

## Creating DeltaV Business Value and Operational Excellence with Emerson's Collaborative Lifecycle Services Approach



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

**To locate a sales office near you, visit our website at:**

[www.EasyDeltaV.com/reach](http://www.EasyDeltaV.com/reach)

**For large power, water, and wastewater applications contact Power and Water Solutions at:**

[www.emersonprocess-powerwater.com](http://www.emersonprocess-powerwater.com)

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## **Introduction**

Collaborative Lifecycle Management is the term Emerson uses to refer to the procedures, responsibilities and activities associated with proactively 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 DeltaV 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 Application 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 product support, migration products, and services that deliver positive return on those investments and preserve the end-user's prior technology investments. We have delivered some 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.
- The DeltaV architecture embraces the integration of new technology

### **Emerson Lifecycle Management and Support**

Since the introduction of our first control systems more than forty years ago, Emerson Process Management has been an acknowledged leader in providing long-term product support and cost effective migration paths to technological advancements. We are proud that our legacy control systems are in operation around the world today, and challenge our competitors to match our record of forward migration and long term support. We continue to sell and support legacy systems and our flagship line of DeltaV. Our product support guidelines state explicitly our approach to maximizing the return on your automation investments, longevity and life-cycle management. Today our product development philosophy continues to emphasize technical compatibility and preservation of our customers’ technology investments. As with other technology suppliers, the advent of open system technology and the general acceleration of technology changes have challenged our ability to provide a continuous level of support for all systems. In spite of these challenges, we have managed to maintain a solid track record.

Emerson Process Management systems have routinely achieved 20+ year functional life spans provided an end-user properly maintains the system and makes periodic sustainability re-investments to change out subsystem components in response to the evolving technologies. As an example, the PROVOX system was introduced in 1980 and only moved to *Active* status at the end of 2003. Emerson Process Management will provide a minimum of 10 years of product support once a product moves from *Current* status to *Active* status as outlined in the Emerson Product Support Guideline. Thus, the PROVOX life-cycle will ultimately exceed 30 years. Even better, the robust migration paths available from PROVOX to DeltaV enable these customers to leverage and extend their original system investments for decades to come.

The Emerson Process Management product support guideline is realistic and responsive to user requests for information on product obsolescence, support options and migration alternatives. Our Guardian Support service proactively informs customers of lifecycle status information listed by node name and Emerson model number to help plan system management and sustainability.

DeltaV goes to the heart of PlantWeb. Emerson has invested hundreds of millions of dollars in the DeltaV system and PlantWeb digital plant architecture products. By the investments we have made and continue to make in the enhancement, delivery and support of DeltaV and all elements of the PlantWeb architecture, Emerson remains committed to this platform.



## **SureService – the Right Service at the Right Time**

Emerson provides a comprehensive portfolio of lifecycle services to meet each customer's specific needs. SureService is our service brand name. 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.
- **Application 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.

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

- Guardian 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
- Application Enrichment
- Alarm Management Services
- Control Performance Improvement
- DeltaV Evergreen Program
- Integration Testing Services
- Modernization Consulting Studies
- Training
- Premier Support Program

Guardian Support ([www.sureservice.com/guardianbenefits.asp](http://www.sureservice.com/guardianbenefits.asp)) is the core element of the SureService support program. Guardian enables real-time visualization and management of Lifecycle Support requirements. The ARC Advisory Group has completed a detailed



analysis of Guardian. The analysis and customer feedback is documented in an ARC White Paper "*Collaborative Service Management Reduces Cost and Risk*" ([www.sureservice.com/viewpoint/ARC\\_GuardianSvc\\_whitepaper.pdf](http://www.sureservice.com/viewpoint/ARC_GuardianSvc_whitepaper.pdf))

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."*

Collaborative Lifecycle Management involves multiple 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. Because of similarities between the IT environment and the process control environment, one can use a method invented by the U.K. Central Computing & Telecommunications Agency (CCTA). This method is called ITIL (Information Technology Infrastructure Library). ITIL describes best practices and processes required.
- 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.



## **DeltaV and Commercial off-the-shelf technologies**

The DeltaV architecture embraces the integration of proven, low cost, easy-to-integrate, commercial off-the-shelf technologies (COTS). Such technologies, known by a wide pool of professionals, form the fundamental building blocks of the DeltaV System and are proven across many industries. Good DCS lifecycle management requires consideration of evolving technology. DeltaV incorporates new technology and standards so you can “do more” over time.



*Emerson focuses on its core competency in advanced process control via the PlantWeb architecture.*

*In 1965, Gordon Moore made the empirical observation that the numbers of transistors on an integrated circuit will double every 24 months. Some studies have shown that the trend can be expected to continue until physical limitations are reached (probably around 2017).*

Examples of DeltaV adoption of COTS technologies include:

- Microsoft Windows Software
- Dell Workstation and Server based PC's.
- Ethernet technologies and Network based communications.
- Open, interoperable BUS technologies like FOUNDATION Fieldbus, AS-i bus, Profibus DP, and DeviceNet.
- Open, interoperable standards like OLE for Process Control (OPC), XML, and ODBC.

Emerson makes specific choices for COTS content, then integrates and tests them to ensure DeltaV features and value are best in class. As an example, on Dell Workstation and Server based PC's:

- Platforms are fully hardware qualified using DeltaV test cases.



- PCs are shipped “hardware ready” – all non-Dell standard cards (extra NICs, parallel port card, etc) are included and pre-installed.
- PCs come preinstalled with a tested DeltaV custom OS image – ready “out of the box”
- Standard configurations are specified in all regions for product consistency across the world.
- PCs are 100% supported through the Global Service Center & Product Hardware Engineering.

Emerson employs available standards (and even creates new ones) to ensure the maximum transportability of your investments. Emerson also segregates hardware, software and licensing to maximize your platform investments. Examples include: a DeltaV V1 license works in a V10 system; Hardware is distinct from software; Flash downloads deliver new software to existing hardware.

### **Total Cost Of Ownership (TCO) - Lifecycle Management 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 current 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 Vista) 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.



**There are different approaches that can be taken within the restricted and expanded lifecycle management models:**

- 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.

**Microsoft End of Support for Windows NT and XP Service Pack 1 and 2**

Microsoft Corporation communicated the end of their support cycle for Windows NT ([www.microsoft.com/technet/archive/winntas/ntendlife.aspx?mfr=true](http://www.microsoft.com/technet/archive/winntas/ntendlife.aspx?mfr=true)) during specified dates in 2004 and 2005. Consistent with that change, computer and peripheral manufacturers ceased the design, manufacture and support of NT-compatible hardware, drivers, and applications. Well in advance of this event, Emerson provided our customers with notification of the obsolescence. In 2004, we notified our customers of a “last-time-buy” opportunity for new Windows NT-configured computers for use in Emerson DeltaV process control systems. In addition to the “last-time-buy” opportunity, Emerson also developed and introduced a refurbished computer purchase program. The Emerson Certified Remanufactured Computers program ([www.sureservice.com/pd/SDS\\_EMRCertRemanComp.pdf](http://www.sureservice.com/pd/SDS_EMRCertRemanComp.pdf)) for DeltaV, PROVOX, and RS3 Systems using Microsoft NT-Based Applications is oriented to the replacement of failed NT computers, spares purchases, and minor (1 or 2 workstation) expansions, with priority given to orders for replacements. The intent of this program is to provide a reasonable window of time for our customers to make the migration to the DeltaV general distribution release that is based on the Windows XP operating system. Emerson will not support extensive expansions to existing Windows NT based systems using this refurbished stock.

As of October 10, 2006, Microsoft ended their support for Windows XP Service Pack 1 ([www.support.microsoft.com/gp/lifean19](http://www.support.microsoft.com/gp/lifean19)) and no longer provides updates for security vulnerabilities found in XP Service Pack 1. Emerson released DeltaV v7.4.2 to be compatible with XP SP2 & Server 2003 SP1.

Microsoft has stated that support for Windows XP Service Pack 2 will end on July 13, 2010 ([www.support.microsoft.com/gp/lifean31](http://www.support.microsoft.com/gp/lifean31)) and as with previous Service Packs this means Microsoft will no longer provide updates for security vulnerabilities found in XP Service Pack 2. With the introduction of DeltaV v10.3 Emerson has continued its commitment to a forward migration with the latest offerings in technology. The DeltaV



v10.3 software now runs in the highly secure Windows Vista and Windows Server 2008 operating system environments. It's also fully tested and certified to run in the Windows XP, Service Pack 3 environment, giving you the flexibility you need for your cyber-security efforts.

### **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:

1. Software Updates include new features to enable improvements in the plant's operation resulting in *Increased Plant Results*.
2. New products and technologies become available when software is kept current resulting in *Increased Investment Life* and *Plant Results*.
3. Many software changes are made to preserve compatibility with the computer platform, embedded software and external interfaces resulting in *Increased Investment Life*.
4. 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*.
5. Efficiencies accrue for multiple systems if all are kept current resulting in *Maintained Plant Results* and *Increased Investment Life*.
6. Improved asset reliability, reduced downtime resulting in *Maintained Plant Results*.

A visit to our [www.EasyDeltaV.com](http://www.EasyDeltaV.com) site reveals that DeltaV v9\* and v10\* software versions include over 30 new features and enhancements designed to improve your plant's bottom line business results. These include:

- Increased Performance and Reliability
- Security Made Easy
- Smarter Safety Instrumented System (SIS)
- Easier Engineering
- Advanced Analysis and Optimization
- More Powerful Advanced Control and Operation
- Enhanced Size and Reliability
- Extended DeltaV Batch leadership
- Enhanced Data Management



- Smart Plant Capabilities
- Ease of Use

**\*NOTE:** For more information regarding release details for DeltaV v9 software, go to: <http://www.easydeltav.com/productdata/releasedetails/version93.asp>  
For v10, go to: <http://www.easydeltav.com/productdata/releasedetails/version103.asp>

Another example is Guardian Support's enhanced management of operating system security updates made possible by new functionality in DeltaV v8.4 and higher. Our Guardian Support subscribers are able to receive automated notifications whenever DeltaV system compatibility evaluations are completed for a Microsoft Operating System (OS) security update that is specifically applicable to one of the system's workstations or servers. The Guardian Support website provides the relevant evaluation details complete with download links for approved OS security updates.

As mentioned earlier, the DeltaV system uses commercial off-the-shelf hardware and software to bring our customers best-of-class capabilities. Some examples of "off-the-shelf hardware and software" are computers and their operating systems, communications gear, database software, data historian software and operator interface software. The suppliers of these products respond to their mainstream markets by continuously updating their offerings. Inevitably, the need arises to accommodate their product changes in DeltaV software. The Microsoft withdrawal of the NT operating system and end of support on XP Service Pack 1 are examples. Customers who upgrade to the latest version of the DeltaV system can in future years purchase new computers for expansion or failure replacement and be confident they will perform optimally with the DeltaV system and will have continued availability of security patches.

Guardian customers have immediate notification whenever relevant actionable system information becomes available.

- Maintenance fixes enable improvements in plant control operations
- A common software version enables your maintenance staff to apply their skills, knowledge and resources across multiple systems. Process control engineers from multiple locations can perform collaborative work with far greater ease. Transfer of control strategies and configurations between systems is simpler, as is preparing for system expansions. Staying current preserves on-going relevance of published technical and application information which leads to the most efficient and effective use of technical consultation and remote diagnostic services.



**The Guardian 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%!

**What comprises the total cost of downtime?** 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.

**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.** Here are some key assumptions and observations regarding DeltaV upgrades:

- The starting point for an upgrade is typically a properly operating system already in place.
- 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.



- Whatever is done to the system, the result should be equal or better overall system functionality and performance.
- There is typically a fixed and relatively short allowable installation time due to the plant's production schedule.
- There is a very high expectation related to the quality of personnel engaged in performing a software upgrade and in the work they perform with almost zero tolerance for errors.
- Any significant system expansion may present the need for an 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.*



Our whitepaper: Upgrading Your Validated System [www.easydeltav.com/pd/WP\\_UpgradingValSys.pdf](http://www.easydeltav.com/pd/WP_UpgradingValSys.pdf) and our service data sheet: SureService System Upgrade Service [www.sureservice.com/sys\\_upgrade.asp](http://www.sureservice.com/sys_upgrade.asp) describes how Emerson makes DeltaV upgrades easier and more reliable.

### **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](http://www.SureService.com)

