Asset Performance Networks

New Best Practice to Deliver Predictably Competitive Turnaround Results

By

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The days of plant turnarounds being considered a natural extension of the site's maintenance cycle are long gone. Many in the Petrochemical, Refinery and Energy industry today can recall this period, where a turnaround, regardless of complexity or significance was approached merely as a "necessary part" of the assets life, minimal time was spent preparing, the concept of optimization was reserved only for business feedstock planning, and the use of tools or technology over and above a "Big Chief Tablet" schedule and a field supervisors' pocket notebook was unheard of.

During this period, often referred to as the "just do it" era, it was commonplace for a turnaround to be considered "successful" and it was only labeled a "failure" as a result of a fatality. Of course, back then success was very loosely defined, schedule and cost targets were highly achievable, safety performance was the result of reactive incident management, environmental regulations were drastically less restrictive, and reliability metrics were insignificant and rarely met.

In current day business environment where optimistic margins are expressed in single digits, the ability to predictably deliver competitive turnaround performance is essential. With few exceptions, the industry now includes turnarounds as an integral component of the short and long range business planning process. Today's turnarounds are complex events that require entire plant cooperation and focus and involve work scopes that far exceed the traditional maintenance jobs of the "just do it" era. Today's turnaround work scopes are often dominated by reliability and environmental improvements, plant expansions and debottlenecks.

In addition to best-in-class cost and schedule targets, today's turnarounds are exposed to extremely challenging safety, environmental, operability, quality and even community affairs targets. Today's turnarounds are expected to deliver step change performance with each cycle. In order to endure the "*natural selection*" phenomenon, effectively adapting to external influences and continuously improving are the difference between thriving business margins and desperate survival.

Industry pressures have transformed yesterday's competitive advantages into today's minimum standards of performance. The ability to institutionalize change, while implementing state of the art tools, is the proven key to improved performance. These conditions are not isolated to turnarounds or even our industry…

The auto racing fan may remember when in 1961 AJ Foyt averaged 139 mph to win the Indianapolis 500 race in a time of 3 hours, 35 minutes and 37 seconds. Then in 1977, the same team won the same race in a mere 3 hours, 5 minutes and 57 seconds averaging 161 mph. Remarkably, in the short time period of 16 years, Foyt's team was able to improve the standard of success by nearly 15%.

In 2006, the Indy 500 team driven by Sam Hornisch, Jr won the same race in 3 hours, 10 minutes and 59 seconds, averaging 157 mph… 5 minutes longer and 4 mph slower than the performance of Foyt's team almost 30 years prior. This is indicative of the many restrictions and limitations that have been imposed since the late 1970's. For reasons dominated by safety precautions and environmental efficiencies, new regulations and prohibitions, race teams have had to discover and implement "game changing" improvements in order to maintain the standard of performance!

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Our industry also faces many types of regulations, restrictions and constraints that require the same type of response in order to merely maintain a minimum standard of performance. The industry's turnaround performance statistics show that there is still significant improvement required to achieve predictably competitive turnaround results. In particular…

- 83% of turnarounds do not satisfy all performance expectations; and
- 1 in 4 turnarounds significantly under-perform in more than one success criteria dimension; and are deemed a failure (or "train wreck").

Referring to Figure 1, the average high complexity turnaround exceeds cost and schedule targets by more than 20% with a range of predictability that is +/- 30-40% around the mean.

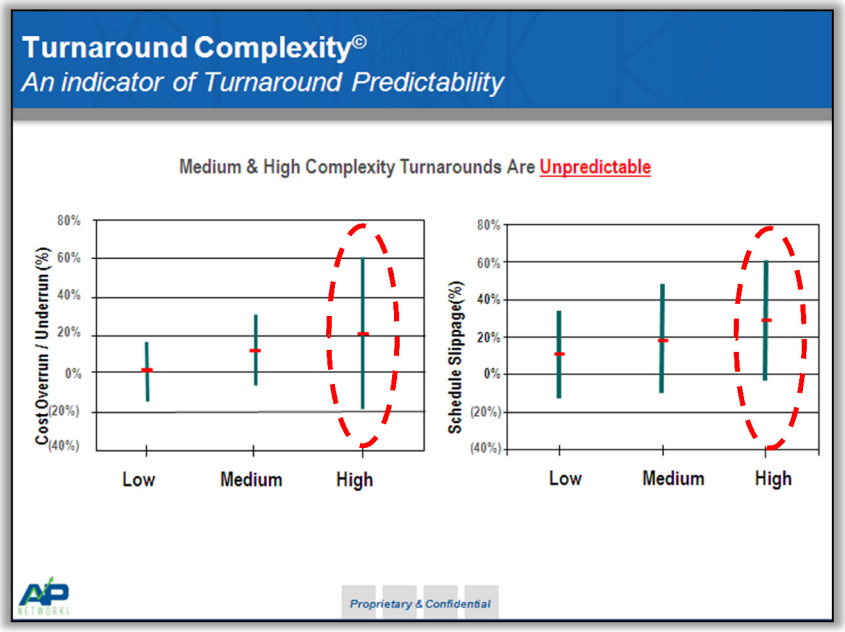

Figure 1

***Note**: AP-Networks' proprietary Complexity Calculator© tool defines turnaround complexity as a function of turnaround man-hours, amount of project capital work and turnaround interval.*

The main reason for this type of performance is that many in the industry simply are not ready to execute the high complexity turnaround. They have not applied the rigor, focus nor attention to detail during the preparation phases to achieve an optimal state of readiness. As shown in Figure 2, there is a strong correlation between a turnarounds' state of readiness and turnaround outcomes. In particular, turnarounds that deploy the industry's best turnaround preparation practices are able to achieve high levels of readiness, as measured by AP-Networks' Turnaround Readiness Index (*TRI*©). An optimal TRI© increases not only the probability that a turnaround will achieve its' targets, but also that it will perform better than others in the industry relative to cost and schedule outcomes.

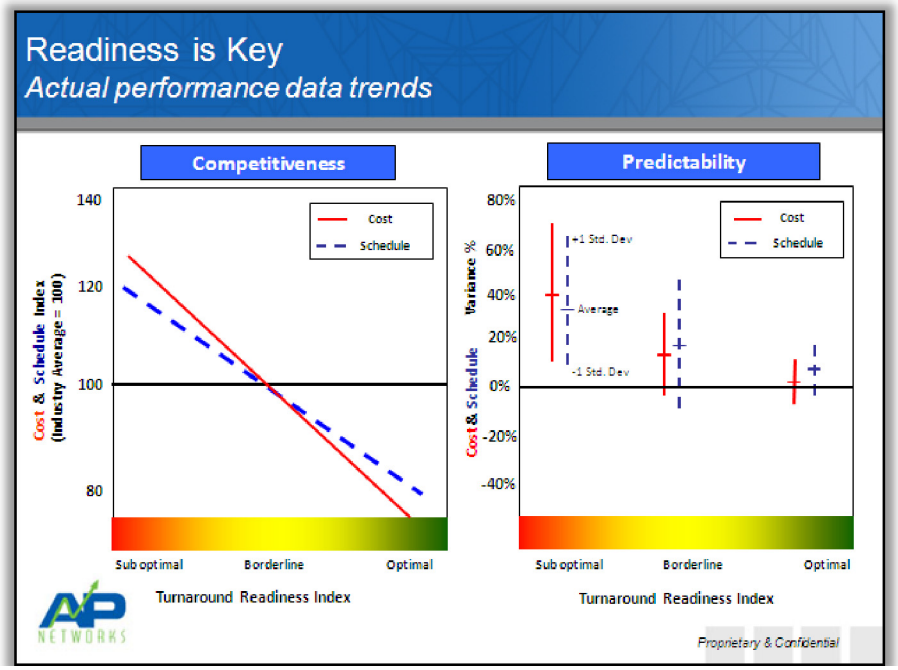

Figure 2

The concept of preparing for a turnaround is not the problem, as nearly every turnaround has an execution plan prepared for it. The problem is the deficiencies that exist in the quality and attention to detail necessary to complete a turnaround preparation effort that results in an optimum level of readiness. This is the paramount issue facing the turnaround industry today, and its solution involves the following:

1. establishing the preparation expectations;
2. providing access to the industry's best practices;
3. developing and following a turnaround preparation "Road Map"; and
4. driving a disciplined approach.

The combination of the first two aspects is commonly addressed through the definition and application of a Turnaround Work Process. Many in the industry have expended enormous organizational focus and effort in recent years to produce a corporate turnaround work process. In some industry sectors "the pendulum" is swinging back after 10-15 years of decentralization; but all segments seem to be transitioning to a corporate center of expertise, which includes capable organizations embodied in a work process-driven culture.

Documented in many different formats and levels of detail, the large majority of turnaround work processes contain an appropriate set of the key elements required to assure an average state of readiness. However, many of these processes, even the most comprehensive, fail to deliver optimal states of readiness for one primary reason… poor implementation!

Implementation of a work process comprehensive enough to define all the aspects of preparing for a high complexity turnaround requires more than just a process manual, a training course, and formal rollout to be successful. It must be institutionalized into the fabric of an organization's normal way of doing business. In today's industry, where

organizational styles vary from matrix, self lead structures to the command and control of yesteryear, the ability to weave the work process deliverables into the natural work group teams' everyday life requires a deliberate strategy complimented by tools that work in concert with today's world.

This is the newly emerging practice in the industry… a tool with the capabilities to define the requirements, provide access to an evergreen set of recommended practices, layout the roadmap of preparation phase milestones and activities, and produce real time reports to gauge actual progress vs plan to drive organizational accountability. Beyond simply the process manual, the set of milestones, and the series of forms; this new tool is able to successfully deliver an optimum state of readiness by "bringing the work process to life."

This new tool takes the current industry practice commonly known as a "Plan to Plan" to such a different level that it would be like comparing a 1984 IBM PC to an IPod. This newly emerging practice enables significant organization capacity increase and a subset of its features are shown in Table 1 in comparison to today's typical "Plan to Plan" practice.

Table 1

Feature	New Practice	"Plan to Plan"
Defines the individual persons and functional teams responsible for completing each preparation activity	Yes	Many
Auto generates due dates and optimum start dates for each preparation activity	Yes	Some
Auto creates world-class turnaround preparation plans utilizing a corporate (or the industry's best) work process	Yes	Few
Contains a hierarchy that relates individual preparation activities to milestone completion within the framework of a phased and gated work process	Yes	None
Provides e-mail notification for critical activities that are upcoming, overdue, or complete	Yes	None
Uses predefined profiles to differentiate users from administrators to limit edit rights	Yes	None
Provides linked access to best practices, job-aids, and recommended deliverables to drive consistent turnaround preparation	Yes	None
Contains real time dashboards showing progress vs plan with drill down capability for one turnaround or for a portfolio of turnarounds	Yes	None

Aside from formal governance programs that provide formal assurance and diagnostic intervention a few times during the preparation cycle, the majority of the industry today progresses through the preparation phases of a turnaround with minimal (to no) tracking of status. They are basically operating on the assumption that each deliverable will be met, each document will be produced and each person will meet the

expectations set forth in their turnaround work process. And although to date this has been acceptable, the deficiencies of this approach are comparable to executing a high complexity turnaround without the capabilities and reporting of a comprehensive scheduling program. Imagine managing the execution of a 250 khr, 35-day turnaround with no progress s-curves, no understanding of earned value, no indication of critical resources, no way to proactively counteract productivity issues, no ability to run schedule contingency scenarios, no real information to forecast completion.

Considering the required pace of change of the industry, especially as it pertains to turnarounds, practices that will increase the capability of an organization, and hence the sustainability of a business, must be quickly adopted. This newly emerging practice that figuratively "brings the turnaround work process to life" is consistent with internal initiatives to improve ROCE and leverage corporate knowledge to do more with less.

Distilling the message into to the basic building blocks of success, predictably competitive turnaround outcomes are directly correlated to an optimum state of readiness, which is produced when high performing teams actively participate in the deployment and execution of best turnaround practices. The emerging practice described within this paper promotes just that by illuminating multi-functional interaction to enable organizational discipline and drive accountability to deliver according to a work process driven culture.

Unlike the opinions of many racing fans, the "game changing" improvements of the past 30 years consist of a combination of human performance enhancements and the remarkable capacity to adopt change. In fact, the auto racing industry's capacity for adapting to change has been the topic of several research studies in the last decade.

A race victory today is the result of flawlessly executing the many details of a comprehensive race strategy. Today's race strategies are laser focused and include specifics that years ago were merely dreams…

- a machine tuned to exact specifications to maximize performance based on the unique conditions of each track;
- a carefully calculated pit strategy that optimizes many factors (like rate of fuel consumption, weight of fuel, desired cornering speed, length of pit row, tire wear, etc) to deliver the shortest theoretical race time;
- uniquely selected tires to maximize traction;
- highly trained pit crews with defined and practiced responsibilities;
- clear lines of authority and communication supported by documented contingency plans to adapt to the never-ending changing conditions of a race.

Our industry must embrace change with the same rigor and zest as a race team; where effectively adopting change is mission critical and used to catalyze the discovery of the next technological advantage that will maximize the industry's ability to improve. The new practice described in this paper will redefine turnaround preparation methodologies and enable any organization to predictably reach an optimal state of readiness, and hence increase the probability of delivering a successful turnaround performance.

About the Author

Bobby Vichich is Vice President of Turnaround Professional Services at AP-Networks. AP-Networks is a global project and turnaround solutions implementation consulting firm with offices in Bethesda, MD., Houston, TX. and Amsterdam, The Netherlands. Since joining AP-Networks, Bobby has consulted on hundreds of turnarounds with many of the largest integrated petroleum and chemical companies in the world. Bobby has earned a recognized standing in the industry as an expert in turnaround management strategies, work process definition and best practice implementation. Prior to joining AP-Networks' executive management team, Bobby fulfilled various planning, scheduling, controls, execution leadership and management roles on major turnarounds with ExxonMobil and Lyondell. Bobby has chaired and presented at the industry's leading conferences, and is a leader in the development of breakthrough best practices for the turnaround community. Bobby holds a Bachelor degree in Engineering from Virginia Tech.