Safety Instrumented Bypass Management

Amol V. Deshpande, CEng, TUV FSEng
Senior Process Safety Engineer
TOTAL Petrochemicals & Refining USA Inc.
Houston, Texas, USA
amol.deshpande@total.com

Abstract

Proper management of Safety Instrumented Function (SIF) bypasses during process plant operation can be challenging and could compromise process safety if the SIF is bypassed longer than its allowable maximum time interval.

Safety bypass procedures are usually written on site to comply with OSHA 1910.119 and IEC61511. However, in practice, safety bypass management can be difficult due to a lack of readily available process safety information, lack of operator awareness and the existence of a production throughput oriented culture.

For many operating sites, process safety information (PSI) is only available in Process Hazard Analysis (PHA) reports. Commercial databases are available which display process safety information and make it readily available to operations and maintenance to properly implement and handle safety bypasses. An alternative approach is the creation of an in-house process safety database to provide easily-accessed process safety information.

This paper will present a case-study on how TOTAL-Port Arthur Refinery developed and implemented such a system. The paper will include our flow chart for bypass approval, how we perform a bypass risk assessment and how we developed our SIS database.

This SIS database has also proven useful for ‘operator training’ on the risks associated with the process unit and the available safeguards to manage those risks.
Keywords:

Safety Instrumented System, Safety instrumented Function, Safety Instrumented Bypass