

High-Precision Positioning Technology to Secure Power System

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Due to the wide area and complex environment, it is a challenging mission to manage important assets and protect personnel safety in the power systems. With high precision positioning technology, assets O&M software, GIS integration and personnel track management platform, Hi-Target provides a vast array of innovative location-based solutions and monitoring services for construction, monitoring, and O&M of these vital links.

I. Problems Faced by Substations

With the development of China's economy, the scale of the power grid has continued to expand, and the operation level has been greatly improved. Within China's long-distance and large-scale power transmission system, every kilowatt-hour of electricity generated from power plants is transmitted at a speed of 300,000 kilometers per second, through several or dozens of substations over long distances and finally arrives at the users.

The running process of the power system consists of several parts, including power generation, transmis-

sion, transformation and distribution. The substation is a base link between power plants and users, responsible for changing and distributing electric energy. With its main function to gather, step up, step down and distribute electric power, it is the core link in the entire grid power system. The power supply plays an important role in various industries, and its quality directly affects the economic benefits of the enterprises. On-site operation safety of substations must be attached great importance, cause only by doing a good job in the safe operation of substations can we provide companies and users with safe, reliable, and qualified electrical energy.

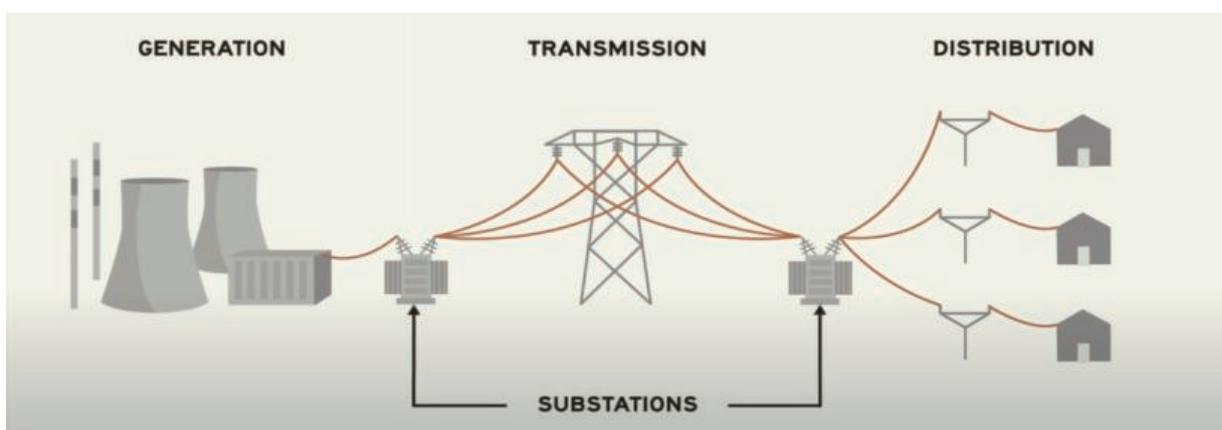


FIG 01 power system

Problems and risks in substations

- The number of operators in the substation is unclear;
- The working area is ambiguous and it may cause accidents by going astray;
- The operators are not clear enough about the safety distance of live equipment;
- The substation lacks of methods to control digital precision.

Needs for substation management

- The location of operators can be tracked in real time, helpful for accurate control;
- Manage safety and eliminate potential safety hazards;
- The task flow is traceable and intelligently manageable.

II. Hi-Target GIS Solution

Addressing the problems and risks at their source is the most effective way to reduce their threats to people's lives and property. To build up a safe and efficient working environment, Hi-Target develops a comprehensive GIS solution for substation management, composed of Hi-Cloud Platform, Hi-Target GIS Hardware and High-Precision Map.

1. Features

Location Tracking

Combined with the high-precision maps, the solution offers both the personnel's real-time and past-time location as well as trajectory information; users can refer to these data at any time anywhere on the Hi-Cloud Platform.

Security Monitoring

According to the location data, the danger area will be assigned an electronic fence; therefore, users will be warned once they enter the danger area and be



FIG 02 Working Site of Substation Personnel

accountable. Meanwhile, users can trigger the SOS alarm button on the positioning terminals and send signals to the management center when there is an emergency.

Immediate Communication

Communication between the team members assures effective work. Within the solution, the on-site operators and the off-site managers can conduct real-time communications, achieving tasks release and adjustment.

2. Components

HiCloud Platform

Based on Beidou high-precision technology, map visualization technology and Internet of Things technology, using high-precision maps as the reference of time and space, HiCloud Platform realizes real-time supervision of personnel and vehicles. It also provides functions like real-time data collec-

tion and upload, intelligent inspection management, electronic fence safety warning, and real-time audio and video monitoring, which can greatly streamline the workflow and improve efficiency.



FIG 03 HiCloud Platform

Hi-Target GIS Hardware

The different types of GIS hardware equipment, including tablet, handheld, box, and hat is self-developed by Hi-Target and designed to meet different precision requirements and support hardware/network dual-mode intercom, able to send out warning signs with the sound, light and vibration.

High-Precision map

To meet the needs of operations, it is required to collect high-precision location information of all equipment in the substation range in advance, including the buildings, lawns, roads, switches, lightning rods, capacitors, transformers, terminal boxes, power boxes, etc., which are the basic data support for the realization of platform business flow.

| Product | Qpad | Qmini | Qbox | Qhat |
|-----------|--------|----------|----------|------------|
| Picture | | | | |
| Meter | ✓ | ✓ | | |
| Sub-meter | | ✓ | | |
| DM | | ✓ | | |
| CM | ✓ | ✓ | ✓ | ✓ |
| Type | Tablet | Handheld | Wearable | Protection |

FIG 04 Hi-Target GIS Hardware

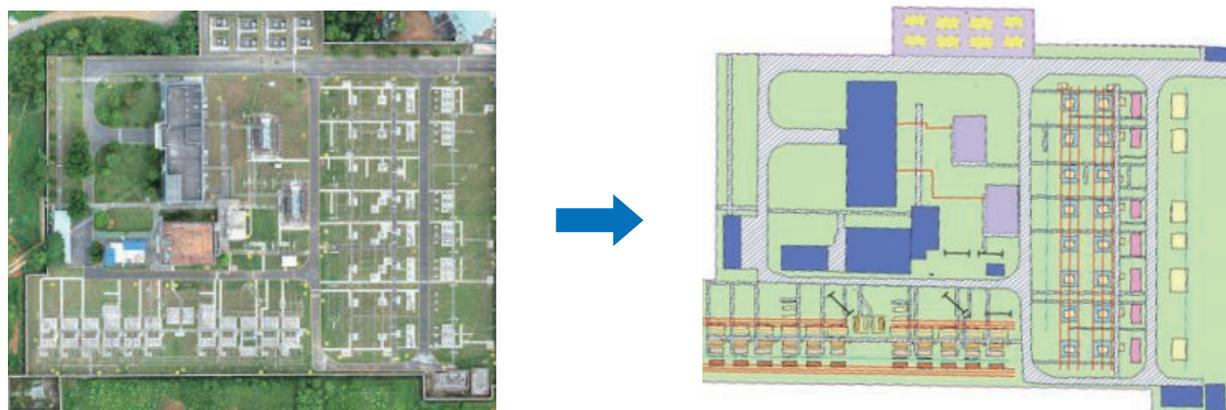
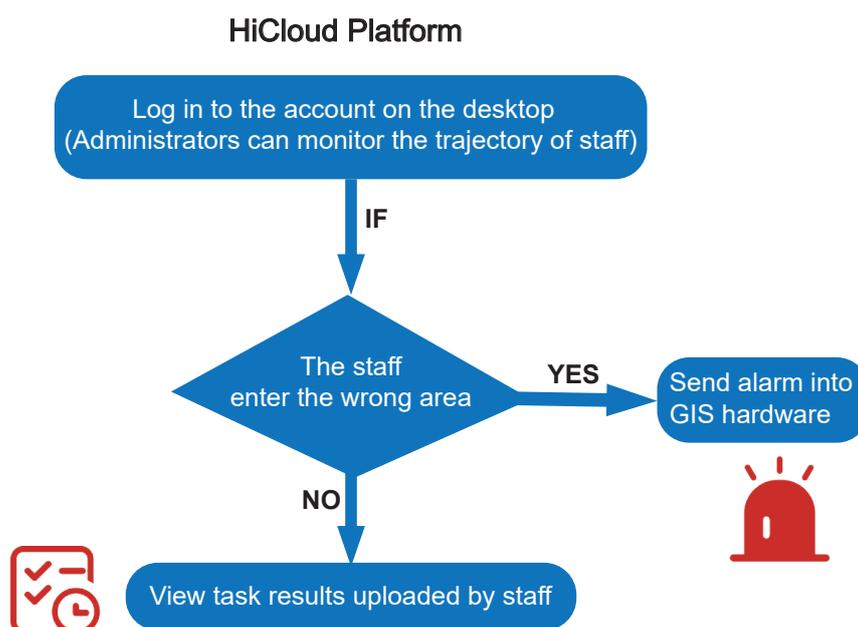
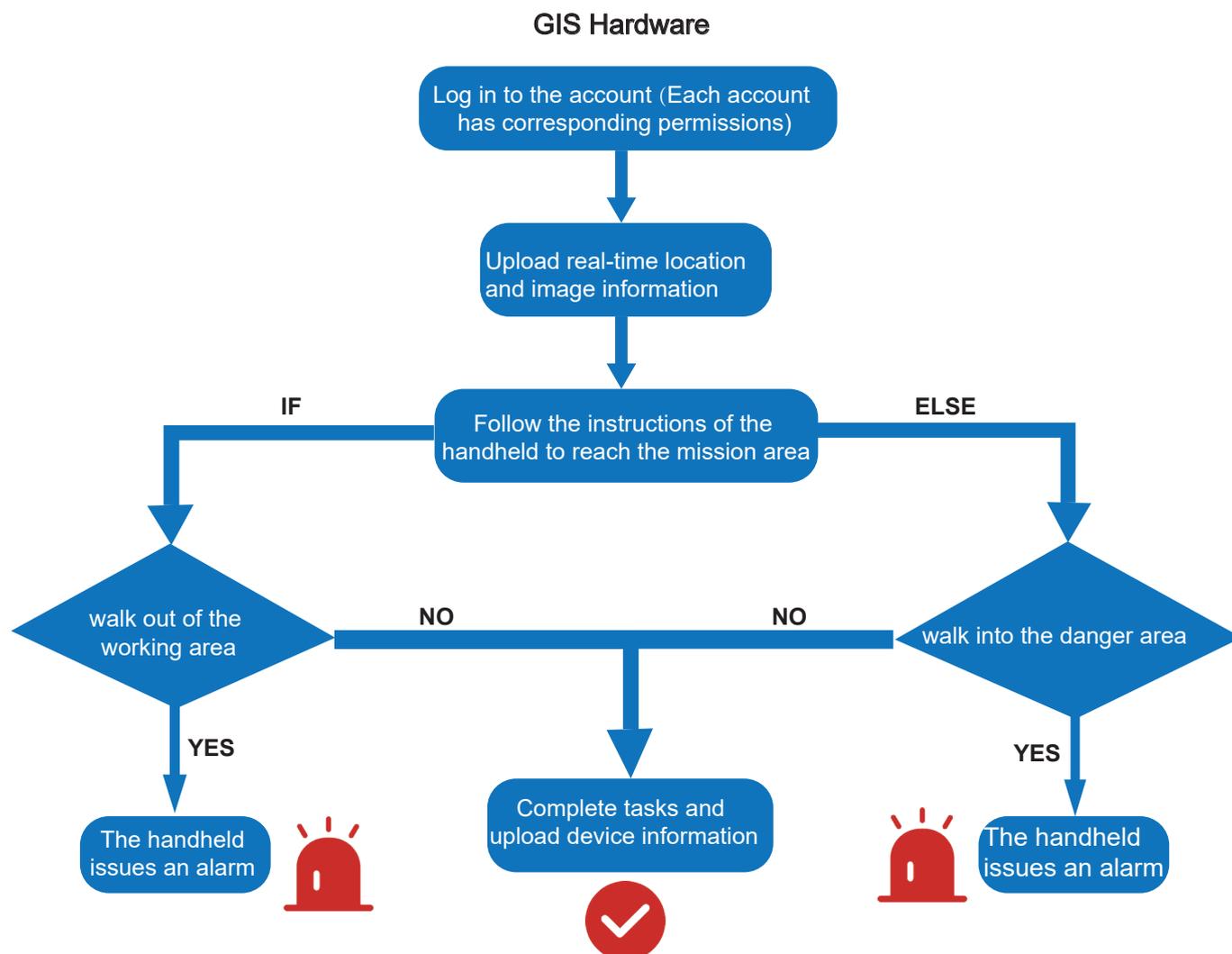


FIG 05 High-Precision map

III. Workflow





More information at www.hi-target.com.cn/become-our-partner/

About Hi-Target

Established since 1999, Hi-Target is the first professional high-precision surveying and mapping instrument brand to be successfully listed in China.

Hi-Target provides a wide range of surveying equipment including GNSS receivers, CORS stations, Total Station, 3D Laser Scanners, GIS Data Collectors, UAV/UAS, and Hydrographic products to offer complete commercial solutions for various industries.

As the leading brand in the geospatial industry, Hi-Target invests heavily in research and development, on top of collaborating with more than 100 universities globally to bring the latest positioning technology and innovation for product development.

For over 20 years, Hi-Target has approximately 3,300 employees worldwide, with an established network of 64 subsidiaries, 28 branches and more than 200 partners in over 60 countries to service and support our customers.

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