

Digital Electrical Safety Management

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- I . Definition of Digital Electrical Safety Mgmt.**
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I . Definition of Digital Electrical Safety Management

1. Definition of Digital Electrical Safety Mgmt.

- A system that comprehensively analyzes and utilizes various safety information, operational data, and real-time test reports measured through status monitoring devices and systems installed inside or outside electrical facilities via a platform
- A new paradigm that moves away from a human-centered approach and manages the safety of electrical facilities constantly based on ICT



2. Necessity about Promoting Digital Mgmt.

- In Korea, more than 150 electrical shock accidents involving workers in the electrical industry have consistently occurred every year over the last five years ('17-'21)
- The previous method of using old equipment and one-time inspections had limitations in proactively responding to unpredictable accidents
- The development of IoT and sensing technology can overcome these limitations and enable an innovation in the paradigm of electrical safety

Category	2017	2018	2019	2020	2021
Fatalities	3	5	8	3	5
Injuries	195	186	182	148	156
Total	198	191	190	151	161

3. Promotion Strategy

Establishment of Standards

- Review product standards and criteria
- Secure a legal framework for inspections

Establishment of Installation

- Provide installation guidelines according to the type of electrical facilities
- Review and correct issues by piloting the installation standards

Application of Inspection

- Judgment for periodic inspection
- Measure values during pre-use inspection
- Judgment for periodic inspection

Dissemination Plan

- Amend related laws
- Provide incentives



4. Expected Effects and Policy Implications

- **Enhanced Safety**

- Proactively prevents accidents by identifying facility status in real-time, improving facility soundness

- **Improved Inspection Efficiency and Convenience**

- Eases public inconvenience by shortening inspection time and extending inspection cycles

- **Reduced Worker Safety Accidents**

- Reduces the frequency of high-risk tasks and enhances workplace safety by enabling early detection of facility abnormalities

- **Revitalization of Related Businesses and Expansion into the Private Sector**

- Creates opportunities for new industries such as device manufacturing, communication infrastructure, and software during the digital transformation process

→ **The goal is to shift the paradigm of electrical safety management, thereby improving the safety level of power facilities and driving industrial development**

5. Necessity of Official Standards

- **Legal and Institutional Necessity**

- To be established as an official inspection method, a legal basis is absolutely necessary

- **Ensuring Reliability and Fairness**

- The establishment of detailed procedures and judgment criteria is required to evaluate facility status identically anywhere in the country

- **Foundation for the Industrial Ecosystem and Market Expansion**

- The quality of industrial services can be improved and order can be established through a credible system recognized by the state

- **Data Management and Social Trust**

- Social trust begins with securing data quality and stability

6. Consideration Before Implementation

- **Enhance Expertise in Field Inspection**

- It is necessary to benchmark the experience of national safety management organizations to supplement the qualified professional system

- **Introduce Digital Management System Technology**

- It is expected to improve the efficiency of operating renewable energy electrical facilities scattered across the region

- **Introduce Expert Qualifications for Accident Investigation**

- Analyze the causes of accidents to prevent a sharp increase in accidents due to the introduction of renewable energy facilities

- **Introduce Electrical Facility Inspection and Check Standards**

- Establish standards optimized for Sabah instead of applying the current inspection standards of the mainland

II. Korea's Digital Electrical Safety Management Cases

1. Digital Inspection in KESC

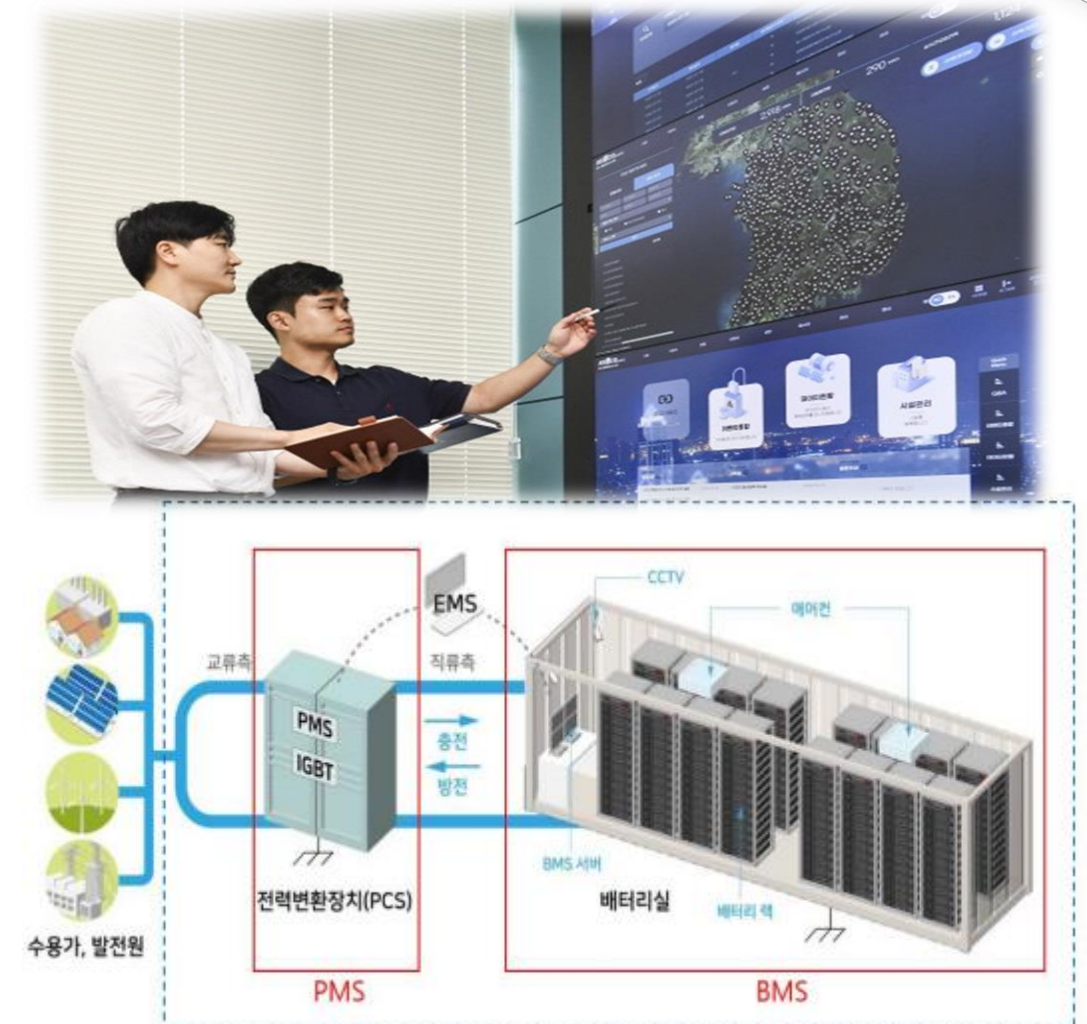
- KESCO has established and is operating standards of digital system inspections within Chapter 4 of the KESC, in order to proactively respond to future digital system inspections
- KESC : Korea Electrical Safety Code

NO.	Title	Contents
450.1	Applicable Scope	Facilities Undergoing Digital Inspection
450.2	Definition	Main Terms
450.3	Standards by Inspection Items	Surge Arrestor Leakage Current, Cable, Power Quality
450.4	Standards by Facility Type	GIS, Oil-filled Transformer, Receiving Panel, Switchboard. Etc.

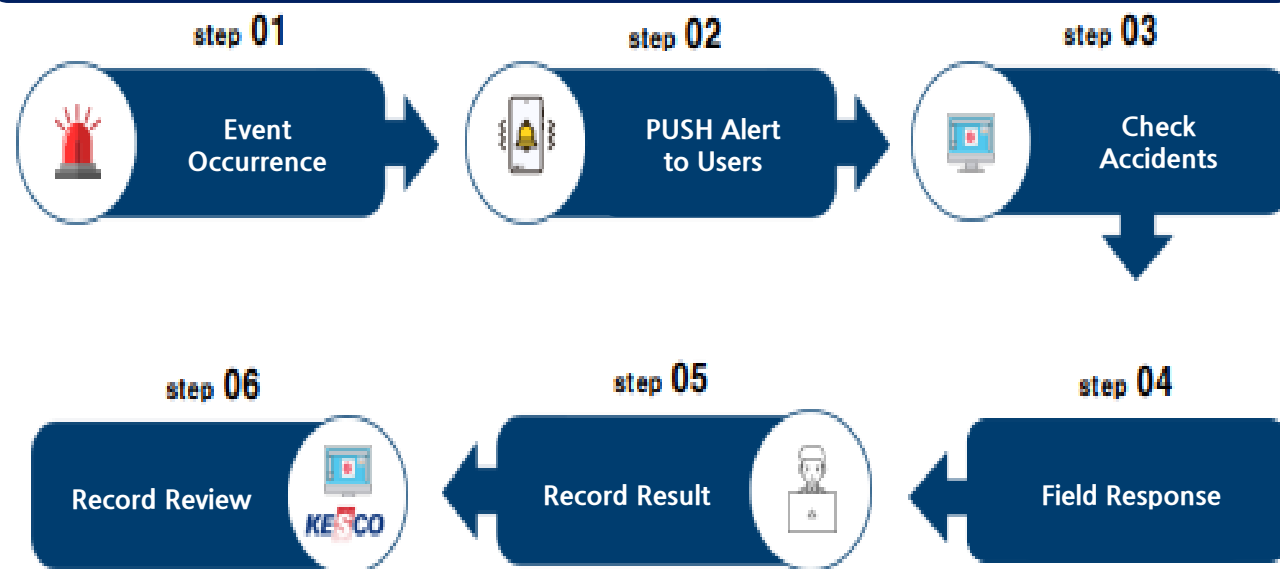
2. Digital Inspection Items

Installations	Voltage and Component		Inspection Items and Parameter
GIS	154kV, 345kV		Partial Discharge, Breaker Operating Characteristics, Gas Density, Surge Arrester Leakage Current
	22.9kV		Partial Discharge
Oil-Filled Transformer	154kV, 345kV		Gas in Oil, Partial Discharge, Temperature(Winding, Insulating Oil)
	22.9kV		Gas in Oil
Receiving Panel Or Switchboard	Extra High Voltage	Entrance Cable	Partial Discharge
		Surge Arrester	Leakage Current
		Switchgear, Power Line, Breaker, Dry-type Transformer	Partial Discharge, Temperature
	High Voltage	Breaker, Dry-type Transformer	Partial Discharge, Temperature
	Low Voltage	ACB, MCCB	Temperature
	22.9kV, 154kV, 345kV		Partial Discharge

3. ESS Management System

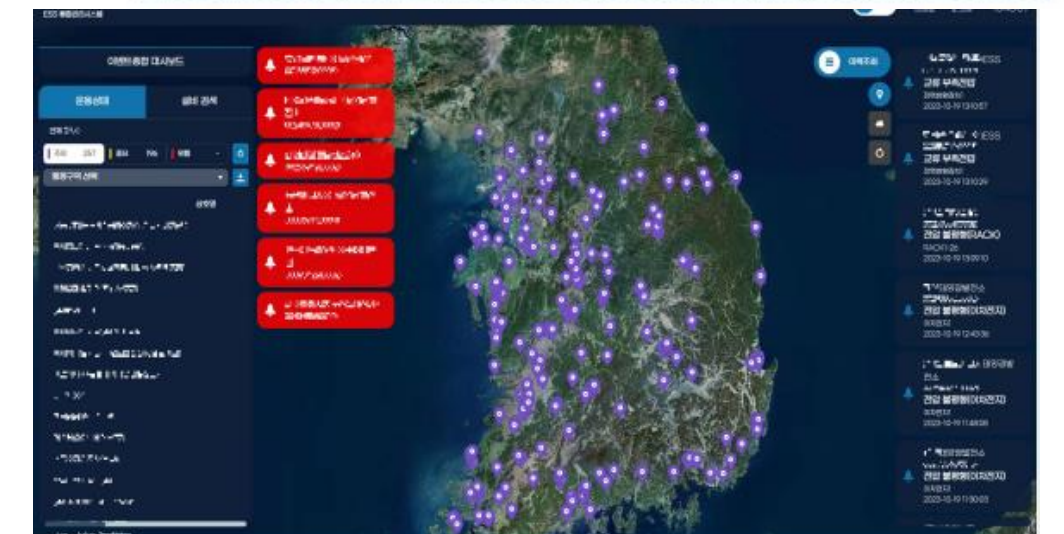


ESS Safety Incident Handling System



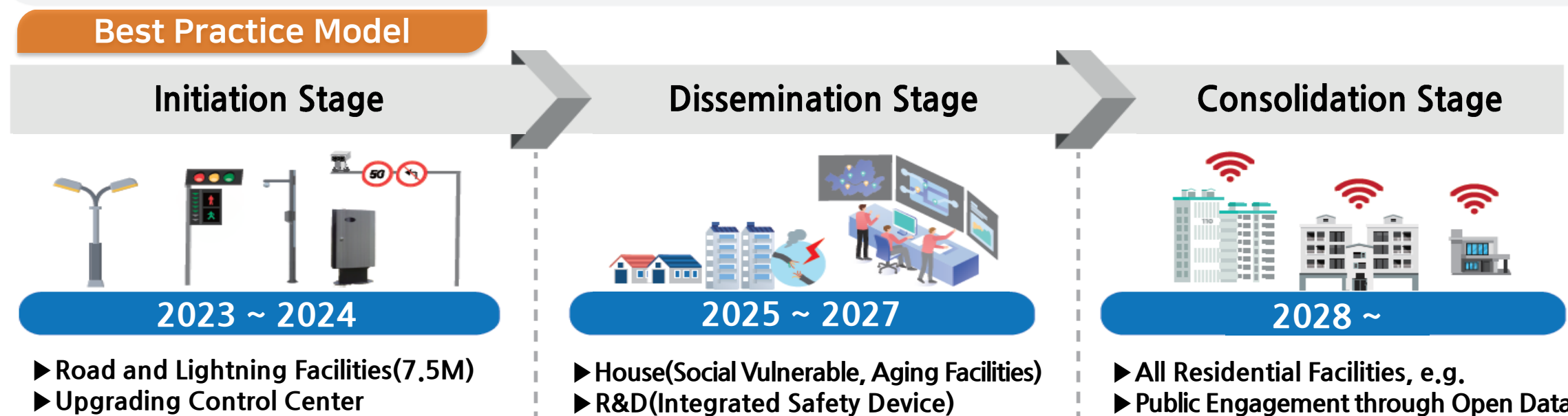
◆ ESS Fire Incident

- ▶ First Fire Occurrence in 2017
- ▶ Total of 54 Cases Reported by 2024
- ▶ Fire Cause Analysis and Preventive Measure

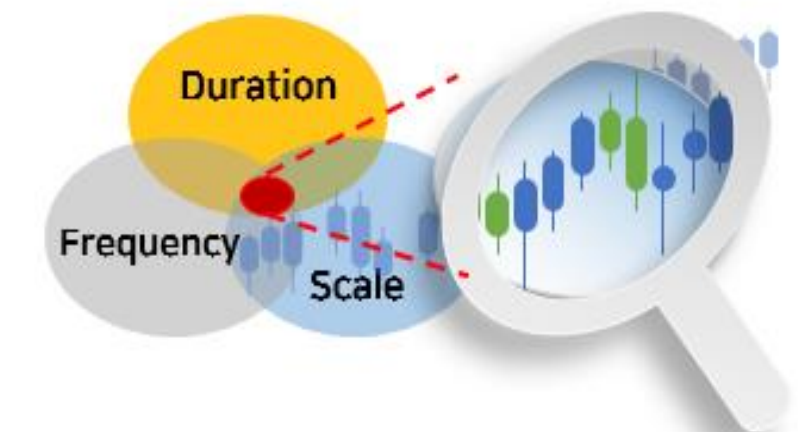


4. Remote Monitoring on General Electrical Facilities

◆ Proactive Safety Management System Based on Electrical Safety Information



실시간 대국민 안전서비스 제공



Thank You