



HIPPS Justification

What's a HIPPS and where are they used?

There are two common applications for a High Integrity Pressure Protection System (HIPPS).

First, many process facilities have expanded to the point where the original pressure relieving and flare system may no longer be able to handle a potential event. Preventing a potential overpressure through the use of a HIPPS can be done at a much lower cost compared to installing a new flare and header system.

Second, many subsea and land based pipelines are not designed to withstand full wellhead pressure. In some cases it is not physically possible to lay subsea pipe that is thick enough, and in other cases the project may not be commercially viable using pipe that is thick enough. In such cases, HIPPS are installed to protect the lower pressure rated portion of the pipeline

So a HIPPS measures pressure (usually using redundant transmitters), utilizes a logic solver (many technologies and configurations are acceptable), and closes valves. While such designs are allowed per current codes, the justification of such a system requires careful analysis by a team of specialists. The justification and analysis of a HIPPS must consider all operating and upset conditions that might cause an overpressure. Process dynamics must be analyzed to determine if the HIPPS can respond quickly enough to prevent the hazard. Some cases may be quite complex with multiple scenarios and multiple HIPPS.

Without an adequately sized conventional relief system, the HIPPS represents the last line of defense against an



overpressure event. Subsequently, many end users require an independent, third party review of the justification of such a system.

How good is good enough?

A HIPPS should offer performance as good or better than the conventional relief system it may be replacing. The performance of relief valves in the process industries varies considerably depending upon the application. Published sources of data show that relief valves in some applications offer performance no better than the equivalent of Safety Integrity Level 1 (SIL 1). Considering the uncertainty of the data, many specify that HIPPS meet SIL 3 performance. This requires the use of fault tolerant sensors and valves. The use of a SIL 2 system is still a possibility, with significantly lower capital and operational costs.

Questions to ask yourself

1. Do you have a case where the existing relieving system is unable to adequately handle the load, and has this been documented in a thorough hazards analysis?
2. Is the vessel in air, water or steam service? (If yes, the use of a HIPPS is not permissible.)
3. Is approval of local authorities required?
4. Do you have a case where a pipeline is not rated for the full wellhead pressure?
5. Have you performed a SIL selection study to determine the level of performance that will be required by the HIPPS?

aeSolutions is here to help

aeSolutions can help you determine whether a HIPPS is a viable option for your application. If justified, we can work with you to develop the requirements specification and deliver a system that will meet your specific safety and cybersecurity needs.

