RECOMMENDATIONS FOR MANAGING COMPLEXITY IN PHARMACEUTICAL OPERATIONS

There is an inherent tendency in regulated industries such as pharmaceutical operations to make things much more complex than they need to be. “More” is considered to be better and what regulators want to see. However, more content in an SOP, additional signatures, and new forms and control loops do not necessarily equate with better. How often do technical personnel come to you and report that they have addressed the root cause of a problem by removing content from an SOP? Probably extremely rarely, if at all. What drives this tendency for more?

Physiologically, we are wired for simplicity. We love intuitive systems — take the iPhone, push button controls in newer automobiles, Nest thermostats, etc. However, despite this desire for a simple, clean look, we are amazingly good at overengineering simple systems. As humans, we have the unique capability of elastic thinking,1 connecting ideas and concepts in highly inventive ways, but this also leads to more bells and whistles and overcomplicated systems. The simplicity we crave in our personal lives should drive our actions and decisions in our professional lives. Let’s dig further into the root cause of this issue and what we can do about it.

A lack of technical understanding is often at the root of the problem. A manufacturing site or any production environment that uses procedures that involve many layers of controls often does not appreciate what really matters. In the pharma sector, most people can appreciate the act of gowning to enter a controlled classified environment. At some manufacturing sites, operating personnel are required to wear three layers of gowning to protect the aseptic processing environment and product from the operator. Imagine performing your work effectively with three to four layers of clothing! The fault lies in a lack of appreciation of the microbiological risk and a desire to exercise an overabundance of caution.

Silo thinking can also drive overcomplexity at a site. Consider a manufacturing campus with several different receiving and shipping areas, each with a unique set of procedures for managing the same activity. Why not harmonize them and make it easier on internal personnel and simpler to explain to external audit personnel? Again, unnecessary complexity creeps into the operation due to a lack of communication and personnel operating with silo mentalities.

RECOMMENDATION 1:
Challenge the status quo and determine whether additional steps/precautions make technical sense and whether could they have unintended consequences.
RECOMMENDATION 2:
Avoid silo thinking and leverage best practices at a single site or across a network of manufacturing sites.

The tendency to overengineer an activity is sometimes due to a lack of appreciation for what the regulations require and a desire to adopt a “beyond compliance” approach. Overengineering is often a characteristic of company’s investigation system and is typically driven by the underlying IT system, for instance, TrackWise. The beauty of these IT systems, whether purchased or home grown, is they can be configured to offer a lot of functionality. For instance, CAPAs can be delegated electronically to personnel who can execute a task such as revise an SOP, redesign a part, change a packaging component, etc. Another benefit is that CAPA effectiveness checks can be programmed to occur at set frequencies for an extended period. Both aspects appear to be beneficial. However, in practice what we often see are high numbers of open CAPAs and ongoing effectiveness checks. These activities can quickly spin out of control and result in a tremendous amount of non-value-added activity.

RECOMMENDATION 3:
An IT system can be engineered to offer a lot of functionality, but we need to challenge IT system creativity and determine whether the additional functionality is going to add value.

Another reason often cited for SOP complexity is the desire to quickly satisfy regulatory inspection or auditor inspection findings. Industry often fails to appreciate the fact that most regulators and auditors are well tuned to the risks of human error. EudraLex Volume 4, Chapter 1: Pharmaceutical Quality System specifically requires investigations related to human error to go beyond the human error. Section 1.4A (xiv): Where human error is suspected or identified as the cause, this should be justified having taken care to ensure that process, procedural or system corrective actions and/or preventative actions have not been overlooked, if present.

Therefore, managers should be confident in pushing back on responses or commitments that are non-value-added and increase the risk of operator error.

RECOMMENDATION 4:
Consider the impact an audit commitment will have on the organization. Are you adding complexity? Try ranking proposed actions on the basis of solution robustness and solution complexity. Then choose solutions that rank highest on the robustness scale and lowest on the complexity scale.

There is a push in many companies today to pursue SOP simplification. I am often asked whether I have seen good models of documentation systems that drive operational excellence. I have seen pockets of excellence in many companies and have witnessed manufacturing sites dramatically changing the way work is conducted by moving away from SOPs in favor of work instructions and by leveraging electronic systems. For example, a highly manual OTC manufacturing operation in Thailand relies heavily on work instructions posted near where work is conducted – at the equipment, in the washroom, etc. Another excellent example is a highly automated pharmaceutical operation in Israel that has little need for detailed forms since most operations are barcoded and automated, thereby minimizing human interface and the risk of error. A continuous solid oral manufacturing operation in the U.S. is using a system called Tulip which allows operators to call up images on a portable device and confirm the correct orientation of parts (gaskets, tubing, etc.) when assembling the product.
RECOMMENDATION 5:
Be bold and move away from SOPs with buried, text-heavy instructions.

If your site is paper-based, consider shifting from SOPs to work instructions for the specific details needed to carry out tasks. Strive for simplicity of instruction and use bullets, photos and logical flow. Leverage portable devices and the power of a photograph to capture exactly what must be done and how a part needs to be oriented, i.e., what “good” looks like.

To unwind complexity, there are straightforward steps companies can follow. However, this work generally falls on the shoulders of personnel who have the expertise but not the time. The bullpen approach has been proven to work. SMEs are relieved of their daily routine for a limited period by other trained personnel. Secondly, these personnel are linked with internal or external simplification experts well versed with simplification techniques that have been demonstrated to work. This hybrid approach yields results more quickly than expecting line personnel to achieve SOP simplification milestones along with their routine operational responsibilities.

REFERENCES

RECOMMENDATION 6:
Test the bullpen approach for an SOP simplification project that puts your subject matter experts alongside internal/external simplification experts for concentrated periods of time with clearly defined priorities and milestones. This way, the benefits can be measured in the space of months, not years.

CONCLUSION
Simplifying and avoiding complexity is hard work. As famously quoted by Mark Twain, “I didn’t have time to write a short letter, so I wrote a long one instead.” We need to get on board with greater degrees of automation and increased use of work instructions, avoiding overengineering internal systems and keeping the “short letter” in mind when writing procedures and work instructions and identifying CAPAs.

ABOUT THE AUTHOR
Jim Morris has over 25 years of pharmaceutical management experience in both plant operations and corporate offices in the U.S. and Europe. He has held positions as deputy director of QA/QC and regulatory affairs at Mass Biologics, director of QA/QC for the Biologics business unit of Cilag AG, and a number of quality assurance and manufacturing roles with Pfizer over a 16-year time frame, culminating as the head of quality assurance in Latina, Italy. His areas of recognized expertise include: quality leadership development, supply chain auditing and managing audit programs, quality management systems, parenteral product manufacture and compliance, and OTC product manufacture and compliance.

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