Ken Bannister, Contributing Editor Arguably the most important of all manufacturing intracorporate partnerships, the relationship between production/operations and maintenance is often a bittersweet accord, in which both teams continually struggle to define their roles. For those who do manage to do so and build a working relationship, the results are often no less than spectacular, being recognized as one of the major hallmarks of a world-class organization.

In order to synergize energy and work together as a unified manufacturing team, both maintenance and production/operations must realize and accept the fact that"maintenance is as integral to the production process as production is to the maintenance process." This statement underpins all of today's major management methodologies, including Total Productive Maintenance (TPM), Reliability Centered Maintenance (RCM), Total Quality Management (TQM), ISO 9000, Six Sigma, etc.. The premise is simple in that to achieve maximum equipment availability and reliability, maintenance must be proactive and work with operations to develop an engineered maintenance approach that respects operations' need to deliver high-quality product at a consistent rate of throughput. This calls for development of a reliability program in conjunction with the operations team, as opposed to the old approach of building a preventive program in isolation and expecting operations to cooperate without understanding the maintenance process or position.

Maintenance has traditionally been poor at communicating the why and the how of the maintenance process, and is typically considered to be ignorant of operations' needs. Building a combined proactive approach to reliability allows operations to understand why equipment needs to be monitored and maintained on a regular basis. At the same time, maintenance learns to appreciate problems from the operations side.

Examining the typical complaints from both partners' perspective can lead a workable

approach that allows both departments to focus their efforts on the equipment's ability to produce consistent product without taxation.

The following represent the top complaints voiced by both maintenance and operations:

1. Operations: "*A machine is only broken when it can't produce parts anymore!"*
Maintenance: "*Operations will only hand over equipment for scheduled maintenance once it dies."*

Solution…
Defining failure is the first task in building a reliability- based approach to equipment management. In TQM and RCM, the key performance measurement for success is Overall Equipment Effectiveness (OEE) that views the relationship of equipment availability, rate of manufacturing throughput and rate of product quality. OEE will suffer terribly if maintenance is not allowed to ensure that the equipment is capable of manufacturing product at its minimum specified rate of product throughput, just as it will if operations continues to operate the equipment in an obvious state of disrepair. Both scenarios adversely affect quality. Setting and defining an agreeable minimum rate of throughput that is well within the design specification of the machine, and working together on a strategy to consistently achieve a higher measure is the first stage in combating catastrophic equipment failure, production slowdowns and poor quality. This minimum machine throughput rate becomes the threshold failure point at which both teams mobilize together.

2. Operations: "*We can't afford to shut down operations to allow maintenance to perform PM"*
Maintenance: "*We couldn't get the equipment, so we will perform PM on the next PM cycle."*

Solution…
PM should not be an intrusive operation requiring equipment shutdown and lockout to perform.Utilizing a perimeter-based maintenance approach, equipment can be redesigned at virtually no cost to be more interactive, allowing both operations and maintenance to perform rudimentary PM without slowing the equipment.

All visual checks of fluid levels, performance output (gauges) and cleanliness levels can be

set up with visual management devices set up to reflect predetermined levels of variance acceptability. Thus, the person doing the checking only needs to take action if a NO-GO (out-of-acceptable variance) state is found; predictive maintenance can be set up for remote sampling at the machine's perimeter.

With a reliability focus, the old way of performing overhaul maintenance will be virtually eliminated, allowing new thinking toward scheduled maintenance requirements that will include subassembly cassette-style component replacement and instant accessibility from 30-second articulated guarding.Working together to determine agreeable time slots for performing short-burst planned maintenance events will allow development of a"Pit-Stop" maintenance-style approach.

3. Operations: "*Downtime is a maintenance problem, not a production problem!"*
Maintenance: "*We always get the blame for equipment downtime!"*

Solution… Deflecting and placing blame is a favorite human pastime. Taking ownership and being accountable requires us to determine what we are responsible for and managing that part of the equation, while advising those responsible for the areas we cannot manage of their current status.Maintenance cannot and does not manage everything that affects its daily operation. Through development of fault codes used on work order completion, equipment failures can quickly be categorized into maintenance and non-maintenance related failures. Specific non-maintenance related failures, such as waiting for production, operator error, raw material blockage, etc., can be reported and communicated to the production team.

4. Operations: "*When we try to tell maintenance about a machine problem they ignore us!"*
Maintenance: "*Production doesn't know anything about maintenance."*

Solution…
Operators instinctively know when their machines are no longer on the"sweet spot," but often are not able to successfully articulate the problem to maintenance, who quickly can lose patience and choose to ignore complaints. In setting up a proactive approach by working together as a team, many early detection failure warning signs and events can be pre-determined and written in a language that is understandable (and trainable) to all current and new operators and maintainers. This machine language then can be tied into the evaluation of when a failed state is near or has occurred.

Conclusion

When a cooperative environment is created between maintenance and production/operations teams, levels of appreciation for each others' role is elevated significantly, resulting in an effective maintenance approach that delivers consistent throughput at a high level of quality. **MT**

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