

ABSTRACT

The oil and gas industry in Indonesia is one of the industrial sectors with high complexity and risk. PT XYZ is a company focused on managing domestic oil and gas. PT XYZ's operational activities are supported by several offshore platforms and facilities located in the middle of the sea. Given the location of these platforms and facilities, they are naturally subject to various potential risks. Therefore, procedures are needed to prevent major incidents. Process safety is a top priority to prevent major incidents or significant accidents that could cause losses. The procedure used by PT XYZ is called Process Hazard Analysis (PHA). The PHA documents must be continuously revalidated to ensure that the procedures align with existing conditions. Ideally, PT XYZ revalidates the PHA every five years.

This research focuses on one of PT XYZ's facilities, namely FSO Federal II. FSO Federal II is a ship that functions as a storage tank for processed crude oil. This ship has a capacity of up to 200 thousand barrels and has a high potential for major incidents. To identify risks that could lead to major incidents, PT XYZ performs the PHA procedure, which consists of several methods. The methods used in the PHA are HAZOP and HAZID. HAZOP and HAZID are used to identify the identified risks. Although PT XYZ has conducted the PHA procedure, it does not yet have a control system that workers can use directly. This final research aims to create a risk control system that FSO Federal II workers can use as a work guideline. These guidelines will be used as a reference if unwanted events that could potentially lead to major incidents occur.

The proposed improvement involves creating work guideline documents from risk identification results using the Bowtie Analysis method. The output from this method is a diagram mapping the causes, top events, resulting hazards, and consequences if the top event occurs. However, to facilitate the workers, a simplified diagram will be created from the Bowtie diagram. This is done because there are many processes occurring on FSO Federal II, requiring an emergency response scenario guideline to help workers prevent major incidents.

Keyword: Process safety, Major Incident, Process Hazard Analysis, HAZOP, HAZID