Written by Bob Baldwin, Editor
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At the recent executive member meeting of the Society for Maintenance and Reliability Professionals, representatives from host Shell Chemical Co. provided some insight into how they do maintenance and ensure reliability.

One of their tools is total productive maintenance (TPM), which they renamed Total Productive Equipment Management (TPEM). It was renamed to remove the word maintenance from the title. Otherwise, it would be easy for others to think the process doesn't apply to them because it is a maintenance-only initiative.

To reinforce the importance of the basic equipment cleaning activity in the TPEM process, participants are given a colorful sticker for their hard hats. Around the perimeter of the main TPEM graphic is a chain of functional statements: Clean to Inspect–Inspect to Detect–Detect to Correct–Correct to Perfect–Perfect to Protect.

The chain is similar to the functional analysis processes I learned in value analysis/engineering courses I attended in the 1970s. Value analysis, developed by Larry Miles at General Electric in the late 1940s, is based on functional analysis in which equipment and process functions are described by an active verb and noun-object such as transfer fluid, reduce noise, clean equipment, or correct defects.

The process has evolved to include the functional analysis system technique (FAST) and various charting methods that systematize the relationships among functions to identify the primary function. The FAST diagram format that I prefer organizes functions in a flow-chart that chains secondary functions on the right to the next higher order function to their left.

The question "Why?" is used to pursue higher level functions and the question "How?" is used to collect secondary functions. In the TPEM example, moving from top to bottom in

the example list (left to right on the diagram), the question “Why do we clean equipment?” produces the functional answer “To inspect equipment.”

The why question leads up the chain to the highest order function of “protect process.” The how question leads in the opposite direction to succeeding secondary functions. By asking “How do we correct defects?” about the function in the middle of the example TPEM chain, we identify “By detecting defects,” the next secondary function.

Functional analysis is fundamental to most improvement processes. It is unfortunate that so few people learn how to use it. More maintenance and reliability practitioners should use it to pursue the higher order functions that flow from the question: “Why do we maintain equipment?” **MT**