



# Cenex Harvest States

## Designed for Success

### Results

- Significantly lower operating costs
- Higher efficiency
- Simplified inventory and billing management
- Scalable system to accommodate future growth and changes

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**Bob Gauthier**  
Automation Engineer  
Cenex Harvest States

### Fueling Efficiency

#### GE Fanuc Automation Drives Down Truck Fuel Loading System Operating Costs by 50 Percent

Petroleum facility managers are constantly searching for ways to reduce operating costs and billing time while improving product accountability, productivity, and security at the loading rack. The recent rise in oil prices has made this task both more challenging and more crucial than ever, as facilities have less money available for loading rack improvements and a greater need to ensure that fuel is dispensed accurately.

With the help of CIMPLICITY®\* software from GE Fanuc, two companies recently worked together to develop a highly reliable system that cuts operating costs and easily adapts to changes over the long term. SEBraun, Inc., a Bellingham, Washington-based automation system designer and integrator, and Cenex Harvest States, a Laurel, Montana-based integrated agricultural cooperative whose services include petroleum supply, incorporated CIMPLICITY as a key component in their new LoadMaster™ dispensing system. CIMPLICITY software monitors and controls this state-of-the-art dispensing system for fuel truck loading facilities, increasing efficiency, simplifying the documentation process, and decreasing operating costs.

#### Full Service

Gasoline, diesel, and heating fuels produced in the U.S. are transferred from bulk storage facilities, such as refineries, tank farms, and barge loading terminals to tanker trucks at truck loading racks, and then delivered to retail outlets. A tanker can range in size from a single 250-gallon truck to multiple truck and trailer combinations in excess of 12,000 gallons.

\* Part of Proficy Intelligent Production Solutions from GE Fanuc.



A basic truck loading rack comprises:

- Facilities access control
- Identification
- Metering
- Bill of Lading
- Reporting
- Rack management

The new LoadMaster system unites all of these processes, providing information not only about rack status and conditions but also monitoring and controlling each step of the loading process.

Within the LoadMaster configuration, CIMPLICITY software is linked to a GE Fanuc Series 90™-30 PLC via Ethernet to provide real-time monitor and control of serial interfaces, field I/O, and other peripherals (such as card readers) that make up the loading rack. A series of graphics and text representing different areas of the rack are displayed on a main CIMPLICITY screen that provides access to loading rack status and meters, alarm status, rack control, and transactions. Program values, PLC configuration, startup, and shutdown are also accessible from the main screen.

The software's rack status window is a real-time display of activity at the loading rack. Each meter is represented by a background color that corresponds to status. For example, black indicates no activity; blue, a driver attempting authorization; yellow, the meter is unauthorized; green, fuel is flowing; and flashing red means the meter is in an alarm state, such as additive pump failure or no flow.

The rack meter control screen also conveniently permits a Cenex operator to turn meters off and remove them from service directly from the PC terminal, which can be a considerable advantage when the loading rack itself is a half-mile away. Rack meter control screen indications include in/out of service, meter on/off, and NRT (nonresettable totals), while screen controls include modify gravity buttons, meter totals, print meter report, all meters on/off, and time settings. "Basically, CIMPLICITY is a window into the process, so the operator can see exactly what each truck is doing and troubleshoot when necessary," says Bob Gauthier, Cenex automation engineer.

Though the loading rack is in operation 24/7, the typical LoadMaster system operated by Cenex is only manned from 8 a.m. to 5 p.m., Monday through Friday, by one operator. The LoadMaster is designed to operate predominantly unattended, saving time and money. "The independent nature of the LoadMaster and GE Fanuc system has cut operator expenses in half by allowing us to perform operation and maintenance tasks in a fraction of the time," Gauthier notes.

### Racking Up Efficiency

In addition to displaying rack status and conditions, CIMPLICITY is the tool that monitors and controls each step of the loading process, beginning with facility access. At Cenex's Glendive facility, access control generally consists of the security gates and doors. Typically, a truck driver must present a magnetic or proximity-type card to a reader at a main gate to access the loading rack area. Identification is achieved via operator interface stations centrally located to the truck rack. The driver positions the trucks, connects overfill and grounding safety systems, attaches delivery pipes to the truck manifold, and proceeds to the driver data entry area. After logging in with the same card used for entry, the driver is further prompted at the operator interface station for additional information, such as a PIN, truck number, trailer number, customer number, product, and quantity desired.

Once verified by the database, the quantity of fuel required is dispensed during the metering step, also known as a batch load. The link to the serial networked metering system is handled by a third party addition to the PLC system. This information appears as virtual PLC I/O to CIMPLICITY. Since a truck can contain numerous compartments, each of which can hold a different quantity and type of fuel, each compartment is filled from a different valve on the truck manifold. Following each batch load, the remote computer is notified and all batch transaction information is retrieved and recorded by the software.

After filling the truck with all the required fuels, the driver uses the same card to log out of the system. The software then retrieves all batches from the database for that particular driver session and produces the Bill of Lading, or manifest, which is required by the Department of Transportation and attests to load quantity.

Each day a number of CIMPLICITY reports are generated from the load rack computer by the rack operator. These reports help the operators with balancing quantities of fuels sold with inventory amounts, fuel additives, reconciliation and customer billings. The reports are also used for maintenance purposes to summarize the operating characteristics of the load rack. The operator can troubleshoot the rack, lock certain drivers or companies out, restrict products, disable load rack positions, and change values in the metering systems.

Cenex and SEBraun engineers were able to develop the databases from which the reports are generated without any traditional programming. Because CIMPLICITY can be configured to automatically log data to Microsoft Access®, a Windows®-based, relational database, Cenex operators simply select the items and conditions for logging. The system then records individual points in detail and groups others for trend analysis.

The LoadMaster is enjoying successful operation at six different Cenex dispensing locations, and SEBraun is anxious to introduce the system to other facilities seeking an affordable, adaptable loading rack solution. "With the LoadMaster and GE Fanuc system," Gauthier says, "we've successfully streamlined all of our dispensing facilities with the power to keep things pumping well into the future."

### GE Fanuc Automation Information Centers

USA and the Americas:  
1- 800-GE FANUC  
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(352) 727979-1

Asia Pacific:  
86-21-3222-4555

### Additional Resources

For more information, please visit the GE Fanuc web site at:

[www.gefanuc.com](http://www.gefanuc.com)

