

**RELIABILITY ANALYSIS OF METHANOL
REACTOR TOWARDS TEMPERATURE
VARIATIONS BASED ON ANSYS**

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**BACHELOR OF CHEMICAL ENGINEERING
(ENVIRONMENT) WITH HONOURS**

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ANSYS**

By

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ABSTRACT

The increasing of accident at chemical plant is becoming a growing concern. The problem of chemical reactor system failures cannot be solved simply by spending more money on buying new equipment. There is an urgent need for innovation, for better understanding of the current problem. Thus, the use of engineering simulation is one of the approaches that had been used to study the chemical reactor in the industry. This research aim is to design and validate the modelling of fixed bed reactor tubing in methanol production using ANSYS – Fluent and to study the effect of temperature variations toward the reliability of the fixed bed reactor tubing using Fluent – Structural – ANSYS. In this study, the tube geometry was created by using ANSYS Design Modeler. The tube model is meshed and imported to ANSYS Fluent for the validation. Result obtained from validation was transfer to ANSYS Static Structural for reliability analysis based on various temperature. The result obtained shows that the validation error for these studies comparing with industrial data is 2.5% and the outlet's temperature of the tube gradually increases with increasing of feed temperature. Apart from that, the lifespan for the tube was found to be declined when the temperature increased. In general, the simulation's result corresponds extremely well with industrial data.