



RENAISSANCE RELIABILITY

“Manufacturing Enlightenment”

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The RESH Declaration

KEY TERMS & DEFINITIONS

RESH – is a manufacturing concept that establishes **Reliability** as a manufacturing core value alongside **Environment, Safety and Health (ESH)**. **RESH** is a cultural innovation designed to improve production results by eliminating risk and increasing total manufacturing effectiveness through holistic, value-based analysis, evaluation, and decision making.

Cultural Innovation – a timely reimagining of cultural norms, artifacts (tools, doctrine, etc.), language, and value systems that increases the team’s probability of long-term success.

Business & Manufacturing Processes (B&M) – any activity or set of activities that accomplishes a specific *organizational* goal.

Compromise – accepting standards lower than desired.

Cooperation – the process of working together towards the same end.

Declaration – a formal document specifying a cause of action, including the facts necessary to sustain that cause of action.

Renaissance – a revival or renewed interest in something.

Reliability – the probability that an asset will perform its given function without failure over a designated time.

Renaissance Reliability – a renewed interest in the art and science of reliability and reliability culture.

Dear U.S. Manufacturers,

Please allow me to introduce RESH: the future of American Manufacturing. RESH is a culturally innovative concept that generates a renewed interest in reliability culture by establishing Reliability as a manufacturing core value alongside Environment, Safety and Health (ESH). Companies that possess the foresight and courage to fearlessly reimagine manufacturing and accept reliability as a core value will enjoy a distinct competitive advantage over their competition and realize great value.

RESH was out of a sense of duty to the American Manufacturer.



Respectfully,

William "Bill" Leahy
Chief Executive Officer
Renaissance Reliability, LLC.

RESH MANUFACTURING

At the most basic level, manufacturers must focus on five factors to make decisions and deliver results:

1. *R* - Reliability
2. *E* - Environment
3. *S* - Safety
4. *H* - Health
5. Business & Manufacturing (B&M) Processes

RESH elevates Reliability as a core value alongside Environment, Safety, and Health.

OUR CHALLENGE

We believe one of the greatest threats to American Manufacturing is the company's willingness to *compromise* the performance of one department to ensure the success of another, in lieu of facilitating *cooperation* between departments to ensure achievement of the company's unified vision and goal. Regardless of which side is prioritized, this dynamic of compromise over cooperation undermines all aspects of the *RESH* equations; production, maintenance, ESH, and profit are negatively impacted.

The phenomenon of compromise over cooperation is not new in industry, and the costs incurred by this culture is why world class manufacturers use cross-functional metrics to accurately assess their performance. The considered variables cannot be looked at in isolation, but rather require cooperative attention for the company to meet its objective(s). Focusing on any one variable, or

an incomplete combination of variables, compromises results. The implications of compromise over cooperation can manifest in several ways; for example:

Production-centric organizations routinely overvalue throughput and defer critical maintenance activities, resulting in more frequent, costly, and often dangerous emergency breakdowns.

- **Cost of being unreliable:** According to Fortune Global 500 (FG500), unplanned downtime costs manufacturing and industrial firms nearly \$1 trillion per year year.¹
- **Cost of being unsafe:** The National Security Council estimates that work-related deaths and injuries cost the nation, employers, and individuals \$171 billion in 2019 (pre-COVID).²

Maintenance-centric organizations overvalue reliability and protect it by over maintaining equipment, which is costly in both lost production time and expense of non-value-adding maintenance.

Unfocused organizations struggle to find direction without a guiding vision, leading to poor planning, uncertainty, and costly consequences.

- **Cost:** April 17, 2013, an explosion at a fertilizer storage facility in West Texas exploded, killing 12 first responders and three civilians, while injuring 260 others. The company had been dropped from their insurance the previous year because of *deferred maintenance*, identified by the insurance company. The subsequent insurer did not conduct an inspection.³

OUR SOLUTION

Cooperation over compromise, one of the fundamental tenets of *RESH*. Compromise requires one party, or some combination of parties, to sacrifice their objectives for the benefit of another. Conversely, cooperation is the consolidation of efforts to achieve the collective's goals. By implementing cooperative B&M Processes and sound metrics, *RESH* Manufacturing decreases costs and boosts profitability. *RESH* Manufacturing requires a cooperative commitment to the company mission, as well as a clear understanding that such commitment requires continuous adjustments, because though *conditions change, standards do not*.

In environments often punctuated by an endless carousel of initiatives, meetings, and other indirect activities it is admittedly difficult to maintain focus. However, the key to remaining on-

¹ Niall Sullivan. "Almost \$1 trillion: the staggering cost of unplanned downtime to major manufacturers", *Senseye – A Siemens Business* BLOG post, June 30, 2021. Accessed November 01, 2022; <https://www.senseye.io/blog/the-true-cost-of-downtime>.

² Occupational Safety & Health Administration, "Business Case for Safety & Health", *United States Department of Labor* website, accessed November 01, 2022; <https://www.osha.gov/businesscase>.

³ US Chemical Safety & Hazard Investigation Board, "CSB Business Case for Safety – Explosion at Fertilizer Storage Facility (West, Texas) April 17, 2013". Finding report, January 28, 2016. Available through; http://www.idevmail.net/assets/chemsafety/CSB_Business_Case_for_Safety_01.pdf

mission and upholding the company vision is through closely monitored, cooperative B&M Processes and metrics, which we conceptualize in the *RESH* Manufacturing Equation (RME).

THE *RESH* MANUFACTURING EQUATION (RME)

The RME is a mathematical representation of the relationships between the elements of *RESH* (Figure 1). It states that improvements in B&M Processes yield inherent improvements in Reliability, Environment, Safety & Health, thereby increasing ROI. To succeed in manufacturing, we need to cultivate and balance the five elements of *RESH*: before decisions are made, the consequences of those decisions for *Process, Reliability, Environment, Safety & Health* must be understood and controlled through the RME.

Cooperation is the only way to maintain a well-balanced RME, and the results of a well-balanced RME are undeniable, as are the consequences of ignoring them.



Figure 1: *RESH* Manufacturing Equation

THE CURRENT STATE OF INDUSTRY

The RME is not well-balanced for the majority of U.S. Manufacturers. Over the past 50 years industry conditions have changed dramatically. In 1970 and 1971 President Nixon established the EPA and OSHA to provide protections for ESH. Nixon’s timely reimagining of the value system is an example of cultural innovation. His timely actions justifiably expanded the U.S. Manufacturing value system, and we believe that time has come again. But it cannot be the president that steps up. It will require executive leadership to invest in more than just parts and labor, they must invest in reliability culture.

The business case for ESH is both undeniable. As such, ESH competes for resource control in ways that Reliability cannot. This biased advantage for ESH was furthered by Nixon promoting three (3) out of five (5) RME factors to levels requiring government agencies to ensure regulatory compliance. This is the type of reinforcement or incentive needed to secure a spot on the agenda of every U.S. Manufacturer’s Senior Leadership Team.

Unfortunately, Reliability remains underrepresented, resulting in uninformed decisions and unintended consequences that occur time and time again. The scenario in Table 1 (pg. 5) is a representation of one such decision.

Issue	Options	Result
<p>Did not meet production goal for the week and needs to catch up. However, the only time to complete scheduled corrective and preventive maintenance is each weekend during a 36-hour window. Additionally, asset calibration and cleaning are completed during this time, and historically “contamination” is the leading cause of downtime and environmental risk.</p>	<p>DECISION MADE:</p>	<p>Production goal met</p>
	<p>Defer weekend maintenance to complete run.</p>	<p>Decreased profit due to the excessive cost of emergent work (6x more expensive than planned work)⁴</p>
		<p>Increased risk of injury due to unmanaged cleaning and calibration of machinery during operation</p>
		<p>Increased risk of environment fault due to unclean operating conditions.</p>
		<p>Decreased reliability due to poor quick fixes</p>
		<p>Reduced workforce morale due to forced overtime for operations.</p>

Table 1: Manufacturing decision making scenario

If your natural inclination is to run, run, run, your company will never escape the pre-1950’s “*fix it when it breaks*” manufacturing model, which is expensive and ineffective. Success is dependent on making the business predictable. Accordingly, with every decision or prospective decision, the team must ask: “how does this affect the RME?”. This type of transparency improves cooperation between departments and stimulates coordinated planning efforts that will boost ROI.

The best companies in the world foster partnerships between departments. Maintenance, Operations, ESH, and all other departments are respected and represented in the coordination of activities. This requires accountability, trust, and a notable leadership effort to accomplish. By establishing a *culture of cooperation* one can build a manufacturing team that focuses on the collective goals of the company, instead of on potentially divisive self-interests.

Case Study

A former client had four identical grinding and polishing machines that were plagued with recognized, measured, and consistent systemic failure mode. The most notorious issue was the premature failure of a small air motor. A single motor cost \$1,400 and should last years. The company was replacing up to 12 per month, resulting in up to 576 hours of collective downtime. This may not sound like a lot; however, considering direct labor usage, overtime, contractors, scrap, reduced capacity, reset, start-up, idle operators, and customer service risks, the true cost of one hour of downtime is significant. In the automotive industry one hour of downtime on the line costs \$1.3 million.

This is inexcusable and occurs by choice – not by chance. The client has a fifth machine that serves the exact same function, is from the same manufacturer, and is maintained and operated by the same team as the other four. However, it is not plagued by the same issues because of a slight design modification that eliminates the need for air motors. At a conversion cost of \$250K it would take less than one year to achieve 100% ROI for this conversion.

⁴ Tom Wilcock, “Getting it just right. Pros and cons of preventative maintenance”, *Expansive*, December 01, 2020; accessed December 14, 2022; available through <https://www.expansivefm.com/latest/preventative-maintenance>.

The rationale for not updating the equipment is inter-department politics and budgeting. Fixing the motors comes out of the maintenance budget, while reconfiguring the machine comes out of the production budget. Production was unwilling to make the modification, putting the burden on maintenance to respond in costly fashion. Ultimately, the company was making unintelligent business decisions because of an unbalanced application of the RME that pitted complementary departments against each other.

CONCLUSION

The current state of the RME in U.S. Manufacturing is biased because we are conditioned by norms, systems, policy, and ignorance to focus on only a few components of the RME. The solution is a cultural innovation, incorporating Reliability through collective, goal-oriented strategy. Cooperation and trust between contributors leads to good *RESH* performance. Reliable equipment does;

- ✓ does not leak hazardous material to the ground.
- ✓ does not require middle of the night emergency work in dangerous conditions.
- ✓ protects the people that operate and maintain it.
- ✓ protects the environment.

Through an understanding of the RME leaders can identify the best leading Key Performance Indicators (KPIs) to create, understand, and support the corresponding Business & Manufacturing Process that will deliver results. And, by cooperatively incorporating Reliability into industry core values and adopting the *RESH* mindset, we balance the five factors of the RME. With a balanced RME, profit – the ultimate Key Performance Indicator – naturally follow.

Profitability is the ultimate lagging Key Performance Indicator (KPI) – the goal of every business is to make money. Through an understanding of the RME leaders can identify the right leading Key Performance Indicators (KPIs) to create, understand, and support the corresponding Business & Manufacturing Process that will deliver results.

U.S. Manufacturing has been the world's manufacturing vanguard for generations. However, we can no longer be complicit in the industrial level of wasted resources if we wish to hold onto our competitive advantages.

In U.S. Manufacturing we do not have a resource issue, we have a resourcefulness issue. We have the talent and tools, but we lack an understanding of the bigger picture. The *RESH* Manufacturing Equation is not simply a solution, it is a conceptual lens to observe the world through, in order to cultivate the best possible solutions and deliver the best collective results for your company.

Together we can Protect and Advance MADE IN AMERICA prestige. Connect with us at rtwo.info today to learn more about how we can move forward together.

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Respectfully,



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