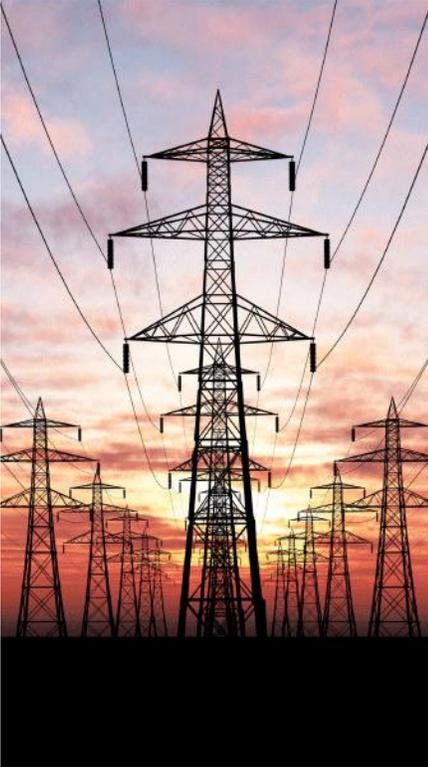


Cisco Incident Response and Workforce Enablement for the Utility



Over the next ten years, it is predicted that aging energy infrastructure and utility industry workforce will undergo their greatest transition in a generation. Critical to this transition is enabling utilities with practices, systems, and technologies that turn employees into significant contributors to the organization's overall profitability. Providing access to information, continuous training, better safety practices, and improved workflows, these workforce enablement capabilities integrate the knowledge of field operatives, maintenance specialists, engineers, operations managers, and expert advisors across the utility enterprise.

Today's incident response and workforce enablement solutions are empowered by advances in collaboration and mobile technologies. Based on a common network platform, radios, smartphones, and tablets equip field personnel to resolve issues at the site of the problem. Mobile technologies also enable remote learning for new personnel, more accurate data collection, and improved task management to support grid operations, maintenance, and regulatory compliance. A workforce enabled by mobile applications has become a vital part of the utility operation.

Cisco Incident Response and Workforce Enablement solutions provide a set of architecture services and products to improve field communications and coordination. These integrate disparate fixed and mobile communication systems, IP-based dispatch, and physical security systems to improve coordination between utility field crews, dispatchers and remote experts. They also improve situational awareness, help coordinate incident response, and enable remote workforce collaboration and training. Based on the Cisco GridBlocks™ architecture, Cisco combines mobility and collaboration within a single interoperable environment to deliver an end-to-end communications network.

Challenges Facing the Utility Workforce

One of the greatest challenges facing today's operations managers is the aging of the utility workforce. With the departure of older workers, the business loses an important information resource. According to the ARC Advisory Group (2011), up to 42 percent of all intellectual capital is held in employee memory, outside of any official documentation. This expertise may include knowledge of good safety and efficiency practices, operational experience, and general functional capabilities that improve productivity and response. These knowledgeable employees are being replaced by younger, less experienced recruits – and fewer of them due to pressure to reduce operational expenses.

As the workforce shrinks, it is confronted by rapidly changing circumstances. Operational environments are becoming more complex, encompassing aging infrastructure as well as increasingly stringent environmental, safety, and security regulations. New employees need to be trained to respond appropriately to grid

events and remain in procedural compliance. They must also consistently follow best practices, processes, and safety protocols across shifts and sites.

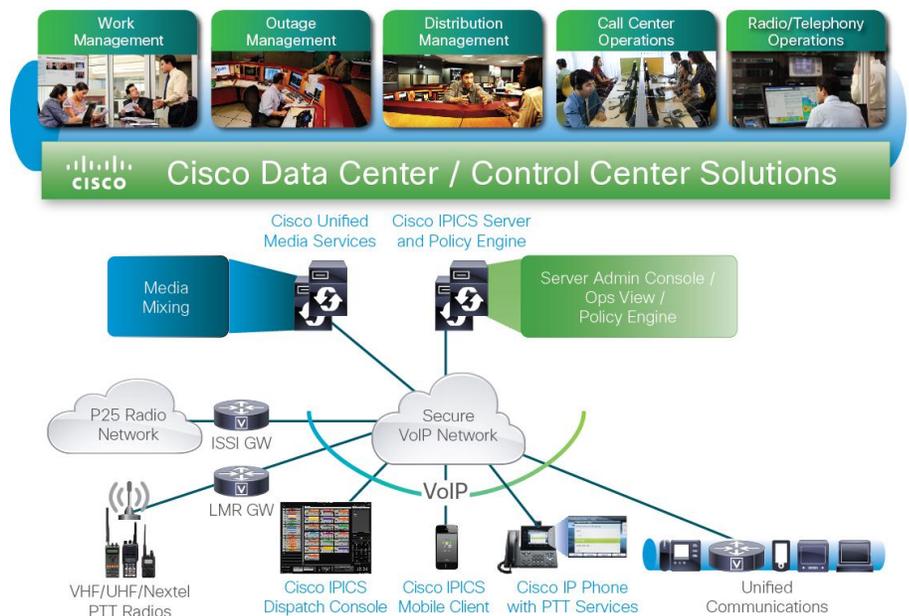
At the same time, they are being challenged by non-integrated systems such as land mobile radios (LMR). Radios are well embedded within the field environment. However, they cannot share information with other communications systems and in an emergency may complicate an incident by limiting contact between responding teams. As well, many radio systems are nearing their end of life. Utilities must decide whether to update existing technologies or follow the general trend toward interoperability.

Cisco Workforce Enablement for the Utility

Clearly, new processes and technologies are required to support today's workforce. Utilities have the opportunity to make the workforce more productive with improved interactivity, collaboration, and automated information gathering across a single platform that integrates with current systems.

Based on a field-proven physical safety and security architecture, Cisco offers a family of solutions and services to enable incident response and workforce collaboration for the utility. Our flagship solution is the Cisco® IP Interoperability and Collaboration System (IPICS), which creates a gateway to integrate incompatible existing communications systems such as radios. IPICS also integrates with Cisco Video Surveillance Manager (VSM) and third-party situation awareness applications to enhance situational awareness, response time, operational efficiency, and collaboration across the utility and across agencies when needed. Each of these solutions can be integrated with utility operational systems, such as Outage Management, for faster response time and better coordination between field crew, dispatchers, and remote expert advisors.

Figure 1.





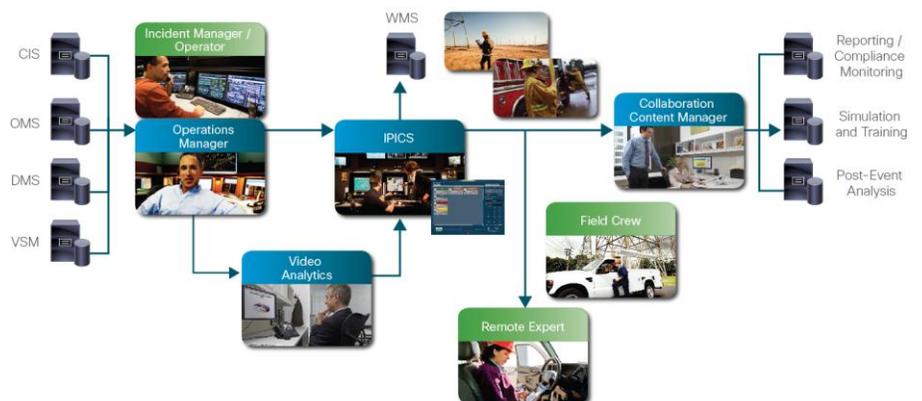
The Cisco Incident Response Solution

The Cisco Incident Response solution is a comprehensive IP-based incident and operations response solution that unifies dispatch, UHF/VHF radio interoperability, emergency first responder notification, integration with IP phones, smartphones, PCs, tablets, and other mobile devices to create a single communications system for field operatives. By integrating existing communication technologies, utilities are able to collaborate up the chain of command and across peer groups. It also enables faster access to information and better decision making for executive planning and public announcements.

The real-time, multimedia-enhanced IPICS communications capability supports faster problem solving by:

- Enabling multigroup, multiagency, peer-to-peer talkgroups; talkgroups between disparate radios; and talkgroups including radios, PCs, phones, smartphones, and IP phones
- Providing distributed command and control and peer-to-peer communications in the field
- Supporting both audio and video communication and a new generation of mobile endpoints
- Offering new tools to simplify notification and improve response time
- Providing a quick launch module with one-click access to complex actions for utility personnel
- Supporting P25, Tetra, and other radio protocols

Figure 2.



Real-Time Applications with Video Surveillance Management (VSM)

Integrated with the Cisco network, the Cisco VSM software suite provides a highly scalable and flexible video system that supports real-time retrieval of live or recorded video using a web browser interface. This easily customized tool supports networked video surveillance to:

- Improve situational awareness to support emergency response and disaster recovery
- Protect substations, plants, and other facilities from physical intruders

- Remotely inspect physical grid assets for predictive and preventive maintenance, powered by video analytics and aided by remote experts
- Provide real-time video from crew locations to dispatch and control centers

VSM integrates with a wide range of third-party devices and applications, allowing utilities to mix and match system components. Authorized network users can view and control live video from IP or encoder-connected analog cameras, as well as retrieve recorded video from storage. VSM enables an infinitely scalable number of cameras and fault-tolerant recording options and supports offsite storage in case of emergency.



Integrating with Situation Awareness Applications

IPICS integrates with onsite physical security information management (PSIM) and dispatch systems, enabling command and control to support incident response with a detailed common operating picture and work team collaboration. PSIM applications respond to manual or automated alerts and provide human operators with an action plan and options for gathering further information, such as by moving nearby cameras to observe the problem. For example, operators can:

- Initiate a talkgroup through IPICS to unite remote experts and remote and field personnel for a diagnostic assessment
- Gather and share information such as substation diagrams, video clips, real-time video streams, images, and other critical visual data
- Send crews to the repair site with a greater level of awareness and preparation
- Enable crew and remote experts to collaborate and share information throughout the diagnostics, repair, and restoration process
- Disseminate information to public officials, media representatives, executives, and other stakeholders

With these capabilities, teams are able to respond more quickly based on improved situational awareness and centralized coordination. Such applications also provide the situation and collaboration data to support utility reports, helping them comply with operating procedures and security standards such as NERC CIP.

Remote Expert and Training to Improve Workflow

Cisco's mobile video collaboration solutions combine unified communications (UC), the unified wireless network architecture, and mobile wireless video solutions to enable Cisco Remote Expert, a real-time mobile collaboration between local personnel and remote experts. This powerful remote capability supports continuous access to expertise for the enabled workforce using IP-based video, data, and voice.

When workers need to consult, Remote Expert allows them to quickly locate and connect with a more experienced worker or subject matter specialist. From the work site, they may collaborate in real time with local or remote experts, exchanging photos and video as required. Newly recruited workers also gain instant onsite access to videos and trainings that guide them through the procedures for repairs and maintenance and help them to learn appropriate best practices.

Cisco Unified Communications also support an efficient workflow for field personnel. Instead of traveling back and forth to headquarters, workers can download work orders and safety information using smartphones and tablets, reducing the amount



of time spent on travel. They can also determine inventory availability from the site and submit work orders when a job is completed rather than having to wait until the end of the day.

Solution Benefits

By enabling workforce collaboration over a converged network platform, the Cisco Incident Response and Workforce Enablement solution provides utilities with:

- Better situational awareness and appropriate response to incidents
- Powerful diagnostics; predictive and preventive asset maintenance
- Increased worker productivity, with better service levels at a reduced cost
- Accessibility of information and procedures on demand
- More efficient work process/workflow decision support
- Support for increasingly complex mobile devices over time

Cisco Services and Solutions in the Utility

Cisco brings more than 25 years of networking experience to utility projects, offering secure, reliable, and scalable communications for the industry. Cisco's Connected Grid provides an end-to-end, highly secure, and interoperable networking infrastructure for electrical grids that allows utilities to better manage power supply and demand, improve the security and reliability of energy transmission, and optimize operations.

By delivering multiple applications over a single, intelligent and secure platform, electric utilities benefit from both lower total cost of ownership as well as create value from new services and functional integration. The Connected Grid is part of Cisco's broader vision of the Internet of Everything, to connect people, processes, data, and things.

To learn more about Cisco workforce enablement solutions, please visit our website at www.cisco.com/go/smartgrid.

Cisco services. smarter *together*



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