Co-innovating tomorrow®

Yokogawa Plant Security

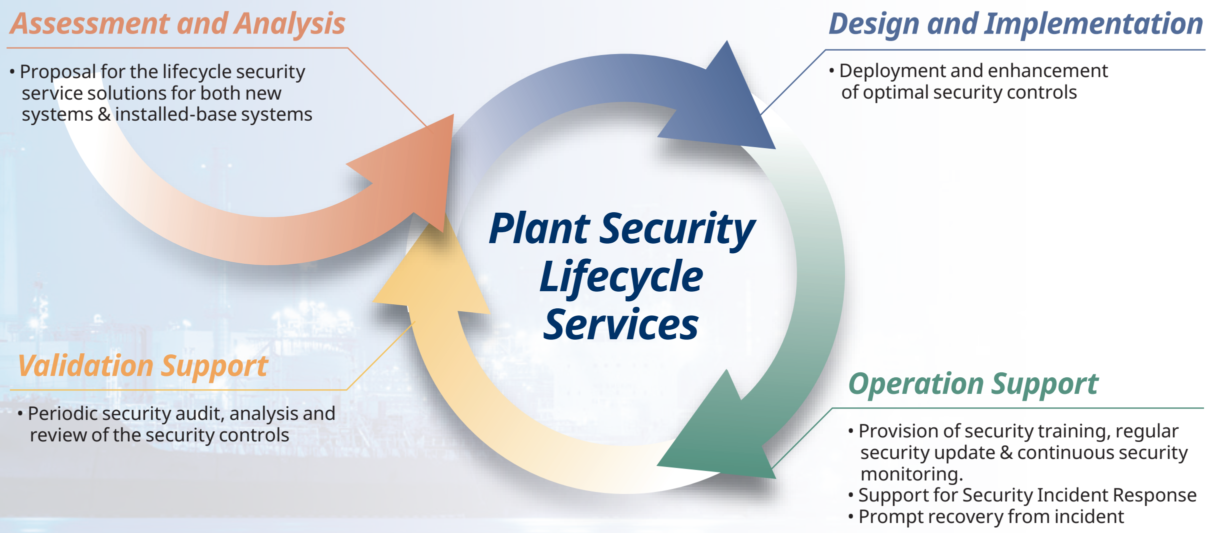
Bulletin 43D02T07-03EN

Comprehensive Solutions to Reduce Risk and Create Value

In order to benefit from the connected world, cyber security issues need to be addressed by professionals of both IT and OT. As your proven and trusted partner, Yokogawa will deliver Plant Security Lifecycle Services to ensure plant safety and security for the mission-critical industry. Based on the defense-in-depth approach and Yokogawa's global standard corresponding to international standards, we provide a comprehensive approach to enhance operational resilience.

Yokogawa's Approach

Yokogawa's cyber security approach is composed of 4 phases that would start from the assessment of the system until the validation of the security controls. This approach ensures that the design and implementation are catered not only for the industry but for each customer's unique environment.



Assessment and Analysis
- Proposal for the lifecycle security service solutions for both new systems & installed-base systems

Design and Implementation
- Deployment and enhancement of optimal security controls

Operation Support
- Provision of security training, regular security update & continuous security monitoring.
- Support for Security Incident Response
- Prompt recovery from incident

Validation Support
- Periodic security audit, analysis and review of the security controls

Yokogawa's Cyber Security Portfolio

Yokogawa developed a comprehensive network and system security for its industrial process control systems. These security solutions address common and known internal/external system vulnerabilities and these security solutions can be deployed to both green field and brown field facility.

Assessment and Analysis	Design and Implementation		Operation Support			Validation Support
	Host Based Security	Network Security	Security Update	Situational Awareness	Respond and Recovery	
Security Assessment	Antivirus Implementation/ Management	Secure Network Design	Security Information Service	Virus Check Service	Software BackupService	Audit
	OS Patch Management	Firewall	Antivirus Update	Network Healthiness Check Service	Security Incident Response	
	Malware Inactivated Service	Network Monitoring System	Application Whitelisting Update	Security Awareness Training	SOC (Managed Service)	
	OS hardening/ USB Port lock	Next Gen Firewall	OS Patch Update			
	User/PC Setting Management	IPS / IDS				
	Backup Recovery System	Unidirectional Gateway				

■ Yokogawa Security Solutions and Services ▨ Project Based Reference

Yokogawa is the best co-innovating partner to minimize security risks of our customers

For more than a decade, Yokogawa has developed and provided proprietary cyber security solutions and technology for our customers. During the time, the Yokogawa Industrial Cyber Security group has gained experience and knowledge through various cyber security projects around the globe. Yokogawa is the best co-innovating partner for our customers to minimize security risks and maximize corporate values.

Security Competence

The research and development centers of Yokogawa are located across the globe to develop security techniques and for the process control system. With a long experience in control system integration, we understand the importance of CIA triad. As being pushed by the industry, we have numbers of certified engineers not only GICSP (Global Industrial Cyber Security Professional) but also CISSP, CISA etc around the globe to serve our customers.

Growing with the Industry Standard

The industrial security expert and development team are actively participating in the development of international industrial standards from ISO, IEC and ISA. Yokogawa has been developing techniques and solutions for the purpose of security risk management for process automation systems.

Industry Best Practice

In the implementation of security controls, specific requirements and consideration are required for the process control network. In Yokogawa, based from its long years of experienced in the control system has established best practice in the implementation of security controls. These best practices are compliant with international and industrial security standards.

Global Reach and Local Delivery

We have more than 230 service office globally to provide a better service to customers which enable customer to contact closest service office to receive faster response. Our response to all kinds of customer inquiries on an around-the-clock, 365-day-per-year basis by global service network.

Assessment and Analysis

Assessment and Analysis

Assessment and Analysis is a comprehensive approach that helps customers determine their current overall security posture based on practices that Yokogawa has gained from our rich experience.

Yokogawa offers various security assessments dedicated for Industrial cyber security, from the simple assessment that can easily be engaged, providing simple result and recommendation of necessary countermeasures; until on-site assessment where Industrial security specialists visit customer's plant to check the settings and policies to provide comprehensive result with recommendations.

Customer will be able to identify vulnerabilities, understand their assets and possible impact of security risks, weakness and threats in order to apply appropriate security measures.

Design and Implementation

Host Based Security

Host Based Security is designed to provide basic protection for customer's endpoint. The Human Machine Interface (HMI) is one of the essential device that allows the plant operators to regulate and check for the smooth running of the plant. It is essential that certain amount of protection must be given to these HMI.

- Yokogawa's dedicated team of researchers to test and verify Yokogawa's Standard Antivirus and Microsoft Security Patch every month to ensure customer's secured operation by performing validation in advance.

- A system-hardening is recommended as a protection measures implemented in order to prevent the system from the attack over a network or direct attack by operating a terminal and theft of critical data.

- Backup the data and to have disaster recovery plan is essential in the event of a hardware failure, virus infection and environmental catastrophe. The centralized backup infrastructure is an effective way to administer plant-wide backup operation from a single location.

Network Security

The process control network has evolved from individual isolated computers with proprietary operating systems and networks to interconnect various systems and applications employing commercial-off-the-shelf technology.

Network Security is critical important in recent years as it is constantly being subjected to new threats. These threats are continually increasing in numbers and getting more sophisticated. Network security does not rely on one method, but uses Defense-In-Depth Strategy to defend your business in different ways.

- Yokogawa provide a secure network architecture, a design based on IEC 62443 that includes zoning or grouping of assets based on customer's security requirement.
- Secure network architecture is equipped with firewall (with strict policies and customization as recommended by Yokogawa) which acts as the first line of defense against network intrusion.

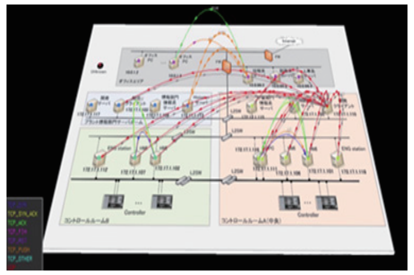
Operation Support

Security Update

Security researchers have shown that installing system and software updates is the best way to defense against the common viruses and malwares especially for computers running Windows. **Security Update** keeps your control system updated and protected with validated Microsoft security updates and verified Antivirus.

- Yokogawa updates Antivirus Definition File and Microsoft Security Patch on behalf of customer using various methods based on customer's preference.
- Yokogawa updates Yokogawa's Standard Whitelisting when change is necessary.

Situational Awareness



Situational Awareness provides current situational awareness of new vulnerabilities. These services help engineers and plant managers stay earnest, be aware of risks and identify warning signal to prevent incidents.

- Network Healthiness Check Service enables visualization of communications traffic on a network after periodically collecting and analyzing log data.
- One-shot virus check enables you aware of possibility of virus infection.
- An extensive range of training courses on network security is provided, which enables you to understand the necessity of industrial control system cyber security and overview of risks involved.

Response and Recovery

Response and Recovery

While traditional preventive security methods may not fully detect or block frauds and cyber attacks, Yokogawa offers comprehensive managed service of security monitoring to provide reliable information for quick decision making as well as Security Incident Response service to help our customer recover from security incidents as quickly as possible and to minimize the duration and impact of security breach. Our Managed Security Operation Center experts remotely operate and monitor your plant using remote infrastructure.

- Assets Monitoring
- Security Update
- Security Incident Management
- Risk Compliance
- Investigation
- Backup and Recovery
- Reporting

Validation Support

Validation Support

Yokogawa conducts **Validation** to our customer by using multiple methods such as checking status of Microsoft Security Patch update and Antivirus software, analyzing logs of firewall and network devices, as well as windows and application logs to see if any of unauthorized communication is allowed.

- Check whether the necessary security control is introduced and operated properly on the system.
- Provide reports and visualize points to be improved by sharing content with customers.
- Propose one level higher of security countermeasures to our customers by following international standards, laws of each country and industry guidelines.

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