

# BIC

MAGAZINE

BUSINESS & INDUSTRY CONNECTION

May/June 2021

BICMagazine.com

A **BIC ALLIANCE** Publication

## BRANSAFWAY: DELIVERING SAFETY, PRODUCTIVITY, SAVINGS

BrandSafway has more ways to help customers add up the savings through digital worksites, leak detection and repair, rope access, refractory innovations, winterization, elevators and freestanding hoists.

## TWS FINDING SUCCESS WITH 'ONE APPROACH' PHILOSOPHY

With its "one approach" philosophy, Turnaround Welding Services (TWS) creates a winning environment for its clients and employees. TWS' clients receive the "power of teamwork" while its employees work for a company that helps create the American Dream.

## FEATURES

Zervoudis leads Covestro's Baytown site during 50-year celebration

Eastman's Harris: St. Gabriel site's products matter more than ever

Ropes: The 'new' solution in industrial access

LyondellBasell, Dow: Plastics remain vital in changing world

Chevron's Wirth: 'Intersection' is key to future innovation

What to know about the emerging, evolving hydrogen economy

ConocoPhillips' Currie: Key variables impact future oil market

Keys to a successful turnaround partnership

MSC's Callahan: Shale benefits an 'incredible opportunity'

PLUS...

Forward thinking —  
together



# ADD UP THE SAVINGS

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See Page 14



# Virtual functional acceptance testing is now a reality

Control systems that are responsible for the safety, start-up sequencing and operating supervision of critical applications such as burner management, combustion control and boiler control systems must be designed to be both fail-safe and reliable. To prove the functionality and reliability of these systems, a functional acceptance test (FAT) performed at the manufacturing facility prior to shipment is often required.

A FAT, also known as factory acceptance test, is an essential element of these critical control systems. There can be different levels of FAT, from basic configuration with temporary wires to complete testing where the manufacturer physically constructs and tests the system in a simulated operating capacity.

The FAT is typically performed by quality managers, design engineers, operators and maintenance personnel.

The main goal of the FAT is to certify performance of the equipment built for a specific application, and to ensure all design requirements are attained. A thorough FAT, where all the system's inputs and outputs can be simulated (both discrete and analog), will provide a framework to prove that the system

has been assembled, wired and designed properly. This is especially important when the system utilizes a programmable logic controller (PLC).

The FAT is performed in a shop environment and is often the final determination of whether the system is ready to ship to the customer's site. A preliminary FAT allows the PLC programmer to more thoroughly test the operation of the system and catch any major issues in all areas of the design. When a preliminary FAT is performed, commissioning in the field is often considerably shorter and the risk of damaging the boiler or fired equipment upon start-up is minimized. Another major advantage of performing a FAT is to get the start-up and commissioning crew familiar with the equipment ahead of time. This adds a level of confidence to the end user that the control system has been thoroughly vetted at the factory.

Lastly, another value point and often the final step at the conclusion of a FAT is operator training. Operators can "test fly" the system without the worry of damaging equipment, allowing them to identify operational issues the engineering team may have

overlooked.

In this age of digital technologies and pandemic isolation requirements, companies have developed enhanced testing gear that allows for a remote, virtual FAT. The test gear consists of a 19-inch human machine interface (HMI) that replaces the toggle switches, indicating lights, potentiometers and analog gauges. A PLC drives relays and consists of contacts that can be configured for the voltage that is required for input simulation. Outputs are displayed via selectable 120VAC and 24VDC terminals. Analog 4-20 mA inputs are selectable as either loop or self-powered.

During the virtual FAT, a web portal is accessible by the client through an audio/video link to the testing, and the client can remotely operate the test rig HMI screen. Links are also furnished to the burner management/combustion control system PLC and HMI. Figure 1 shows this enhanced testing device, with technicians performing a full FAT for a system consisting of a burner management/combustion control system, fuel skid and selective catalytic reduction system.

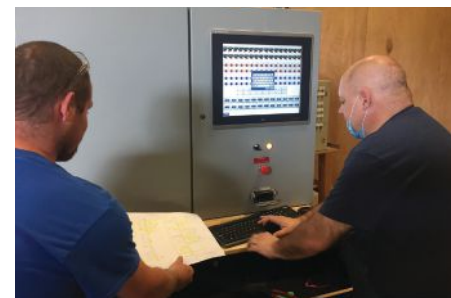


Figure 1.

What might come as a surprise to some is that not all suppliers of these critical control systems provide factory logic testing or a formal FAT. Testing at this level can be expensive and add cost to a new system, but it's an important step to alleviate the risk of overlooked faults in the design or construction of equipment. Furthermore, advances in technology have made it possible to perform virtual FATs when travel might not be an option, allowing business to continue even in the midst of a global pandemic.

**For more information on control systems and virtual FATs, visit [www.pce-pbc.com](http://www.pce-pbc.com) or call (360) 335-1443.**

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