2015 Japan Technology Summit
Yokohama, September 9-10

Quality Optimizer (QO) for QCS
HyuongSun Lee, Solutions Consultant – CWS, HPS
Agenda

1. Introduction
2. Quality OptiMiser Overview
3. Quality OptiMiser Functions
4. Reference Cases
5. Q & A time
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Introduction: Industry Challenges

• Markets & business environment rapidly changing

• Necessary to reduce cost and streamline operations
  – Manage complexity of having multi-grades, multi-machines & mills
  – Target quality conscious customers & high end export markets with uniform product
  – Increase customer confidence & protect against competitors entering
  – Reduce quality losses and increase profitability
  – Maximize Share Holder Value
Quality OptiMiser Objectives

• **Business:**
  – Significantly reduce quality rejects, improve customer confidence and prevent margin erosion
  – Uphold highest quality standards
  – Reduce variations and improve quality in shortest period
  – Reduce and manage customer claims efficiently

• **Organization:**
  – Enable critical Production and Quality decisions at the production floor
  – Consistent quality evaluation & disposition across enterprise
  – Single window and common repository for all Quality information easily available to those who need it
  – Up-to-date consistent quality reporting at all levels without manual work
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Quality OptiMiser Overview

Complete Quality Management

Integrates sensor data, lab data, surface faults data, event data, and maintains “as-built” quality optimization.
Flexible Architecture Options

Quality OptiMiser Users

Legacy & Third Party QCS

WSG

Experion MX DaVinci MxProline QCS

OPC server

Enterprise Network (L4)

Business Network (L3)

Plant Network (L2)

L2/L3 Firewall

Ametek-Cognex SmartView / Other Web Inspection Systems

Automated Lab Equipment

PHD Historian
Other Historians
OPC DA/HDA Read/Write Quality and Process Data

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Quality OptiMiser Workflow

1. Specify and Define
   - how the quality measurements must be performed by mill, machine, product type or customer and quality property tolerances

2. Collect
   - the results of laboratory analyses or collect from automated lab system
   - measurements from process, QCS, on-line scanners and fault detection systems and off-line analyzers

3. Analyze
   - quality on before and after cutting by reels, rolls and runs
   - machine reel specific historical process trends and profiles by events, time, reels, rolls and runs

4. Check and optimize
   - the impact of different cutting pattern to customer quality requirements and losses
   - Simulate: As Cut Roll Set - a winder and performs roll turnups from parent reel
   - complex user-definable calculations based on 1 or more properties

5. Document and Notify
   - with Certificates of Analysis, Quality Diary, Scan Historian, Genealogy, e-mail tracking and Complaint Tracking
   - Export quality data in excel sheets for analysis & reporting.
Quality OptiMiser System

Quality Procedure Manager
Grade Spec & Tag Management Application

Lab Entry and Quality Diary

User Configurable and Templated Trend & Profile

Contour Map, CD and MD Profile Application

Certificate of Analysis

Certificate of Analysis - DONALD MURRAY PAPER

Shawano Specialty Papers - Shawano, WI
1. Specify & Define – Quality Procedure Manager

Problem:
How to specify and maintain Quality Specifications?

Solution:
An application where user can specify maintain and update Quality Parameters.

Benefits:
1. Maintain QP’s with audit records.
2. Ability to define tolerances as numbers, % and Enumeration.
3. Audit records for changes done to QPs.
2. Enter & Collect – Quality Diary

Problem:
How to Integrate automated results and manual entries for quality disposition?

Solution:
An application which permits to enter lab data

Benefits:
1. Single window to enter quality data from various systems.
2. Role-Based security and maintains test audit records.
3. Test values for reels, rolls and sample based testing
3. Analyse – Contour Map

Contour Map

Toolbar

Data Filter

MD Profile Graph

CD Profile Graph

Information Panel

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Contour Map – WIS Interface
**4. Check and Optimize: As-Cut Roll Set**

**Problem:**
How to generate sub rolls from Parent roll and disposition based on quality?

**Solution:**
An application that simulates the winder and enables user to generate patterns to cut the reel.

**Benefits:**
1. Patterns can be applied and checked for quality even before turnup.
2. Changes can be made to the planned patterns to adjust the quality compliance.
3. Quality disposition supported for splicing as well.
Check & Optimise – As-Cut Roll Set Analysis
Problem:
How to monitor and analyze quality variation across two or more rolls

Solution:
An application which helps in analyzing two or more rolls for one or more quality parameter.

Benefits:
1. Helps customer to track production related quality issues
2. Decide on an action and check and compare the results before and after
Problem:
How to examine the quality specifications over a period of time?

Solution:
An application which shows the average trend for various parameters over a duration of time.

Benefits:
1. Quality Parameter variation can be tracked over a period of time.
2. Multiple windows and variables to facilitate easier analysis.
5. Document and Notify

Certificate of Analysis - DONALD MURRAY PAPER

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Min. Value: 59.5 | 4.2 | 4.5 | 94

Max. Value: 62.5 | 5.1 | 5.6 | 96

Unit_id: PHYSICAL | OPTICAL

Add-ins right on the Excel toolbar

Resulting queries are available for reuse to create customized results.

Pop-up “Wizards” ease in querying data
Summary: Quality OptiMISER Benefits

- Ensures customers obtain quality they expect: quality real-time information and history can be connected to MES and prevent deviations in product quality from being shipped.

- The value of quality information is improved: the automatic collection and manual entry procedures are configured in detail for each specific grade. The procedures can be made mandatory to comply with the mill, product and customer standards. The system does not allow faulty data or procedure violations.

- Facilitates analyzing of quality information: all information is visible at an indicator level and at a value level. It may be time based, entered manually or logged automatically by analyzers.

- Quality loss decreases: last minute changes can be made in winder slitting patterns based on reliable and timely information resulting in unnecessary loss.
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Consistent roll quality is critical
- Corrugation of 3 layers amplifies quality problems
- Analyze for warp and crinkle

Fast and wide automated machines with few grade specifications
- Sophisticated calculations automatic analyze product for product deviations
  - Process analysis to research quality issues
  - Evaluate new products

Roll quality known before cut is key value delivered with QO
- Not possible to have this view of data prior to QO
- Prior to QO had to reject whole jumbo to eliminate risk of shipping bad product

Improved efficiency researching complaints

All quality decisions based on QCS data not lab
- Roll quality is determined by customer in advance of automated winder line
Specialty Materials (USA) – Automatic Defect Management

• High performance specialty materials
  – Produce a bulletproof yarn which is pulled off spools

• QO used for ballistic sampling and automated defect analysis
  – Each ballistic lot undergoes sampling recorded in QO
  – QO applies calculations to WIS data to determine quality status codes based on a complex set of business rules (quantity of certain types of defects per unit area, etc.) with project specific applications

• SAP interface to QO
  – Use SAP for registering production, for providing turnup-like dimensional information, and for being the ultimate storage system
Battery Separator Production (Korea)

• Mission-critical film sold to lithium-battery makers
  – Verification of quality via historian data was a requirement by their customer

• QO is collecting data from 3 biax film lines at the mill
  – Customer has expanded the use from simple data storage to process analysis
  – Roll-to-Roll analysis of data from the 3 lines provides them with general operational statistics as well as for process improvements
  – Production, Quality and Management team call all access the same data via the company LAN

• Planning another QO at a nearby mill
  – All data will be available for authorized access from either sites via the company LAN
• Quality control in food & beverage markets is highly regulated

• Box producers demand very stringent control and documentation of product quality
  – Certificate of Analysis (COA)

• Previously used only QCS data but now integrated to QO with WIS and Lab, provides additional confidence

• Maximize usage of jumbo and cut around bad spots

• 85% percent of product is sheeted at 3rd party facilities and product/quality genealogy back to jumbo critical to regulate sub-contractors

• Fully automated and integrated with MES and ERP systems
Why Choose Honeywell for Quality Management needs?

**Execution**
- Project Methodologies
- Proven Track Record
- Software and Service

**Growth**
- Engagement Models
- Forward Looking
- Global Perspective

**Customer Focus**
- Trusted Partner
- Long Term Presence
- Loyalty and Service

**Innovation**
- Break Through Technologies
- Customer Driven Industry Expertise
- Market Lead Innovation

**Culture**
- Accountability
- Enthusiasm
- HOS

Innovative Technology & Industry Domain Expertise
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Honeywell Quality OptiMiser for QCS
Key Part of an End-to-end Quality Management System