



PLANNING GUIDE

Successful Shutdowns, Turnarounds and Outages

From pre-event
planning, to planning
for the unplannable


EMERSON[™]
Process Management

Successful shutdowns, turnarounds and outages (STOs) are the happy result of millions of correct decisions that begin months before the actual event. Success doesn't come easily, or often. A recent survey revealed that 74 percent of all STOs fail to stay within 10 percent of the allotted schedule and budget.⁽¹⁾ From deciding what to put on the work list, to scheduling the work, to coordinating the many activities that will take place within a limited amount of scheduled downtime, STOs require detailed planning covering every aspect of the plant.

Even when all participating service partners agree to follow the same industry best practices for STO event planning, the actual execution can vary greatly from one participating vendor to the next. Flawed implementation—like using outdated methodologies that are prone to errors and inefficiencies—contribute to health and safety incidents, post-startup trips and other failures.

Scope creep. Budget overruns. Safety concerns. Work delays. There's a lot at risk. So it is important to choose carefully when you're selecting the team of professionals who will be working alongside you. Ask potential STO service partners: "What's your planning approach?" Then, dig deeper into the details:

- Do you understand our STO objectives? How can you help me fulfill them?
- What's the approach for determining which products or parts will be replaced or repaired?
- What's the plan for dealing with the unplannable discovery or emerging work during STO execution?

DEFINING THE SHUTDOWN, TURNAROUND AND OUTAGE OBJECTIVES

It is fair enough to ask outside vendors some hard questions. But it is equally important for STO leaders to chart the course for everyone involved early on by asking themselves, "So, what's our strategic plan?" Today the STOs that are producing the greatest ROIs are those that have clearly defined objectives and key performance indicators (KPIs). Due to the high cost and infrequency of planned shutdowns, few of these events are simply about routine maintenance anymore.

Every scenario is different, but across all industries there are a few common themes that are being driven by plant managers who want to see a greater return on their planned downtime:

- Upgrading technologies and creating a high performance plant
- Reducing inventory budgets through vendor standardization
- Assuring that installation follows industry best practices
- Sequencing the replacement of obsolete instruments

These are just a few of the ways plant managers are addressing STOs more strategically to make the most of the rare opportunities that scheduled downtime provides.

1. "Turnaround Benchmarking Studies," Asset Performance Networks, Web, 2016.

DEFINING THE WORK SCOPE: FOCUSING THE WALK DOWN

What does best-in-class STO planning look like? Today, formalized STO planning processes and innovative technology-based tools are helping to ensure that all the boxes are checked before a STO begins.

Effective planning should begin with a pre-walk down meeting between the STO management leaders and each participating service partner. Gaining a clear understanding of the overall STO strategy and objectives allows service partners to review the installed base and formulate their work lists in a more focused way.

At Emerson™, we've found that giving every single one of the installed measurement and analytical devices equal attention during the limited timespan of a planned shutdown is an inefficient (and often impossible) approach that can lead to unfulfilled objectives and an inefficient use of the budget. In contrast, when our STO personnel are prepped in advance, they can zero in on the instruments, areas and conditions that are most critical to the defined KPIs. In a typical plant, there may be thousands of devices from multiple vendors installed for measuring temperature, pressure, level and flow. Emerson personnel can evaluate any type of measurement instruments, not just the company's Rosemount™ and Fisher™ brands, and recommend actions that are based on strategic objectives.

SYSTEMATIZED ENGAGEMENT



Planning meeting



Standardized forms and procedures



Focused walk down with debriefing



Comprehensive report with executive summary

GIVING PRE-STO PLANNING A TECH LIFT

Compared to recent technology leaps that have transformed the way plants are running today, certain aspects of STO planning have stayed woefully unsophisticated. It is true that smart plants can use current instrumentation data as a starting point for STO planning. For example, real-time monitoring can detect which steam traps are currently in failure mode. But there's still no replacement for a hands-on walk down inspection when it comes to device-by-device assessment. Unfortunately, despite the inefficiencies and inaccuracies that are inherent to hand-written inventories ("Is that an I or a 1?"), the popular "clipboard approach" has been slow to evolve.

Clipboard reviews produce limited data in a lengthy amount of time. Lacking thorough instrumentation data, it has been nearly impossible for service partners to determine which products and parts are not acting correctly, which were serviced during the most recent STO, or which items are the most critical to the current STO strategy. That's why, historically, it has been difficult for instrumentation providers and other STO participants to schedule the right equipment and manpower, procure the right parts and replacement products, and to coordinate STO logistics.

At Emerson, we realized that in order to overcome the challenges of a traditional walk down customers needed a dynamic solution that could provide real time results. Our solution, the focused walk down tool.

This exclusive walk down tool standardizes the inventory and assessment processes used by Emerson personnel globally. Temperature, pressure, level and flow instrumentation of every make, model and brand are all within its capabilities today. (Next-

generation versions will expand to cover measurement and analytical devices more comprehensively to provide a more universal picture of instrumentation health.) Only Emerson personnel have access to this throughout the walk down, using it to quickly capture and document inventory details and condition-based information. It even prompts them to take a photograph of the installation to ensure best practices have been implemented during the installation.

A mobile technology solution with proprietary software replicates and automates the decision thought processes of Emerson's top instrumentation engineers.

AUTOMATING EXPERTISE

Automating this process ensures that adequate data is collected, and leaves less to subjective chance. Emerson's software-driven approach to a focused walk down all but

eliminates the variability that is inherent to manual inspections that are heavily dependent upon the individual technician's experience or opinions.

The assessment software *standardizes*. Exclusive analytics produce globally-consistent, expert recommendations regarding technology improvements, installation best practices, site conformity and other operational improvements. So now, partnering with Emerson for your next STO will ensure your plants regardless of location will receive the same quantitative and qualitative information.

INFORMING PLANT DECISIONS

At any time, Emerson personnel can send walk down status information directly—and immediately—to the site team leaders. Here’s a quick overview of the type and extent of the information that can be provided:

- ✓ Application and setting
- ✓ Age and lifecycle expectations
- ✓ Condition
- ✓ Known performance issues
- ✓ Installation (is it installed properly?)
- ✓ Location and functional criticality
- ✓ Manufacturer (brand) of the device

69% of turnaround managers report having problems finding qualified manpower to perform shutdowns.

Source: Oil & Gas IQ, 2015

The automated process ensures that adequate data is collected, and it leaves little to subjective chance. Based on the input, the built-in analytics produce recommendations about whether each device should be repaired, replaced, or left as-is. The results, with photos, are presented in a customized report. In addition, STO leaders will see technology conversion recommendations for items that must be replaced, including obsolete products, complete with two “good/best” choices, with the benefits of each option clearly spelled out.

Emerson’s reliability and performance experts help align the data output and recommendations based on the strategy and criticality of each device. (Some discovered repair situations may need immediate action, and shouldn’t wait until the scheduled STO.) Ultimately, the STO leaders make the final decisions about which instruments will be repaired and replaced. And they’ve never had more information to guide them.

AVOIDING UNNECESSARY WORK

Most plant managers understand the value of a data-driven repair/replace work list. But equally important is what’s *not* on list. A high percentage of cost overruns are attributable to work that did not need to be done and parts that did not need to be ordered. Through this technology, Emerson can provide important insight into what work doesn’t need to be done—at least not at this time. What’s more, the software saves information that supports the sequencing of maintenance and repairs from one STO to the next. Down the road, all data that is collected will be stored in a portal that STO and plant managers will be able to access directly at any time.

Clipboard Reviews	Focused Walk Down by Emerson
<ul style="list-style-type: none"> • Slow and labor intensive • Limited data collection • Prone to written errors and misinterpretation • Variable results from one technician to the next • Each STO starts from scratch 	<ul style="list-style-type: none"> • Results guided by STO objectives • Dropdowns and checklists eliminate handwritten errors and misinterpretation • Automated expert decision paths • Easy-to-read summary reports with recommendations spelled out • Consistent results produced across all personnel globally • Results saved from one STO to the next

Technology improves speed and accuracy, and supports informed decision making.

PLANNING FOR THE UNPLANNABLE

Better planning and improved processes are the masters of complexity. However, even the best up-front processes will never completely eliminate the unexpected. Discovery work is going to crop up, and an STO can fly off track in a hurry when a service partner discovers work that was not included in the original scope. Changing course to compensate for the unexpected leads to costly and time-consuming “makeshift solutions” that may, or may not, solve the problem. Meanwhile, resources must be redirected from other maintenance priorities, resulting in schedule conflicts, equipment shortages, and even the cancellation of discretionary upgrades. All the while, the plant is losing productivity—and profits.

Discovery work is perhaps the greatest hazard to the STO budget and schedule. Service partners should be able to articulate their plans for dealing with the unplannable. Emerson's approach to handling uncertainty is centered around its Mobile Service Center.

At first glance, a Mobile Service Center looks like an unassuming Emerson semi-trailer parked on the lot. Inside, it is a command center and inventory warehouse that is fully stocked with the parts and spare devices that are required to complete the planned—and unplanned—work. It's also a custom-equipped mobile workshop. Skilled Emerson personnel stand by, ready to repair or adjust instruments, and to assist with diagnostics and calibration.

Results of the focused walk down inform the inventory that is necessary for the planned repairs and upgrades. Based on decades of experience, Emerson also knows which additional supplies should be readily available to handle most unplanned needs.

And what happens if a replacement device or part isn't in the truck? The Mobile Service Center includes an on-site procurement desk, linking directly to the company's network of distribution centers. Eliminating the need to order through a third-party procurement agent saves valuable time. Distribution centers keep parts and products in stock and ready for urgent delivery. Depending on the plant location, most items will arrive within three days, and usually quicker.

The Mobile Service Center is an on-site inventory warehouse, workshop and procurement desk.

KEEPING SUCCESS WITHIN REACH

Planning is critical to keeping the STO on time and on budget, while meeting management's strategic objectives. A best practice approach to STO planning spans from front-end discovery through the final day of the actual event—and beyond. A review process reinforces the commitment to making each STO better than the one that preceded it.

Technology is elevating the ability to plan for supplies and focus work more strategically. Most importantly, when the work comes down to the wire, the ultimate advantage is having the products, supplies, tools and personnel that are required for a successful STO—as you've defined it—right within easy reach.

**For more information on improving your next shutdown,
turnaround or outage visit www.EmersonProcess.com**

Global Headquarters

Emerson Process Management

6021 Innovation Blvd

Shakopee, MN 55379, USA

 +1 800 999 9307 or +1 952 906 8888

 +1 952 949 7001

 RFQ.RMD-RCC@EmersonProcess.com

00804-0100-6114, Rev AA, September 2016



[Linkedin.com/company/Emerson-Process-Management](https://www.linkedin.com/company/Emerson-Process-Management)



[Twitter.com/Rosemount_News](https://twitter.com/Rosemount_News)



[Facebook.com/Rosemount](https://www.facebook.com/Rosemount)



[Youtube.com/user/RosemountMeasurement](https://www.youtube.com/user/RosemountMeasurement)



[Google.com/+RosemountMeasurement](https://plus.google.com/+RosemountMeasurement)

Standard Terms and Conditions of Sale can be found at
www.Emerson.com/en-us/pages/Terms-of-Use.aspx

The Emerson logo is a trademark and service mark of Emerson Electric Co.
Rosemount and Rosemount logotype are trademarks of Emerson Process
Management.

All other marks are the property of their respective owners.
© 2016 Emerson Process Management. All rights reserved.