Shutdowns, Turnarounds, and Outages the Pit Crew Way

The secret—and not so secret—methods of motorsports racing and their pit crews can provide some invaluable insights for plant shutdown, turnaround, and outage (STO) maintenance. People, machines, plans, schedules, parts, supplies, and so much more all have to come together in short periods of time to accomplish specific maintenance and repair tasks during pit stops. While a race team’s pit crew is considerably smaller than the STO teams in our plants, many of the same principles and methods apply. Let’s explore.

Several years ago, I was asked to observe a 24-hour STO in a paper mill from a pit crew perspective and offer suggestions. Here’s the story.

Ready …
I arrived on site two days ahead of the shutdown to review the plan and schedule and inspect the targeted equipment and facilities. The overall STO planning team was comprised of team leaders from the many different sub-teams, each with specific work packages to accomplish, had been working off-and-on for six weeks on a master plan for the STO event. During the STO planning process, some of the sessions proceeded with substitute representatives or absences. But any of the known gaps were ultimately resolved during the final planning session.

The teams’ plans and schedules all rolled up into the master STO plan and schedule that was posted on the walls of the “war room.” Cross-team sequencing, overlapping activities, access to special equipment were all worked out in the planning sessions.

Set …
Armed with the final STO plan and schedule, the work package planners had been issuing work orders, ordering parts, materials, and supplies and lining up contractors. A marshalling area had been set up for the support equipment. Materials and parts were being assembled into kits, along with the associated work orders and necessary documentation. Work packages, plans, and schedules were distributed to various project teams for their preparation.

Meanwhile, work package team leaders focused on their parts of the overall STO schedule, communicated to their team members, and made sure their parts, supplies, and special tools were staged and ready.

Go!
At 6:00 a.m., the shutdown work began. Nearly 200 people grouped in smaller task teams descended on the plant. Work appeared to be going smoothly. Team leaders were gathering their teams in front of their posted plans and schedules. Work packages were assigned as planned. Last minute questions were clarified.

Problems started to surface about two hours into the shutdown. The operations team had turned the power off and locked out the machine while a maintenance team needed the machine powered up to move a major component into position. A heated debate ensued. Two teams’ work came to a halt.
Schedules were consulted, and the overall STO project leader was invited to referee the dispute. Work was interrupted for one team while the other team performed their powered up tasks. The operations team had developed their own project schedule that conflicted with the maintenance schedule.

Later, it was discovered that the operations project team leader was not in most of the STO planning sessions. This was a “maintenance shutdown after all,” he said. “We thought we could accomplish some of our tasks during the shutdown.” The operations team was not pleased that their work plan had been compromised.

**The Checkered Flag**

As the 24-hour shutdown neared the 20-hour mark, some of the smaller project teams began wrapping up their work. Several team members shifted to other project teams to assist as planned. Other project teams’ work packages were in the final stages and on schedule, with no surprises to speak of.

Then, at hour 22, a major problem surfaced. The electrical contractor work package was running far behind schedule as the contractor completed a major tie-in project that began before the shutdown.

The electrical project engineer advised the STO leader that the contractor work would take another four to six hours to complete. Several short delays occurred while the contractor waited for other teams to provide equipment access and support. We would learn later that while their work package timeline appeared in the overall STO master plan and schedule the contractor had not been involved in the STO detailed planning sessions.

**The race to the green flag**

While the STO project cited here initially had all the appearances of a well-oiled machine, there were disconnects in leadership and communications focused on common goals. Whether in motorsports racing or STO projects, these are some of the most common problems. A plan only works when leadership at *all levels* is aligned and communicating from a common perspective focused on common goals. In this STO case, the common perspective was the integrated master plan and schedule that embodied the common goals. Obviously, the operations and contractor’s team leaders were not fully integrated with the goals of the master plan and schedule.

Motorsports race teams have a more holistic view of their work. For the racecar to be successful, every person, every group, everyone who touches the racecar or makes decisions that affect that car must consider how their work and decisions affect the work of others.

Every race fan perceives the race as ending with a checkered flag. The winner crosses the finish line first. From the race team’s perspective, the thought “if we can’t finish, we can’t win” permeates their work. To accomplish this, the racecar must arrive at the track ready to race and ready for efficient and effective pit stops. Think of it as a race to the green flag.

The design engineering of the racecar and its components have to be aligned with the goals and expectations of the race team’s business goals. The racecar must be “pit-able.” In other words, in
addition to being designed for performance and reliability, the racecar must be designed to enable routine pit stops in record-setting times. Engineering teams, build teams, shop teams, and the pit crew members must all be aligned toward common goals ensuring a high-performing and reliable racecar.

Pit stops are planned maintenance downtime for the most part. Any of the work that can be done in the pit stall on pit road has been planned. Every team member, the pit crew, crew chief, and pit support have trained, practiced, and drilled—they know what to do and how to approach the work. All of the needed parts, tools, and supplies must be at hand.

Pit stops and STOs while focused on a major piece of equipment are more about the people (teamwork and leadership) than about machines. Efficient and effective pit stops as well as STOs begin with designing and modifying the equipment to make it maintainable. Then, thorough planning and scheduling becomes the master plan for winning the race.