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## Three Waves to Reliability Excellence (Rx)

*Three Waves to Reliability Excellence* is an established process for effectively implementing a reliability improvement strategy in manufacturing operations. This approach consists of proven maintenance, reliability and manufacturing fundamentals, planned and implemented by the local organization to provide the stability required to support manufacturing improvement initiatives. It relies upon unwavering corporate sponsorship and a well-planned and executed performance strategy implemented by the local operation, guided by qualified subject matter experts and coaches. The foundation of this methodology is a cooperative partnership between operations and maintenance in which operations owns asset reliability and maintenance is an equal partner providing prompt and effective skills, expertise and support.

LCE’s approach to implementing Rx consists of three waves that have been proven to deliver astonishing results:

Wave 1: Education and Communication

Wave 2: Assessment, Master Planning and Business Case Development

Wave 3: Master Plan Implementation, Measurement and Follow-up

### Wave 1: Education and Communication

The first wave focuses on providing the management and leadership team, union leadership and key stakeholders and participants with a common understanding of the concepts, strategies and activities required to achieve and sustain Rx. Activities include:

- Conducting initial strategic planning workshops
- Executive-level introduction to the principles of Rx
- Integrating reliability improvement initiative with the overall business plan
- Developing manufacturing objectives, goals and targets
- Establishing a cross-functional leadership team to sponsor the Rx program

In Wave 1, a high-level business case is prepared and communicated to executive management to gain sponsorship for the improvement initiative. Highly convincing business cases stress the competitive environment and external threats to the business. Executive management must provide the sponsorship and demonstrated commitment required to successfully move the initiative forward. This executive sponsorship, and only this executive level sponsorship, will provide the entire organization a compelling reason to change.

Educating the entire organization on reliability principles makes it clear that reliability – like safety – is everyone’s responsibility. Wave 1 education creates the expectation that everyone will participate in the process. It also makes connections between Rx and other processes that may be under way, such as TPM, 5S, RCM or Lean manufacturing. It’s critical to communicate that the Rx reliability improvement initiative is not a stand-alone new initiative but rather a foundation and enabler for other improvement processes.



The purpose of Wave 1 activities is to create awareness and the desire to set the stage for cultural change that must occur within the organization as we move further into the process.

## Wave 2: Assessment, Master Planning and Business Case Development

The second wave identifies key opportunities for improvement and creates a plan to maximize the return on investment from the reliability and business initiative. The objective of the assessment is to examine and evaluate current reliability processes and practices as compared to industry-accepted best practices. This analysis is used to build an Rx implementation Master Plan and a business case that supports the plan. Activities include:

- Identifying key opportunities using Rx assessment methodologies
- Identifying current asset problems where mitigation could self-finance
- Developing the Master Plan for Rx implementation
- Quantifying the business case for Rx implementation
- Establishing the change management structure required to support implementation

By using LCE's proven process our clients can determine how well they execute Rx best practices, identify the value associated with their application and determine the actions required to achieve sustainable improvements. Our process is based on a standard set of questionnaires that quantify approximately 650 attributes of the manufacturing operation including fixed assets, work processes, information systems and human resources. We align these attributes to the 29 elements of LCE's Rx Model and rate them against our database of Rx best practices. In this process we work with our clients to review and benchmark their organization's operational and financial performance. We partner with our clients to identify and prioritize improvement opportunities and use this information to develop the implementation Master Plan, along with the business case to justify the project.

This process addresses the operation holistically and promotes reliability throughout the organization. Although there are many activities that are primarily controlled by the maintenance organization, our experience has shown that a collaborative relationship between maintenance and other departments, such as engineering, production, quality, finance and regulatory compliance, is critical to success. The integration and interdependencies that exist between these other functions and maintenance can greatly impact the potential of Rx and overall business performance. Additionally, we have found that in order to achieve Rx, executive management must understand the value associated with reliability and actively participate in the cultural change and application of Rx best practices.

The many steps in the process – including data gathering, observations, on-site interviews, data analysis, planning and building the business case – increase awareness throughout the organization of the impact reliability can have on the business. Participation in the process facilitates organizational alignment as the future state becomes clearer and the stake each department/individual holds in the improvement process is defined. This alignment/buy-in is critical to the effective implementation of cultural and behavioral change associated with adopting Rx best practices.

Our experience executing more than 350 Rx assessments confirms that the process provides immediate benefits to the client's organization. In addition to building organizational awareness, alignment and buy-in, the process delivers:

- Widespread understanding of the current state of operations and the gaps that exist between the current state and Rx best practices
- Awareness of limiting factors and quick win opportunities
- Leadership commitment to the initiative
- A defined roadmap – the Master Plan – that will lead to the future state
- A cost/benefit business case that supports the financial justification to undertake the initiative
- The identification of prospective change agents who will actively drive and sustain the new organizational culture

The cost/benefit business case compares the projected financial impact of closing the gaps between current state and Rx best practices with the cost of implementing the Master Plan. In most cases, the ROI exceeds 10:1 and in a few cases it has exceeded 30:1. Addressing quick wins and limiting factors during Wave 3 has been proven to self-finance many implementations of Rx. Savings or cost avoidances generally come from similar areas in most plants – loss of product due to availability, rate or quality, maintenance spending, overtime, inventory investment, etc. Typically, gains from operating improvements range from 1.5 to 6 times more than gains from maintenance.

### Wave 3: Master Plan Implementation, Measurement and Follow-up

The final wave implements the Master Plan, including education on proper techniques, capturing quick wins, coaching on correct execution and establishing defined processes and effective measures of progress. Activities include:

- Establishing leadership and focus team structure to execute the Master Plan
- Providing Rx subject matter and leading change training to accelerate the design process
- Addressing limiting factors and infrastructure
- Supporting development of business processes with dedicated subject matter coaching
- Continually monitoring project progress against agreed-upon deliverables and time line
- Proactively managing culture change to ensure early adoption of new business processes

By implementing an Rx Master Plan our clients have recognized improvements such as **capacity increases greater than 45%, greater than 10% reduction in cost of goods produced, maintenance cost reduced by more than 30%, improved safety and regulatory compliance, substantial avoidance of capital investment and extended asset life.** These business improvements are

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the direct results of a change in culture combined with the application of Rx best practices. Reliability is achieved not only in the equipment/fixed assets, but also in the work processes, the information systems and organizational behavior.

There are a number of important roles in implementing sustainable Rx:

**Leadership Team** – The organization will only succeed in implementing meaningful change when management is fully committed to creating the environment to allow changes to occur and dedicated to its successful completion. Leadership is the key *and* the prerequisite for sustained change. The Leadership Team provides the direction for the overall change initiative and guarantees compliance with company policies, established change control procedures, and business directives. It should consist of no more than six to eight participants that represent a good cross-section of the local management team. These Leadership Team members define the objectives of the Focus Teams, reconcile the investment and return for the overall initiative and collectively have the authority to make decisions to eliminate any barriers identified during the master planning and implementation process. To ensure appropriate sponsorship, an Executive Sponsor should be identified to guarantee participation and input from executive management.

**Reliability Excellence Facilitator** – Selected from within the organization, this individual is dedicated to the Rx initiative for the duration of the implementation to keep all activities on track and guarantee the implementation's success.

**Focus Teams** – Consisting of six to eight participants, plus a subject matter Coach that provides training and change management facilitation, these teams develop detailed action plans for each specific element of the Master Plan. When action plans are agreed upon with the Leadership Team and coordinated with all Focus Teams, execution of the Master Plan commences. Each Focus Team serves as the “design” team focused on business process engineering, and supports the implementation of developed processes as internal coaches and subject matter experts. Team leaders need to be selected carefully to make certain they have the proper training and coaching to facilitate a cross-functional team.

**Support Team** – The Support Team provides resources – external consultants and coaches, vendors, accounting, human resources – to the Focus Teams as required. These individuals are not full-time participants but are identified and available, when needed, for consultation and communication with the Leadership and Focus Teams.

The number of Focus Teams depends on the identified Master Plan subject matter and the magnitude of work within each work stream, and will heavily influence the duration of the change initiative. Time required for Leadership and Focus Team participants during master plan development and implementation range from 10% to 15% for Leadership Team members, 25% to 30% for Focus Team leaders, 20% to 25% for Focus Team members and 100% for the Reliability Excellence Facilitator. All Focus Teams are commissioned in parallel to ensure a holistic solution, and remain active until all elements of the Master Plan are fully implemented.



Establishing the ownership of reliability is fundamental to the *Three Waves to Reliability Excellence*. It is very similar to your automobile. Who owns its reliability? Is it your mechanic or the dealer? No, ownership lies with the driver or operator. Operators live with plant equipment day in and day out, much like the driver of a car. Good operators have an inherent feel for when their equipment's performance begins to deteriorate or is in jeopardy. When you create ownership by operations for their equipment, the desire to fix it before it breaks or fails increases. If maintenance becomes a true partner, then both operations and maintenance have an increased desire to do what's best for the equipment/line/plant. "Fix it right to avoid the failure," replaces "Fix it quick and hurry up to get it back on line."

Just as effective leadership and communication are critical to a successful Rx implementation, so they are critical to sustaining the changes that have produced results – reliable equipment and processes that support all other improvement initiatives and ultimately drive stronger and more competitive business performance.

### **About Life Cycle Engineering**

Life Cycle Engineering (LCE) provides consulting, engineering, applied technology and education solutions that deliver lasting results for private industry, the Department of Defense and other government organizations. The quality, expertise and dedication of our employees enable Life Cycle Engineering to serve as a trusted resource that helps people and organizations to achieve their full potential. Founded in 1976, LCE is headquartered in Charleston, South Carolina with offices across North America and experience around the globe.

