

Fuel Line

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DESC 2004 Worldwide Energy Conference, Sept. 28-30see page five for the details.

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Naval Facilities Engineering Service Center Designs Safety System

*By Rosalie Bareng
Naval Facilities Engineering Service Center*

Naval Base Ventura County's (NBVC) three fuel sites are located within a Class Four Seismic Zone, a region surrounded by major active faults that frequently produce small and large magnitude earthquakes. The largest site is at Naval Air Station Point Mugu (NASPM), with an approximate 1.2 million gallon storage capacity. One of three 300,000 gallon tanks is online to the pump house around the clock for alongside refueler issues. These tanks are surrounded on three sides by environmentally sensitive marshlands, lagoons and waterways that directly connect with the Pacific Ocean. Several endangered and protected species of migratory birds and other marine life use this habitat for shelter.

Concerned with the possible failure of fiberglass reinforced pipe (FRP) outside of containment areas, and the potential cost for cleanup of the marshlands, Don Stits, fuel division manager, sought a reliable solution. Stits turned to the innovation and expertise of the Naval Facilities Engineering Service Center (NFESC) Energy and Utilities Branch to design a seismic shutdown system.

Responding to the challenge, the Engineering Service Center's Galen Marks, designed and installed a system that incorporates a motorized valve activated by a remote seismic sensor. The automated valve is located within tank containment on carbon steel piping before transition to FRP. The remote seismic sensor utilizes a tri-axial digital acceleration sensor with variable trigger set points anchored to the concrete floor of the nearby pumphouse. The sensor detects primary and secondary seismic energy, and is capable of filtering out industrial vibration "noise."

Additionally, the seismic safety system is interlinked to the pre-existing leak detection system, and emergency stop circuitry at the fuel complex. Upon activation by a seismic

event, leak or emergency, the valve closes and stops the flow of fuel to any pipeline outside contained areas. This minimizes the potential fuel release to that contained only in the piping downstream of the seismic valve. Due to the Department of Defense mission, circumstances that warrant the need, the seismic valve is fitted with lockable manual override.

The system utilized at NASPM could be modified to control most any device that needs to be activated and deactivated during a seismic event.

The seismic shutdown system affords the highest confidence in environmental protection without compromising mission readiness.



Seismic shutdown system designed by the Naval Facilities Engineering Service Center Energy and Utilities Branch.