 75
SUB-CATEGORIES
Sub Head | Number
PIPE LINE DAMAGE | 62
FUEL TANK | 4
JACK SYSTEM | 3
COUPLER DAMAGE | 2
CRIMPING ISSUE | 2
ENGINE SYSTEM | 2
Total | 75
VEH/EQPT DETAILS
Veh/Eqpt No. | Number
BET-45 | 8
BTE-29 | 8
KA43A0128 | 8
TWT-11 | 8
BTE-35 | 7
CPT-4 | 7
AMB-2 | 6
BTE-25 | 6
KA05MU8773 | 6
KA431703 | 6
LDL-1 | 6
MFL-9 | 6
KA03MX1277 | 5
KA433580 | 5
KA43A0126 | 5
KA43A2768 | 5
KA43M9805 | 5
KA50B4236 | 5
KA593325 | 5
LDL-4 | 5
Total | 1230
TOP 10 CATEGORIES
Main Head | Number
HYDRAULIC_OIL | 22
FUEL | 7
STEERING_OIL | 3
GEAR_OIL | 1
Total | 33
SUB-CATEGORIES
Sub Head | Number
PIPE LINE DAMAGE | 28
COUPLER DAMAGE | 1
FUEL INJECTOR | 1
LOW LEVEL | 1
STABILISER SYSTEM | 1
STEERING SYSTEM | 1
Total | 33


OBSERVATIONS
1230
2024
WHEEL ASSEMBLY
2025
TOP 10 CATEGORIES
Main Head
Number
TYRE 41
WHEEL 25
AXLE 7
WHEEL_DRUM 1
Total 74
SUB-CATEGORIES
Sub Head
Number
WORN OUT 17
DISLODGED 14
BALD TYRE/NO TREAD 10
TYRE PUNCTURE 8
AXLE PIN BROKEN 4
BROKEN 4
TYRE BURST 4
MISSING BOLTS 3
WOBBLING 3
DAMAGED 2
DEFLATED 2
MISALLIGNMENT 2
SMOKE 1
Total 74
VEH/EQPT DETAILS
Veh/Eqpt No.
Number
BET-45 8
BTE-29 8
KA43A0128 8
TWT-11 8
BTE-35 7
CPT-4 7
AMB-2 6
BTE-25 6
KA05MU8773 6
KA431703 6
LDL-1 6
MFL-9 6
KA03MX1277 5
KA433580 5
KA43A0126 5
KA43A2768 5
KA43M9805 5
KA50B4236 5
KA593325 5
LDL-4 5
Total 1230
TOP 10 CATEGORIES
Main Head
Number
TYRE 19
WHEEL 13
AXLE 2
Total 34
SUB-CATEGORIES
Sub Head
Number
WORN OUT 11
BALD TYRE/NO TREAD 6
DAMAGED 6
BEARING ISSUE 2
BROKEN 2
DISLODGED 2
TYRE PUNCTURE 2
WOBBLING 2
MISALLIGNMENT 1
Total 34
EQUIPMENT
VEHICLE

SAFETY ASPECTS

2024

TOP 10 CATEGORIES

Main Head	Number
EQUIPMENT_PASS	95
SAFETY_BUFFER	83
ACCESSORIES	77
SEAT_BELT	30
ALARM	14
LOCKING_MECHANISM	14
INFORMATION_DISPLAY	11
JACK	11
FIRE_EXTINGUISHER	10
SPEED_GOVERNER	9
Total	**354**

Main Head	Number
ACCESSORIES	120
SAFETY_BUFFER	106
EQUIPMENT_PASS	98
OBS_LIGHT	90
HYDRAULIC_OIL	87
TYRE	60
BRAKE_LIGHT	44
SEAT_BELT	43
BATTERY	41
EXHAUST	41
Total	**730**

SUB-CATEGORIES

Sub Head	Numbe
MISSING PASS	52
MISSING BUFFER	48
SIDE VIEW MIRROR N/A	44
FADED PASS	31
DAMAGED BUFFER	23
NOT LOCKING	17
EXPIRED PASS	12
WINDSHIELD N/A	12
LOOSE BUFFER	11
PLATFORM LOWERING ALARM	10
UNSERVICEABLE	8
NON-STANDARD	7
SIDE VIEW MIRROR DAMAGED	7
DAMAGED	6
LOCK UNSERVICEABLE	6
NOT INSTALLED	6
NOT RETRACTING	6
LOW PRESSURE	5
REAR VIEW MIRROR	5
Total	**384**

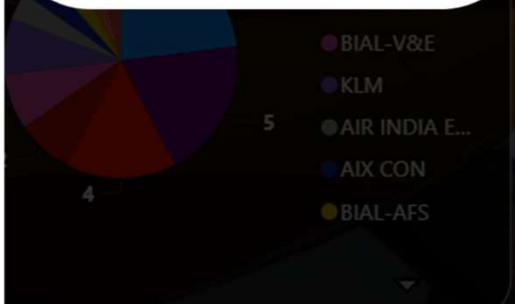
2025

SUB-CATEGORIES

Sub Head	Numbe
CHOCK CHAIN BROKEN	25
SIDE VIEW MIRROR N/A	19
UNSERVICEABLE	18
MISSING BUFFER	13
WINDSHIELD N/A	13
NOT RETRACTING	10
DAMAGED BUFFER	9
NOT INSTALLED	9
WIPER UNSERVICEABLE	8
LOCK UNSERVICEABLE	5
MISSING PASS	2
NON-STANDARD	2
PLATFORM LOWERING ALARM	2
REFLECTOR	2
COMPANY LOGO/STICKERS	1
EXPIRED CONTENT	1
EXPIRED PASS	1
EXPIRED PERMIT	1
LOCK DAMAGED	1
LOW PRESSURE	1
Total	**155**

TOP 10 CATEGORIES

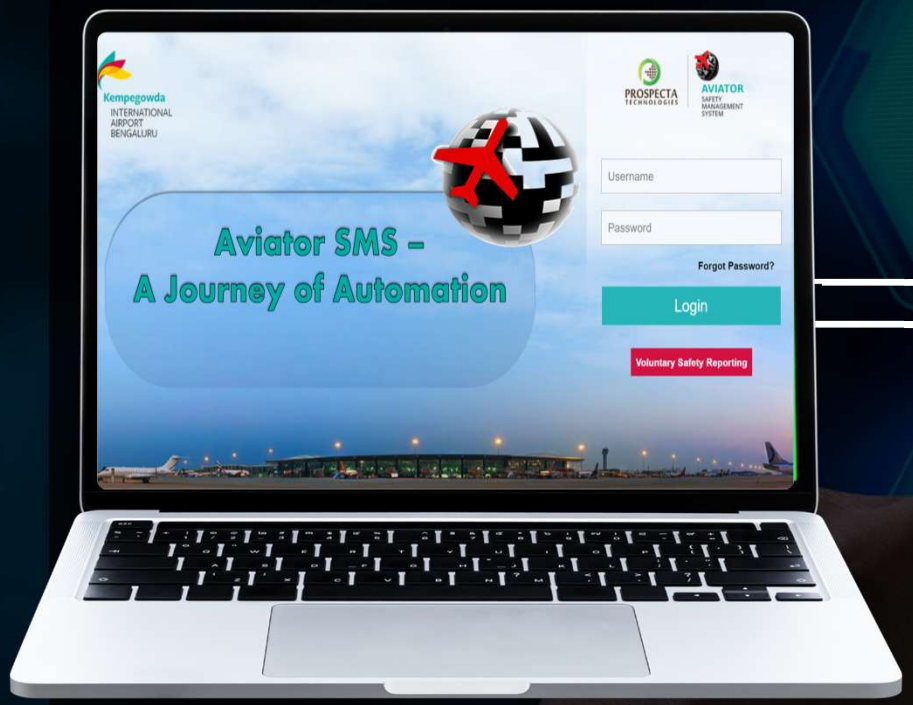
Main Head	Number
ACCESSORIES	43
C_TYPE_CHOCK	25
SAFETY_BUFFER	23
SPEED_GOVERNER	23
SEAT_BELT	13
LOCKING_MECHANISM	7
ALARM	3
EQUIPMENT_PASS	3
FIRE_EXTINGUISHER	3
JACK	3
Total	**146**



SUSTENANCE PLAN

Kempegowda INTERNATIONAL AIRPORT BENGALURU

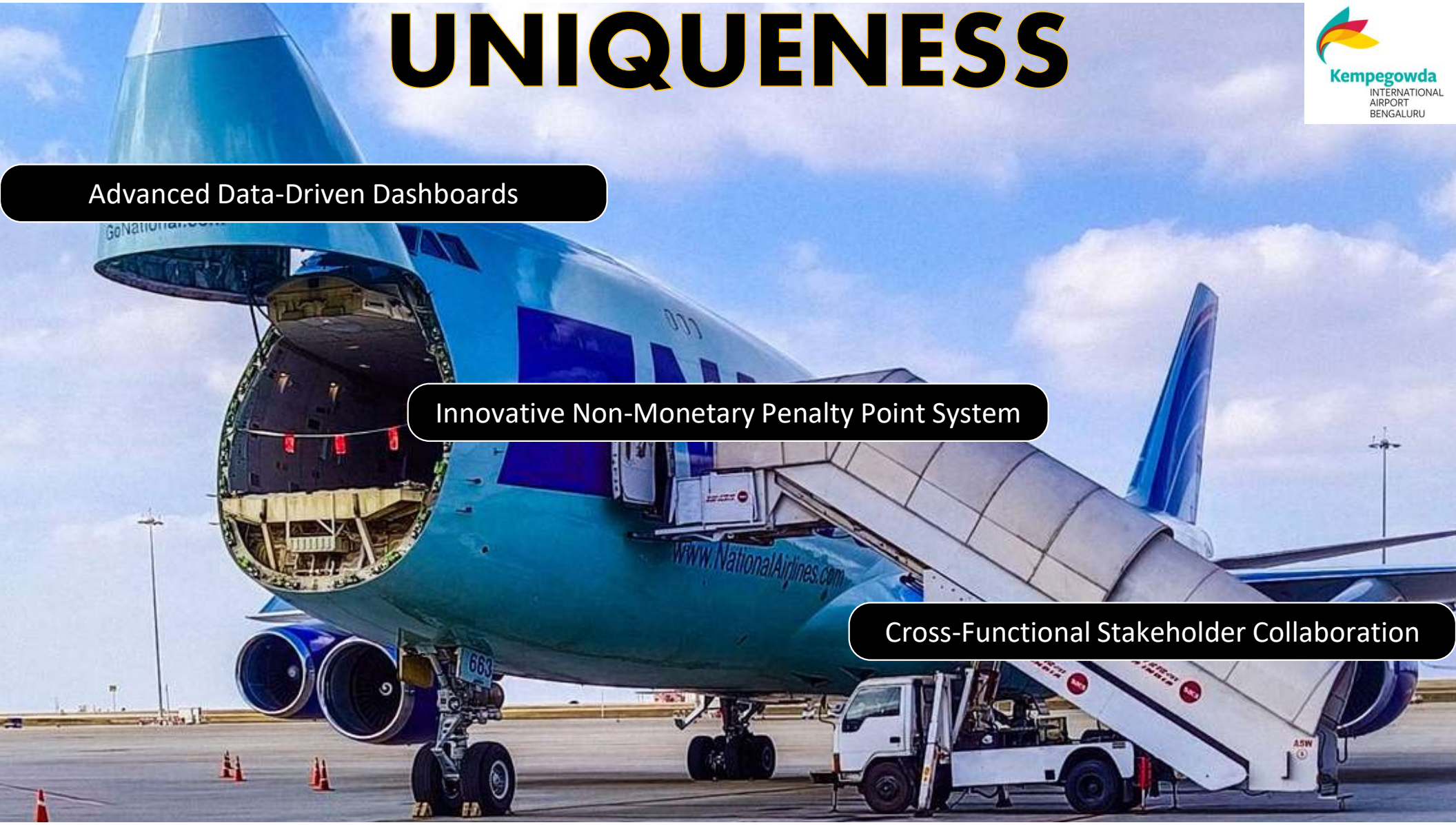
- Continuous Data Collection Process
- Regular Audits & Reviews
- Cross-Stakeholder Collaboration
- Automation
- Predictive Analytics



- Compliance – Four components of SMS
- Web Based application
- Common platform for Airport operator & Stakeholder
- Integrated E-Learning
- Develop Training Modules in any language and format
- Effective data capturing & analysis
- Real time Dashboard generation
- Security : Unique User ID Login
- Customized

UNIQUENESS

Kempegowda
INTERNATIONAL
AIRPORT
BENGALURU



KEY LEARNINGS

Kempegowda INTERNATIONAL AIRPORT BENGALURU

- Transparent Communication is key to Stakeholder Buy-in
- Data Visibility drives Accountability, Collaboration & Financial Savings
- Behavioral Metrics & Technical Checks
- Data Intelligence is a Major Driving Force

THANK YOU
Kempegowda
INTERNATIONAL
AIRPORT
BENGALURU