

**ABSTRACT**

The problems faced in the operation of a gas plant are the risks of having leakage of pipelines and pressure vessels. The risks might be high, medium or low. They depend on how likely the pipelines or pressure vessels are being leaked and how severe is the consequences of them.

Lapindo Brantas Inc is one of Oil and Gas Company which processes natural gas from production wells, transports the gas to Gas Processing Plant, processes the gas, and then sends the gas to customers. Considering the characteristic and behavior of the commodity i.e. natural gas, it is acceptable that production facilities handled by this company have a relatively high risk for fire and explosion.

Risk is defined as the product of two separate terms – the *likelihood* that a failure will occur and the *consequence* of a failure. This thesis discusses the process of identifying risks of pipelines and pressure vessels operated by Lapindo Brantas, Inc. The methodology outlined in API 581 is adopted in determining risks of current operational practice of Lapindo Brantas, Inc. The risk analysis discusses in this thesis is comprised of five steps; system definition, hazard identification, likelihood assessment, consequence assessment, and risk result.

The results of this thesis is the risk mapping of equipment items currently operated in Lapindo Brantas, Inc. Having these risks mapped, the inspection program of the equipment items can be prioritized.

Key words : Risk assessment, gas processing.