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IMPROVING TURNAROUND PERFORMANCE WITH DETAILED INSPECTION PLANNING

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INTRODUCTION

The most valuable unit of measure within an outage, shutdown, or as referenced in the energy industry, a turnaround is not money, but instead, it is time. If forced to do so, one can produce more money; one cannot produce more time. The loss of time equates to the loss of opportunity, something that cannot be reversed and made up. Time is the most often used unit of measure on the abscissa (x-axis) in key performance indicators (KPI). Reducing the time required to complete the activities of a planned turnaround—**without reducing scope**—returns dividends several times more than the cost of the activity itself. These dividends are paid in the form of opportunity.

However, to reduce the time within the outage, one is required to carefully plan the activity to a level that reduces the risk of any dead or downtime, inefficiency, and uncertainties. Then, one must execute the plan in accordance with its requirements. Such sophisticated planning often requires the utilization of an individual with improved skills over conventional, traditional planners of today. The personnel with these skills are most often found in the Inspection Departments of owner-operators or their contracted inspection service providers.

Successful turnaround planning (TAP) organizations are now integrating the Detailed Inspection Planner (DIP) within their teams to increase the accuracy of planning, ensure the execution of the correct work scope, and reduce the time required to complete the TAP activity.

THE INSPECTION PLANNER JOB DESCRIPTION

Below, you'll see an excerpt from a sample job description for a DIP. The major differences are obvious; there is a heavy emphasis on mechanical needs for fixed equipment reliability and inspection. The subjects of welding, bolting, gaskets, heat treatment, cathodic protection, torque, demisters, refractory and insulation are often referenced. Then there are the code requirements, jurisdictional restrictions, inspection and non-destructive testing requirements. Additionally, these personnel are most always certified by national trade organizations that validate competency. Notice the emphasis (and advantages) of the requirements within the job description:

- Knowledge of Mechanical Integrity, the requirement of containment and where to find both the permanent records (i.e., drawings, specifications, manufacturer data reports, material test reports, etc.) and progressive records (e.g., inspection history, corrosion rates, reports, repair history) of equipment
- Knowledge of the OSHA Process Safety Management (PSM) regulation 1910.119 to include the value of Process Safety Information (PSI), Management of Change (MOC) and permitting (Hot Work)

- Understanding Quality Assurance, Quality Control, the closed loop Inspection Work Order (IWR) process or equivalent
- Capable of Process Flow Diagram (PFD) systemization and Piping and instrument diagram (P&ID) circuitization. With this information be able to properly evaluate damage mechanisms and determine the correct inspection and non-destructive testing methods for both corrosion and environmental cracking (i.e., developing an inspection and testing plan or ITP).
- Select advanced non-destructive testing techniques to reduce time to prepare for inspection (i.e., surface preparation, cleanliness, etc.) and testing or for the testing itself.
- Effective communication skills from top management to unskilled labor in large settings or in one-to-one meetings.
- Ability to expedite, supervise and yet provide technical direction during the execution phase.
- And many more.

THE INSPECTION PLANNER PROFESSIONAL'S BENEFIT TO INDUSTRY

Visit inspectioneering.com/DIP to download a complete Detailed Inspection Planner job description for use at your company."

The expansion of inspector utilization in TAP is working to benefit both the energy industry and the site. An additional advantage is that the career of the DIP can be prolonged by removing the inspector from performing

actual inspections and putting them in a position of utilizing their experience intellectually; what I like to call "using their six pounds of muscle six inches between their ears." Removing the physical demands of one job for the intellectual demands of the other is a "good trade" for an aging inspector. And the turnaround team wins by capitalizing on the DIP's vast experience. Win-win situations are always great to identify.

Historically, planning roles within turnaround organizations come with higher pay—often 15-20% more an hour—than traditional inspection positions. The added value means the TAP organization is getting additional intellectual mechanical integrity knowledge provided by the inspector, for the same cost a traditional planner.

So, the advantages of inspection personnel performing TAP are win-win-win. The organizations win by utilizing an individual that is certified and has additional skill sets without any additional costs. The TAP individual performs an intellectual and less physical role while earning more income and being on the job longer. The industry benefits by having better plans to execute

turnaround events, which leads to increased time savings and finally more availability (opportunity) for the facility.

BEING QUALIFIED AND CERTIFIED

Inspection personnel are required to carry nationally-recognized (now worldwide) certifications to perform quality assurance, quality control, inspection and non-destructive testing activities in the energy industry. Individuals must first show they are qualified before gaining access to becoming certified. Then, having to pass rigorous examinations on a periodic basis, completing an exhaustive work history narrative, providing reference personnel, and even taking an oath on ethics are required to obtain and maintain these certifications. Costs associated with maintaining even one certification can be several hundred dollars, and many inspection and testing personnel carry multiple certifications. These certifications are recognized by governing and auditing organizations as regularly accepted minimum standard certifications. They are also regularly accepted as proof of training proficiency in PSM and Operator Qualification (OQ) regulated facilities. As illustrated in the DIP job description, at least two certifications are recommended with additional certifications in failure mechanisms or risk suggested (e.g., damage mechanisms or risk-based inspection).

Unfortunately, traditional planning personnel are not required to carry any specific certification as there are currently no national or worldwide certification systems that exist. Not unlike inspection and testing personnel, traditional planners often begin their career in a craft capacity; however, that is generally where the similarity ends as inspection and testing personnel often work their way through the quality control or inspection hierarchy on their way to achieving certification. The skills required for a traditional planner are generally the efficient use of a customary spreadsheet and word processing software to accompany their craft and safety-related knowledge. Some progress further by taking a course and maybe even receiving a certificate of completion on some specific planning and scheduling software platform, such as Primavera or equivalent. These skills are mandatory (minimum requirements, less the specific software) for the inspection and testing professional to begin their career, along with:

- The total understanding of mechanical integrity
- The ability to find permanent and progressive records on equipment
- The ability to read and interpret such documentation
- The ability to determine the work scope, including the inspection and testing practices to be deployed and to what level or quantity.

As a Turnaround Manager facing a readiness review or possible work scope challenge, even a possible audit, one would most assuredly feel more confident going into the audit with DIPs on their staff and the certifications that are behind them.

ELIMINATE THE SHELL GAME

Utilizing a DIP from a contractor service organization can help the facility avoid playing the shell game; the temporary assignment of inspection personnel to the turnaround team to successfully plan and execute a turnaround event. Traditionally, the facility's

turnaround manager will request a specific inspector from the Inspection Department be reassigned to their turnaround team to help facilitate the preparation of the turnaround plan. In return, the turnaround manager agrees to pay for the inspection supervisor to backfill their temporary loss with a contract inspector.

And, the shell game cycle begins... The contract inspector arrives, is tutored by the "loaned" inspector on their area, file system, meetings, responsibilities, etc. All the while, the loaned inspector has to spend time in their new role with the turnaround team preparing for the event with meetings, planning, etc. The two are a pair for a duration of time, joined at the hip with time enough for the organization to get confident with each in their new respective roles. Not to mention that they generally have to put in extra time while paired up in order to cover each other's responsibilities. In time, they gain enough knowledge and confidence to separate and begin their new roles on their own.

Utilizing the DIP, the contractor service provides the qualified personnel straight to the turnaround organization. This means there is no longer a proverbial "robbing of Peter to pay Paul" by taking an inspector from the facility inspection organization, placing them on the turnaround team, and backfilling them with a contractor. Now, the experienced DIP joins the TAR and the company inspector stays in their wheelhouse.

PROLONG THE INSPECTOR'S CAREER

As hinted at earlier, the role of an inspector contains responsibilities that are not only taxing on the mind but especially on the body. Routine job duties require inspection and testing personnel to scale ladders to high elevations, enter confined spaces for internal inspection, climb over, under or on equipment and piping, kneel, crouch, and more. They spend much time in the elements and are often in or around equipment at elevated temperatures and in high noise areas.

As inspection personnel age, they are less likely to be able to perform the physical aspects of the job description, much less enjoy it. Similar to pro athletes, father time catches up to the individual and the physical body cannot perform at levels required to fulfill the job description. Ideally, this is the time when the value of the inspector is measured more by his or her experience and intellect, and that six pound muscle, six inches between their ears is redirected toward inspection planning. In the DIP role, an inspection professional might prolong their career another five to ten years; all while performing a valuable and contributing role for the team. From a contract point of view, employee duration can be extended from the usual thirty days of turnaround inspection activity to a twelve to fourteen month stint (maybe even longer) preparing and planning for a turnaround event. In many cases, the next event at the same location could be within the planning window of the current event, so after a brief recoup period, the next event planning process is begun.

RISK MANAGEMENT

An added and rarely identified benefit of utilizing a DIP in the turnaround planning organization is that of risk management. During the planning phase there are often "long-lead" items being fabricated that require inspection at certain "hold points." In these

cases, the DIP can either assign this responsibility to the facility inspection team or perform the activity independently. Since the DIP is certified and qualified, there is little chance for the DIP to be misled or “bamboozled” by the manufacturing facility should they be the actual inspector for the activity. The DIP will also be the most qualified individual to review the report following the inspection should it be performed by others.

If pre-turnaround inspection and testing activities are required to assist in determining assets that will remain or be removed from the turnaround work scope, the DIP can schedule them, follow or even expedite them, review results, and even explain the findings to the team. A better evaluation can be performed and better decisions should be made by a team relying on the DIP.

Turnaround work scopes can be better scrutinized with the addition of a DIP on the turnaround team.

Yet, another risk mitigation advantage that can be observed—if it's even needed at this point—during the turnaround event itself, is having the DIP perform an inspection activity. Should the work activities fall behind and contractor maintenance personnel are waiting for results from inspection on vessel closure or additional work scopes or similar, the DIP can pitch-in to help with field inspection and/or quality control activity. The DIP can be available to watch a single vessel or activity, perform expediting, field supervision, or similar—something very valuable when dealing with a critical path item.

CONCLUSION

As discussed earlier, the most valuable unit of measure within a turnaround is time, and reducing the time required to complete a planned turnaround pays dividends in multiple. A more sophisticated and detailed plan is required to minimize risk and save time during the event thereby leading to additional plant availability.

Successful TAP organizations use DIP personnel within their teams to capture this availability. In doing so, they receive several benefits including the following:

- Improved quality of TARs and, in turn, benefit the industry
- Planning ranks staffed with personnel that are not only qualified but also certified
- Elimination of the shell game
- Prolong inspector's careers
- Reduced TAR work scope risk
- DIP can play a utility role to cover other inspection needs that may arise

As more TAP teams begin to take advantage of the valuable skill set of the DIP, their organizations will reap the benefits and the bar will be raised, yet again, on turnaround performance... and that is good. Possibly, one day soon, the days observing “Open/Clean/Inspect” in the turnaround plan will finally be eliminated and thereby become obsolete. ■

For more information on this subject or the author, please email us at inquiries@inspectioneering.com.

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James "Chezo" Cesarini is an experienced engineer with 20+ years in the Petrochemical industry. Chezo spent 14 years with Valero serving corporate and site roles in PSM, Engineering, Reliability and Inspection, Turnaround and Maintenance Management. Previous to Valero, Chezo served as an Inspection Supervisor for Marathon and as a Mechanical Designer for Dow. Chezo has two Engineering degrees from Texas A&M and is a Registered Professional Engineer in the State of Texas.