

Earning Doctoral Degree After Researching Buckling Failure in Perforated Steel Pipe


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Marine environment has high vulnerability towards structural failure of steel pipe frame due to corrosion process. Hole in steel pipe frame not only happens because of corrosion but also fabrication failure. However, reduction of corrosion potential in steel pipe during both onshore and offshore refineries construction or oil drilling is required, thus the structural failure in steel pipe frame can be prevented.

A doctoral student from Civil Engineering, Faculty of Engineering UGM, Miftahul Iman, succeeded to conduct experimental and numerical studies regarding buckling failure in perforated steel pipe frame's structure. Miftahul Iman tested the influence of the holes' position and diameter towards buckling failure reduction.

The experimental and numerical results show the hole's existence can significantly reduce the buckling load capacity. "Maximum reduction happens when the hole is located in the center of the pipe's length," said Miftahul Iman during an open examination for Doctoral promotion at Faculty of Engineering on Monday (22/1).



When the buckling happens, according to Miftahul, the form of pipe deformation is single curvature with an opposite curvature direction in the hole's position. In addition, there is a buckling capacity decrease due to the change of hole's diameter at every position. "The lowest critical load value happens in the piping model with the biggest hole's diameter which is located at the center of the pipe's span," he added.

Miftahul concluded that the bigger hole's diameter, the bigger reduction factor can be obtained. However, the hole's existence will reduce the buckling load capacity.

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