

## World-Class Simplicity—from the 14<sup>th</sup> Century

“World-class simplicity,” a term that we coined in 1996 to describe what a top NASCAR race team was doing to achieve the highest levels of performance and reliability, is based on the teachings of a 14<sup>th</sup> century English logician and Franciscan monk, William of Ockham (1285-1349). “Occam’s razor” in part states that *the explanation of any phenomenon should make as few assumptions as possible*. The principle is also known as “the law of parsimony,” “the law of simplicity,” or just plain “keep it simple.” William of Ockham’s 14<sup>th</sup> century thinking and writing, considered to have laid the groundwork for modern scientific inquiry, makes sense for today’s maintenance and reliability.

Our world of maintenance and reliability, manufacturing reliability, and lean production systems often becomes unnecessarily complicated, confusing, fragmented, and costly. Numerous activities and attempts to improve performance are often based on opinions, assumptions, and gimmicks rather than objectivity, evidence, and facts. Unfortunately, improvement programs requiring “a leap of faith” sometimes prevail over fact-based, simple solutions. Too often, complex solutions are developed to address relatively simple problems (“accidental complexity”). But sometimes “simple solutions” will not adequately solve complex problems as well as more complex solutions (“essential complexity”).

Now is the time to seek “world-class simplicity” as a response to the exponentially accelerating rate of global competition since the 1960s—Japan, then Korea, then Taiwan and Mexico, now China and India. In an era of growing skills shortages, the nation that embraces “world-class simplicity” of their advanced manufacturing systems and equipment reliability will always be on top.

The American manufacturing machine has demonstrated its awesome capability for more than a century. Our ability to anticipate, to innovate, to think outside the box, to be flexible, and to respond quickly to market and customer demands made our nation and our economy strong. Today, foreign competition, outsourcing, and offshore manufacturing are becoming all too common. However, more and more businesses are finding out that outsourcing to low-labor-cost countries is not a benefit when delivery times are slower, domestic inventory levels are higher, defects are more difficult to resolve, and lead time to make improvements is huge and costly. Accidental complexity?

We must get back in step with our heritage of a well-trained workforce, experienced leadership, focusing on results, using the right tools, and doing things right the first time. Unfortunately, by overcomplicating our systems and processes without fully paying attention the basics first, we can become less productive. History shows that we know how to improve our plant performance and our equipment reliability. But we have to make a conscious effort to do it now. And we can do it!

Think about it: Why is it that an American workforce in 27 foreign auto plants and hundreds of suppliers operating in the U.S. can out-produce the traditional “American” auto producers and suppliers? Why is it that many of our traditional manufacturing plants

in many industrial sectors are over-capitalized and grossly underutilized, operating flat-out but only at 50 percent efficiency because of quality issues, unreliable equipment, inefficient work methods, old work rules, and complex manufacturing processes? Modern maintenance and reliability methods and advanced manufacturing practices (such as Lean) are challenging the inertia of the past, the “we’ve-always-done-it-that-way” syndrome, and industrial folklore. Many times, the old ways win out because the new ways appear overly complicated or actually are over-complicated.

The principles underlying the Toyota Production System, Lean Manufacturing, Total Quality, and Total Productive Maintenance are all based on the principles of “world-class simplicity” and not on assumptions or accidental complexity. Beware of the “tool heads”—the purveyors of the tools, the silver bullets, and the cookbook approach to reaching world-class levels of performance. If proposed solutions require a leap of faith, are not focused on fast and sustainable results, back away. Assess the facts. Define the problem, seek the simplest solution and then try it. Measure the results. If it works, learn from the new solution. Leverage the new solution and the processes that got you there to improve other problem areas. World-class simplicity!

Leonardo da Vinci (1452–1519) stated, “Simplicity is the ultimate sophistication.” Albert Einstein (1879–1955) said, “Everything should be made as simple as possible, but not simpler.” A modern explanation of the 14<sup>th</sup> century Occam’s razor states, “If you have two equally likely solutions to a problem, pick the simplest.” Yet another states, “The explanation requiring the fewest assumptions is most likely to be correct.” In other words, **“If you hear hoof beats, think horses—not zebras.”**

Likewise, **when your competitive advantage slips, look at your maintenance, reliability, and manufacturing processes, not outsourcing.** World-class simplicity!

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Robert M. Williamson  
Strategic Work Systems, Inc.  
Columbus, NC 28722  
RobertMW2@cs.com  
www.swspitcrew.com