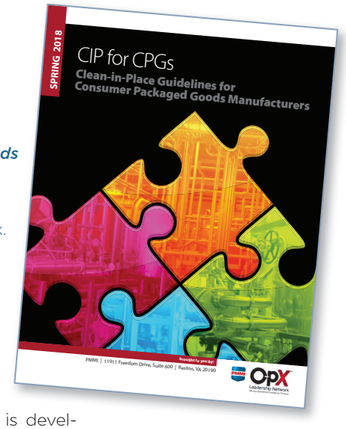
A Guide for the CIP Multiverse

The OpX CIP document is a treasure trove of information on CIP systems. It gives users a great start by having documents, recommendations, and legacy knowledge in one place and guides users through a clear, stepwise process to ensure an effective CIP system.

STEPHEN M. PERRY, PH.D. CO-FOUNDER AND COACH, FSO INSTITUTE
DAVID DRUM SENIOR AND PRINCIPAL ENGINEER, GLOBAL ENGINEERING SHARED SERVICES, KELLOGG COMPANY
BRYAN DOWNER VICE PRESIDENT, SALES AND MARKETING, SANI-MATIC, INC.

FOR MANY, CLEAN IN PLACE (CIP) conjures up images of CIP standards and techniques from the dairy industry that has served as a beacon of best practices for many decades. But what about the many manufacturers who process food, beverages, cosmetics, personal care, pharmaceuticals, nutraceuticals, pet food, and bio-tech products? Turns out that there's not just one universe—the dairy industry—but a multiverse of manufacturers for whom CIP guidance is warranted.

The situation defined the need for consumer packaged goods (CPG) manufacturers—CIP guidance beyond dairy only—and became the goal of PMMI's OpX Leadership Network's CIP Solutions Group when it developed the *CIP for CPGs: Clean-in-Place Guidelines for Consumer Packaged Goods Manufacturers* work product in 2018. A goal of this document is to outline generic definitions, equipment considerations, best practices, and protocols for CIP that can be leveraged across multiple process lines to drive improved operation, product quality, consumer safety, and sustainability results.



The *CIP for CPGs: Clean-in-Place Guidelines for Consumer Packaged Goods Manufacturers* work product provides definitions, equipment considerations, best practices, and protocols for CIP. Source: PMMI's OpX Leadership Network.

A key feature of this document, like all OpX work products, is that it is developed by CPG and OEM practitioners currently active in manufacturing—by industry, for industry! Accordingly, the document is organized around the day-to-day challenges and solutions for CIP cleaning and sanitation as follows:

Case in Point: Kellogg's and Sani-Matic


David Drum


Bryan Downer

NEARLY TWO YEARS AFTER the OpX clean-in-place (CIP) document release, the FSO Institute checks in with two members of the original OpX CIP Solutions Group—David Drum of the Kellogg Company and Bryan Downer of Sani-Matic—to see how the document is being used and the benefits accrued from using it.

FSO Institute: David, you were there from the beginning in developing the OpX CIP document and clearly saw the need for a broader CIP document that could be used beyond dairy. So, a couple of years later, in what ways is the Kellogg Company using this document?

Drum: When it comes to hygienic design at Kellogg's, we have a workflow or process that project teams are expected to follow. There's a substantial amount of design guides on our internal library, as well as historical information, all of which are based on industry best practices and regulatory standards. These give the teams a starting point for sound design. One of the early moves was to put a link to the OpX CIP document on our library site. That makes it readily available to our engineers, engineering support providers, and quality staff.

As a practical matter, we used the OpX CIP document to help guide the technical work of three project teams shortly after it was published. One was to guide the design of a heat exchanger used in the routine CIP of a large piece of processing equipment. Once design was proven in the field, and the process set, it was simply repeated for every cleaning.

On another project, we were evaluating upgrades to an existing CIP system, where some valves and pipe runs were not being adequately cleaned after formulas were changed. In this case, we used the OpX CIP document to help troubleshoot the issues, then engaged an OEM to recommend solutions for the problem. This gave the team a great start right out of the gate, instead of starting from the beginning. One of the key features of the OpX CIP document is the recommendation it encourages: to collaborate with OEMs.

Still another project team worked on solving some of the problems associated with cleaning tanks on a nondairy application with high water activity and high sugar content. This project, too, began with the appropriate applications of the fundamental principles contained in the OpX CIP document.

The beauty in all three of these projects is that we didn't have to reinvent our approach each time we went through a similar process.

FSO Institute: What improvements have you seen from having a document like this to guide CIP cleaning and sanitation at the Kellogg Company?

Drum: When the CIP team began, and Bryan Downer and I started the journey, one of the biggest goals was to pull a lot of good information together in one place. The OpX CIP document is a treasure trove of information on CIP systems. It doesn't design systems, but, instead, gives the user a great start by having a lot of information—documents, recommendations, and legacy knowledge—in one place and guides the reader through a clear, stepwise process to ensure an effective CIP system.

While not always immediately apparent, there are time and money savings that have accrued to our hygienic design activities. By having this information easily available to entire operations and design teams, we expedite the time to completion. Information and the application of it spreads much more rapidly. Simple productivity savings relative to nimble project teams is in the thousands of dollars per project, and due diligence up front using the OpX CIP document gives capital savings in the tens of thousands of dollars. When we consider the cost avoidance and production savings, that savings is probably in the millions of dollars. The cost savings can be significant by doing the work up front!

I have now participated in several of PMMI's OpX Leadership Network Solutions Groups. The by-industry-for-industry development process is, at times, a bit slow. This is volunteer work for all who serve, and I can also say unequivocally that the payback is phenomenal for CPGs (consumer packaged goods). You don't have to constantly reinvent the wheel, and you get the best of industry knowledge and leadership from other solutions group members. The OpX CIP document is no exception!

FSO Institute: Bryan, you were also there from the beginning in developing the OpX CIP document and clearly saw the need for a broader CIP document that could be used beyond dairy. So, from an OEM perspective, in what ways is Sani-Matic using this document, especially in working with your CPG customer base?

Downer: As long as the concept of clean in place has been around, many people still struggle to understand how to apply it, particularly in CPG sectors that are emerging or have recently recognized the need for proper automated cleaning. We are often asked questions like, "Can I clean in place?" or "What do I need to consider when I'm looking at a clean-in-place system?" The OpX CIP for CPGs document is a valuable resource to help give people not only an overview of what to consider, but a comprehensive understanding of all that is involved in implementing a clean-in-place system and the choices they have if CIP is not appropriate for their situation. The document explains things like tank and heat exchanger sizing, floor drain considerations, and the instruments and components that make up a proper CIP system.

As an OEM, the OpX document gives our customers the information they need to make educated and informed decisions about how they want to use their clean-in-place system and which metrics will help them realize their goals for implementing a new CIP system. This also makes for a quicker implementation as their team understands not only what they are buying, but why each part of the design was specifically engineered in the way it was.

FSO Institute: What benefits have you seen from having a document like this to guide CIP cleaning and sanitation in product development at Sani-Matic and with your CPG customer base?

Downer: As our customers become more educated, through documents like those created by OpX, they begin to align in their understanding of what makes a system, CIP in this case, most effective. As the understanding of CIP becomes more common knowledge, we can align our offerings and efforts toward meeting these more common, consistent expectations.

For instance, when customers understand there are certain components of a CIP system that should not be considered optional, we can move toward including those as part of standard design. This, in turn, allows us to focus our engineering and development on improving efficiency, maintainability, and/or adaptability of the standard designs.

Additionally, by us and our CPG customer having a common language, so to speak, provided by the OpX documents, we can communicate much more efficiently and effectively on our custom-engineered systems. Often, customers have unique circumstances, like space constraints or utility challenges, that require a custom-engineered system. This process creates a lot of interaction between the customer and our sales or engineering team, and using the OPX document as a reference can aid in helping the customer understand not only the language of CIP, but some of the fundamental rules and considerations they need to make for their installation and operations once they take ownership.

- **Cleaning** – definitions, reasons to clean, and cleaning approach.
- **Cleaning in Place** – preparation, pre-rinse, wash, cleaning solutions, fluid characteristics and time, sanitation, final rinse, and inspections and testing.
- **CIP Equipment and Sanitary Design** – relevant CIP standards and guidelines, CIP equipment, and CIP systems.
- **Validation Activities** – validation, verification, and monitoring.
- **Glossary** – definitions.
- **CIP Tools and Resources** – checklist for CIP, examples of CIP systems, guidelines for common design considerations, and 10 commandments for CIP design and references.

For document users, there are key considerations to keep in mind:

1. While the Food Safety Modernization Act (FSMA) does not currently have a mandatory validation requirement for CIP cleaning and sanitation, a well-designed CIP system can help meet the recommendations of FSMA on cleaning and sanitation.
2. This CIP guidance for CPG companies is specifically developed for manufacturers that use "wet" cleaning procedures. Operations that avoid water and moisture for cleaning, using "dry" cleaning techniques, use practices and procedures that are not the focus of this CIP document.

Another key feature of this document is the use of leadership guidance throughout it. As there is no one method for CIP cleaning and sanitation that fits all manufacturing and processing applications, this leadership guidance assists the user with important considerations when determining the appropriate activities for its CIP system. **PFW**

About the Case in Point Series

IN THE PAST FEW YEARS, PMMI's OpX Leadership Network has produced more than 20 manufacturing process-improvement documents for CPGs and OEMs. More recently, the FSO Institute has facilitated the adoption and implementation of these documents, especially for food and beverage manufacturers. In this 2020 Case in Point series with the FSO Institute, *ProFood World* presents actual cases to show just how CPGs are using OpX documents to improve their overall manufacturing health and their collaboration with OEMs and other suppliers. Learn more at www.opxleadershipnetwork.org and www.fsoinstitute.com.