

GAIL (India) Limited

Chhainsa Compressor Station, Faridabad

Strengthening of Lopa to Enhance Fire & Safety in a Plant

The Layer of Protection Analysis (LOPA) technique is widely recognized and utilized across process industries as a valuable risk assessment methodology. Its primary purpose is to evaluate and manage the risks associated with potential hazardous events by assessing the effectiveness of existing protection layers and identifying the need for additional safeguards to prevent or mitigate accidents.

LOPA holds significant relevance in industries such as oil and gas, chemical manufacturing, pharmaceuticals, and others, where ensuring process safety is of paramount importance. It empowers decision-makers to make informed choices regarding risk management strategies and effectively allocate resources to enhance safety measures.

Typically, LOPA is conducted during the early stages of the plant's control system planning, and its recommendations play a crucial role in finalizing the design, particularly in terms of safety aspects.

In the specific context of our plant, the Gas Engine Generator (GEG) machine operates using natural gas for captive power generation. Given the hazardous nature of natural gas, it is vital to thoroughly analyze the critical process parameters of the machine to ensure safe operation. Any malfunctions or failures could lead to severe accidents, posing risks to both individuals and surrounding property.

To address this need, an analytics dashboard was developed and added as an additional layer of monitoring on top of the existing LOPA layer. This innovative tool leverages data from the machine's control system to detect anomalies and potential safety hazards in advance. By extracting key insights from the machine's data, the analytics dashboard plays a vital role in predicting fire and safety hazards. It continuously monitors critical alarms and events, ensuring the safe operation of the GEG machine and providing enhanced protection for both people and property.