2015 Japan Technology Summit
Yokohama, September 9-10

Honeywell Pulp & Paper DCS Technology
Fredrik Westerberg, HPS, Asia Pacific
Papermaking Business is Changing

• Markets & environment changing
• Necessity to reduce cost and streamline operations
  – Simpler to operate & maintain BUT
  – Automation needs to “do more” to sustain impact over time
  – Service approach also transforming
  – Industry 4.0 Smart Factory ready
Industry 4.0 – Key Elements to Smart Factory

Vision of Industrial Production of the Future

- Big data and analytics
- Augmented reality
- Collaborative manufacturing
- Cloud computing
- Cyber security
- Horizontal and Vertical Integration
- Internet and Wireless Everywhere
- Optimization and Simulation

Autonomous Robots

Source: Boston Consulting Group

With Experion PKS Honeywell is ready to help customers take advantage of the coming technology transformation
Pulp & Paper Manufacturing 4.0 Vision
The Control Room of the Future

Total integration is seen and experienced in the control room and available wirelessly everywhere.
Collaborative Manufacturing

A new way to unite information

- Process Control Information
  - Vital process information
  - Design and maintenance & tools
  - Process and event history
  - CCTV, process and surveillance cameras

- Business Planning and Monitoring
  - Production and Logistic Planning
  - Quality Management
  - Maintenance Planning
  - Daily Meetings

- Company and Corporation Communication
  - Occupational health and safety
  - Audio and video conferencing
  - Kaizen & SixSigma processes
Native QCS and DCS Integration

- Experion MX R611 supports interoperability with R410 and R430 versions of Experion PKS control platform
- Common HMI
- Common Alarms
- Virtualization ready
- Distributed Server Architecture
- Native C300 peer to peer communication
Integrated Profit Loop is a model predictive single input, single output (SISO) control algorithm that is derived from Honeywell’s “Patented and Proven” Profit Suite control technology.

- **PID Replacement Features:**
  - Range Control Algorithm (RCA) w/Minimum OP
  - Single Handle Tuning
  - Improved Anti-Windup Handling
  - Insensitivity to Process Noise

- **Advanced Control Features:**
  - Non-linear Level Control
  - Inverse Response Control
  - Asynchronous PV Inputs
  - Smith Predictor Control
  - Predictive Alarming
CPM: KPI Driven Control Improvement Activities
Single Window Integration for Smart Field Devices

Experion PKS

Series C HART I/O

Series C FIM

Series C PGM

OneWireless FDAP
Universal IO Channel Technology

New UIO – Any Channel can be DI/DO/AI/AO

- Simpler project design
- Shorter cut-over time
- Reduced hardware

-40C to +70C
HART 7 and FDM support
Field-mountable or standard
Proven redundancy

Reduces Project Cost and Risk
Field Advisor for Mobile Productivity

- Mobile Productivity Solution for execution and tracking of operator field tasks
  - Developed from Shell Global Solutions (OTTER program)
  - Supports maintenance excellence initiatives
  - Digitize field operations, quality, HSE, maintenance
  - Integrated with historian, DCS, and MES

- Currently deployed at 25+ sites
  - Estimate over 1000 handheld computers deployed
  - Temperature, vibration, RFID and barcode scanners
Industrial Internet – Wireless Enabled Mill

• Battery-powered mesh routing or non-routing
• Line powered ISA100 Wireless access points for highest speed, reliability, scalability, and maximum battery life

IEEE 802.11 Backhaul
ISA100 Wireless
Wi-Fi
ISA100 Wireless Field Instruments

Multi-Application Plant-wide Network
• Single network for Wi-Fi, ISA100, Ethernet
• Line powered multi-application access points for the highest automation network performance, reliability and scalability
Honeywell’s Holistic Approach to Physical Security

**COMMAND AND CONTROL**
Control center that brings all systems together at a central point's on a single platform for event reporting and response.

**ACCESS CONTROL (ACS)**
Systems used to secure the access to a facility or an area. Includes locks, card readers, visitor/contractor badging, biometric readers, and software used for access authentication, asset tracking, mustering and site lockdown.

**EXTENDED PERIMETER**
Systems used to detect or protect approaching threats. Includes RVS and barriers for use near waterways and open areas beyond the perimeter.

**VIDEO SURVEILLANCE (CCTV)**
Systems used to watch a facility. Includes cameras, housings, mounts, monitors and software used for security and process control.

**PERIMETER INTRUSION DETECTION (PIDS)**
Systems used to secure the perimeter of a facility or an area. Includes fence detection, PE beams tied back to a panel and reported through the software.
Complete Industrial Cyber Security Solutions

- Security Assessments
- Network & Wireless Assessments
- Security Audits

- Current State Analysis
- Design & Optimization
- Zones & Conduits

- Firewall
- Intrusion Prevention
- Access Control
- Policy Development

- Patching & Anti-Virus
- Application Whitelisting
- End Node Hardening
- Portable Media & Device Security

- Assessments & Audits
- Architecture & Design

- Backup and Restore
- Incident Response

- Response & Recovery

- People, Process, Technology
- Situational Awareness

- Endpoint Protection

- Continuous Monitoring
- Compliance & Reporting
- Security Analytics
- Security Information & Event Management (SIEM)
- Security Awareness Training

- Network Security

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Easy to Use Dashboard Interface

- Developed specifically for industrial environments
- Easy to use interface
- Translates complex cyber security indicators into simple measurements
- Prioritize and focus efforts on managing risks
- Immediate information for ongoing situational awareness
- A real-time assessment of information from devices throughout the process control network

The dashboard interface provides an easy-to-use interface for managing cyber security risks, with real-time assessments and immediate information for ongoing situational awareness.
Internet of Everything – Services & Support

- Fast diagnostic support
- Regional & global expert access
- Mill engineers
- Secure access via hardware key
- “Over the shoulder” remote measurement and control optimization
Reference of Remote Services Architecture

PHD Collector PF1
Shadow Server
Switch connecting to all PHD collectors, Shadow server and Service Node
DMZ
To Internet
Corporate Firewall
Relay Server

More than 20 Honeywell QCS / DCS / CD / Cognex WIS systems available online 24x7 from anywhere in the world...
Cloud Computing – Honeywell is Virtualization ready

Reduce PC Hardware Requirements

Simplify overall system management

Reduce the Impact and Frequency of OS and hardware change

Improve availability, reliability and disaster recovery

Customer is locked into the Hardware, OS and Application. Open to malware threat.
Cloud Engineering: Virtual Project Execution

Many People in One Staging Location

Project Staged In Cloud; People Distributed

Virtual Project Engineering and Staging
Customers who are using Virtualization today

<table>
<thead>
<tr>
<th>Company Name</th>
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<tbody>
<tr>
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<td>Göteborg Energi AB</td>
<td>Phillips66</td>
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<td>Ashland Specialty Ingredients</td>
<td><strong>Graphic Packaging International Inc</strong></td>
<td>Procter and Gamble</td>
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<td>Imperial Oil Ltd</td>
<td>Progress Energy Inc</td>
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<td>Australia Pacific LNG Pty Ltd</td>
<td>INEOS USA LLC</td>
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<td>Invista</td>
<td>Sappi Fine Paper NA</td>
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<td>GB Biosciences Corp</td>
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Greenfield Example: Montes del Plata

- Stora Enso’s and Arauco’s joint-venture project Montes del Plata is building a new state-of-the-art 1.3 M tons per year pulp mill in Uruguay. Start-up planned early 2014
- Biggest industrial investment in Uruguay ever, around $1.9 Billion
- Mill wide Honeywell Experion PKS covers entire pulp mill:
  - 20 + 4 Operator Stations
  - 3 System Clusters
  - 44 C300 controllers
  - 3500 Instrument loops (HART)
  - 2100 ProfiBus motor controls (66 PGMs)
  - 100+ remote cabinets
- Mill’s Process Information System by Honeywell’s:
  - Uniformance Process Studio
  - WorkCenter PKS
  - Operations Logbook
  - Operations Monitoring
  - BizCalc Manager
  - Quality OptiMiser
  - OptiVision Production Management for Bale Tracking
  - OptiVision Planning & Scheduling
  - OptiVision Warehouse Management & Container Loading
  - Advanced Alarm Management
- Drying machines equipped with Honeywell’s Experion MX QCS, profiling actuators Devronizer XP10 and ProFlow, and web monitoring systems ProWeb 4G
- Entire mill covered by Honeywell Fire Protection System with EBI and XLS3000

“This mill will have a significant impact not only on the region’s pulp production capabilities, but also on the local economy. It will employ 6,000 construction and 500 once in operation,” said Carlos Pastrana, Project Director at Montes del Plata. “It’s important that this state-of-the-art mill be outfitted with the best process and quality control systems supported by experienced organization, and Honeywell’s track record of implementing mega-projects speaks for itself.”
<table>
<thead>
<tr>
<th>Expected Results from Technology Transformation</th>
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<tr>
<td>✓ Improve Customer retention and satisfaction</td>
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<td>✓ Increase throughput by 10%</td>
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<td>✓ Reduce Raw Material Costs up to 2%</td>
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<td>✓ Eliminate 5% of Quality Losses</td>
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<td>✓ Improve Finishing/Converting Losses by 10%</td>
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<td>✓ Reduce Inventory by 20%</td>
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<td>✓ Fewer Customer Quality issues</td>
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<td>✓ Savings on Logistics ~$2 per ton</td>
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<tr>
<td>✓ 25% Reduction in Total Cost of Ownership</td>
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Summary

• Maximum Benefits with measurement, control and operational excellence
  – Simple to operate & maintain
  – Automation achieves bigger sustainable impact over time
  – Transformed service approach
  – Industry 4.0 Smart Factory ready

• All adds up to Reduced Costs and Streamlined operations for maximum profitability
Thank You!