

# Upgrade Brewhouse Control System for Founders Brewing Co.

The project was completed at the facilities of the Founders Brewing Company, with headquarters in Grand Rapids, Michigan, a globally recognized brewing company, and one of the top 10 largest craft brewers in the US. According to Alec Mull, Vice President of Brewing Operations at Founders Brewing, the project was critical. "As we grew and matured as a brewery, it was important for us to decrease our digital risk and increase our security and reliability of our most important software and network." Alec went on to say that, "Virtualization, though not common among our brewing peers, was developed and implemented with a cooperative between our brilliant Founders OT/IT teams, the great brewing minds at Krones, and the incredible people at PDA. This project, though challenging, was handled with the utmost skill and professionalism, culminating in an outcome we are all proud of. Hats off to our colleagues at Krones and PDA for executing this exciting improvement."



The project consisted of two isolated brewing control systems, referred to as "Gigantor" and "CombiCube," were operating at the facility, the first with a BOTEC F1 License installed on two redundant servers and four clients. The second system is operating with a BOTEC Classic license installed on one server.

The upgrade would involve combining the two systems to allow an operator to control any portion, according to security credentials, from any HMI in the plant. This required merging the equipment and software currently used on the Gigantor process control system with that of the CombiCube control system. To achieve this merger, it was necessary to create a system with two redundant virtual server pairs in separate locations with a virtual SQL Server and several client machines.

# IMPLEMENTATION OF A VIRTUALIZED SYSTEM

UPGRADE FROM **BOTEC** CLASSIC TO **BOTEC F1** 

#### UPGRADE THE VISUALIZATION SYSTEM

### **About Founders Brewing**

Founders Brewing Co. is one of the top 10 largest craft brewers in the US with global recognition for many of their quality beers. Founders Brewing Co. has evolved into one of the highest recognized breweries in the United States. They have been ranked in the top breweries in the world by Ratebeer.com for the last five years, and have several beers listed in the top 100 beers of the world on Beeradvocate.com. Founders Brewing is now among the top 10 largest craft breweries in the country and considered one of the fastest growing.



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# **Phase 1 Advantages**

The first phase provided several advantages, migrating the process data server and SQL server to a virtual machine, to:

- Reduce the time required the recover from hardware failures
- Allow periodic backup of the virtual machines
- Split the load across multiple servers thus reducing redundancy
- Create a system that is controllable from any server location

The upgrade from **BOTEC Classic** to **BOTEC F1** and merger of the applications effectively replaced an obsolete product, as well as provided the capability to control all the systems from anywhere in the plant.

In the future, upgrading from Iltis V2 to Iltis WPF will add new features, together with the ability to add improvements as they may be developed. This approach will bring all the automated brewhouses to the same visual system giving the brewers more familiarity with all the brewhouses.

#### Implementation

The project involves three phases (with the third to be completed in 2021):

- Implementation of a virtualized system, BOTEC process data servers, and an SQL server to reduce risk.
- Upgrade from BOTEC Classic to BOTEC F1 and merge applications. The brewhouse has been running on BOTEC Classic, operating on an unsupported system without backup for that system. By upgrading to BOTEC F1 (which is in use at the company's larger brewhouse) and merging into one cohesive system, the brewers were able to control multiple areas of the facility (such as the 300 bbl and 80 bbl brewhouses, or the cellar) from any of the server stations and/or client screens.
- Upgrade the visualization system (to be completed 2021) from Iltis V2 to Iltis WPF. The former is an older version of visualization and is not supported for new features on the BOTEC roadmap. In contrast, Iltis WPF uses open-format Windows standards and incorporates enhanced features related to trending, screen manipulation and troubleshooting issues.

Our road to a more consistent and automated brewing process started in 2011 with our first Krones/Steinecker brewhouse operating under the BOTEC Classic program. It was an incredible improvement for us in technology that helped us to further develop world class beers that were even more consistent and reliable. A few years later in 2015, the world demanded even more Founders beer, and our obvious choice was to once again lean on the experts at Krones to build us a world class customized brewhouse and cellar, though this time operating BOTEC F1. Our team found tremendous value in this updated software, so we reached out to PDA to execute an upgrade of our BOTEC Classic to F1. While this sounds easy, it was clearly a large project, as we needed to execute this upgrade and virtualization simultaneously due to brewing demand. I am amazed at the skill and professionalism of our colleagues at PDA, who seamlessly integrated this software upgrade and virtualization project with minimal down time. We didn't miss a beat, and we really appreciate the opportunity to work with PDA and Krones on these exciting upgrades.

> - Alec Mull, Director of brewing operations at Founders Brewing Co.

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The most difficult part of the project was coordination of available down time in the brewhouse with completing the changeover from a physical server configuration to virtual. With only a short window of time available, this changeover was successfully completed without any unexpected impact on the brewing schedule. This represented a substantial amount of work being completed in a single shift of downtime.

Data from the Combicube brewhouse is now recorded in the same way as that for the larger (Gigantor) brewhouse and the SQL data base, which includes recipes, is backed up daily. The system, completely reprogrammed to function with BOTEC F1, operates as it did previously but now includes the added features of BOTEC F1. Upgraded development programs from Krones for both BOTEC F1 and the visualization system may be implemented in the future.



# When asked about the project, Eric Williams, Project Lead at Process and Data Automation said:

It was a real pleasure to work with the Founders team in executing these upgrades. We had the opportunity to work with everyone from Admin to the key team members of the IT/OT group and brewers, all of whom worked diligently to support our endeavors towards the upgrade and were eager to accept the system once implemented.

The virtualization portion of the project was only to be considered a success if completed within the downtime window and without notice by the brewers. We totally changed the back end of the system and brought the brewhouse back online after only one shift. The brewers were back to crafting delicious brews without our assistance that evening. I am very proud of this successful project.

The Combicube was taken down for only one week. We worked closely with the Founders technicians and brewers to completely recommission the brewhouse. Due to solid planning, tight coordination of all involved, and the team's dedication we were running CIPs by the third day and water brews by the fourth. As planned, the brewhouse was back to running production brews with only minor parameter tweaks required the following week."

- Eric Williams, Project Lead at Process and Data Automation

#### **About Process and Data Automation**

Process and Data Automation (PDA) is Krones' North American Industrial IT Provider and SYSKRON's Execution Arm. PDA is a full-service, CSIA Certified industrial control systems integration firm. The Controls Engineering group specializes in physical automation system design, programming, and commissioning. PDA also features a dedicated Digitalization Group (DSG) that connects automated equipment and systems to the business system environment including protected recipe systems, data collection and reporting, and data historian implementation. DSG can provide the systems you need to set your systems up for proper operation and then provide the tools you need to make sure you execute as planned.

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