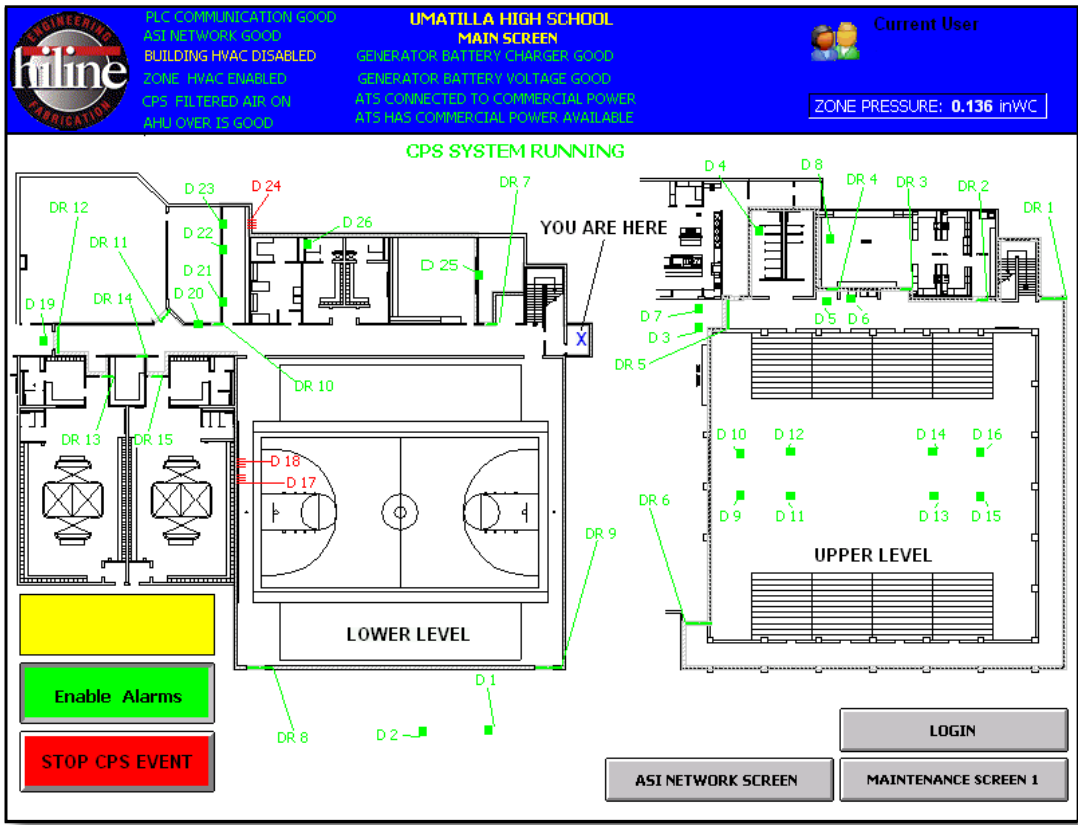


With Contents Under Pressure

county, state, and federal agencies develop interoperable first responder network with InduSoft Web Studio



- High resolution graphic interface, easy to use in emergencies.

- Local area network collects all sensor information.

- Comprehensive real-time and historical trend records record pressurization.

- Data available over web connections to password-embedded browsers everywhere.

- WiMax technology for multi-county, multi-agency first-responder network.

High resolution drawings make it possible to see the status of protection systems at a glance .

Background

All politics is local. In the case of a decision to destroy existing stockpiles of U.S. chemical weapons, the impact to local communities was a concern of agencies tasked with managing that effort. Of particular interest was a chemical depot in Umatilla, Oregon, one

of eight U.S. Army installations in the United States that currently store chemical weapons. The local component was a commitment by a dozen or more U.S. counties and the U.S. Army Chemical Command. The original mission was to stockpile American chemical weapons in 1941 in preparation for U.S.

participation in WWII. From 1990 to 1994 the facility reorganized in preparation for eventual closure, shipping all conventional ammunition and supplies to other installations. Today, the Umatilla Chemical Agent Disposal Facility is designed for the sole purpose of destroying the chemical weapons

stored at the Umatilla Chemical Depot. The facility was completed in 2001, and the Army began weapons disposal in 2004.

To protect the local communities, a special program was needed. FEMA and the Army partnered



Continued from front page...

with local communities to develop CSEPP: Chemical Stockpile Emergency Preparedness Program. As part of CSEPP, first responders can use wireless, InduSoft Web Studio to monitor the status of the systems used to keep schools safe. A school like this can be a safe refuge when properly equipped and monitored.

The Problem

The U.S. Army had to deal with over 31 million pounds of the worst imaginable chemicals—Sarin, VX, and blistering agents—all stored and destroyed inside nine federal arsenals. For this reason the CSEPP program is comprehensive, providing protective measures outside the perimeter of arsenals.

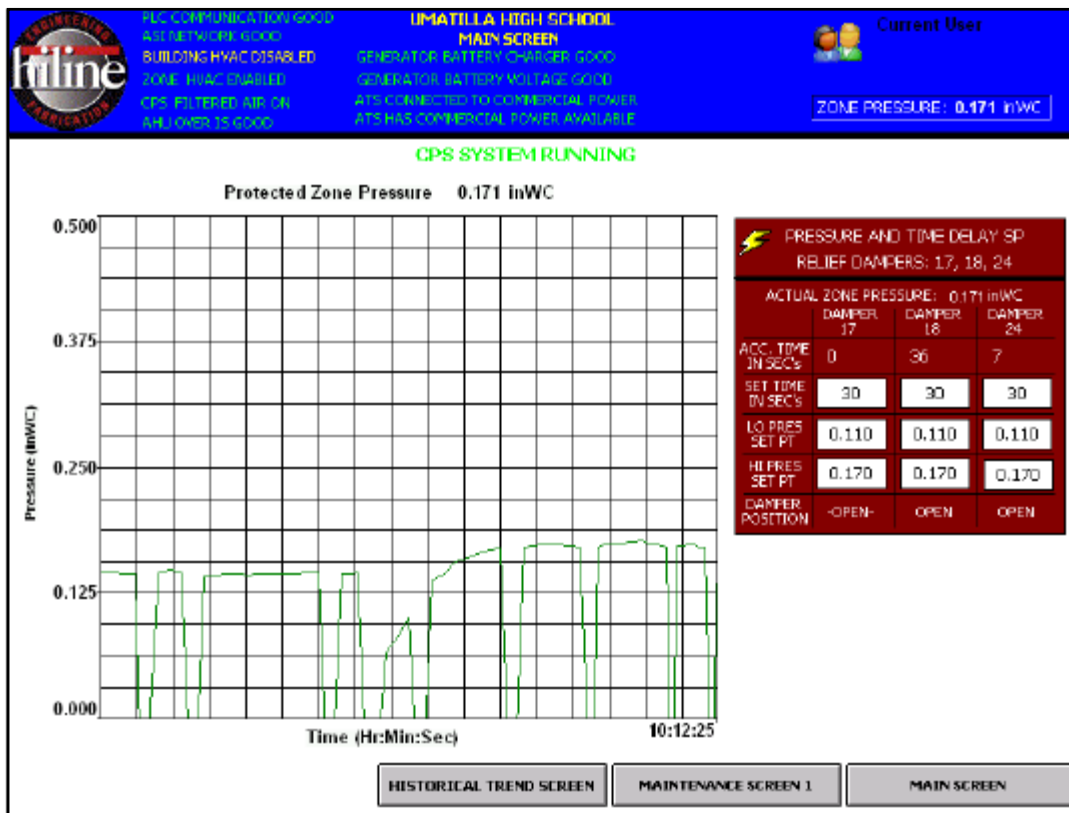
Early warning systems and special ‘always-on’ radios—like weather

radios—could give individual households plenty of time to either evacuate or to take precautions in their current shelter, but schools posed a special problem. To protect the children, the best defense would be protective systems at the schools themselves. Powerful carbon filtration would filter inlet air at locations inside the school—like the gym—could be kept under positive pressure until the hazard had

passed and cleanup accomplished. To make the system work, school officials needed to monitor the position of every door and window damper so pressurized lockdown could be achieved.

The Solution

To keep the schools safe, a noted consulting firm, SCM, developed an overall scheme and designed specialized systems, including high



Left:

The pressurization of the school is trended to show if and when any hazardous conditions exists

capacity carbon filters and specialized HVAC equipment. In the original deployments, this special HVAC system was controlled by pushbuttons and lamps. However, Bill Howard of Umatilla County Emergency Management felt a more modern system with a graphic display would be better. “If there is an event, we have to quickly move people into the protected zone and then verify that all doors

and windows are closed, perhaps sending people out to close them. With the old system, this meant cross referencing numbered lamps using a placemat-sized drawing. This takes precious moments, and introduces an opportunity for error in an operation where error is just not acceptable.”

Protective systems were procured through the usual acquisition process. Umatilla County CSEPP

selected prime and sub contractors, and turned to Hiline Engineering to create the critical new safety control system. Hiline picked InduSoft Web Studio because InduSoft could offer both a superior HMI on an embedded, Windows CE device with a flat panel display, and a reliable interface to the PLC and I/O network used to monitor door window damper and HVAC status throughout the school.

Using the InduSoft Web Studio software, school officials could see the status of school pressurization, and quickly identify any open doors or windows that could prevent a safety seal. “We picked InduSoft for its features, but what was most important was the support,” said Tim Armstrong of Hiline Engineering. “To increase usability, we were using high resolution architectural drawings

Right: School officials hope the system will never be used. But it is seen as a necessary part of the regular maintenance program for the special HVAC system at the school.

hiline ENGINEERING FABRICATION

PLC COMMUNICATION GOOD
 ASI NETWORK GOOD
 BUILDING HVAC DISABLED
 ZONE HVAC DISABLED
 CPS FILTERED AIR ON
 AHU FLOW IS GOOD

UMATILLA HIGH SCHOOL MAINTENANCE SCREEN

Current User: [Avatar]
 ZONE PRESSURE: 0.154 inWC

RESET FILTER RUN TIME

CPS SYSTEM RUNNING

ELAPSED TIME OF CPS EVENT: Hrs 0 Mins 32 Secs 24
 ELAPSED FILTER TIME: Hrs 37 Mins 14 Secs 12

PRESSURE AND TIME DELAY SET POINTS RELIEF DAMPERS: 17, 18, 24			
ACTUAL ZONE PRESSURE: 0.154 inWC			
	DAMPER 17	DAMPER 18	DAMPER 24
ACC. TIME IN SEC'S	0	49	6
SET TIME IN SEC'S	30	30	30
LO PRES SET PT	0.110	0.110	0.110
HI PRES SET PT	0.170	0.170	0.170
DAMPER POSITION	-OPEN-	OPEN	OPEN

Buttons: GENERATOR CONTROL AND STATUS (START/NOT RUNNING), GENERATOR ENABLE (ENABLE/GEN DISABLED), AHU CONTROL AND STATUS (START/RUNNING), TAKE COVER AND DOOR ALARM POWER (ENABLE/DISABLED), ATS (AUTOMATIC TRANSFER SWITCH) (START TEST/NOT IN TEST), SCHOOL HVAC DISABLE (ENABLE/SYSTEM DISABLED), PROTECTED ZONE HVAC ENABLE (DISABLE/ZONE ENABLED), MANUAL CONTROL DAMPER POWER (DISABLE/ENERGIZED).

Bottom Navigation: START CPS SYSTEM, STOP CPS SYSTEM, REALTIME TREND SCREEN, HISTORICAL TREND SCREEN, MAINTENANCE LOGOUT, ASI NETWORK SCREEN, LOGIN, MAIN SCREEN.

Right Panel: Technician (Tech) Maintenance Time, 5:40, Enter Time in Seconds, Load New Time.

for the graphics. This pushed us to the limits of the hardware platform, but InduSoft helped us work past the bottlenecks”.

As the project developed, the need for interagency communication became evident to Bill Howard. In the event of a chemical release, first responders needed to know where people were and the status of their protection systems. And all of this information had to be communicated across Federal, State and City agencies.

Fortunately, the CSEPP program allowed for the provision of supported development for a first responder wireless network. A global WiFi/WiMAX company, ezWireless, won the contract to provide seamless broadband coverage from towers across an area covering

eight cities and 35 State, Local and Federal agencies—more than 600 square miles in all. This is one of the first WiMAX networks; using 802.11g for connection to devices. The system is locked down and secure, and is available only to authorized agencies. Bill Howard had HiLine develop an open Web portal to the wireless network. The InduSoft Web Studio software becomes a Web server, displaying the system status through a simple Web page, available to anyone with access privileges.

In addition to the InduSoft Web Studio software in the school, hundreds of people and devices connect over the network; IP wireless video cameras, street lights, emergency signs, automated barricades and, of course, police and fire vehicles all

connect to the system as needed. ezWireless further backs this communication network with applications that can track the plume from a possible discharge. Factors such as local weather and wind patterns can be tracked, and many other applications including day-to-day law enforcement all benefit from the system. Now, Police and Fire units can check the status of an incident even when traveling at 70 miles per hour between access points. And the status of the schools safety systems are available seamlessly at Bill Howard’s desk 30 miles away, and on his laptop.

Results

The system is and has been working well in Umatilla and Morrow Counties, although it has been used

only in practice drills. The Web-connected InduSoft system has proven so successful that its use has been expanded to other counties and other states. It’s also retrofitted to older schools that had been previously protected by un-communicative, outdated pushbutton and lamp systems.

The success of this sophisticated system to ensure the safety of schools stands in stark contrast to some other efforts at Federal, State and Local interconnectivity. Many of these have fallen short, mired in inter-agency turf battles and funding disputes. Bill Howard thinks he knows why. In this case, everyone involved managed to push the limits of technology and get the system they needed. “We needed to be completely sure, for the safety of our children, that the system would work”.



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