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Are You Ready for the Future?

By Bob Motylenski, P.E.

In today's environment of excess capacity, poor profit margin, and capital restraint, should operating plants consider directing their efforts at optimizing process operations and improving reliability? Despite the current downturn and restrictions on expenditures, this is the best time to consider investing in the future. This can be achieved by identifying and resolving persistent reliability problems before utilization increases and profit margins improve. As inefficient and unprofitable process units are shut down, those process units that will be onstream will need to operate efficiently and reliably. When plants operated at maximum capacity, there was little incentive to either shut down or slow down to improve reliability or efficiency. However, by improving equipment, systems, and operations reliability, process unit availability will improve, maintenance costs will be reduced, and there will be less potential for injury or environmental violations.

Every plant has a list of operational issues and "bad-actor" equipment, but the question is, are they the right ones? Unless a plant has a very proactive and integrated team, each organizational group will have a different list. Process Operations will prepare their list from an availability perspective, while the Mechanical Department's list may be derived from cost or frequency of repair data, and Engineering may use a totally different set of criteria for preparing its list. Previous surveys have shown that the lists rarely agree. So how do you determine what are the key issues restraining operational availability?

One approach is to use a team of outside experts to interface with the various departments and identify the key issues restraining reliability and operational efficiency. There are several advantages to using an outside team, as opposed to an internal team.

Work Highlights

Fired Equipment



Provided Fired Equipment support in an Energy

Management Assessment for a major oil company. This included participating with a team of process and equipment specialists in a two-week onsite visit to one of their facilities that focused on identifying potential energy savings. When accounting for added equipment and utility costs, the Fired Equipment component of this team effort identified annual savings in excess of 3M\$. This would represent a return on capital investment of over 20%.

Process, Operations, & Safety



Providing a number of hydrotreating unit performance

modeling and revamp screening assessments for a major licensor. This included three naphtha hydrotreaters, three heavy gas oil hydrotreaters, plus a high pressure unit. Some units were in ultra low sulfur diesel service, and some with various amounts of coker distillate feed component.

- One is that they have no ownership to the existing lists so they can better identify and prioritize the concerns.
- Another advantage is that they bring to the plant a broader experience base.
- And finally, plant personnel are sometimes more willing to open up to outsiders than to internal teams.

The team would be supplemented with several plant people to coordinate the team's plant activities, provide the necessary plant information, and ultimately have ownership of the recommendations and resulting implementation plan.

The outside team approach has been successfully used by a number of refineries to assess the reliability of entire plants. Also, the approach has been applied to individual process units that have experienced reliability problems. The scope of a review can vary depending on the key issues: it can focus on specific equipment services or equipment categories, an unreliable process unit, or the complete plant. Some of the factors that influence the type of review undertaken are logistic plans, product yields/quality, unit and equipment availabilities, maintenance costs, and frequency of unplanned interruptions. The size and makeup of the outside team will depend on the survey scope as well as the time to implement the survey.

The approach is to use an integrated team or task force to perform a detailed review of the equipment or process units to identify operating and reliability issues and concerns. Once the issues have been identified, the team prioritizes the issues and prepares action plans to correct the unreliable situations. The last phase is implementation by the plant.

Even before a plant decides to embark on a study, especially for an entire plant or multiple process units, one needs to determine if it is really necessary. Carmagen Engineering, Inc. (CEI) can assist you in making that evaluation. Once the decision to conduct a study has been made, CEI has the experience and expertise to both conduct the study and assist in implementing the recommendations. Conducting such a study will cost some money, but probably not as much as one might think. Experience has demonstrated that the study cost will be recovered many times over by the improvements that are identified, which often can be easily implemented and with no or minimal additional cost.

Bob Motylenski has over 40 years experience in the reliability and maintenance area, mostly with the Reliability and Maintenance Services Group of Exxon Research and Engineering Company. Please contact Vince Carucci (vcarucci@carmagen.com) if you'd like more information on Carmagen's expertise in this area.

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