



PWST Needs at Yokogawa

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- ❖ Introduction
- ❖ Yokogawa Field Digital Vision
- ❖ PWST as One of Complementary Wireless Family Solution

Introduction



Yokogawa History



1915 – Established electric meter institute

1917 – First production and delivery of electric meters in Japan

1924 – First to develop a portable magnetic oscillograph in Japan

1933 – Aircraft instruments, flow, temperature, and pressure controllers

1950 – Developed Japan's first electronic recorder

1963 – Established joint venture with Hewlett-Packard

1966 – Released vortex flow meter

1975 – CENTUM, the world's first distributed process control system

1982 – Established joint venture with GE

1983 – Yokogawa and Hokushin merged

1999 – Formed alliance with Shell on APC

2000 – Announced VISION-21 & ACTION-21 corporate strategy

2004 – HuiZhou service center open

2005 – Yokogawa Electric International Pte. Ltd. (YEI) is established in Singapore as HQ of global IA business

2006 – Announced Second Milestone of Vision-21 & Action-21

2007 – Established company in Sakhalin

2008 – Acquired Analytical Specialties, Inc. (ASI)

2011 – Announced "Evolution 2015" Mid-term Business Plan"



Corporate Management (ERP*)
Integrated business operation systems

Integration

SAP, Oracle etc.

Production Management (MES*)
Systems for advanced control,
simulation, production
management, and scheduling

APC & AOA Advanced Process Control &
Advance Operation Assistance

PIMS Process Data Acquisition
& Management

Exa Series, Trainer

Exaquantum

Production Control System
Production control systems

DCS/SIS Integrated Production Control-
Safety Instrumented System



Hybrid RTU/SCADA System



Field Instruments
Field instruments, sensors, measuring
instruments, analyzers and other equipment

Fieldbus Networks

FF, Profibus-DP
DeviceNet, Ethernet/IP

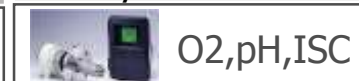
Instrumentation



Gas Chromatography



Analytical Instruments



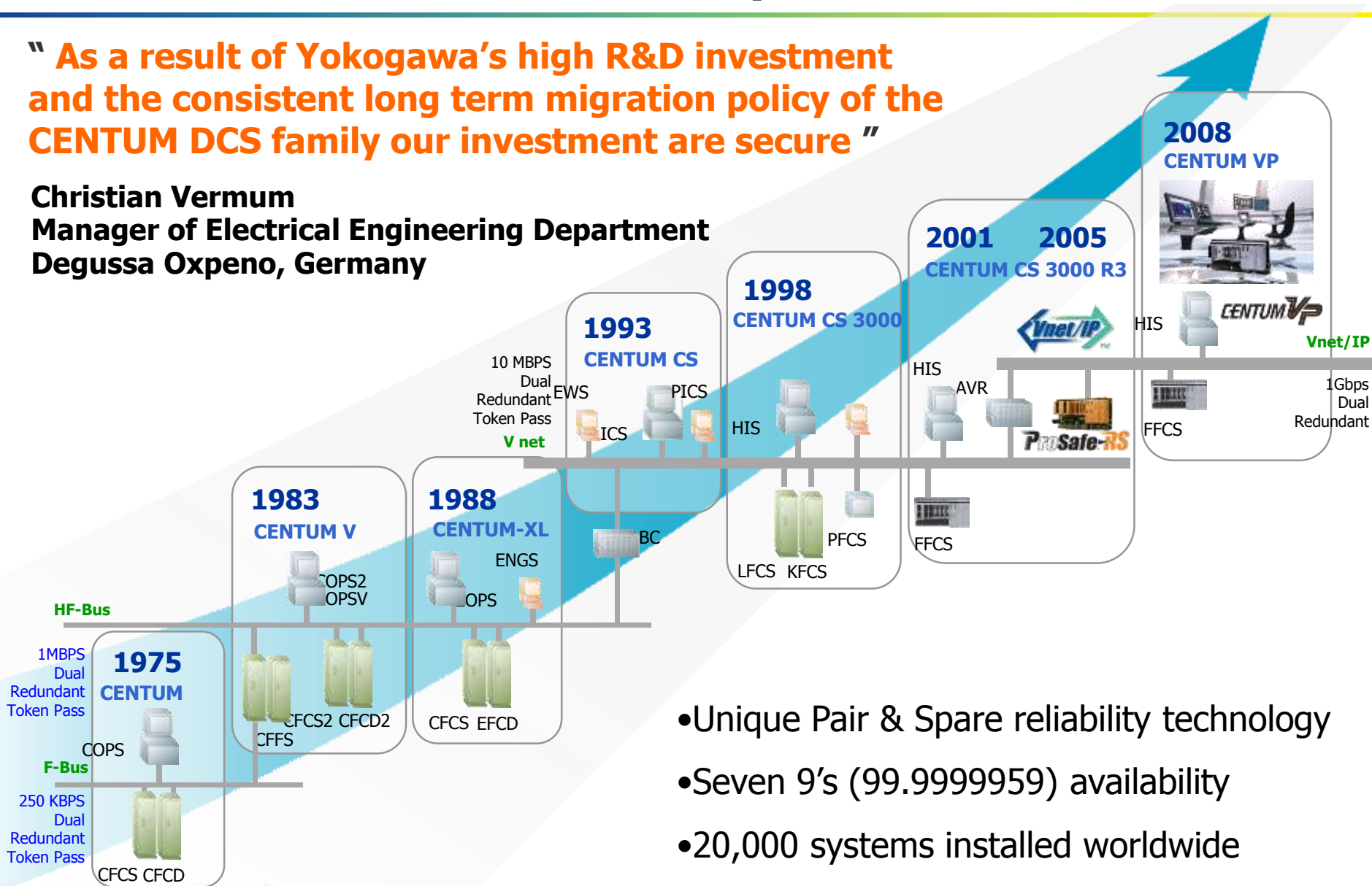
* ERP = Enterprise Resource Planning

* MES = Manufacturing Execution System

Reliable Distributed Control Systems

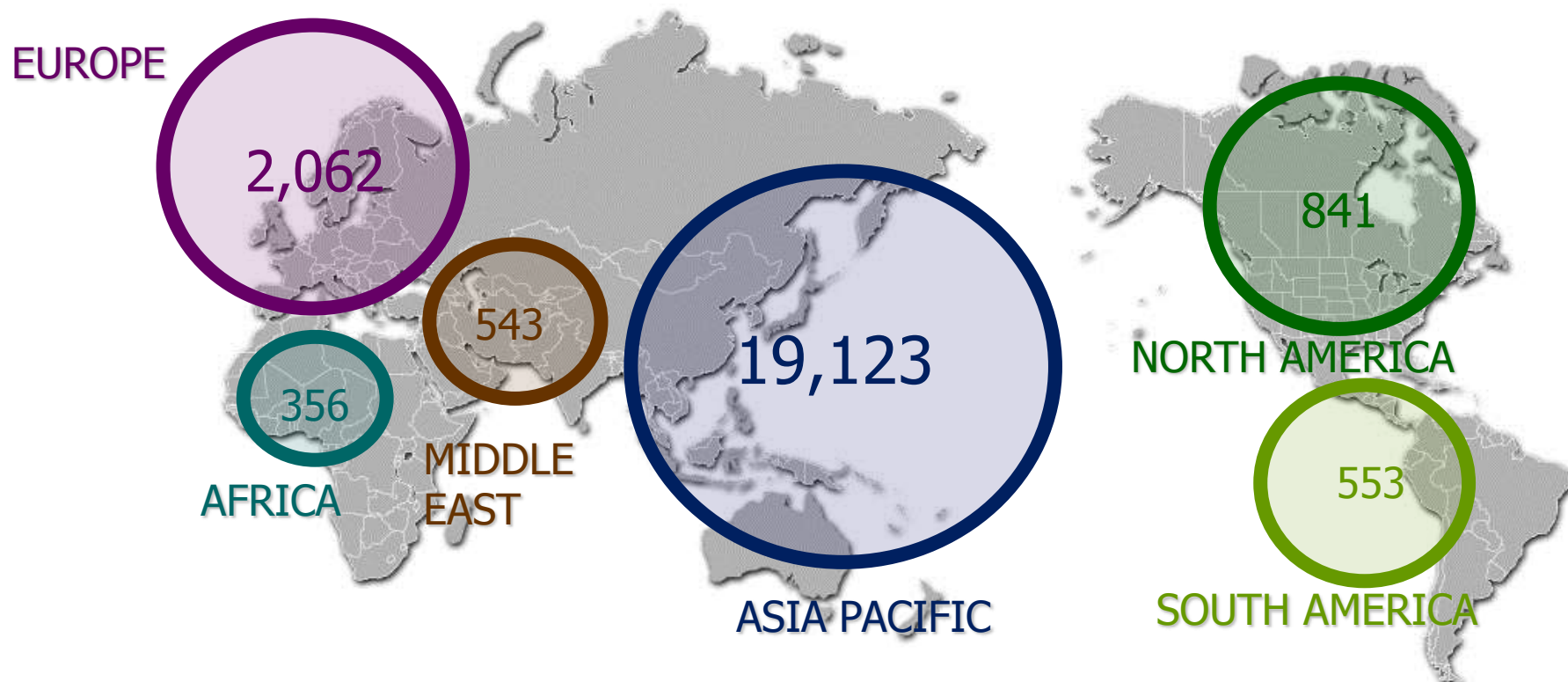
" As a result of Yokogawa's high R&D investment and the consistent long term migration policy of the CENTUM DCS family our investment are secure "

Christian Vermum
Manager of Electrical Engineering Department
Degussa Oxpeno, Germany



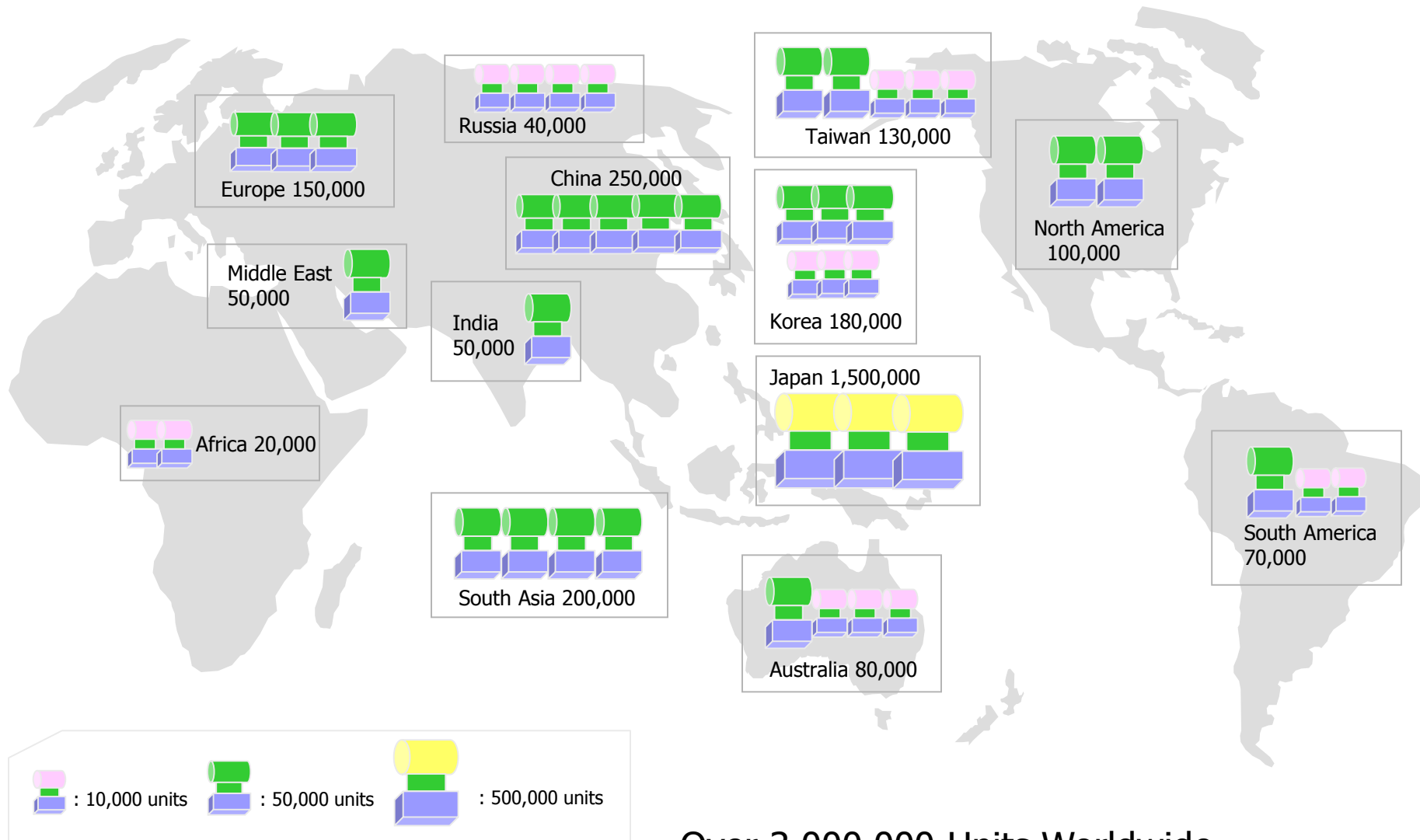
- Unique Pair & Spare reliability technology
- Seven 9's (99.9999959) availability
- 20,000 systems installed worldwide

23,478 PROJECTS in the World (2011)



CENTUM is well-accepted widely in the market

Yokogawa Transmitters at Work



Over 3,000,000 Units Worldwide (2009)

Operational Excellence in Your Future Plant

vigilantplant.™



SEE
CLEARLY

Less blind spots
Avoid guesswork, instability, sub-optimization

Fewer surprises
Minimize reactive measures, unexpected downtime, quality variations

KNOW
IN ADVANCE



ACT
WITH AGILITY

Free of bottlenecks
Reduce delays, lost opportunities, knowledge silos



Worldwide Business Operations

Global Network Supporting Business Growth

As of the end of March 2010

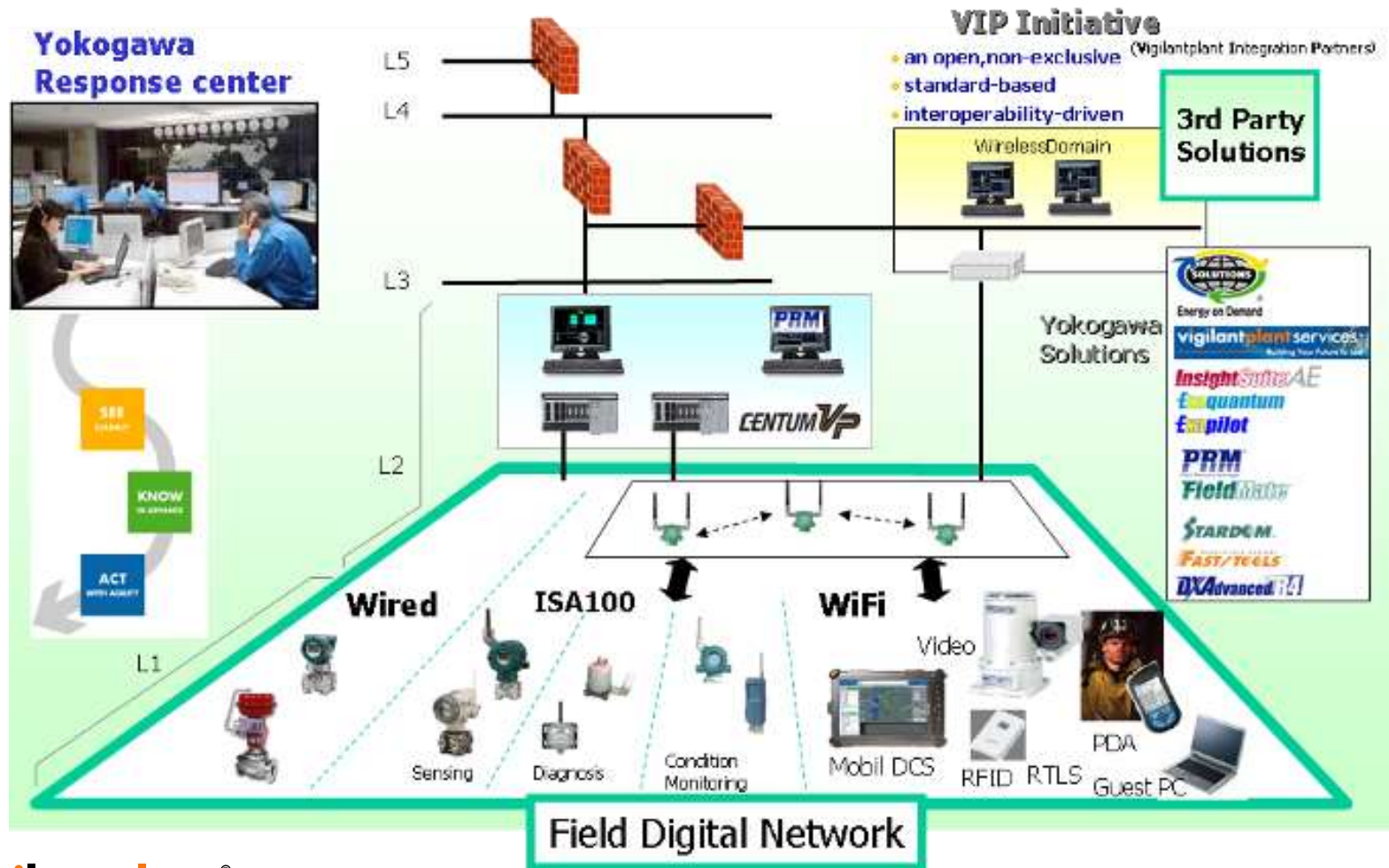


Yokogawa Field Digital Vision



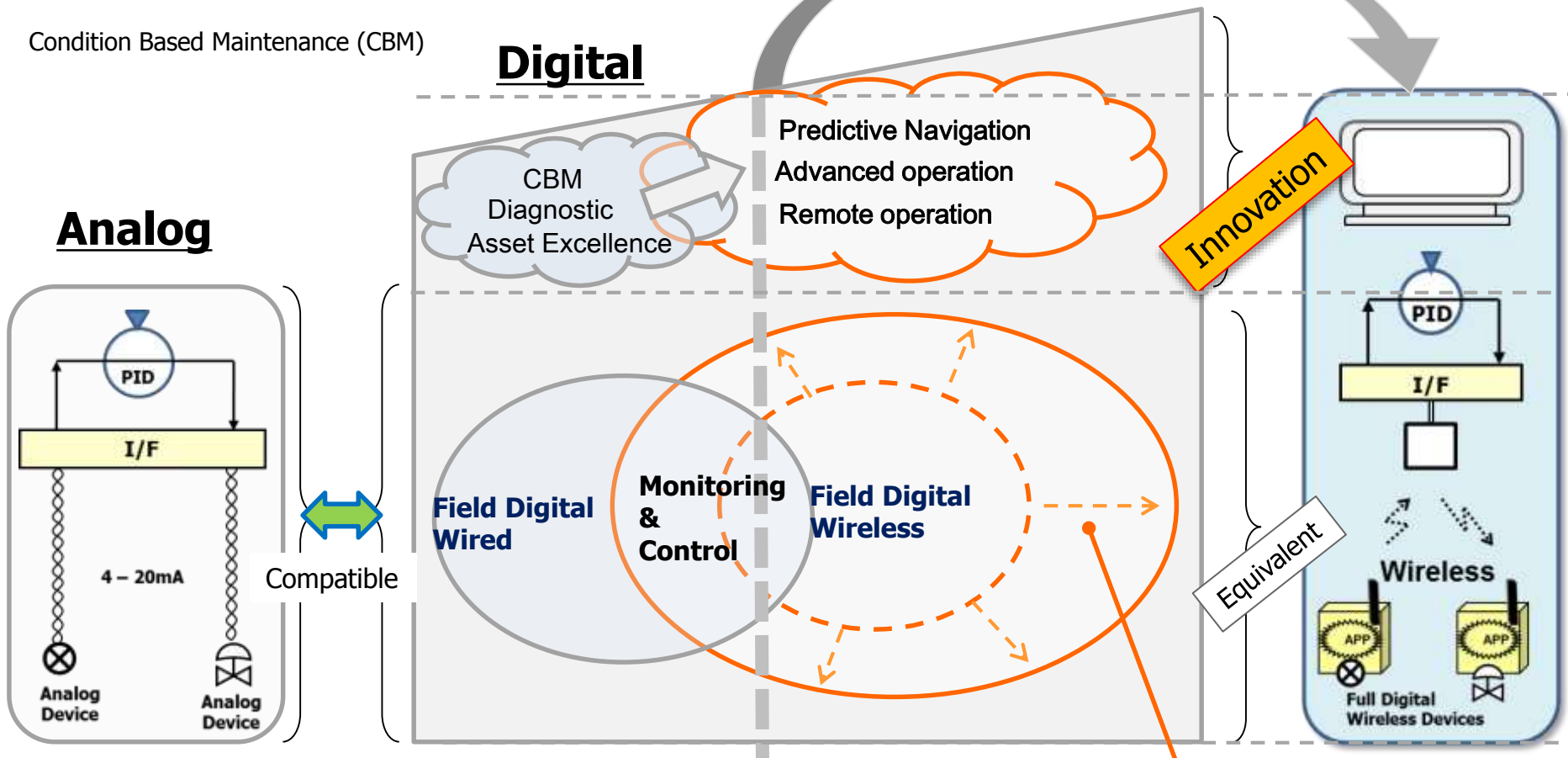
❖ Yokogawa “Field Digital “ Innovation

- ❖ A new field digital features including “Field Digital” innovation that contributes to customers’ productivity improvement.



Field Digital Innovation

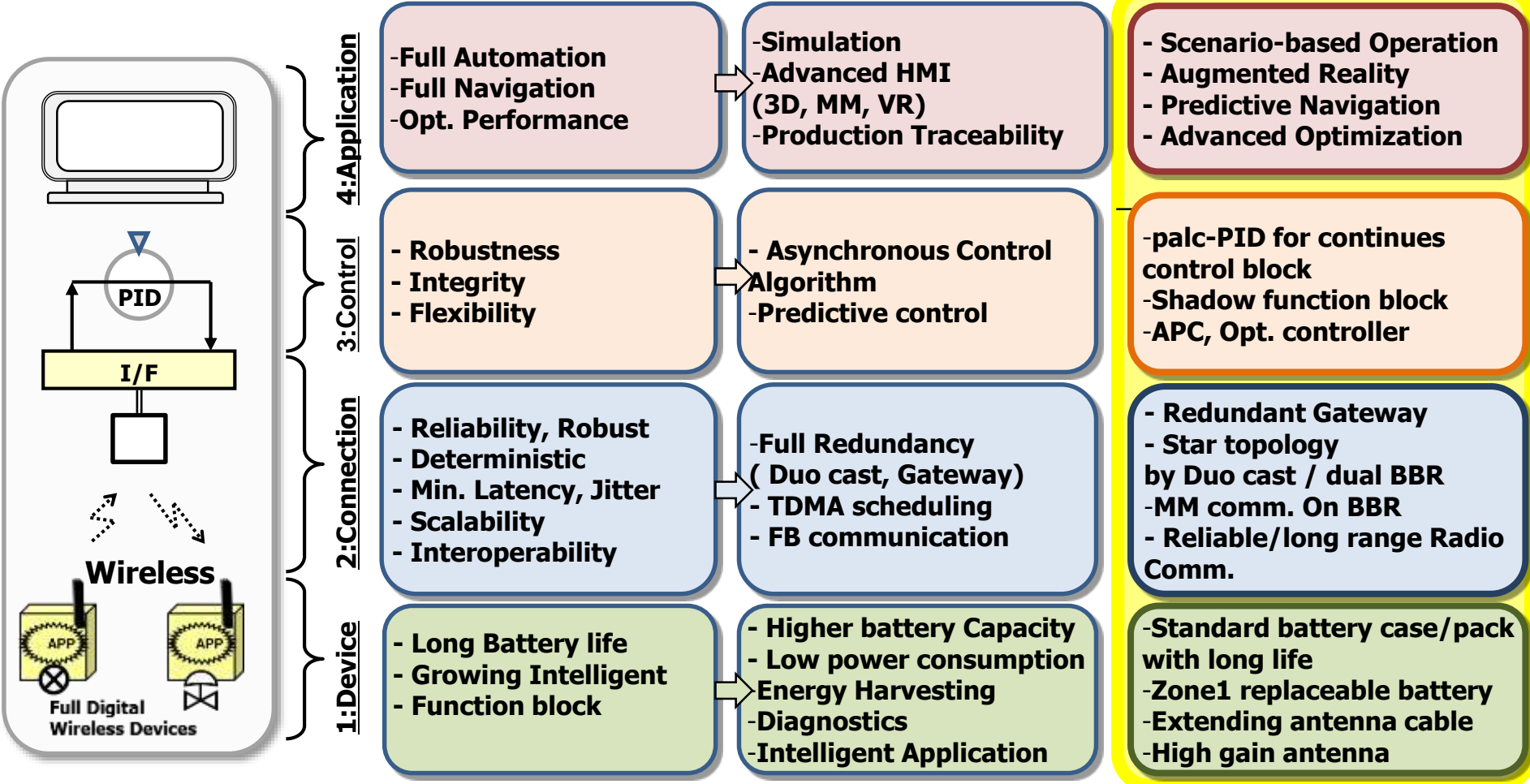
Condition Based Maintenance (CBM)



"Field Digital" brings a new features of applications against the legacy analog system, not just digital communication. Wireless technology enables full range of intelligent applications to be practically workable for the innovation.

- New innovative sensors
- Disposal sensors
- Intelligent applications
- Highest accuracy/speed
- Moving object
- Multi-media Monitoring

Key technologies and solutions



The "Field Digital" innovation is realized by integrated technology innovations in each of above four areas. (It is not just by one layer enhancement, but should be entirely and collaboratively workable in order to leverage full digital device intelligence.)

PWST as One of Complementary Wireless Family Solution

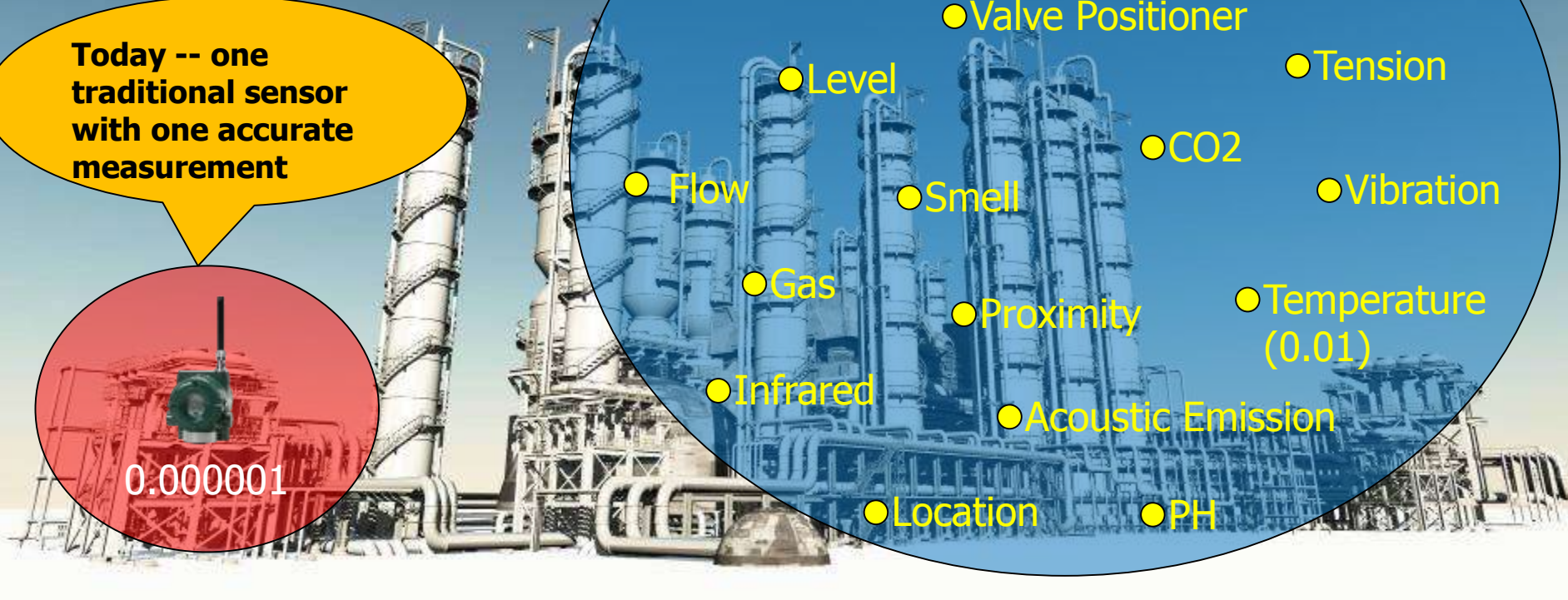


❖ Field Digital – Today & Tomorrow

Tomorrow -- millions of
PWST measurements with
combination of intelligence
(vision, hearing, smell,
taste, touch)

Today -- one
traditional sensor
with one accurate
measurement

0.000001



- Corrosion
- Humidity
- Pressure
- Optical
- Valve Positioner
- Tension
- Level
- CO2
- Vibration
- Flow
- Smell
- Temperature (0.01)
- Gas
- Proximity
- Acoustic Emission
- Infrared
- Location
- PH

Today & Tomorrow -- Which one is more intelligent?

❖ Potential Applications of PWST

- ❖ Provides more touch-and-feel to plant asset
- ❖ Value added information based on its characteristics (e.g. asset tracking, personal safety, measurements on rotating or moving equipments)
- ❖ Cost effective (e.g. design cost, material cost, installation cost, maintenance cost, affordable blink spot deduction -- higher visibility into operations,)
- ❖ Lifetime maintenance (e.g. embedded into material for plant asset lifecycle management, condition monitoring, infrastructure monitoring before/during/after earthquake, steel pipe jungle monitoring)
- ❖ Remote operation



Industrial Requirements

Characteristics

→ **Mission Critical**

- Continuous Operation
- Large Energy
- Extraordinary Incident

→ **Harsh Environment**

- Ambient Condition
- Explosive Gas
- Strong EM Noise

→ **System Attribute**

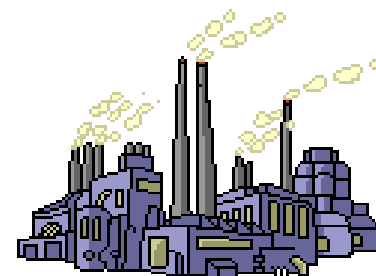
- Wide Area
- Large Scale
- Complex
- Long Plant Life Time

Requirements

- Reliability
- Robustness
- Quick Response
- Regulatory Compliance

- Scalability
- Flexibility
- Maintainability
- Different Attribute

- + Wireless Property



❖ Challenges of PWST

- ❖ Industrial environment -- hazardous area, harsh environment, extra heavy metal jungle, open unmanned large area
- ❖ Lifetime reliability & stability
- ❖ System scalability to support large deployment cost effectively
- ❖ Provide robust, secure wireless communications for some wireless applications
- ❖ Large data acquisition, analysis and system integration as well as low initial entry cost
- ❖ Support variety type of sensors
- ❖ Coexist with many wireless transports medias
- ❖ Open standard based with interoperability





Thanks for your attention