REVEAL YOUR BEST

Migration CoE
June 2019
MIGRATION PLANNING BEST PRACTICES
Americas HUG – Monday 3:45pm
Introduction

Owen is a Senior Manager at Honeywell and is responsible for leading the Migration Centre of Excellence (CoE) team. Owen has been in the process control industry for over 20 years in a variety of service, project, and management positions. Owen has worked for Honeywell for 15 years, having spent 7 of them in Australia.

Owen is now based in Ireland and has studied Electrical Engineering at Cork’s Technical Institute of Technology.
Learn more about migrations

Catching up with Experion Innovations : Monday 4:45pm
- Greg Heaton

Migration Round Table : Tuesday 2:30pm
- Owen Sillett

Come and see us in the Demo Room!
Agenda

Migration Planning
• Where and what to start?
• Networks
• Virtual or Physical?

Migration Planning Tools
• Migration Automation Plan - MAP
• Integrated Automation Assessment – IAA

Lifecycle Contract Management – LCM

Migration Centre of Excellence - CoE
Migration Planning

Where and what to start?

A Migration or Upgrade can at times be very overwhelming:

- Where do I start?
- What do I start with?
  - L1 or L2? Controllers or HMI?
Migration Planning

Network
• Is my network ok?
• Do I need to replace my network?
• Do I need a new network?
• Cyber?
• Am I at risk?

Let Honeywell help - we offer 2 Network Audit options:

1. GTAC Experion Network Audit
   1. Experion L2/L1 Network Audit
      i. GTAC Network data collection guidelines
      ii. Experion Network GTAC Audit Document
   2. Covered under SE&SP or Project
   3. Can be completed remotely, with minimal on-site assistance

2. HPS Industrial Cybersecurity (H-ICS) Network Assessment
   1. Assessment Services:
      i. Assessment Portfolio, section “Network Assessment”
      ii. CyberVantage Assessments – Service Note, section “Industrial Network Assessments” Covered under SE&SP or Project
   2. Proposal: Speak to your account manager
      i. Price: based on Node Count
      ii. Delivery: typically 1 week onsite plus 1-2 weeks for reporting
GTAC Experion Network Audit

• Intended Uses:
  – FTE fault finding
  – FTE Experion network design and configuration compliance
  – At the end of FAT
  – At the end of SAT
  – After patch installation
  – Before / After release migration
  – As a Preventive Maintenance activity on periodic basis
  – When GTAC recommends upon any network related incident/problem

• “Troubleshooting Honeywell System”
• “FTE Experion Compliance”

• “Audit” - compares existing controls or conditions to a specified standard or control requirement.

• Scope and Deliverables:
  • FTE Driver Check
  • HOSTS file Check
  • Binding Order Check
  • FTE and SRP Multicast Check
  • Cisco IOS version Compliance
  • Cisco Switch Configuration Compliance
  • Port Connectivity Compliance
  • Spanning Tree, Network Loops, Duplicate MACs
  • DNS Check
  • Disable iDRAC
  • Time Synchronization
  • Active Directory OUs
  • Password Policies
HPS Industrial Cybersecurity (H-ICS) Network Assessment

• Intended Uses:
  – Evaluation of the entire network (L1-L3.5)
  – Onsite required (e.g., physical inspection)
  – Complex Experion migration (i.e., precursor to full network design)
  – Network Engineers will be required during the project to install and configure network infrastructure
  – End-of-Life Network Equipment Exists (i.e., Secure Network Refresh (SNR) required)
  – UCN to EUCN
  – LCN to ELCN
  – Virtualization added to existing environment
  – Integration / connectivity with multiple 3rd-party (non-Honeywell) networks

• “Lifecycle Upgrades”
• “Complex Networks”
• “Network Expansion”
• “Vendor Agnostic (Available for non-Honeywell)”
• “Certified Network Engineers”
HPS Industrial Cybersecurity (H-ICS) Network Assessment

• Activities:
  – Perform a basic walk through of critical areas of the plant (ICS) components.
  – Interview key personnel
  – Assess existing wired and wireless networks
    ▪ Design, Infrastructure, Active electronics, Network environment, Network loading, Network errors, Remote access
  – Identify possible problem areas with current networks
  – Analyze collected documentation
  – Survey existing perimeter devices
    ▪ Ingress/egress firewall/router
    ▪ DMZ (Demilitarized Zone)
  – Review network device configurations
  – Document data flow requirements in/out of ICS
  – Provide best practice recommendations

• Deliverables (Customizable):
  – Assessment of current ICS network infrastructure
  – Best Practices Observations and Recommendations Report
    ▪ Executive Summary
    ▪ Environmental – Enclosures, HVAC, power requirements
    ▪ Required equipment – Switches, routers, firewalls
    ▪ Infrastructure - Installation practices, cable plant requirements
  – Network errors identified
  – Misconfigured / inadequate firewall rules
  – Logical Diagram of the existing ICS infrastructure (Visio format)
    ▪ Current ICS connectivity depicting switches, routers, firewalls
  – High level detailed design to support future upgrades to Experion on FTE
    ▪ FTE community connectivity
    ▪ ICS connectivity represented as Honeywell Levels
    ▪ Materials list
  – Tele-conference to review Assessment Report
Migration Planning

- Network
  - Don’t let network issues delay your project
  - Don’t let network issues cause migration failures.
  - Don’t be at risk.
  - Act now and start that migration project with confidence.

- Additional sessions:
  - FTE Network Best Practices
    - 13-06
    - 1pm
    - Monet -Mezzanine
    - Jay Gustin & Brian Polcyn
  - Panel Session: Cybersecurity Challenges & Opportunities to Consider When Migrating to Newer Control Systems
    - 12-06
    - 10.30am
    - Metropolitan -Mezzanine
    - Donovan Tindill
Migration Planning

• Virtual or Physical?
  – There is no right or wrong decision when it comes to Virtualization.
  – Is it a migration influencer? Absolutely it can be.
  – Virtualization enables Optimized On Process Migration technology (OOPM)

• Additional sessions:
  – Workshop – Virtualization – Premium Platform and design Strategies
    ▪ 13-06
    ▪ 3.30pm
    ▪ Senators Lecture Hall
    ▪ Rick Stopf
Migration Planning Tools

Migration Automation Plan – MAP
Need for Upgrade/Migration

Every Distributed Control System (DCS) at some point requires upgrade to ensure reliable operation and to leverage the latest technology. However, justifying automation projects today is extraordinarily difficult, any system being migrated must provide a superior business value proposition to justify the spend.

A well-planned and executed migration to a modern control system not only improves plant availability and reliability but can also provide a more flexible production platform. Flexibility is the key battleground on which companies seeking to make the most of business opportunities will thrive.
Migration Planning Tools

Migration Automation Plan – MAP
Defining the Problem

• Hardware and or software obsolesce
• Performance issues
• Lack of openness for expansion or integration with newer systems
• Lack of features required for enhancing the control philosophies
• Maintenance costs is high
• The number of operators and engineers who understand your existing DCS is shrinking
• Product support may have ended long ago, upgrades are more challenging
• Old systems only allow for configuration of certain types of controls
• The cost of staying with an old system eventually exceeds the cost of an upgrade or full migration
Migration Planning Tools

Migration Automation Plan – MAP
Choose the Best Methodology

Typical migration options include:

**PHASED MIGRATION**
Allows system modernization in gradual steps, replacing the HMI or a particular unit first. Once this is completed, the end user can take advantage of solutions improving operations and safety. The rest of the system can be replaced over several years.

**COMPLETE REPLACEMENT**
Allows the entire system to be replaced all at once during a planned outage. In some cases, hot cutover can be used to minimize downtime and ensure seamless integration of current control assets.

**SYSTEM UPGRADE**
Allows an upgrade of critical system components at the end user’s own pace. The control system vendor must be committed to retaining the value of existing systems and continuing to offer parts and support for the legacy platform.
Migration Planning Tools

Migration Automation Plan – MAP
Creating the MAP

• The Automation Plan is a process to help our customers to bring their installed control system to the latest system solutions. This process will be using as input of the Honeywell installed base of the systems with respect to the current product roadmaps and support policies. It is based on a review of basic system architecture drawings, server/workstation audit files and the LVRLOG file for TPS systems.

- To have an Automation Plan Contact to Account Manager.
Migration Planning Tools

Migration Automation Plan – MAP

The Importance of Planning

• You should strongly consider taking this opportunity to leverage the latest technologies and standards to innovate and improve your process.

By improving your operator interface and experience, you can put safety first.

By implementing alarm management as part of the migration, you create improved operator awareness and response to abnormal situations.

By assessing cyber security risk as part of the migration, you can identify vulnerabilities, implement good process, and deploy technology to protect assets and operations.

• Walk around the demo room, see the new features/functions you may be missing out on today.
Migration Planning Tools

Migration Automation Plan – MAP

Why Honeywell?

Honeywell offers a wide range of migration options and is the only vendor that continues to support 30+ year-old control systems. These migration solutions are designed to provide access to up-to-date technology without having to “rip and replace” the entire legacy hardware and software system.

With Honeywell’s investment protection strategy, plants continue to operate and be supported on their legacy equipment. The transition to new technology can be executed with practically no change to physical wiring and intellectual property. The availability of multiple controllers on a single network also provides freedom of choice for new installations or upgrades.

Whichever migration path is chosen, Honeywell’s migration solutions and world-class services organization support customers’ systems throughout their entire lifecycle, helping sustain the benefits of investing in Honeywell technology. The Migration CoE has supported over 7000 migrations.
Migration Planning Tools

Integrated Automation Assessment – IAA

- Integrated Automation Assessments (IAA) are a value-added method of assessing the state of your automation assets, confirming adherence with Honeywell best practices for your Experion PKS & TPS Systems, determining areas for improved performance, and highlighting potential risks to process uptime.

Features & Benefits:

Ensure Compliance to Honeywell Best Practices
- Identifies issues and recommend corrective actions for all critical systems and components
- Address latent and hidden issues to reduce risks

Measure System Performance
- Automated & non-invasive data collection
- Identify performance risks on PCs, Controllers, Network
- Take pro-active actions
- Vies level of support for system components
- Support better planning of upgrades and migrations to minimize exposure of obsolescence issues

Identify Obsolescence & Support Issues Improve Operational Performance
- Measure alarm system performance against EEMUA 191 & ISA 18.2 guidelines to reduce risk of operator overload
- Measure control loop performance and recommendations to maintain control performance

Improve Decisions Support
- Intuitive executive summary
- Easy to follow recommendations
- Organize all relevant system health information in a single report
Migration Planning

Life Cycle Management - LCM

- LCM is a service delivery model that provided planned migration, modernization, & projects execution over a specified period of time based on customer needs and resources that insulate from and linearize year-over-year price escalation.

LCM VALUE

- Collaborative plant wide automation planning
- Life extension of assets
- Planned upgrades & migrations
- Improved Risk Mitigation
- Investment prioritization based on risk assessments
- Flexibility to accommodate scope changes
- Flexible payment options
- Favorable Capex/Opex mix
- Long term planning with short term milestones
- Predictable cost

RISK REDUCTION

EXECUTION CONTINUITY

COMMERCIAL BENEFITS
Migration Planning

LCM cont’d

LCM Program

LCM STUDY
• Automation Plan
• Cost Analysis
• Benefits Analysis

LCM Elements
• Phased migration & modernization
  - HMI
  - Controllers
• Technology Refresh on regular schedule
  - Servers, Stations, FPDs, FTE Switches
• Support Services
  - SESP
  - Parts Management
  - Hardware Refresh
  - Projects Services
  - Preventive Maintenance
• Payment options
  - Even payment schedule over 3-5-7 years
  - CapEx/OpEx invoicing available
Migration Planning

LCM cont'd

LCM Planning Process

• Pre-meeting and planning for assessment
• On-site system assessment
• Automation planning
• Adjust LCM plan based on feedback
• Review LCM scope and financials
• Implement delivery model – PO Issued
• Schedule Kick-off meetings
• Kick-off meeting and LCM underway
• Annual review pf deliverables

All migration, modernization, & project needs can be managed within a single LCM scope
Migration Planning

LCM cont’d

LCM Execution Process

Key Resources to Execute a ICM
- Honeywell Project Manager
- Customer Project Manager (LCM lead)
- Honeywell Field Service Manager

Scheduling the Implementation
- Annual review
- Quarterly status reports

Flexibility
- Customer driven delivery schedule
- Accommodate scope changes

Processes
- Honeywell best practices in Engineering services and Project Management
Migration CoE

Did You Know?
The Migration CoE is multi Discipline organization?:

- EPKS Migration
- ELCN
- C200 to C300
- xPM to EHPM with ENIM or ENB
- Data Hiway Migrations
- FSC to SM migrations
# Migration CoE

## What We Bring to The Table:

### Standardization & Experience
- Work Packages: are the result of lesson learned from 7000+ migrations
- Scope Definition Form (SDF): System specific Impact Assessment of the migration
- Enhanced Method Statements for use by Honeywell employees supplement product documentation

### Risk Mitigation
- Analysis of Experion system against known migration issues
- Pre-Migration of customer databases and displays
- Usage of Virtual Engineering Platform for all technical reviews
- Application of Voice of the Customer (VOC), lessons learned, deep technical understanding and GTAC recommendations

### Continuous Improvement
- Integration with GTAC Incident and Problem management of ‘Migration Issues’
- Integration with Technology to ensure VOC and Lessons Learned are fed back into the product
- Key Stakeholder in Migration and Interoperability testing
Thank You