SMART SUBSTATION SOLUTION FOR ELECTRICITY

-Smart
-Integrated
-Professional

Remote Surveillance
- Station surveillance
- Equipment checking
- Instrument checking

Production Safety
- Staff auto-tracking
- Accident analysis

Perimeter Protection
- Intrusion alarm
- Alarm linkage
- Access control

Thermal On-Line Detection
- Remote detection
- Equipment predictive maintenance
ELECTRICAL SYSTEM INTRODUCTION

Generation
Electricity is generated by hydro and other independent power producers.

Transmission
Electricity is moved from where it is produced to where it is used.

Substation
Voltage is changed for long distance power transmission.

Distribution
Low voltage electricity is provided to neighborhoods and businesses.
SOLUTION OVERVIEW

• Perimeter
Perimeter protection is the first and most important defense for a substation.

• Transformer
Transformers make up the heart of a substation. Thermal temperature analysis and video provide real-time monitoring capabilities.

• Control Room
The control room houses critical hardware and needs to be monitored around-the-clock.

• Switchgear
The switchgear contains numerous circuit breakers which need to be protected from trespassers and destruction, and housed in a suitable environment.

• Entrance
Video surveillance placed at the substation entrance provides efficient user and vehicle management capabilities.

• Switchyard
The switchyard includes a series of electrical equipment. Thermal temperature analysis and video provide real-time monitoring.
CHALLENGES AND SOLUTIONS

• Unmanned Facilities
  Substations are scattered and sometimes located in remote areas. Administrators need to constantly monitor the status of substations and ensure normal operation.
  
  ![Remote video surveillance for administrators]

• Accident Prevention
  High voltage power poses a great danger to human safety, and in the process of maintenance and repair, accidents can be easily caused by improper operation.
  
  ![Remote video surveillance for safety managers]

• Trespassing and Damage
  Substations are key components in the power infrastructure and must prevent the entry of trespassers or suspicious persons who could cause damage or be electrocuted.
  
  ![Perimeter protection and access control]

• Electric Equipment Malfunction
  Malfunctions may occur in equipment after extended operation, especially power transformers. Transformer explosions could disrupt access to electricity or threaten lives.
  
  ![Remote thermal detection]

• Natural Disasters
  Natural disasters such as typhoons and earthquakes can damage the substation and cause power outages.
  
  ![Power rush-repair command]
SOLUTION DETAILS

Remote Video Surveillance

- Complete station surveillance
- Staff auto-tracking and surveillance
- Electric equipment checking
- Electric instrument checking
- Alarm linkage

Installing a complete station surveillance system provides remote status analysis of key equipment and instruments.

Auto-tracking enables the remote monitoring of station workers and accident analysis.

Perimeter Protection and Access Control

- Perimeter intrusion alarm
- Switchgear access control
- Perimeter video surveillance
- Control room access control
- Alarm linkage
- Station gate surveillance

Perimeter protection ensures substation security with an access control system, remote 24/7 surveillance and perimeter intrusion alarm.
Thermal Remote On-line Detection

- On-line temperature measurement
- Equipment predictive maintenance
- 360° measurement
- Live HD video
- Remote and real-time detection
- Temperature threshold alarm

Thermal temperature measurement is the most effective means for real-time, remote on-line detection of high-voltage equipment.

Typical Subjects of Thermal Temperature Measurement

- Connector
- Breaker
- Arrester
- Transformer

Power Rush-Repair Command

- Integrates with station devices
- Manage the video wall
- Make linkage between different devices
- Display video and information
- Remote management and control
- User management

Large screen display enabled by Dahua software allows you to better understand substation status and respond to emergencies more efficiently.
SYSTEM STRUCTURE

VMS Platform For Various Project Sizes

<table>
<thead>
<tr>
<th>Smart-PSS</th>
<th>DSS4004/DSS7016</th>
<th>IAS</th>
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<tbody>
<tr>
<td>For small projects</td>
<td>For mid-size to large-scale projects</td>
<td>For entire electric companies</td>
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<table>
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<tr>
<th>Stand alone software</th>
<th>All-in-one VMS platform</th>
<th>Software for smart-substation</th>
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<tbody>
<tr>
<td>No customization</td>
<td>Supports simple customization</td>
<td>Supports customization</td>
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Includes CCTV, Access control, Alarm, Video wall

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Includes CCTV, Access control, Alarm, Video wall, Thermal analysis
PRODUCT SHOWCASE

Video & Thermal Surveillance System

- Video and thermal surveillance system is comprised of NVR and several cameras, and accesses software through the internet.
- Cameras include IP camera, auto-tracking PTZ camera, indoor PTZ camera and thermal camera, for different applications.

SD42212T-HN

- 1/2.7” 2Megapixel CMOS
- Powerful 12x optical zoom
- Supports triple-stream encoding
- Max. 25/30fps@1080P, 25/30/50/60fps@1050P
- IVS
- Supports PoE+
- IP66, IK10

SD6AE830V-HNI

- 4K
- Powerful 30x optical zoom
- H.265 Encoding
- Max. 30fps@4K and 60fps@1080P
- Auto-tracking
- IR distance up to 200m
- IP67, Anti-electromagnetic interference

IPC-HFW8232E-Z

- STARVIS™ CMOS
- H.265&H.264 triple-stream encoding
- 50/60fps@1080P(1920×1080)
- Smart Detection supported
- Linked to Alarm sensor
- 7mm~35mm motorized lens
- Max. IR LEDs Length 100m
- IP67, Anti-electromagnetic interference

TPC-PT8620A-T

- 640*512 VOx uncooled thermal sensor technology
- 1/1.9” 2Megapixel CMOS
- Powerful 30x optical zoom
- Supports temperature measurement
- Max 160°/s pan speed, 360° endless pan rotation
- Up to 300 presets, 5 auto scan, 8 tour, 5 pattern
- IP66, Anti-electromagnetic interference

NVR608-32-4KS2

- Intel Processor
- Max 32 IP Camera & thermal camera Inputs
- Max 384Mbps Incoming Bandwidth
- Up to 12MP Resolution for Preview and Playback
- Supports RAID 0/1/5/6/10/50/60
- Smart Tracking and Intelligent Video

Temperature Analysis

- Thermal cameras are connected directly to the server for professional analysis such as temperature curve analysis, automatic temperature measurement, reports, and historical analysis.

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PRODUCT SHOWCASE

Alarm system

• Alarm system is comprised of an alarm controller, detector, and siren. Two types of alarm controllers, network controller and field surveillance unit (FSU), are also available. The field surveillance unit is customizable with temperature sensor, humidity sensor, smoke alarm, water sensor, SF6 sensor, etc.

• Dahua perimeter intrusion detector includes infrared beam detector and E-fence functionality. Third party devices are also supported out of the box.

ARC6416U-C

• 16 DI (dry contact) interface
• 8 AI (analog input 4~20mA) detectors, configurable threshold definitions
• 8 RS485 detectors
• 2 RS232 detectors
• 4 channel@1080P IPC
• 4 Channel alarm outputs
• Local storage, 2x3.5-inch HDD, up to 4TB for each HDD

Access Control System

• Access control system is comprised of a controller, reader, magnetic lock, and exit button.
• The controller is the key component and accesses software through the internet. All accessories, such as ID cards, are included.

ARC2008C

• 8 on-board zones
• 4 alarm out, expansion to 20 (ARM708, ARM716)
• 8 alarm keypad (ARK10C)
• Reliable power switch, compatible with storage battery
• Supports PSTN, IP to upload alarm signal

ASC1204B

• Supports multiple cards
• Supports card, password, fingerprint and combination
• TCP/IP interface to PC
• Wiegand or RS-485 interface to readers (2/4 door)
• Door time out alarm, intrusion alarm, duress alarm and tamper alarm
• Anti-pass back, multi-door interlock, multi-card open
• Surface mounted installation
SUCCESS STORIES

Kenya Power
Dahua provided a remote video surveillance system for a 220kV and 66kV power grid in Nairobi, Kenya to help improve the remote monitoring and management capabilities of Kenya’s power grid, improving power supply reliability.

China Southern Power Grid
Dahua is responsible for the access and management of about 50,000 cameras on China southern power grid substations. Constructed video and environmental monitoring systems across approximately 1,000 substations ranging from 35kV to 500kV.

State Grid Corporation of China
Dahua began construction on the power grid remote surveillance system in the year 2000 and has made several rounds of upgrades since then. Performed construction and renovation on approx. 10,000 35kV-1000kV substations. Constructed the first online thermal imaging diagnostics system for substations in China.