Work Management Warning Flags

Some site management teams have missed timely identification of declining facility performance resulting in a significant event or a forced shutdown requiring urgent corrective actions. Most sites use performance indicators to monitor site performance; however, these indicators sometimes lag declining performance. The following are a number of "Work Management Warning Flags" that may be used, in addition to performance indicators and facility assessments, to identify degradation of the site work management process or its implementation. These flags should not be used solely to conclude that a problem exists, but instead are used to initiate a more in-depth assessment and a broader analysis.

Roles and Responsibilities

1. Roles and responsibilities for implementing the work management process are not well understood by facility staff, supervisors, and managers. Clear expectations have not been communicated in written format or are not routinely reinforced.
2. Required attendees for schedule development and workweek implementation meetings are absent, or if present, are not prepared to accurately present schedule development issues or work execution problems.

Performance Considerations

1. Non-outage corrective maintenance backlog is trending up and greater than >50 per facility/area (for sites with multiple areas).
2. Elective maintenance backlog trending up and greater than >450 per facility. Maintenance CM and EM backlogs are trending up and opportunities to correct these deficiencies are missed when equipment or systems are taken out of service for scheduled preventive or corrective maintenance.
3. The average age of the CM or EM backlogs is increasing.
4. The man-hours expended to perform preventive, elective, and predictive maintenance activities are not significantly more than the man-hours expended to perform corrective maintenance activities, which may indicate the site is not adequately focused on maximizing equipment reliability.
5. Work production goals, schedule development milestones, and work execution indicators are not formally reviewed to identify areas needing improvement.
6. Work activities on important equipment are not rigorously scheduled (hourly) to minimize equipment unavailability and proactively monitored for schedule adherence to immediately identify shortcomings in work execution. Work of lesser importance should be scheduled and monitored to verify completion within the day or the week.
7. Scope stability throughout the work scheduling process is not routinely monitored.
8. Scope Stability (scope freeze [T-4] to Friday before execution) < 85%. Work scope changes of greater than 15% occur after scope freeze, which may indicate

that the long-range schedule does not effectively bundle repetitive work within system windows, equipment trains, or component-specific workweeks.

9. Excessive expediting costs are incurred to obtain parts to support scheduled work (i.e., greater than $50,000 per year).
10. Shop productivity is low as indicated by preventive maintenance not being completed as scheduled or by corrective maintenance backlog increasing. Other indicators of low productivity may include completion of less than three key work activities per person per week, inflation of scheduled hours for job performance, and a lack-of-urgency among craft to complete work.

Process Standards

1. Emergent work is not prioritized and coded per site criteria. A multidiscipline team is not used to challenge the necessity of adding emergent work to the schedule or to verify that an emergent equipment problem is an immediate threat to reliable facility operation before adding the work to the frozen work scope or schedule.
2. Emergent work (added to schedule not assigned to FIN) > 10% during execution week. Work scope changes of greater than 10% occur after schedule freeze, which may indicate a problem with the work identification process or with the control of emergent work.
3. Job walkdowns by craft are not identifying problems that later impede job performance. Similarly, job walkdowns are not performed early in the schedule development process to provide an opportunity for planners and schedulers to address craft-identified shortcomings.
4. Craft does not provide feedback on work package quality. Additionally, work package feedback is not formally reviewed by planners or with the planning supervisor to improve the planning process and products.
5. Scheduled work activities are removed from the schedule without adequate challenge. Work activities that are removed are not analyzed to identify programmatic shortcomings.
6. Schedule durations are typically in multiples of 8 hours, indicating individual work activities for important equipment are not rigorously scheduled to minimize out-of-service time.
7. Preventive maintenance activities are frequently performed towards the end of the grace period (125% of schedule interval). Although the grace period is intended to allow some flexibility, bundling of work, and increase overall equipment availability, an excessive number of PM’s are being worked near the end of the grace period tends to result in extended or missed PM’s.
8. Preventive maintenance activities are overdue (i.e., greater than 125%) or frequently deferred. Also, preventive maintenance activities that are approaching overdue do not have documented analysis to allow a deferral be approved prior to exceeding the overdue date.

9. Predictive maintenance activities are deferred or are not performed sufficiently in advance to allow the results to be used for appropriate modification of the scheduled preventive maintenance activity.

Work Preparation

1. Job durations included in work packages and used to develop work schedules do not reflect best-case experiences.
2. Work package shortcomings are causing unnecessary challenges to craft during work execution. Similarly, work package detail is not appropriate considering the knowledge and skills of craft or the degree of supervisory oversight.
3. Post-maintenance testing requirements are not identified and approved in advance and scheduled as part of the work activity.
4. Control room operators sometimes delay or defer scheduled work due to concerns with defense-in-depth or reliable facility operation.
5. Work is delayed or deferred because needed work packages are not ready or procedure revisions are not approved for craft review during the job walkdown.
6. Support activities, such as clearances, permits, and scaffolds are unavailable to support scheduled work.
7. Work schedules do not include sufficient activities to fully engage available shop resources. Also, scheduling more work than can be accomplished by available resources may indicate that work durations are inflated or that the work schedule is not credible.

Management Support and Oversight

1. First line supervisors do not take ownership of the work management process and schedule by supporting the scheduling process and performing oversight functions in the field.
2. Managers do not demonstrate support for the work management process by reinforcing schedule development milestones or adhering to the work prioritization process.
3. Managers circumvent the work control process by adding work to the frozen work scope that normally would not be classified as important per site procedures.
4. Simple jobs having narrow scope and minimal cost take extraordinary effort and time to plan, schedule, and complete.
5. Work on important equipment or during Limiting Condition for Operations is not effectively scheduled and coordinated, or assertively worked to minimize equipment out-of-service time.
6. Facility departments supporting scheduled work activities use different work schedules.
7. The strategy is not well defined for integrating corrective, elective, preventive, and predictive maintenance activities to improve equipment performance.

Similarly, actions to improve equipment performance included in system health reports have not been incorporated into the long-range schedule.

8. Work management software systems are not effectively integrated to provide needed information among software systems or to allow site personnel to readily determine the status of work within the planning, scheduling, and execution processes.
9. Outage milestones are not being achieved. Also, missed milestones do not have achievable recovery plans to minimize the impact on successive milestones.

Learning Organization

1. Internal and industry operating experience are not routinely used to prepare for work. First-line supervisors and craft do not routinely use readily available, up-to-date industry information to improve job performance. In-house operating experience is not captured to enhance future work performance of less experienced craft or to identify error-traps.
2. Post-workweek critiques are limited to execution week performance and do not address work planning and scheduling shortcomings encountered prior to execution week.
3. Corrective actions identified during post-workweek critiques are not captured, assigned a due date for completion, and communicated to a responsible individual for resolution. In addition, corrective actions are not trended, tracked, and assessed to identify areas needing improvement.
4. Facility events attributable to work management shortcomings are trending up.
5. Actual job performance durations are not compared to initially scheduled durations for use in future planning and scheduling.

Preparing for the Unexpected

1. Contingency plans for work on key equipment are not developed, approved, and ready for implementation prior to work execution. Formal contingency plans for important activities provide an added layer of insurance for meeting the schedule safely and efficiently.
2. Forced outage schedules do not provide for a variety of shutdown facility conditions. Additionally, the schedules are not frequently updated to reflect work scope changes.
3. Work identified for inclusion into forced outage schedule is not promptly planned or classified as ready to work.