Brine Injection Pump Incident

Bob Nalbone
nalbonepe@sbcglobal.net

Abstract

A fatal incident on a brine reinjection pumping unit was caused by a "blocked in" positive displacement pump being energized. A common pump protective bypass valve and piping arrangement was not installed on this pumping unit. The piping system was solely protected from overpressure by a Pressure Relief Valve designed to fail at a predetermined pressure by the shearing of a retaining pin, commonly referred to as a "nail". This PRV had been altered to prevent its proper operation.

Prior to this incident, an improperly designed vibration dampener was installed on the pump. This design was technically flawed. It employed a air column as the dampening method, however the the air pocket would collapse under the pump discharge pressure. The collapse of the air pocket resulted in a water hammer shock wave that caused the dampener to explode.