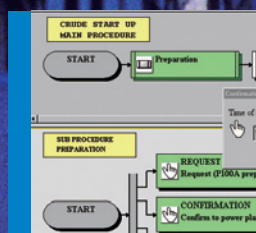
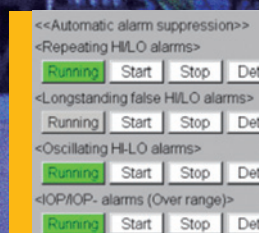


# vigilantplant.®

Volume #2

## Integrated Plant Safety Management for Alert Manufacturers



Bulletin 00A01A21-22E



**SEE CLEARLY**



**KNOW IN ADVANCE**



**ACT WITH AGILITY**

# vigilantplant.®

## The clear path to operational excellence

Envision a plant where people are watchful and attentive while your business responds to change quickly and efficiently. Now picture an operation that delivers non-stop production while confidently expanding your capabilities into the future. Imagine no further. This is the promise behind VigilantPlant, the new concept from Yokogawa.

Industry leaders striving for operational excellence will benefit from a new vigilant approach to plant automation. Making critical plant information fully visible is just the beginning of the vigilant cycle. **Seeing clearly** gives you the knowledge necessary to anticipate the changes required in your process. **Knowing in advance** brings you the speed and flexibility to optimize your plant in real time. And by **acting with agility**, you are able to adapt to the ups and downs of your business environment. VigilantPlant excels at bringing out the best in your plant and your people - keeping them fully aware, well informed, and ready to face the next challenge.

So what makes the vigilant approach essential to a leading edge plant? With the emerging capabilities of plant-wide digital networks, the future is nearer than you may think. VigilantPlant brings you to the forefront of the digital revolution, opening up rich new possibilities for a more integrated plant operation. Yokogawa helps you SEE, KNOW and ACT with greater confidence and ease while providing the tools and services to bring it all together. Choose Yokogawa as your partner for operational excellence.

**Let us be vigilant about your business!**



Volume #2:

“Integrated Plant Safety Management for Alert Manufacturers”

# Safe plants call for more than emergency shutdown Let's look at the big picture.

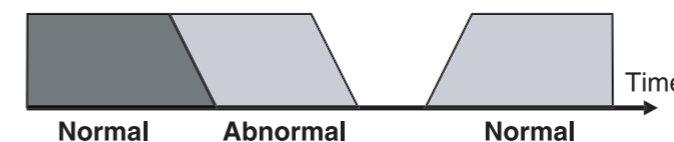
**SEE  
CLEARLY**

The vigilant approach to safety management starts with making the right information visible to the right people. Effective alarm management provides your operators with a clear view of the operating conditions, eliminating blind spots that can lead to unnecessary plant downtime. The embedded diagnostic logic of our Advanced Alarm Administrator automatically reduces nuisance alarms while directing operator attention to critical alarms and predictive alerts.

**More on pages 5-6**

### Plant Conditions

#### Stable Operation



### Yokogawa's Solutions

#### > AAASuite

Advanced alarm administrator

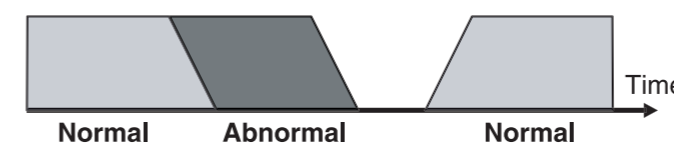


**KNOW  
IN ADVANCE**

In case your process goes into critical conditions, the ProSafe-RS safety controller alerts your operators of the developing conditions in advance through its unified operator interface with the control system. If the process exceeds critical conditions, ProSafe-RS contains the situation promptly while keeping your operators fully informed.

**More on pages 7-8**

#### Safe Containment



#### > ProSafe-RS

Integrated safety controller

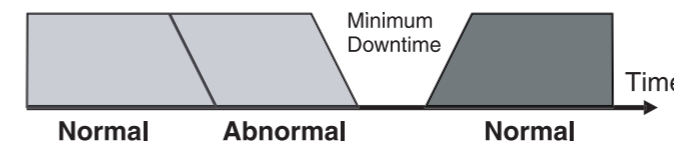


**ACT  
WITH AGILITY**

In case of emergency shutdown, getting back to normal operations as quickly as possible takes the right solution to lend a hand. After the interlock sequence has contained the emergency situation, your next priority is to ensure smooth re-startup of the plant. In these interaction intensive processes, a knowledge-based operation navigator can greatly increase both the speed and quality of non-routine operations, minimizing costly plant downtime.

**More on pages 9-10**

#### Speedy Recovery



#### > Exapilot

Non-routine operation navigator



“ We used Yokogawa solutions and cut the number of alarms by 93%. Operators now have more time to attend to true process concerns. Alarm management does work. Management now understands and fully supports the value of alarm management and that it is a continuous on-going process. ”  
Mike Redman, EVAL Company of America

## > Preventative medicine for safer plant operation

### Avoiding unnecessary plant shutdown by effective alarm management

#### A Recurrent Ailment...

Workload per operator often increases faster than process reengineering efforts, causing them to be inundated by recurrent alarm

#### Alarm flooding going unattended:

- Causes oversights, delays, and incorrect operations
- Leads to a higher risk of overlooking critical information that may lead to hazardous situation



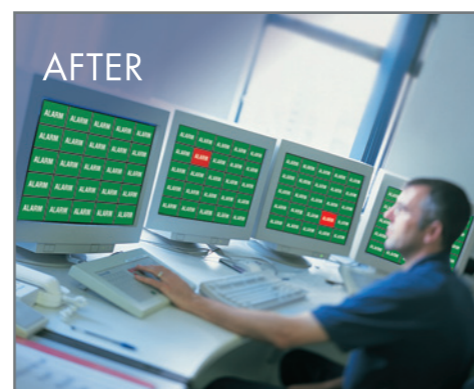
Operators inundated with spurious alarms

#### ...and a Vigilant Remedy

Relieve operators of repetitious and spurious alarms while making them more alert to critical alarms and predictive alerts

#### AAASuite advanced alarm administrator:

- **Less nuisance alarms:**  
Suppresses nuisance alarms automatically with embedded diagnostic logic
- **More value-adding alarms:**  
Adds and highlights value-adding alarms for quick and effective decision making

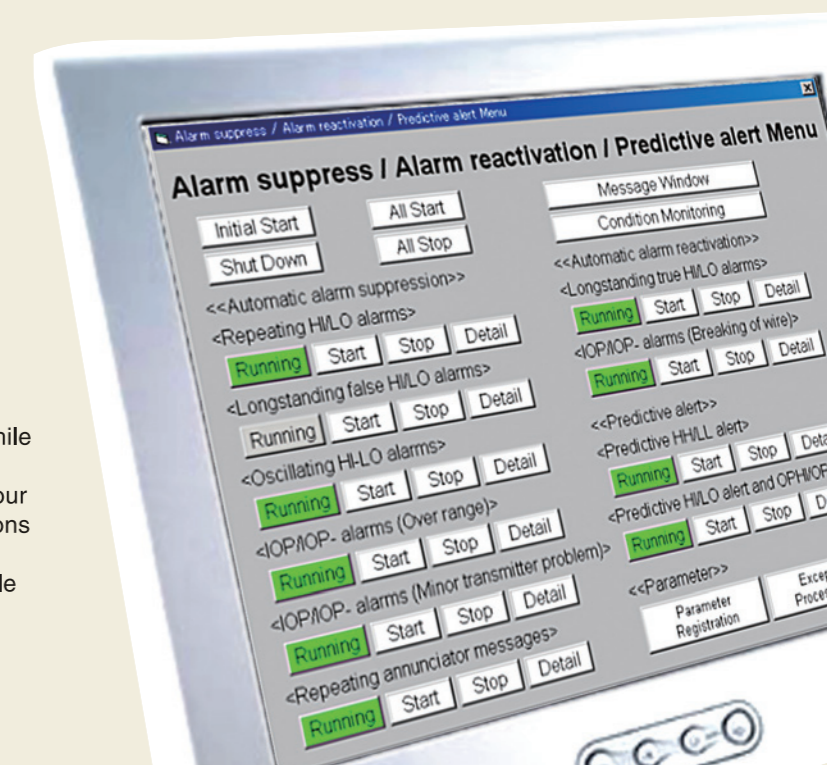


Operators watchful of meaningful alarms and predictive alerts

## SEE CLEARLY

### The SEE CLEARLY Advantage

Embedded diagnostic logic of Advanced Alarm Administrator automatically reduces nuisance alarms while directing your operators' attention to critical alarms and predictive alerts. By avoiding alarm flooding, you help your operators take effective action to prevent critical conditions and unnecessary plant shutdown. With effective alarm management, the right information is always made visible to the right people.



### Key Technologies:

#### Automatic alarm diagnosis

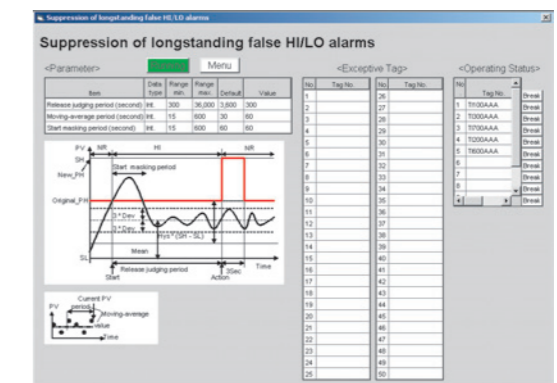
- Embedded diagnostic engine automatically detects potential unnecessary alarms from the alarm log.

#### Automatic alarm repetition suppression

- Repetition of unnecessary alarms can be automatically suppressed by changing alarm settings in the DCS.

#### Audit trail

- The suppressed alarm type and its reason code can be stored in the system audit trail. This can be used for future, fundamental improvements.



Example: AAASuite suppresses long-standing false HI/LO alarms

“ The technical and commercial challenges for the safety shutdown management concept for this project are considerable, with full and unambiguous compliance to IEC 61508/61511 international standards. With the selection of the Yokogawa ProSafe family, we have been able to pursue a truly network based system across various package units.”

Dick Wismeijer, Corp. Head Instrumentation & Control,  
Shell Petroleum Development Company of Nigeria Limited

## > An integrated solution during crisis puts control back in your hands

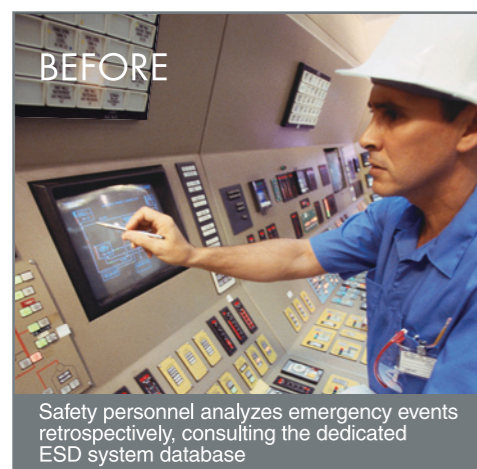
### Keeping your operators fully aware of events as they occur

#### Protect Reactively, Analyze Retrospectively...

A traditional emergency shutdown (ESD) system enables reactive protection under emergency conditions, but offers little help to operators and provides little synergy with production control systems.

##### Conventional ESD system:

- Dedicated human machine interface (HMI), dedicated network, dedicated database
- Enables safety personnel to analyze events retrospectively, but realtime information monitoring through control systems is cumbersome, slow, and limited



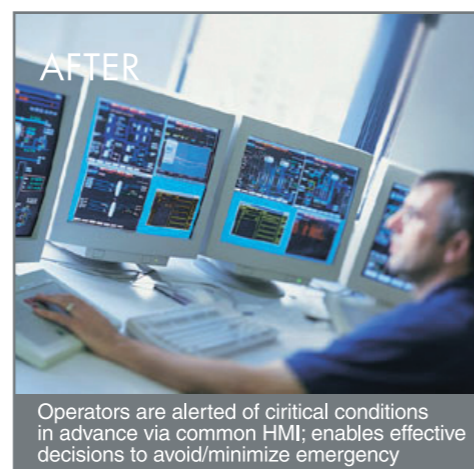
Safety personnel analyzes emergency events retrospectively, consulting the dedicated ESD system database

#### ...or Predict, Avoid, and Minimize Emergency

A better solution is to integrate safety information and enable seamless monitoring and prediction of critical conditions, opening the path back to normal conditions while securing safety loop integrity.

##### ProSafe-RS Safety Controller:

- **Information integration:** Common human machine interface and unified event data enables integrated safety management  
Alerts operators of critical conditions before they reach emergency
- **Safeguarding:** Ensures SIL3 protection in case the process reaches emergency conditions



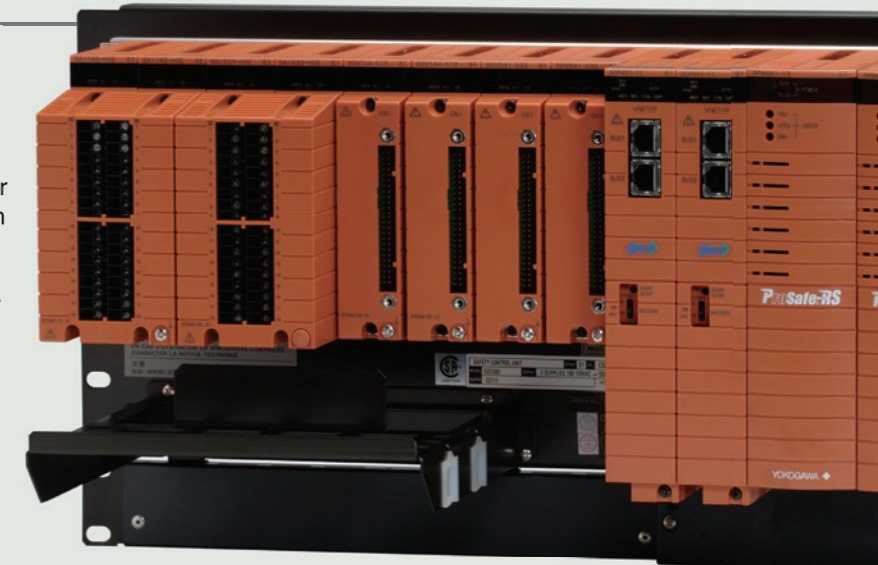
Operators are alerted of critical conditions in advance via common HMI; enables effective decisions to avoid/minimize emergency

## KNOW IN ADVANCE

### The KNOW IN ADVANCE Advantage

The new groundbreaking ProSafe-RS safety controller ensures a seamless integration of your control system and emergency shutdown system, keeping your operators fully informed of unfolding events. Single-window operation through common HMI enables your operators to make effective decisions that bring the process back to a normal condition. The integrated solution helps the operators to minimize hazard even in case of emergency shutdown.

### ProSafe-RS "Shedding new light on integrated safety management"



### Key Technologies:

#### The simplest answer for safety: single-module SIL3 protection

- No more theoretical discussion about 1oo2D, TMR, QMR

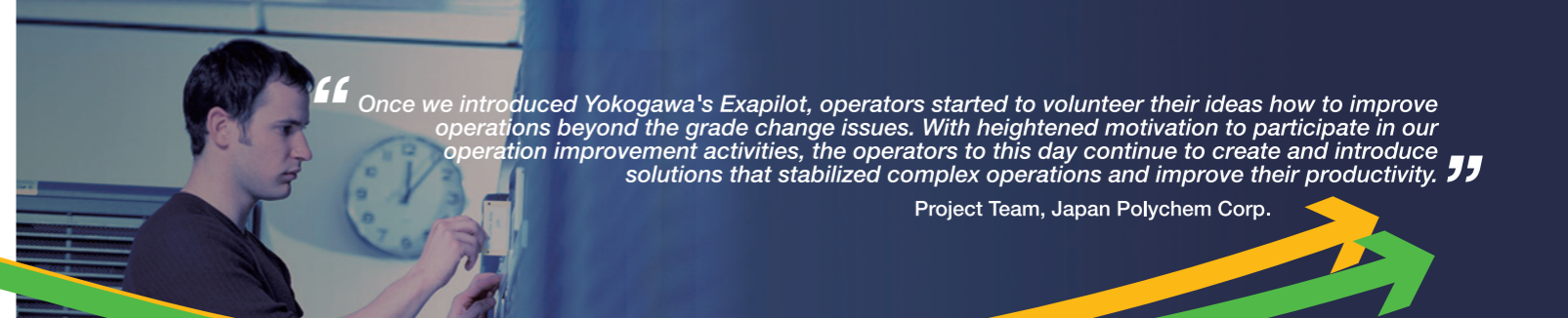
#### The most flexible answer for availability: add-on duplex module

- Easily scales up to the utmost in availability with Yokogawa's unique pair and spare controller CPU technology

#### The seamless solution for integration: single architecture

- Common human machine interface, common communications network





“ Once we introduced Yokogawa's Exapilot, operators started to volunteer their ideas how to improve operations beyond the grade change issues. With heightened motivation to participate in our operation improvement activities, the operators to this day continue to create and introduce solutions that stabilized complex operations and improve their productivity. ”

Project Team, Japan Polychem Corp.

## > Getting the help you need for a speedy recovery

### Managing non-routine operations for a smoother re-startup

#### Scrambled Efforts...

Re-startup of the plant is typically an interaction intensive non-routine operation conducted under extreme time pressure

**The ad-hoc approach:**

- A large amount of manual operations that demand extra care for timing and attention to detail

#### ...or Orderly Teamwork

Non-routine operations can be made smooth and reliable by an intuitive operation navigator

**Exapilot advanced operation navigator:**

- **Knowledge visualization:**  
Interactive and graphical software representation of non-routine operational procedure
- **Operation navigation:**  
Assists interaction intensive procedure with automated standard operating procedure
- **Knowledge retention:**  
Leverages accumulated human know-how of your experienced operators and engineers



Requires a lot of manual and interaction intensive effort to bring the plant back to operation

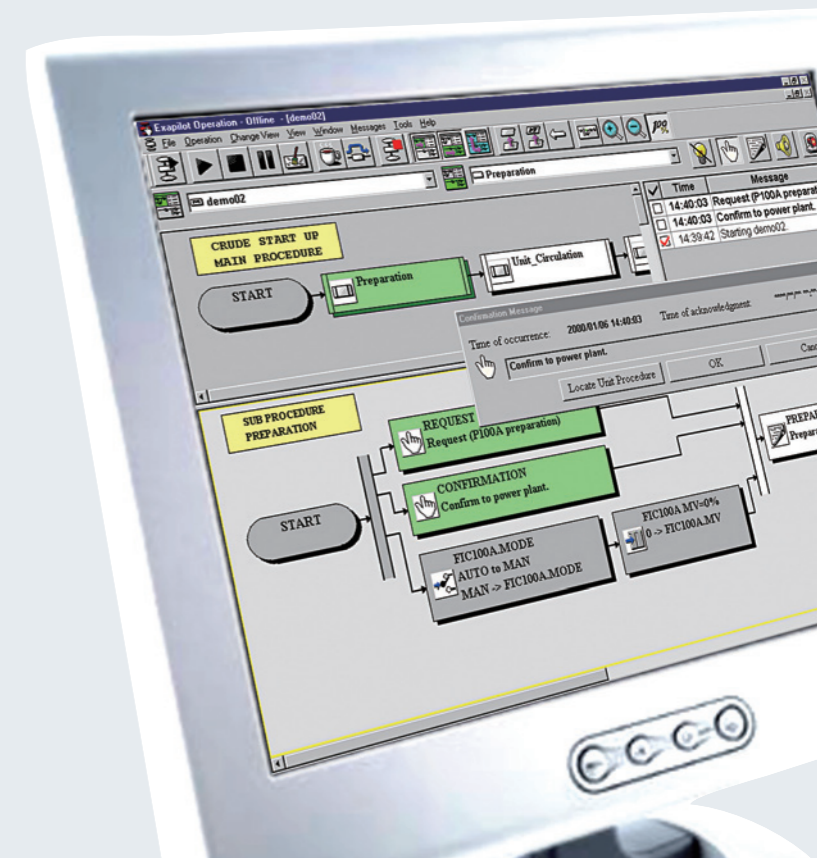


Shared know-how in the form of an intuitive software navigator makes the recovery process less hectic and more reliable

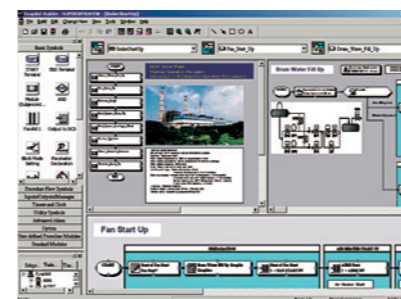
## ACT WITH AGILITY

### The ACT WITH AGILITY Advantage

During interaction intensive non-routine operations, advanced operation assistance (AOA) solutions can greatly increase both the speed and quality of operation. Once the emergency situation is contained, AOA software assists both safe and smooth secondary containment and speedy re-startup of the plant.



### Key Technologies:



**Modern expert system**


Flow chart builder allows all people involved in plant operation to visualize and share their untapped operation know-how




**Operation navigation**

Visualized know-how can be used as an operation navigator in actual operation to prevent manual data entry errors, errors in procedure, or operator oversight.

# VigilantPlant = *The clear path to operational excellence*


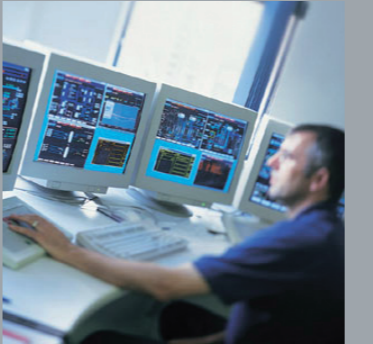



**Revamp and Expansion**  
Online Expansion, Hot Cutover



**Maintenance and Upgrade**  
Asset Optimization, Online Upgrade, Lifecycle Solution Support

Plant-wide integration

<b>Optimize</b> ERP	<b>Production Management</b> Plant Information Management, Advanced Process Control	
	<b>Asset Management and Operational Efficiency</b> Plant Resource Management, Operational Efficiency Improvement	
<b>Control</b>	<b>Production Control and Safety Management</b> Production Control, Safety Management, SCADA and Network-based Control	
	<b>Data Acquisition and Logic Control</b> Recorders, Data Acquisition, IT Machine Control, Single Loop Control	
<b>Measure</b>	<b>Analysis and Quality Control</b> Process Gas, Process Liquid, Stack Gas, City Water, Waste Water Analysis	
	<b>Sensing and Actuation</b> Pressure, Temperature, Flow, Level Measurement, Final Control Elements, Primary Elements and Auxiliaries	

**Design and Engineering**  
Front-End Engineering & Design (FEED), Main Instrumentation Vendor (MIV) Services



**Installation and Commissioning**  
Site Engineering, Integration Tests, Turn-Key Services



**Operation and Optimization**  
Optimization Consulting, 24/7 Operation Support, Online Diagnosis Support



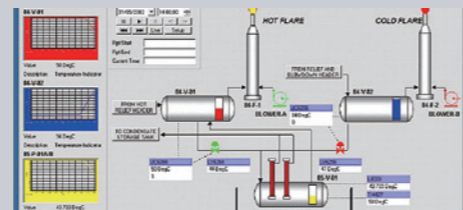
**Life-cycle optimization**

# Enablers of operational excellence

Optimize

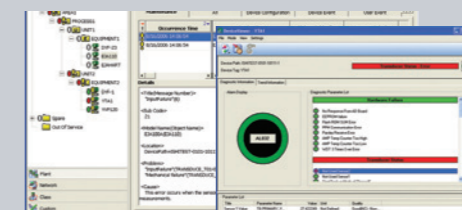
## Production Management

- Plant Information Management
- Advanced Process Control



## Asset Management and Operational Efficiency

- Integrated Plant Resource Management
- Operational Efficiency Improvement
- Advanced Alarm Administration



Control

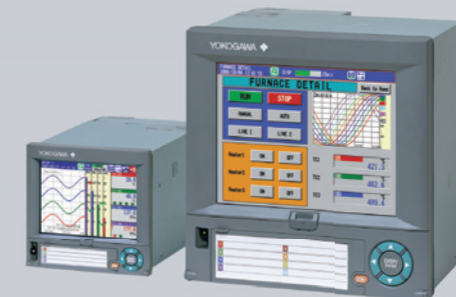
## Production Control and Safety Management

- Integrated Production Control
- Integrated Safety Management
- SCADA and Network-based Control



## Data Acquisition and Logic Control

- Data Monitoring and Recording
- PC-based Data Acquisition
- IT Machine Control
- Single Loop Control



Measure

## Analysis and Quality Control

- Process Gas Analysis
- Process Liquid Analysis
- Stack Gas Analysis
- City Water Analysis
- Waste Water Analysis



## Sensing and Actuation

- Pressure Measurement
- Temperature Measurement
- Flow Measurement
- Level Measurement
- Final Control Elements
- Primary Elements and Auxiliaries





*“The clear path to operational excellence”*

**vigilantplant.®**

The clear path to operational excellence

SEE  
CLEARLY

KNOW  
IN ADVANCE

ACT  
WITH AGILITY

VigilantPlant is Yokogawa's automation concept for safe, reliable, and profitable plant operations. VigilantPlant aims to enable an ongoing state of Operational Excellence where plant personnel are watchful and attentive, well-informed, and ready to take actions that optimize plant and business performance.

#### YOKOGAWA ELECTRIC CORPORATION

##### World Headquarters

9-32, Nakacho 2-chome, Musashino-shi, Tokyo 180-8750, Japan  
<http://www.yokogawa.com/>

#### YOKOGAWA CORPORATION OF AMERICA

2 Dart Road, Newnan, Georgia 30265, USA  
<http://www.yokogawa.com/us/>

#### YOKOGAWA EUROPE B.V.

Euroweg 2, 3825 HD Amersfoort, The Netherlands  
<http://www.yokogawa.com/eu/>

#### YOKOGAWA ENGINEERING ASIA PTE. LTD.

5 Bedok South Road, Singapore 469270, Singapore  
<http://www.yokogawa.com/sg/>

#### YOKOGAWA CHINA CO., LTD.

3F TowerD Cartelo Crocodile Building  
No.568 West Tianshan Road, Shanghai 200335, China  
<http://www.yokogawa.com/cn/>

#### YOKOGAWA MIDDLE EAST B.S.C.(c)

P.O. Box 10070, Manama  
Building 577, Road 2516, Busaiteen 225, Muharraq, Bahrain  
<http://www.yokogawa.com/bh/>

Represented by:

#### Trademarks

**CENTUM, ProSafe, AAASuite, Exapilot, DPharp, Exaquantum, STARDOM, YEWFLO and VigilantPlant** are either trademarks or registered trademarks of Yokogawa Electric Corporation. “FOUNDATION” of “FOUNDATION fieldbus” is a registered trademark of Fieldbus Foundation.

**Windows** is a registered trademark of Microsoft. **Ethernet** is a registered trademark of XEROX Corporation. Other company and product names in this bulletin are trademarks or registered trademarks of the respective companies.