**Abstract**

Gas is one of the alternative energy source to be reckoned with, given the fact that the oil reserves in the world have been depleted. One of the method used to distribute natural gas is using a subsea gas pipeline. Pipeline is one of the important gas transport technology and is often used because it can drain the gas in huge volumes and long distances that can be used by land or sea. Another benefit of the pipeline that is easy to operate, safe and economical when compared to other transport method. It just because the pipe is under the ship traffic, so it could make a risk. This final project presents a risk assessment of the pipeline owned by PT. Pertamina Hulu Energi-West Madura Offshore and PT. Hess Indonesia, which is used to distribute natural gas and pipeline segment of this thesis takes the passing PT. Berlian Manyar Sejahtera (PT. BMS). In this segment of the pipeline is totally under waters. Problems arising in this segment is the trestle construction activities by PT. BMS which it can be making external impacts for the pipeline that has been there before. Risk assessment is used to assess whether the risk is acceptable or not. Consequence assessment of impact on the pipe material is simulated with Solid Work. Risk assessment is based
on DNV RPF-107 standard. After knowing the level of risk then it be evaluated against these risks. For the unacceptable risk, the mitigation process should be done to reduce the consequences and frequencies. The mitigation process used to creat a box cuvert as a pipeline protective. Based on the result of risk assessment where result obtained at high level risk are at ALARP zone. In order to risk at an acceptable zone, it needed mitigation. Mitigation use box culvert to protect pipeline.

Keywords : Proses Piling, offshore pipeline, risk assessment, trestle construction, solid work, DNV RPF – 107.