



**FuelsManager**<sup>®</sup>  
DEFENSE

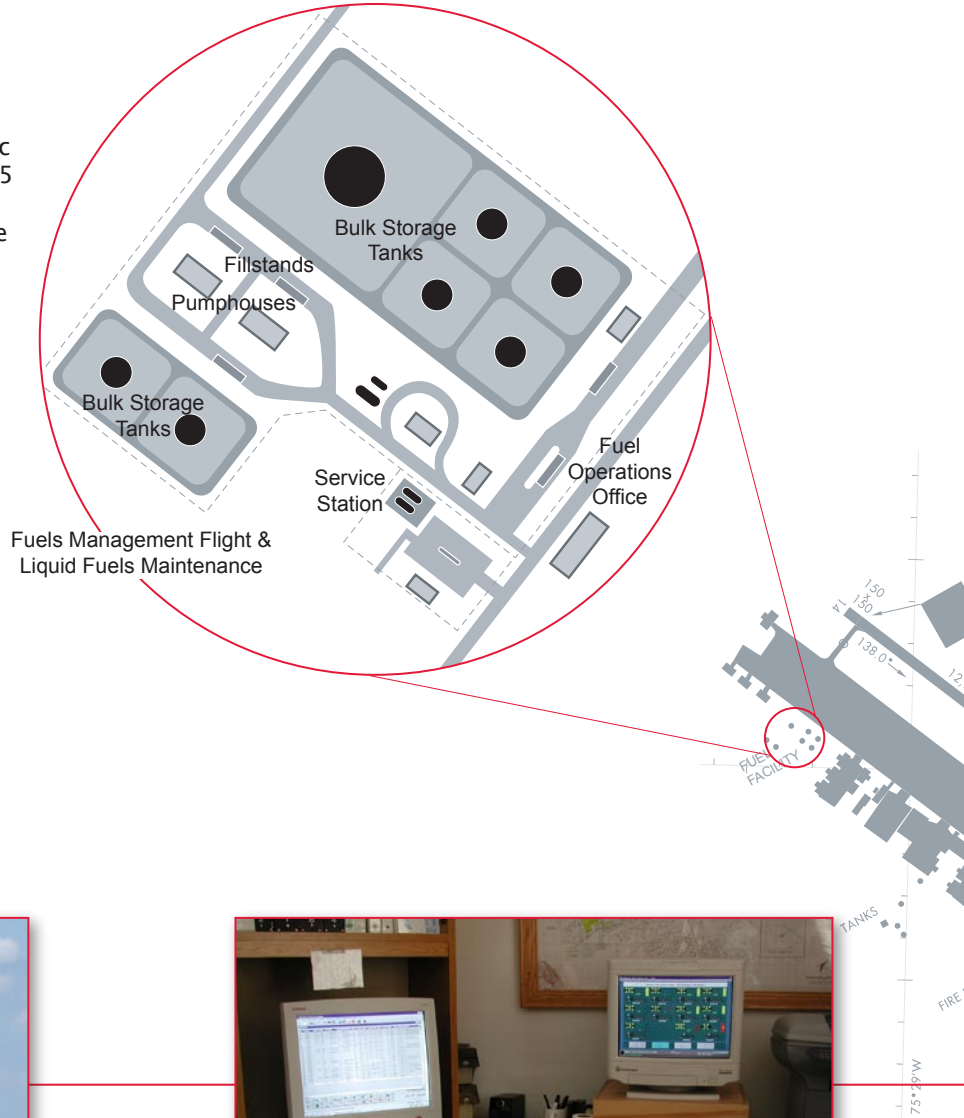


## **Dover AFB - an integrated solution**

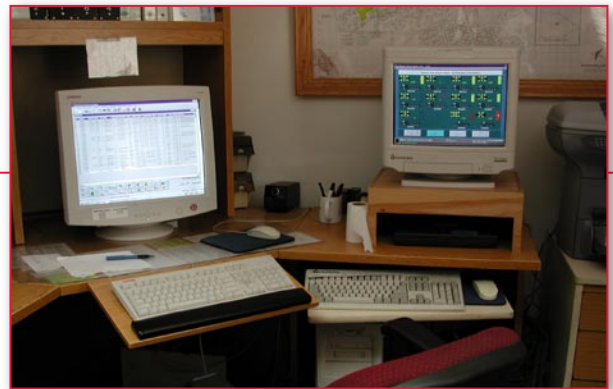
Automated Fuels Management System – Dover Air Force Base, Delaware, U.S.A.

## Dover Air Force Base

The 436th Airlift Wing at Dover Air Force Base (AFB) consists of operations, maintenance, mission support and medical groups, in addition to 14 divisions and two detachments. The wing has over 4,000 active-duty military and civilian employees. Home to C-5 Galaxy aircraft, the wing provides 25 percent of the nation's strategic airlift capability and is the only combat-ready C-5 Galaxy wing capable of employing airdrop and special operations tactics in support of worldwide airlifts. Additionally, the wing operates the largest and busiest aerial port in the U.S. Department of Defense (DoD) with its passenger terminal moving over 100,000 passengers annually.



Dover Air Force Base - Home to C-5 Galaxy aircraft



FuelsManager workstations in the Fuels Management Flight's Resource Control Center (RCC)

# Dover AFB and Varec

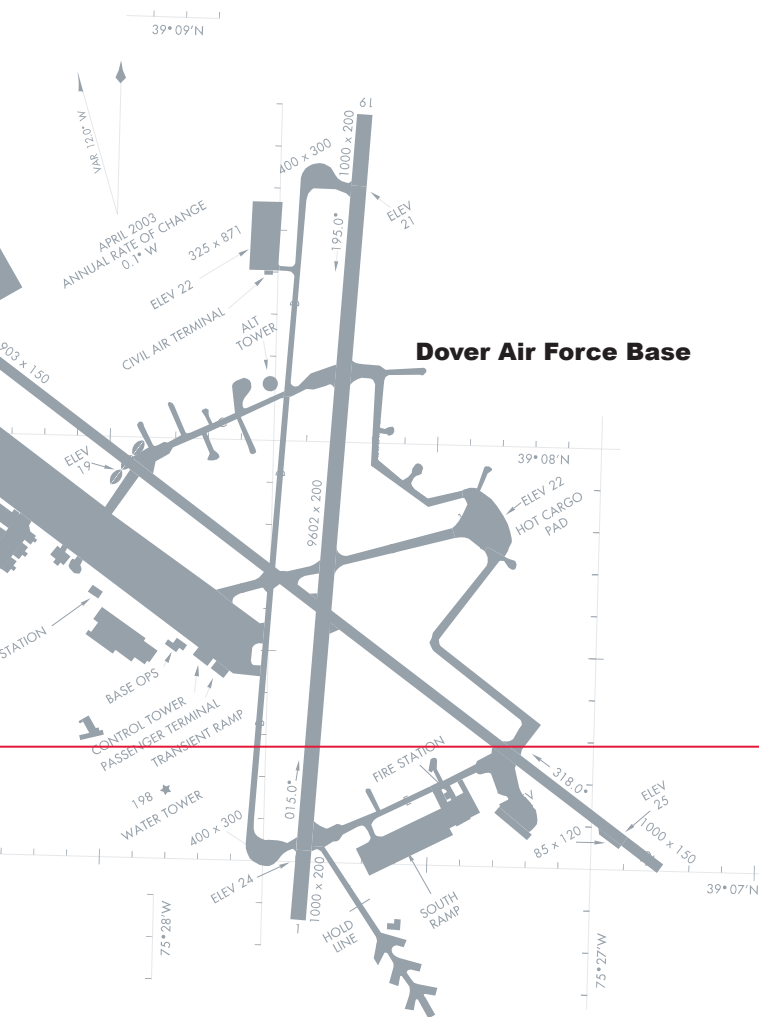
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## Fuels Management Flight & Liquid Fuels Maintenance

The 436th Logistics Readiness Squadron's Fuels Management Flight is responsible for providing refueling and cryogenic support to the wing and transient aircraft. The Fuels Management Flight provides JP-8 fuel using bulk storage tanks, a hydrant fueling system and R-11 refueling trucks. The 436th Civil Engineer Squadron's Liquid Fuels Maintenance (LFM) is responsible for the maintenance of the fuel storage and distribution infrastructure.

The Fuels Management Flight has access to real-time inventory management and fuels transaction data via the BSM-Energy system (formerly referred to as Fuels Automated System or FAS) – provided and supported by the Defense Energy Support Center (DESC) of the Defense Logistics Agency (DLA). The BSM-Energy Base-level system utilizes Varec's FuelsManager® software, which currently consists of two major components: 1) Supervisory Control and Data Acquisition (SCADA); and, 2) Fuels Control Center (FCC). The SCADA component interfaces to automatic tank gauges (ATG) installed on the bulk storage tanks to provide real-time inventory management data, while the FCC component is used for fuels transaction management.

LFM personnel maintain all components of the hydrant fueling system, including Control Panels located in two pumphouses. These Control Panels provide monitoring and operator control for all instrumentation, valves and pumps associated with the hydrant fueling system and bulk storage tanks, including tank high level alarms. Since the pumphouses are not staffed around the clock, Dover AFB did not have a system to effectively monitor the pumphouse overflow protection equipment and other operationally critical alarms on a 24-hour basis, which is vital to ensuring environmental and operational safety and compliance.



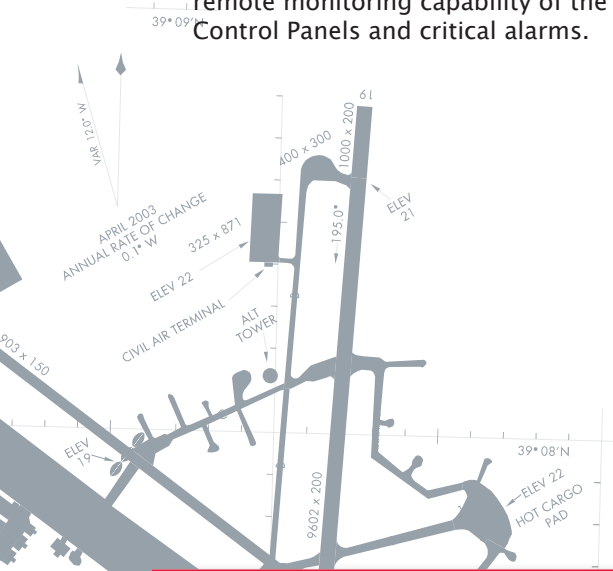
JP-8 fuel bulk storage tanks and hydrant fueling system operated by Liquid Fuels Maintenance (LFM) personnel

## System Requirements

The United States Air Force's Petroleum Office (AFPET), working with DESC's environmental management, recognized a requirement to provide continuous monitoring of the high level alarms installed on Dover AFB's seven bulk storage tanks, as well as other critical alarms associated with the hydrant fueling systems. AFPET, aware of the capabilities of the installed BSM-Energy system, requested DESC to task Varec to integrate not only the high level alarms, but all critical pumphouse alarms into the FuelsManager system. This system enhancement was seen as the best solution to providing the Fuels Management Flight a 24-hour, remote monitoring capability of the pumphouse Control Panels and critical alarms.

## An Integrated Solution

Varec worked closely with Fuels Management Flight and LFM personnel to identify the detailed scope of the system requirements necessary to ensure the project was completed successfully. As a first step, each high level alarm needed to be integrated into the existing FuelsManager system. Existing Air Force information technology security policies strictly limit wireless and dial-up modem communications. After discussions with Fuels Management Flight and 436th Communications Squadron personnel, it was determined that the optimum approach would be to expand the existing Dover AFB fiber-optic network from the Fuels Management Flight's Resource Control Center (RCC) to the pumphouses. Varec, working with the 436th Communications Squadron, installed new fiber-optic cabling from the base communications network to both pumphouses.



Single-mode fiber-optic cables were installed from the pumphouses to the base communications network

Existing programmable logic controllers (PLCs) were upgraded to the latest technology and interfaced to the base communications network

# Dover AFB and Varec

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The next step was to upgrade the existing programmable logic controllers (PLCs) contained within each of the Control Panels, as there were no communications capabilities available for integration into the BSM-Energy system. Varec, working with the Control Panel systems integrator, identified the detailed steps required to upgrade and integrate the Control Panels with the FuelsManager Data Server located in the RCC. It was also determined that LFM personnel needed to monitor the pumphouse alarms in real-time and be more closely aligned with the Fuels Management Flight and their daily operation of the hydrant fueling system. To facilitate this function, a new FuelsManager workstation was installed at the LFM shop.

The final step was to upgrade the existing FuelsManager graphical user interface (GUI) displays to allow for RCC monitoring of the newly installed capabilities in a real-time, graphical format. All existing process schematics of the hydrant fueling system Control Panels were duplicated in color graphics displays on the RCC FuelsManager workstation. An alarm annunciator display was also added to FuelsManager to facilitate ease of monitoring all critical alarms. Now, both the Fuels Management Flight RCC and LFM personnel have the ability to monitor pumphouse alarms and process status information via computer displays that identically mimic the Control Panel piping and instrument diagram in the pumphouses.



FuelsManager was upgraded and configured to communicate directly with the hydrant fueling system Control Panels



FuelsManager real-time color process and annunciation displays were added to the BSM-Energy system



Complete status and critical alarms indications - previously available only on the Control Panels - are now available on the desktop of all authorized FuelsManager users

## Into the Future

The integrated Varec FuelsManager system now provides 24-hour monitoring of critical alarm data to protect the environment against a tank overflow, as well as providing LFM personnel with the ability to monitor operational parameters that could affect equipment functionality. The system in place is fully expandable at the equipment or system level and additional pumps or valves can be integrated or additional system workstations added. The base-wide, fiber-optic network can provide the security and speed needed for future digital communications.

Following these environmental and technology enhancements, Dover AFB was selected by AFPET as the first U.S. Air Force base to beta test Varec's FuelsManager Defense 6.0 software upgrade. Their commitment to excellence in automated fuels management is a major benefit to the United States Air Force and the Department of Defense.

**For further information about Varec's measurement, control and automation solutions for defense applications, please email: [defense@varec.com](mailto:defense@varec.com)**



*"We have found the integration of Type III Hydrant Fueling System monitoring into our overall FuelsManager scheme to be a great tool, particularly for our 24-hour RCC team, who are able to watch operations with a much more scrutinizing eye than simply knowing if pumps are on or off. We see this as an awesome first step in our ever increasing improvement process and look forward to a completely automated fuels storage system with the ability to be able to run typical scenarios at the touch of a button."*

*Dover AFB Fuels Management Flight*