



## CASE STUDY

### LARGE-SCALE, TEMPERED-WATER SYSTEM LOOP

Petrochemical Plant, Saudi Arabia

**Haws**  
*Integrated*<sup>™</sup>  
ENGINEERED SOLUTIONS<sup>™</sup> FOR SAFETY

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The petrochemical industry generates numerous products that can be harmful if not handled with appropriate safety requirements. Frequent exposure to these hazardous materials makes safety management and response important components of day-to-day plant operations.

#### BACKGROUND

The expansion of a petrochemical plant in the Jubail region of Saudi Arabia included a large new facility requiring numerous emergency response systems in various parts of the plant. As with most large projects, there were a number of site-specific conditions. The region's extremely hot, humid summer temperatures and cool winters cause ambient water to reach extreme temperature variations. A full 15-minute flush is required after exposure to hazardous chemicals, and tepid water is essential for emergency shower/eye/face washes. Water that is too hot can scald and potentially aggravate chemical reactions, and water that is too cold can cause hypothermia. Therefore, the petrochemical plant's safety system mandated tempered water at each emergency shower and eyewash.

#### OBJECTIVE

*Haws Integrated™* worked closely with the engineering firm responsible for the plant expansion to properly design an appropriate system. Water pressure, volume and temperature were important requirements. This custom solution would need to factor for particular site conditions and comply with standards set forth by the American National Standard Institute (ANSI), specifically those regarding water used in combination shower and eyewash equipment (Section 7.4.4). All systems would need to run simultaneously while maintaining the appropriate 20-gallon per minute flow for the required 15-minute flush period.

#### SOLUTION

It was necessary to design a single system that would manage both the temperature and pressure of the water across each safety shower and eyewash in a centralized 1.5-mile loop. *Haws Integrated™* worked directly with the engineering firm from the onset of the project to develop a custom system of chilling and heating equipment, pumps and controls that would ensure proper pressure and temperature to every system in the loop. Careful calculations were also made to determine the ideal speed of the recirculating water, ensuring its proper temperature at all points of use. A central control station featuring a Programmable Logic Controller (PLC) would monitor system temperatures and pressures, and additional controls would offer both summer and winter modes.

#### RESULTS

*Haws Integrated™* successfully designed, specified and built the safety system to meet the project's specific needs in compliance with applicable ANSI standards. Engaging *Haws Integrated™* early in the project design stage eliminated costly and time-consuming redesigns that can arise from improper specifications, and to date, the system has performed as intended.

