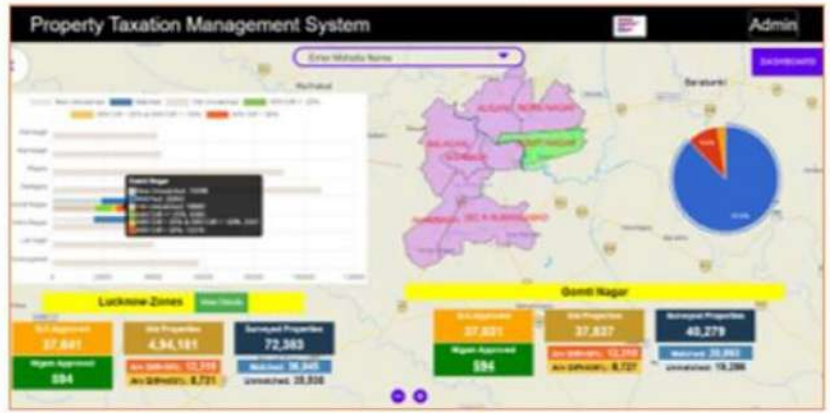
Digital Transformation for Utilities

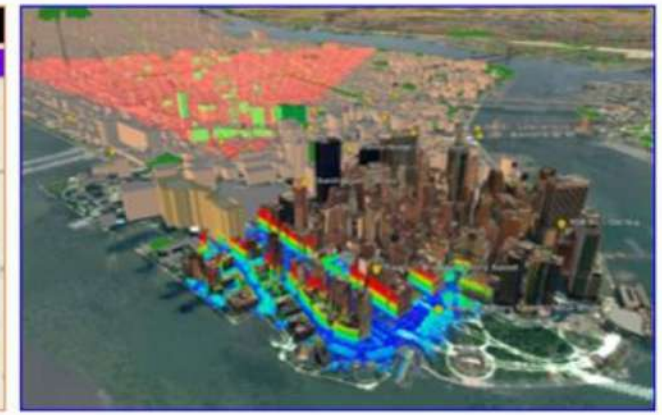
Mitigate revenue threats with digitized assets,
Mobile-first Field Operations and Connected Remote Teams

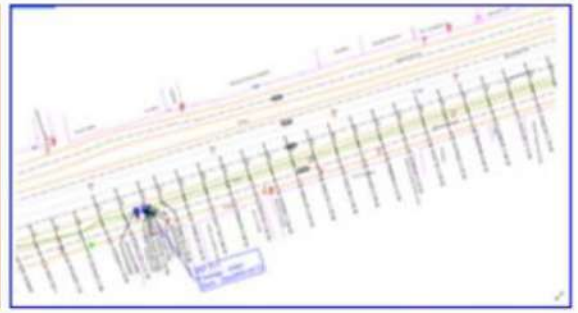
SRIT's OEM Offering

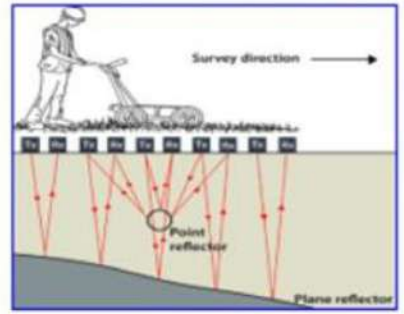
Geospatial Data Acquisition, Modeling and Management

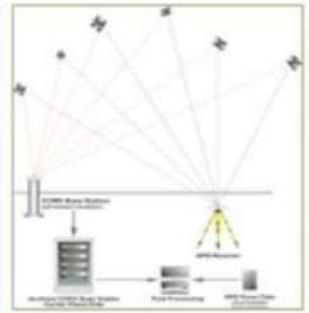
Software Development and System Integration Solutions











Map

Everything Starts With Good Data

- We invest in & deploy the latest and most advanced/ suitable sensor, platform and satellite technologies in the market, to acquire geospatial data.
- Understanding Data Structures and creation of Meta data
- Our acquisition team and technique are Tried-Tested-Proven

Model

Unleash the Power of Science

- We use sophisticated set of tools enabling better view, interpret, manage and share geospatial information across multiple data sources.
- Our superior accuracy and quality practices allow us to reveal more insights.

Manage

Make it Meaningful

- Custom visualizations, software products and cloud-based applications transform complex data relationships into meaningful and actionable information for your industry or area of expertise.
- We bring Data to life

Navigate Geospatial World Confidently

- Our OEM the fastest growing GIS Services Provider company with 2500- man years experience, 200- Engineers, expertise on the cutting edge technologies (LiDAR, Satellite Images, CORS and GPR)
- Rich experience in System Integration, Application Development to provide engineering solutions across Pipeline Networks, CGD Highways, Utilities
- Design and Consultancy Services for Smart/Sale cities, Geo-enabling Property Tares and developing Digital Models for cities
- Rated as one among the 10 Leading Companies in India working on Geo-Intelligence & Emerging Technology Space
- Proficient in Cognitive Technologies (AI Machine Learning/ Robotic Process Automation, Analytics and in developing solutions using web/mobile technologies.
- Worked on Complex & Big projects with majority of government agencies, corporates across sectors in India
- Partner of Choice for major players (Trimble, ESRI, Maxar) in the Industry
- Experience in providing services across platforms - agnostic to the underlying technology stack

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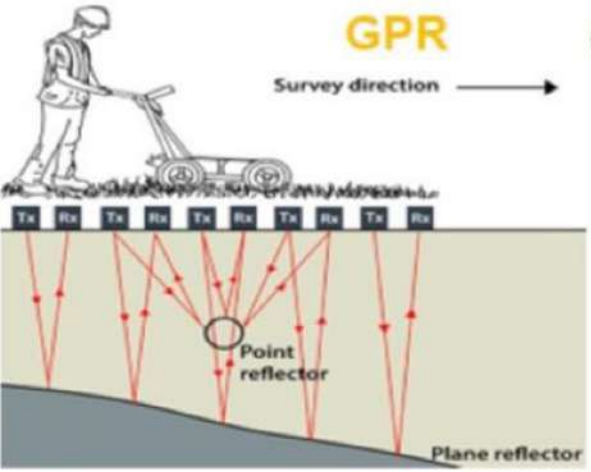
Contributed to Customer Success across Domains

- CORS Establishment and Maintenance-over 524 Stations across 17 states
- Geo-enabling Property Taxes for ULBS- 45 Lakhs properties over 30+ ULBS
- Smart Cities-Integrated Traffic Management, Emergency (Dial 100), Situation Management
- Land Records and Resurvey Project- among the first empaneled service providers
- Water Resources & Network Drainage, Irrigation, Watershed Development and Management
- Cross Country Infrastructure - Highways, Roads and Power Transmission
- Utility Services-High Speed Railways, Power Distribution, Telecommunication and Sewerage
- Data Creation Services - Digitization of Old Maps. Data Interpretation from Satellite Imagery, Aerial Photos, Field Surveys
- Environment and Forest - EIAs and EMPs, Forest- Monitoring and Management, Risk Analysis
- Software Development and MIS-Product Life Cycle Management Services

Mapping Proficiency

LIDAR
(Aerial, Mobile, Terrestrial)

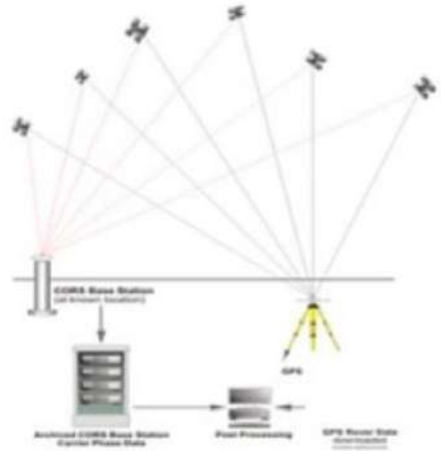
GPR



Satellite

DRONE/ UAV

New Survey Technologies



CORS/ GNSS

- Better Resolution
- Speed of Execution
- People Skill Independent
- Quality of Deliverable
- Convenience

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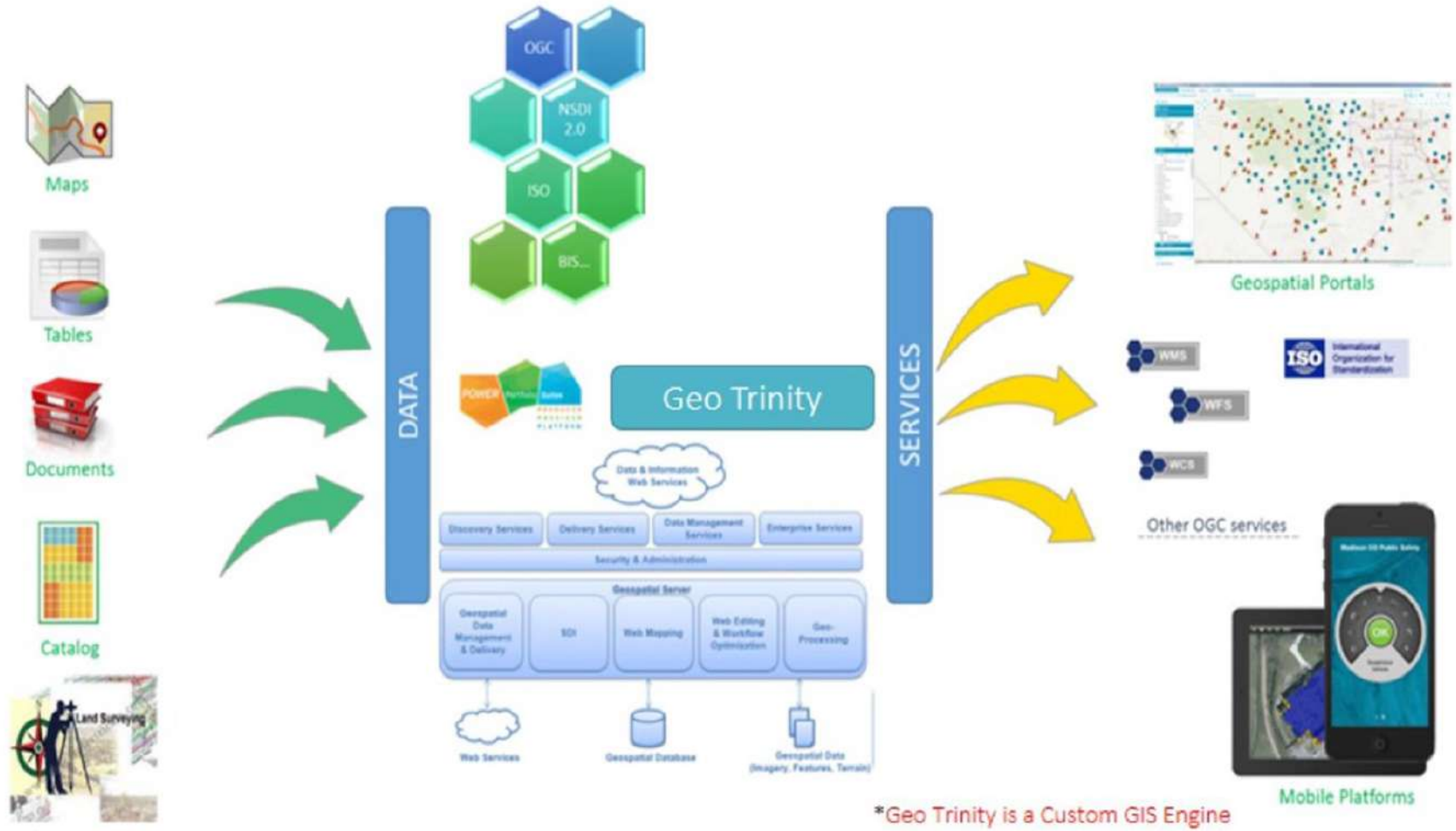
Model Proficiency

- Scalable, Analytics ready, Mobile enabled platform
- Meets the specifications on the users, performance requirements
- World-class solution agnostic to underlying Tech-stack



*Geo Trinity is a Custom GIS Engine

Compatible, Web-based Platform With SO Architecture

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Manage Proficiency

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OEM Tools

MAXAR

- Master Reseller for India
- Represent Maxar – Commercial and D&I
- Work with Partners, Build Network

Trimble

- Technology and Implementation Partner for CORS establishment
- Maintenance and Support
- Scaling up Operations

esri

- strong connect in eGovernance for LUBs offers possibility for Cross-selling
- CoE for ArcGIS based App/ Solution development

Synspective

- Differentiable solutions using SAR imagery.
- Expanding the foot print of data analytics and solution development

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Geospatial Technology – A Game Changer

- ✓ Digital Transformation Helps the Utility Companies to Manage the Fulfillment process efficiently
- ✓ Geospatial Technology Offers a Cost effective, Easy to Implement and Comprehensive Solution

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High Impact Areas

Route Alignment and Survey - Generate Maps & Corresponding BoM showing various design parameters at All Towers and Lines

Asset Mapping and Asset Management

Outage Management & Analysis

Thematic Maps to identify future/ potential consumers and Plan the network

Project Tracking and Management

Integrated Network and Customer Data

Features

Route Alignment and Survey – High Resolution Satellite Images/ Drones/ LiDAR

Asset Mapping and Asset Management – Precise Positional Data, Attribute Info/ Specifications

Outage Management – Detection Sensors, Asset Access Info, Customer Linkages

Thematic Maps to identify future consumers – Temporal Data, Land Base & Customer Info

Project Tracking and Management – Integrated View, Site Engineers Inputs

Integrated Network & Customer Data – Predictability, IoT Sensors, Models

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Map

- ✓ High Resolution Satellite Imagery
- ✓ Drone and LiDAR Survey
- ✓ GPR – Sub Surface Utility Mapping
- ✓ Positioning as a Service
- ✓ IoT Sensors & other Devices
- ✓ Data Conversion & Updating Existing Data
- ✓ Defining Right Data Structure for Collection

Model

- ✓ Creation of DEM/ DTM/ ORI
- ✓ Data Processing for Drone/ LiDAR/ GPR
- ✓ Models for Data Processing
- ✓ IoT Sensor Data Analysis
- ✓ Predictive Analytics for Maintenance
- ✓ Models for Continuous Evaluation and Tracking

Manage

- ✓ Integrated Web/ Mobile Solution for Asset Management
- ✓ GIS Lab Set up
- ✓ Integration with Legacy and MIS systems
- ✓ Systems of Engagement with Public/ Stake holders
- ✓ Crowd Sourcing of Inputs
- ✓ Capacity Creation/ Trainings

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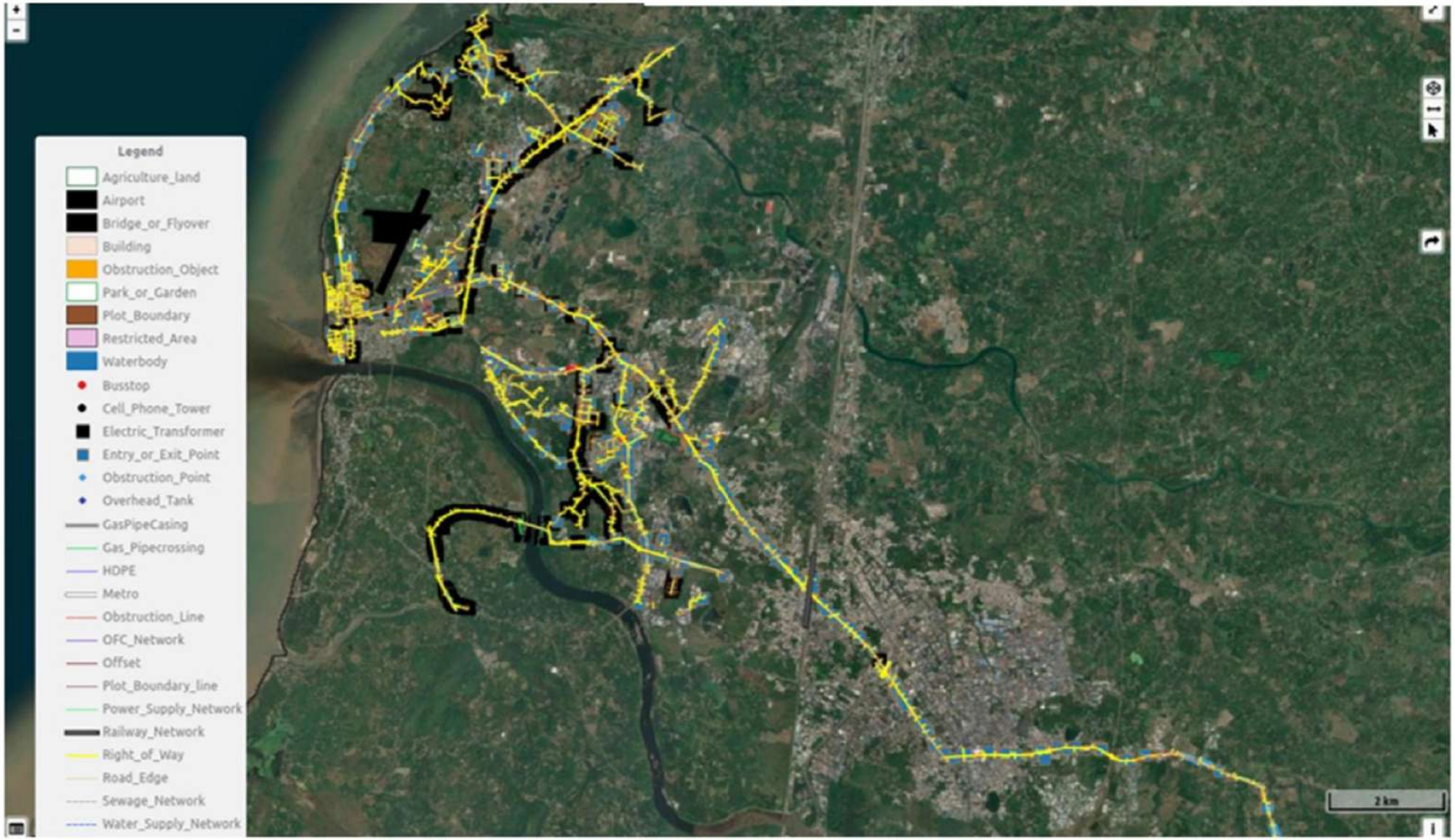
High Resolution Satellite Imagery



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Land Base Map

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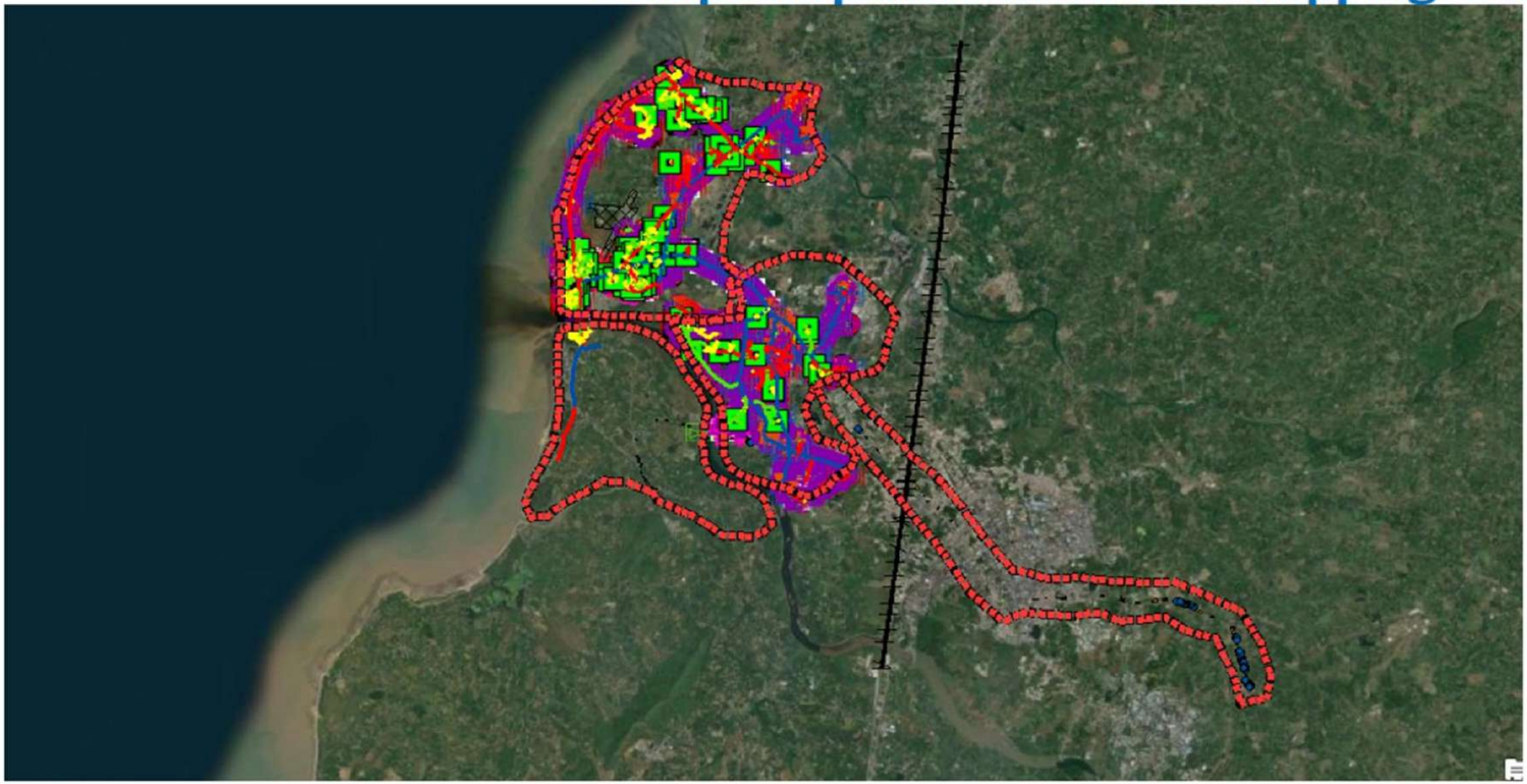
Sample: Pipeline Asset Data Mapping - Steel



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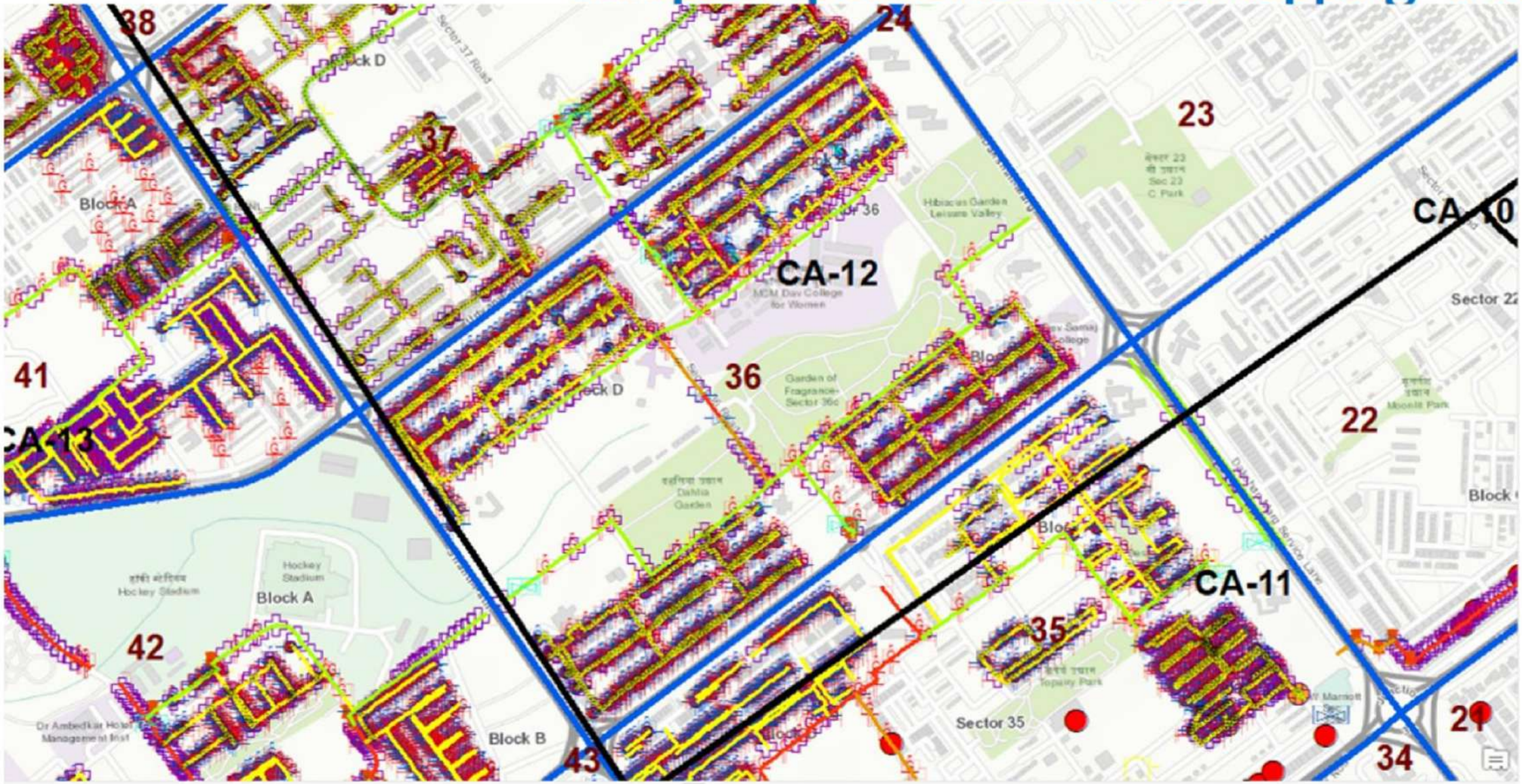
Sample: Pipeline Asset Data Mapping - MDPE



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Sample Model Parameters

Field Data Powered by Location

A. Asset Type

B. General Information
- Size
- Construction materials
- Location

C. Asset Condition
- Physical condition
- Remaining life
- Refurbishment cost estimate
- Replacement cost estimate

D. Asset History
- Original acquisition cost
- Installation date
- Past maintenance
- Cumulative Maintenance costs

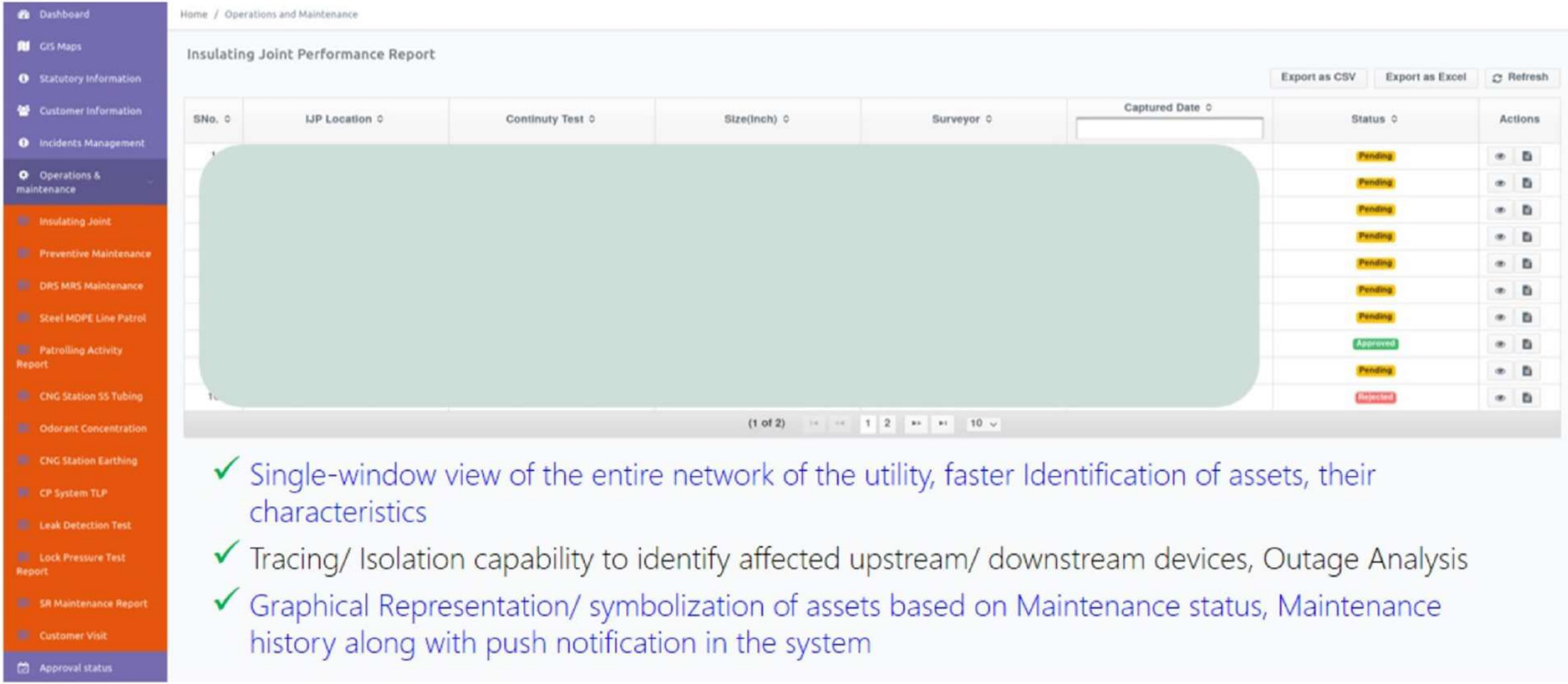
Model Questions, Preventive Alerts & Simulation

- ✓ Is this asset critical to network performance?
- ✓ What are the risks if this asset were to fail?
- ✓ What is this asset's expected lifespan?
- ✓ What actions could be taken to lengthen that lifespan?

Channels for Internal & External communication

- ✓ For employees - clear procedures for communicating asset condition, operational changes, and risk management
- ✓ For customers and other citizens - an accessible platform for maintenance and community updates
- ✓ For other Stakeholders - space for feedback and trust building

Operation and Maintenance



- ✓ Single-window view of the entire network of the utility, faster Identification of assets, their characteristics
- ✓ Tracing/ Isolation capability to identify affected upstream/ downstream devices, Outage Analysis
- ✓ Graphical Representation/ symbolization of assets based on Maintenance status, Maintenance history along with push notification in the system

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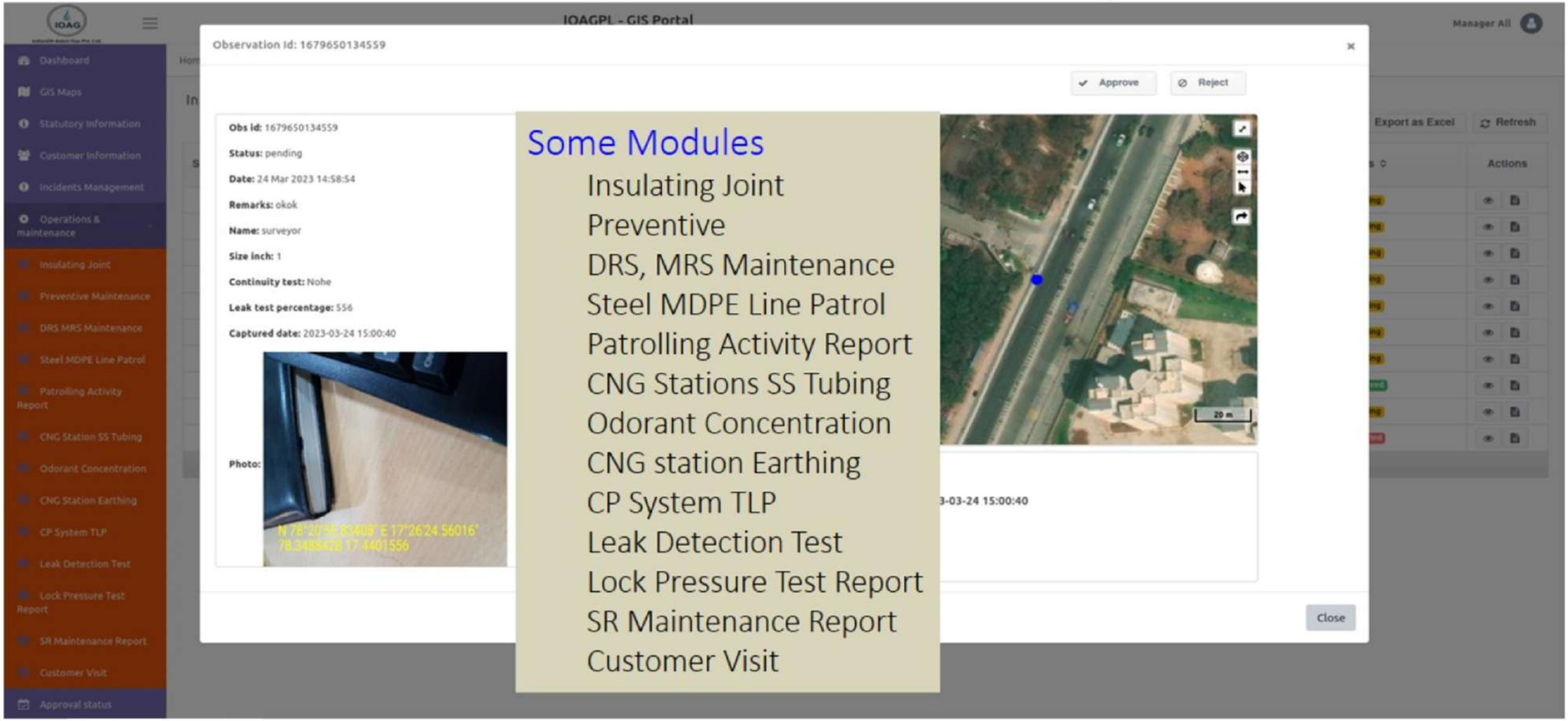
O & M Modules for Pipeline - Customizable



Some Modules

- Insulating Joint
- Preventive
- DRS, MRS Maintenance
- Steel MDPE Line Patrol
- Patrolling Activity Report
- CNG Stations SS Tubing
- Odorant Concentration
- CNG station Earthing
- CP System TLP
- Leak Detection Test
- Lock Pressure Test Report
- SR Maintenance Report
- Customer Visit

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Sample Operation & Maintenance Reports

	Service Regulator Maintenance Report	DOC NO :	MNT 218
		Rev. No:	0
		Effective Date:	23/11/2021

Date&Time: 2023-03-24 15:47:30	Location: hyderabad
Service Regulator No.: 123	

General Maintenance details

General Maintenance: Done	Painting: Done

Leak Detection Test

Leak Detection: Not Ok

Observation / Remark

Remark: ok

Reported By:

Reviewed By:

Print

oc No:	MNT 217
ev No:	00
ff Date:	23/11/2021

Date:24 Mar 2023 15:10:30	Pipeline network (Steel/ PE):steel					Network Area/DRS:wipro circle				Valve U/G & A/G:ag		GA:hyderabad				Report No.-			
SN	Tag No.	Size	Vent Size	Type of Valve	Address/Location	Greasing Done	Operation checked	Dewatering Done	Cleaning & Housekeeping done	Civil Repairs of Valve Chamber if any	Painting Done	Tagging Done	Approach way condition	Position of Valve	Leak Test Done	Fill this, if leakage found: Leakage Point	Leakage Intensity at spot	Leakage Intensity at Top of chamber	Remarks
						Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Ok/Not ok	Open/ Close	Yes/No				
1	O	12	51	wf	3lyf	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Ok	open	Yes	1	21	12	vbhhh

Material used :

	Contractor	TPI	SOAGPL
Name:			
Designation:			
Date & Signature:			

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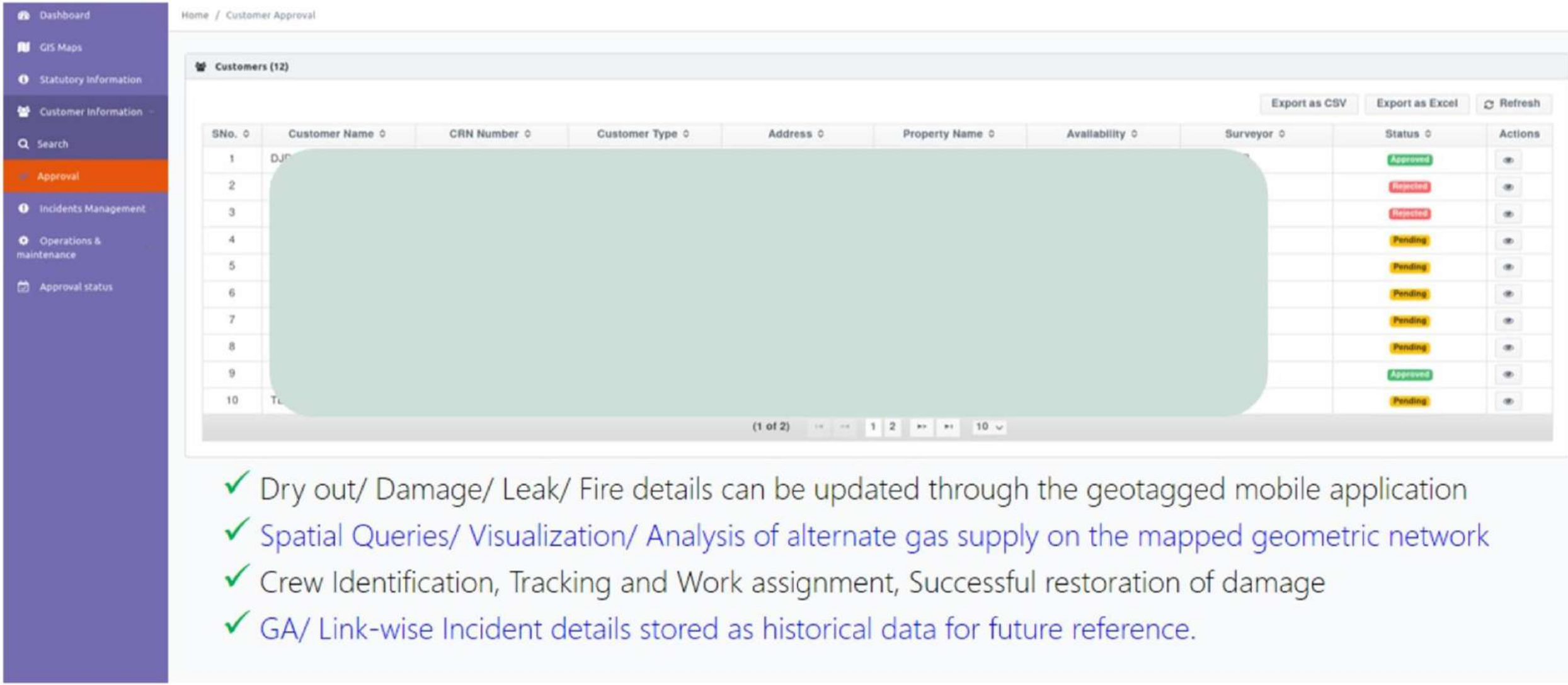
Incidents - Report



- ✓ Dry out/ Damage/ Leak/ Fire details can be updated through the geotagged mobile application
- ✓ Spatial Queries/ Visualization/ Analysis of alternate gas supply on the mapped geometric network
- ✓ Crew Identification, Tracking and Work assignment, Successful restoration of damage
- ✓ GA/ Link-wise Incident details stored as historical data for future reference.

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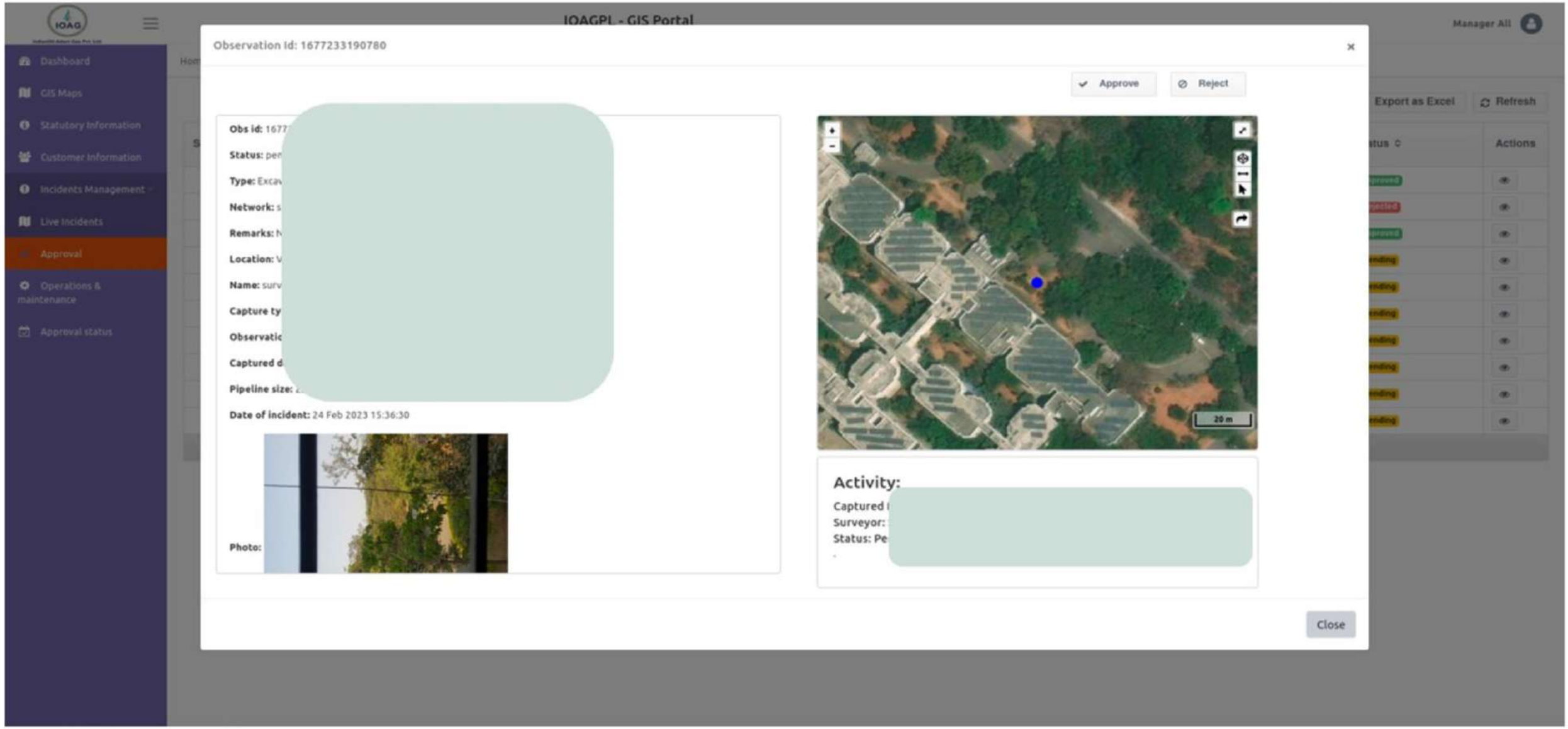
Incident View



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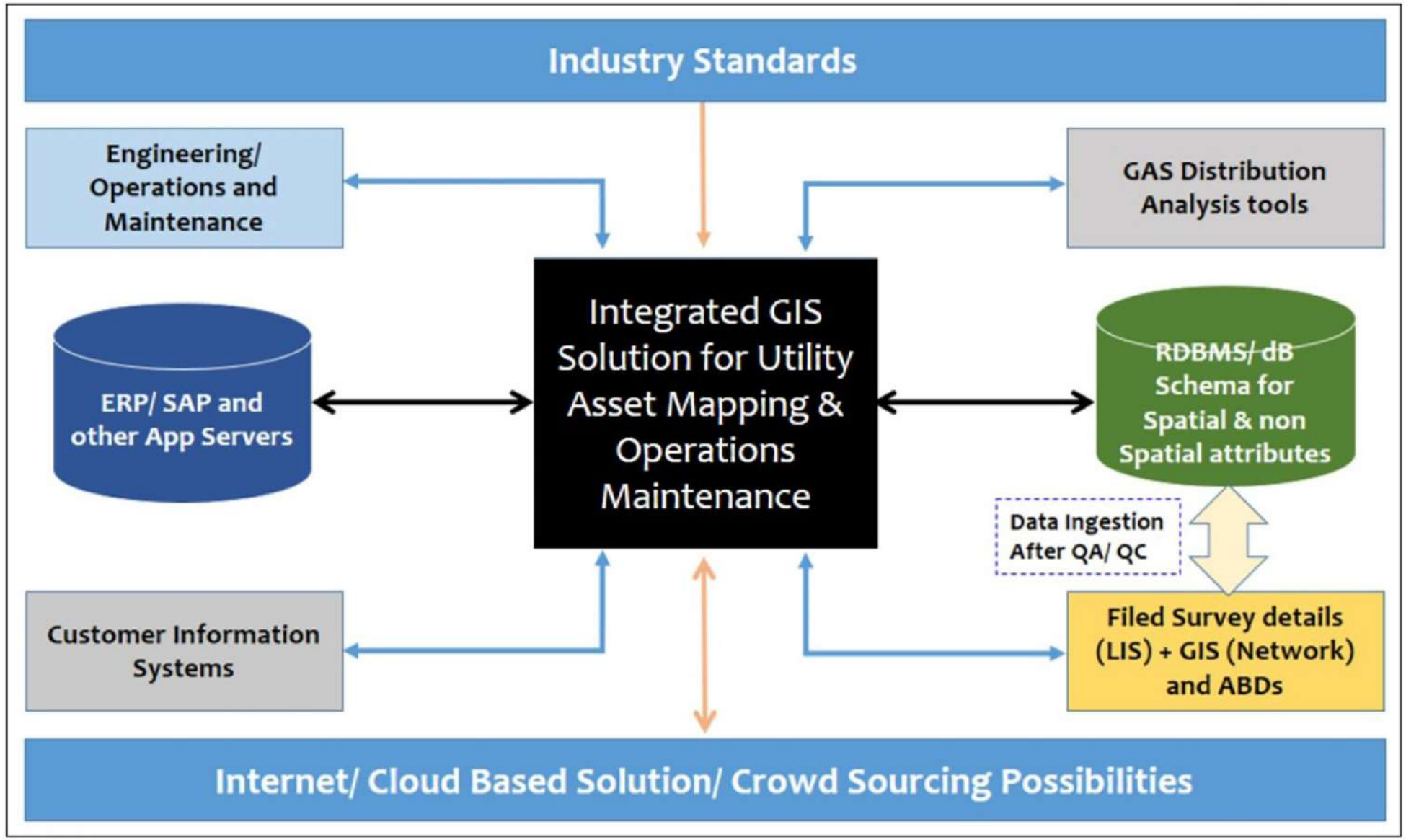
Integration Flow



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Key Features

Capture Data in the Field

- Capture Photos, Take Measurements, Manage Tasks, and Update your Maps – all in the field.
- No Wifi/ GSM Connection? No problem. Capture data in Off-line mode

Use Layers to Build Rich Maps

- Layer Terrain maps, Aerial imagery, and Customer data sets to gain new insights on your territory
- Create from scratch or integrate from your legacy GIS
- All GIS file types including KMZ, SHP, and GeoTIFF are accepted

Manage Tasks Remotely, Predictively

- Create a task directly in your map dashboard. Set a status & assign to a team member
- View all tasks in the report for a snapshot of what has or hasn't been completed.
- Predictive Maintenance Schedules

Receive Updates in Real-time

- Let the information flow freely between field & office-no matter the distance in between.
- IoT sensors for standard/ mechanized updates

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Key Benefits

- Simulate and Change the Network Design to suit the site conditions
- What-if to manually adjust the automatically calculated BOM, Nodes etc.
- Identify weak sections of the pipeline, replace the segment to prevent a leak or an accident proactively
- Efficient DPRS location, Service area & Routing for substantial cost saving
- Plan route to ensure maximum reach with Minimum length
- Reduce the network design time – complete projects ahead of time
- Design the Network without over/ under sizing any element

Save Time Access Data Fast Improve Efficiency Seamless Office Field Operations

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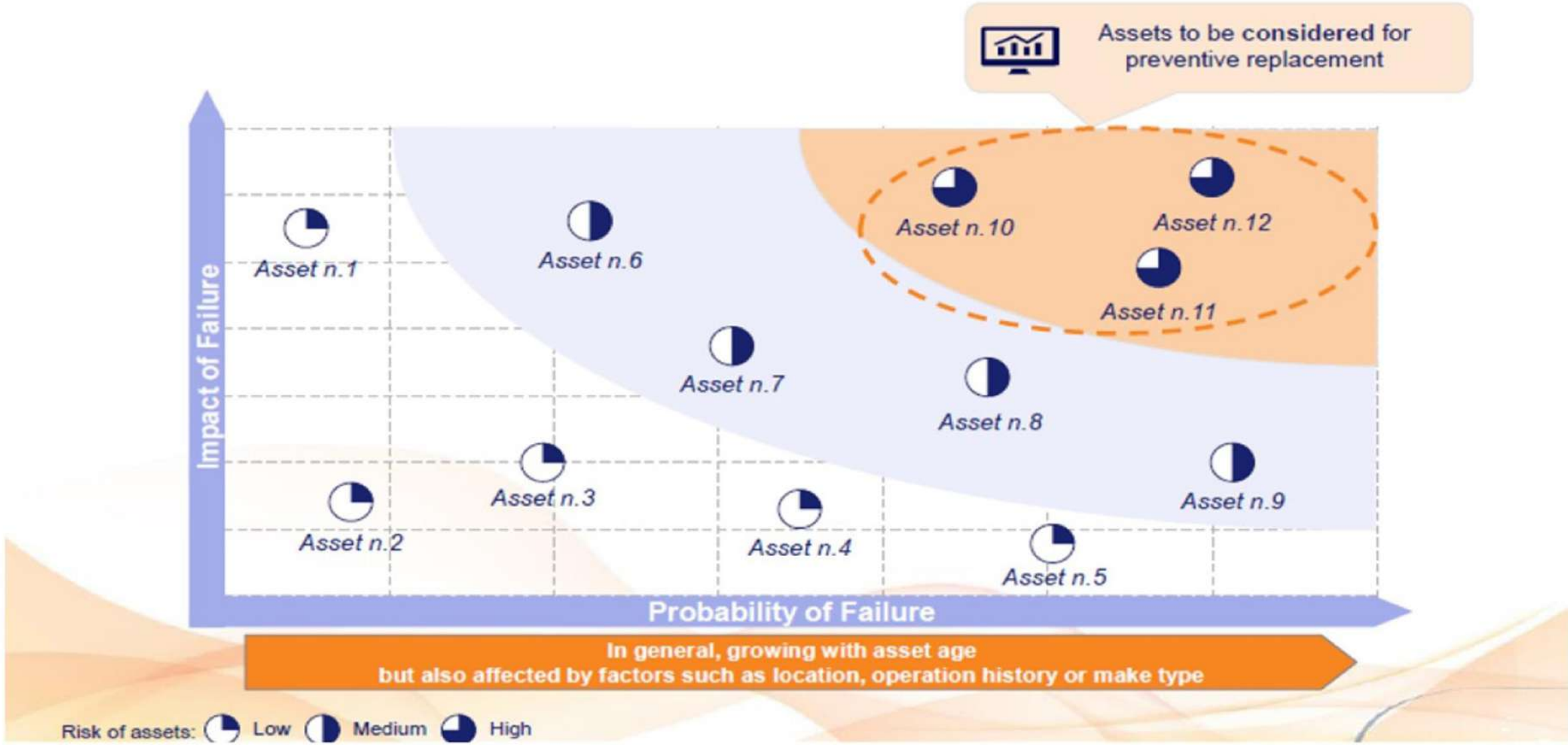
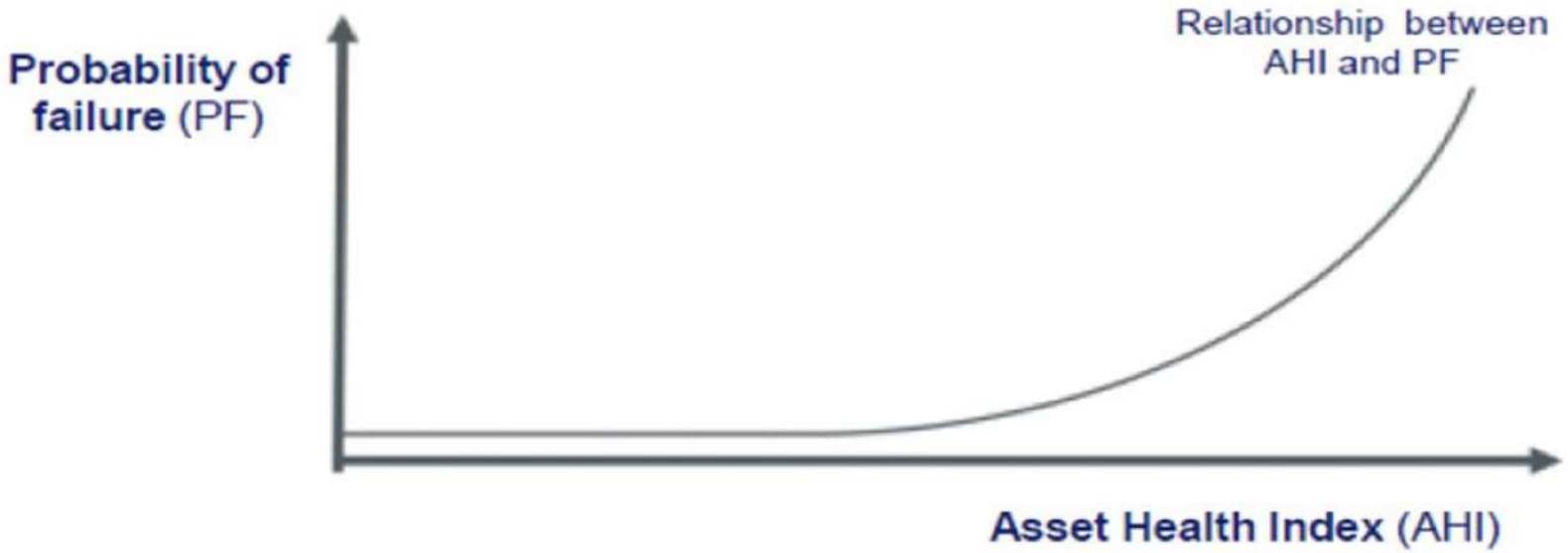
Preventive Replacement - Probability & Impact of Failure



Probability of Failure - Asset Health Indices



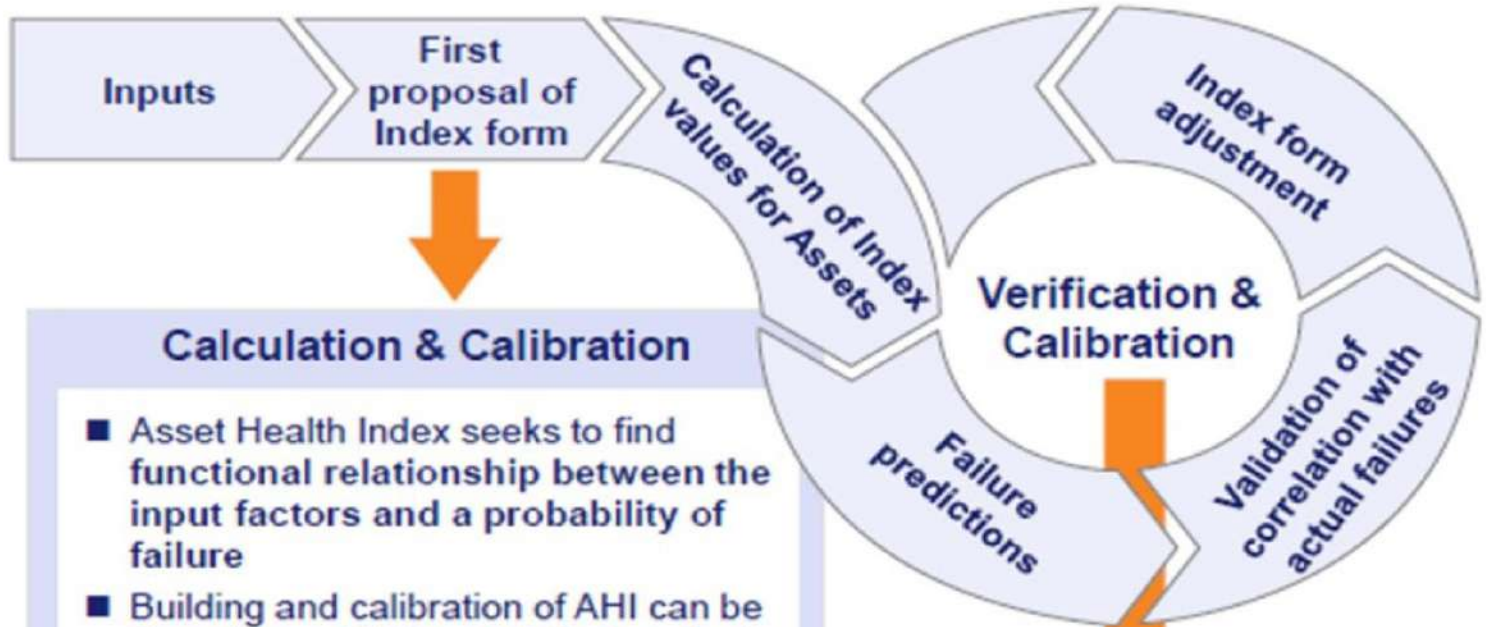
Comment

- Asset Health Index are a fundamental improvement over simple age of asset when deciding about asset replacement
  - Many old assets are in still in good condition, while assets of medium age can be significantly deteriorated
- Asset Health Index considers not only asset age but also range of other factors such as asset condition, operation history and location which provide additional information that can be used to asses probability of asset failure

Standard input factors to Asset Health Index

Lifetime Factors	Asset Condition Factors	Operation History Factors	Location Factors
(e.g. Asset Age relative to expected lifetime)	(e.g. condition assessment, diagnostic data)	(e.g. significant past events, overloading history, past faults)	(e.g. indoor/outdoor, sea proximity)

Asset Health Index - Engineering & Statistical Methods



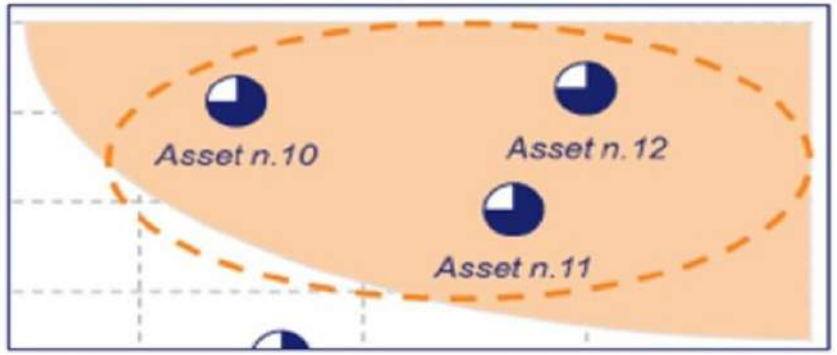
Calculation & Calibration

- Asset Health Index seeks to find **functional relationship between the input factors and a probability of failure**
- Building and calibration of AHI can be done by combining statistical methods with engineering knowledge of asset deterioration mechanisms
- The correlation of AHI with failures in next period should be evaluated (out-of-sample testing)

Select & Prioritize – High Risk Reduction Potential & Budget

Risk reduction potential of replacement

Most risky assets



Rank: Risk reduction potential	Asset	CAPEX per unit
1	Asset n.12	Price of new asset
2	Asset n.10	Price of new asset
3	Asset n. 11	Price of new asset
...	...	Price of new asset
x	Asset n. y	Price of new asset

Budget Limit

Risk reduction due replacement

Replacement lowers probability, impact is unchanged

Methodological approach

- The most risky assets are identified as candidates for preventive replacement
- Asset are ranked by the expected potential for their risk reduction if replaced driven by lowering probability of their failure
- Assets up to budget limit are planned to be replaced in a given year
- The budget for replacement is based on overall risk reduction appetite of the organization