Creating Business Value and Operational Excellence with Emerson Lifecycle Care Services

This paper describes how our Emerson team uses a collaborative Lifecycle Care approach to help our customers achieve maximum DeltaV™ business value and operational excellence.

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Introduction

Lifecycle Care Services is the term Emerson uses to sustain and enhance existing solutions ensuring that a process control system meets pre-defined business objectives. A collaborative approach to system lifecycle management with Emerson will reduce risk and costs, delivering improved return on investment (ROI) on the system while maximizing business benefits.

Our unifying approach for service and support delivery allows us to tailor the Emerson recommendations for lifecycle Availability, Sustainability and Performance Improvement tasks and frequency to a specific DeltaV system (or Site, or Enterprise) tied back to business value and ROI.

Emerson recognizes that a proven, consistent lifecycle methodology is critical to ensuring maximum business value and ROI. Equally important to a proven methodology is the ability of the methodology to be applied to companies of various sizes, locations, technology and resource reaches and requirements.

Emerson Process Management has an outstanding track record of providing systems support, migration products, and services that deliver positive return on those investments and preserve the end-user's prior technology investments. We have delivered over 10,000 DeltaV systems worldwide with some sites having over 30,000 I/O installed. We are gratified that the DeltaV system has been voted the leading automation system by readers of Control magazine in a recent survey. We believe this underscores the fact that real value is being realized for the investments made by Emerson and its customers.

Good lifecycle management requires consideration for evolving technology. *"If it isn't broken, don't fix it"* may have been well-suited for control systems 15 years ago, but perhaps not today.

Emerson Lifecycle Management and Support

Emerson Process Management Lifecycle Care support provides consistent and predictable support availability guidelines, allowing you to effectively plan and manage your support needs.

The PROVOX system was introduced in 1980. The RS3 system was introduced in 1984. We continue to support these platforms today. The historical experience of Emerson Process Management is that our systems routinely achieve 25+ year functional life spans when an end-user properly maintains the system and makes periodic sustainability re-investments to change out subsystem components in response to the evolving technologies.

Emerson migration solutions help maximize financial return on your PROVOX & RS3 investment while modernizing to new DeltaV technologies and extend their original automation investments for decades to come. We work with plant personnel to justify and plan projects to meet the plant's business and operational objectives. Our expert engineers and project managers have extensive experience. They utilize sophisticated tools to analyze existing applications and automatically generate much of your new DeltaV database, dramatically reducing risk of errors. Your new system can then get right to work improving process performance and operational efficiency.

With the great pace of technological advancement and the arrival of the digital plant made possible by the DeltaV process automation system and the PlantWeb® architecture, we have gone to great lengths to ensure that our customers can reap the rewards of technological progress by providing transition paths to DeltaV in steps which are appropriate to each customer. The DeltaV system is the most recent, proven automation system on the market today. Emerson Process Management has a large development and test staff in place for DeltaV, and many developments are underway and planned for the future. The DeltaV v11 release in June 2010 previews a great success according to our customer feedback. The DeltaV v11 release includes major enhancements to all of the systems' I/O processing, operator displays, asset management, batch capability and system security. These combined capabilities reduce customer project complexity, eliminate needless work, and speed system commissioning

Considerations in Lifecycle Management

Total Cost of Ownership (TCO) – Points to Consider

Today, many end users of process automation systems are considering total cost of ownership as part of their automation purchasing decision and plant operations planning process. The Emerson SureService team can assist in this TCO analysis.

When determining Total Cost of Ownership, the end user's business objectives must be clearly understood before attempting to logically evaluate the costs. Perhaps the first question that must be answered relates to the length of time the process control system is intended to be in service, generating revenue:

How long do you plan to keep the system?

■ Restricted Lifetime – The System has a pre-determined, limited lifecycle and then will be decommissioned. The main object is to keep the <u>current</u> system as much as possible with no hardware or functional expansions planned. Some sustainability changes may be made to preserve compatibility with the computer platform (i.e. NT to XP, XP to Windows 7) and fixes. Any expansion that might invoke the compatibility cascade will be purchased separately on an as-needed basis.

■ Expanded Lifetime – The system will be kept up-to-date (or will be updated within a given investment frame). Current purchasable components will be usable for expansions. At any time in the lifecycle, the system should be up-to-date where parts can be installed without compatibility issues.

Restricted and Expanded lifecycle – Points to Consider

When considering the Restricted and Expanded Lifecycle, there are different approaches to consider:

■ Keep the system current - Install the latest software versions, take advantage of the latest features and technologies, periodically refresh the PC hardware (typical is every 4-6 years), controllers, and network equipment as required.

■ Keep the system compatible - Off the shelf spares are compatible with system, system has full vendor support available (such as hot fixes, training, etc.)

■ Keep the current system - Used spares are allowed, fixed system scope with no further expansion foreseen beyond the initially installed system reserve.

The Cost of downtime – Points to Consider

When considering the cost of downtime and the benefit of fixes that enable system performance and reliability improvement, remember that the true downtime costs that are associated with materials and labor (both outsourced and in-house) are realized in five key areas:

- **The Cost of Lost Revenue -** The value of the Total Revenue less direct avoided cost (material and energy).

- **The Capital Cost** - Carrying excess production capacity inventory and associated expenses.

- **The Indirect Costs** - OSHA and Regulatory Compliance costs, Insurance (Safety) costs.

- **The Direct Cost to Return to Operation** - Cost of Unscheduled down-time, material, labor, overtime, off spec product.

- **The Planned Sustaining and Availability Investment** - The Strategy for reducing the unplanned cost of downtime by preventing equipment or process failure requires consideration for planned sustaining and availability investment. DeltaV Guardian Support is designed to improve reliability and reduce maintenance costs.
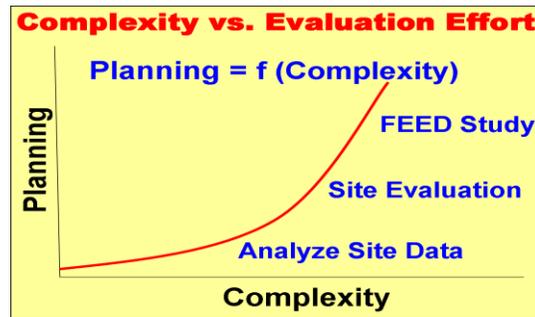
Control System Software Upgrades – Points to Consider

There are many technical and business justifications for upgrading the DeltaV system software. Some of the key reasons and the results that can be expected include:

- The typical upgrade period is every couple of years. Validated batch plants and large continuous plants usually see longer upgrade periods. Few if any systems are able to adopt every software release. However, all systems are subject to patches and revision releases.

- Software Updates include new features to enable improvements in the plant's operation resulting in *Increased Plant Results*.

- New products and technologies become available when software is kept current resulting in *Increased Investment Life* and *Plant Results*.

- Many software changes are made to preserve compatibility with the computer platform, embedded software and external interfaces resulting in *Increased Investment Life*.

- Guardian Support customers receive service notifications matched to system content and pertaining to availability and sustainability of the control system resulting in *Better Decision Making* and *Improved Capital Efficiency*.

- Efficiencies accrue for multiple systems if all are kept current resulting in *Maintained Plant Results* and *Increased Investment Life*.

- Improved asset reliability, reduced downtime resulting in *Maintained Plant Results*.

A DeltaV Software upgrade should be treated as a project in that research, planning, testing, mitigation, and implementation must be considered to minimize risk and allow for a successful upgrade. Upgrades require careful and proper evaluation of the hardware and software upgrade requirements to go from the current release to the new release. Complexity and risk are fundamental and inherent upgrade considerations. Other considerations include: architecture changes, system lifecycle changes, graphics conversion, historian conversion, migration start, number of version jumps, online vs. …, hardware compatibility, capacity checks on controllers and workstations, controller configuration, custom software, and the required upgrade schedule.

Upgrading a suite of complex online process controls software must be executed flawlessly. The greater the complexity, the more effort must be put into up-front evaluation and planning.

Complexity vs. Evaluation Effort
Planning = f (Complexity)
FEED Study
Site Evaluation
Analyze Site Data
Planning
Complexity

Our whitepaper: Upgrading Your Validated System
http://www2.emersonprocess.com/siteadmincenter/PM DeltaV
Documents/Whitepapers/WP_Col_Lifecycle_Mgmt.pdf and our service data sheet: SureService
System Upgrade Service http://www.sureservice.com/systemupgrade describes how Emerson
makes DeltaV upgrades easier and more reliable.

A visit to our www.EasyDeltaV.com site reveals that DeltaV v10* and v11* software versions include
many new features and enhancements designed to improve your plant's bottom line business
results. These include: I/O on Demand, Ultimate Scalability, Embedded Intelligent Control,
Inherently Integrated, Built for Purpose, Increased Performance and Reliability, Security Made Easy,
Smarter Safety Instrumented System (SIS), Easier Engineering, Advanced Analysis and
Optimization.

For more information regarding release details for DeltaV software, go to:
http://www.emersonprocess.com/DeltaVReleaseDetails

DeltaV and Commercial off-the-shelf technologies – Points to Consider

Commercial off-the-shelf technologies (COTS) are commonly used throughout many products and
Emerson has embraced the integration of these technologies into our DeltaV architecture. In doing
so, Emerson can:

- Incorporate new technology more quickly - shorting design-to-production cycles.

- Lower development time and product cost.

- Use easy-to-integrate emerging technologies – increasing backward compatible with legacy
products.

Emerson makes specific choices for COTS content, then integrates and tests them to ensure DeltaV
features and value are best in class. Good DCS lifecycle management requires consideration of
evolving technology. DeltaV incorporates new technology and standards so you can "do more" over
time. Examples of this include:

- Microsoft Windows Software

- Dell Workstation and Server based PC's.

- Ethernet technologies and Network based communications.

- Wireless technologies (SmartWireless Products)

- Open, interoperable BUS technologies like FOUNDATION Fieldbus, AS-i bus, Profibus DP, DeviceNet and WirelessHART.

- Open, interoperable standards like OLE for Process Control (OPC), XML, and ODBC.

The Building Blocks for collaborative Lifecycle Care Services

Emerson provides a comprehensive portfolio of Lifecycle Care Services to meet each customer's specific needs. We deliver on the promise of improving our customers' competitive advantage and bottom line business results through our global network of local and factory specialists. We recognize that lifecycle support needs vary from one customer to another in both services activity content and time commitment. We understand that our customers make investments over the system lifecycle for three basic reasons:

- **System Availability Services – Keep your system running -** The essential day-to-day system maintenance activities designed to help achieve the desired level of certainty for system uptime, taking your process, system design, and in-house resources into account.

- **Performance Improvement Services – Apply the best technologies** with a focus on improvement of plant operation and performance using PlantWeb technology.

- **System Sustainability Services – Preserve your investment** - To sustain the initial investment such that it matches the standard of the technology that can be routinely supported and serviced. These services can include identifying, assessing, planning, and implementing PlantWeb technology updates and upgrades to minimize system down time, prevent system offsets, and minimize total cost of ownership.

Because every customer has different support needs, we created our SureService program to be flexible allowing you to choose the coverage that meets your plant and staff's particular needs. We'll work with you to build a customized SureService Agreement program for one year or multiple years that fits just right based on your plant's unique operating history, maintenance requirements, control system configuration, performance improvement needs, staff experience, manpower levels and budgetary constraints.

The service modules within our SureService portfolio contain all the right elements to tailor a program to fit your specific support needs by addressing your specific availability, performance improvement, and sustainability requirements. Our service modules include:

- Guardian Support

- Extended Software Support

- Wireless Support

- Project-to-Operations Transition Support

- Express Module Replacement

- Spares Management Programs

- Emergency On-Site Services

- Scheduled On-Site Services

- Critical Data Backup Application

- Security Assessment Service

- System Upgrade Service

- Site Performance Services

- Application Enrichment
- Alarm Management Services
- Control Performance Improvement
- DeltaV Evergreen Program

- Integration Testing Services
- Modernization Consulting Studies
- Training
- Premier Support Program

Collaborative Lifecycle Care involves procedures, responsibilities, and activities to be performed. Responsibility for them is often divided between one or more organizations. It is important to use a well-defined approach. The customer's organization (in-house and central) and Emerson SureService should form a team capable of assessing the business needs and supplier recommendations. In general, they should:

- Set up the team to produce the plan.

- Determine the scope of the plan.

- Complete an inventory of all applicable equipment – hardware and software.

- Decide upon the required lifecycle strategy per identified device.

- Detail the lifecycle activity-based approach to maintain the system, maintain the functionality, optimize the system, change the functionality, and support the users. The ITIL (Information Technology Infrastructure Library) method can be used.

- Detail resource (Customer, Emerson or other) and elapsed-time requirements, (Time – Scheduled, Call-Out, elapsed-time base, and frequency).

- Set methods for analysis and improvement – performance indicators.

- Implement the plan for all parties.

Guardian Support is the core element of the SureService support program.

Guardian Support enables real-time visualization and management of Lifecycle Care requirements. Key benefits of Guardian Support include:

- **Better decision making** with data turned into user-personalized and actionable information.

- **Improved staff productivity** through Expert Technical Support and global collaboration.

- **Lower operations and maintenance costs** shift from reactive strategy to predictive & proactive maintenance.

- **Better operating performance** new features and maintenance fixes enable improvements in plant control operations.

- **Improved capital efficiency** through increased investment life as new products and technologies become available.

For additional details on the benefits of Guardian Support, go to:
www.sureservice.com/guardianbenefits.asp

The ARC Advisory Group has completed a detailed analysis of Guardian Support. The analysis and customer feedback is documented in an ARC White Paper *"Collaborative Service Management Reduces Cost and Risk"* (www.sureservice.com/ARC_GuardianSvc_whitepaper)

Key comments and recommendations include:

■ *"Collaborative service management provides a valid model for developing next generation service offerings. End users and suppliers should explore collaborative options for lowering overall risk and costs while increasing service."*

■ *"Emerson is on the right track and should utilize Guardian Support customer engagements to define and deliver additional innovate services."*

Guardian Support provides key benefits

■ Expert technical support by Emerson professionals. Get the answers you need when and where you need them.

■ Remote system diagnosis. The end result is reduced downtime and better operating performance versus the traditional service dispatch form of problem resolution.

■ Software updates maintenance (fix) releases and updates containing new features and functions.

■ Guardian dashboard support website with user-configurable content specific to the customer systems, both real-time and historic. Includes service features such as:

  ▪ Enterprise Explorer and Favorite Systems. View some or all systems in your enterprise.

  ▪ Knowledge Base Articles (KBA's). Matched to the system node names.

  ▪ KBA management. Feature to track the status of mitigation actions.

  ▪ Technical Support call management. Open new calls, call history and call status updates.

  ▪ Operating System security update management. Approval and installation status for Microsoft Operating System (OS) security update by node.

  ▪ Lifecycle status. Lifecycle status by node name and Emerson model number to plan system management and sustainability investments.

  ▪ My System Profile. System content details.

  ▪ License Usage. What licenses are available, assigned, and unused for each node.

  ▪ System Content Change. Share system content changes with others to narrow the focus when troubleshooting.

■ Automated service notifications. Immediate notification whenever relevant actionable system information becomes available.

- Automated software update delivery. Provides system-specific DeltaV hotfixes, Microsoft OS Updates and Symantec Antivirus updates.

- System Analysis Reports. Prepared by Emerson experts and including day-to-day service activity for the covered service period boiled down to actionable informative charts, graphs and recommendations.

Guardian Support provides a Predictive/Proactive solution

The Guardian Support shift from Reactive/Preventive maintenance to Predictive/Proactive maintenance results in improved asset reliability and reduced cost of downtime. What does an hour of downtime cost your plant? Estimates vary based on the industry and size of the facility but have ranged from $50K to over $1M per hour of downtime per incident. Effectively, almost every factory loses at least 5% of its productive capacity from downtime and many lose up to 20%. In addition, downtime consultants estimate that 80% of industrial facilities are unable to estimate their downtime accurately and that many of these facilities are underestimating their Total Downtime Cost (TDC) by 200-300%!

Extended Software Support

Extended Software Support provides flexibility to perform control system upgrades when you are ready or when they are necessary. Regularly upgrading your control system software allows you to take advantage of new DeltaV product functionality. It also ensures that your control system software is compatible with the rapidly changing technology.

Feedback from our customers shows that while keeping your software lifecycle-support current is important to an organization, some are not in a position to upgrade their control system software with the frequency that a new version is released and made available.

Extended Software Support, available to Guardian Support subscribers, offers you the flexibility to perform control system upgrades when you are ready or when they are necessary.

Modernization Consulting Studies

Modernization Consulting Studies is a methodology used to define the economic justification and implementation plans for modernizing legacy automation assets. The study incorporates a plant's business direction, objectives, and issues to create a modernization plan that meets your short- and long-term business and process automation needs. Emerson works with you and others in your company to evaluate current automation status, develop future vision states, estimate benefits, and prepare economically justified project plans.

The Modernization Consulting Studies process involves defining current and future business objectives and matching system functionality to meet those objectives. Examples of current business objectives include system availability, production requirements, quality requirements, and conversion costs. Future business expectations can include such things as known process changes, known expansion plans, performance improvement potential, and market changes.

The Modernization Consulting Studies team performing the study should consist of representatives from your company and Emerson experts. The team would typically cover four functional areas:

- Management/financial perspective: a person from your company

- Process analyst/automation expert: a person from your company, such as a corporate process improvement specialist

- Local process and system knowledge: a person who is a local process automation specialist

- Automation expert/quotations: a local Emerson representative or sales person.

In addition to the efforts of the core team, the study may require input and from others in your organization. For example, engineering, operations and management may need to be interviewed in order to determine business and/or process requirements. Typically, the time required to conduct a Modernization Consulting study will vary from less than a day to one full week, depending on the scope of the study. The study may be applied to part of a control system, such as the consoles or controllers, or it can be applied to the entire system. However, to avoid great complexity the study should be applied to one process area at a time.

Summary

Emerson is committed to keeping our customers' DeltaV systems running smoothly, economically, and with the reliability and business results their processes demand. Emerson has developed the SureService program and global network of certified service providers to collaborate with our customers around the world to achieve exceptional results. We strive to constantly improve our service offerings, our technology, our tools, and our knowledge to meet the ever-changing needs of our customers. Customer satisfaction is our number one goal and it drives all that we do.

For more information, please contact your local Emerson support office or representative, or visit us at: www.SureService.com.

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