

## INTISARI

Dalam industri Pembangkit Listrik Tenaga Panas Bumi (PLTP) terdapat *wellhead* yang menjadi komponen vital produksi uap panas bumi yang digunakan untuk menggerakkan turbin uap pada PLTP. *Wellhead* beroperasi pada tekanan dan temperatur yang tinggi sehingga perlu diketahui batas aman tekanan dan temperatur operasional *wellhead* sehingga dapat beroperasi dengan aman.

Data *wellhead* diambil dari lapangan, tepatnya di salah satu sumur produksi panas bumi milik PT. Geo Dipa Energi unit Dieng yaitu sumur HCE-30A. Tekanan operasi *wellhead* mencapai 550 psi, temperatur operasi mencapai 300°C, dan kapasitas produksi uap sekitar 42 ton/jam. Simulasi dilakukan dengan meningkatkan tekanan pada *wellhead* secara bertahap hingga nilai tegangan von Mises pada *wellhead* mendekati tegangan ijin dari material *wellhead* itu.

Melalui hasil simulasi dengan tekanan operasi simulasi sebesar 6,067 MPa (880 psi) diperoleh nilai tegangan von Mises yang mendekati tegangan ijin, dalam hal ini adalah tegangan luluh material peralatan *wellhead* yaitu sebesar 455 MPa (66000 psi) pada temperatur 300°C.

Kata kunci: PLTP, *wellhead*, *well killing*, *stress analysis*, *thermal analysis*

## ABSTRACT

In Geothermal Power Plant industry, wellhead becomes a vital component in geothermal steam production which is used to drive turbine in a geothermal power plant. Wellhead operates at high pressure and temperature, thus pressure and temperature safe limit need to be known to ensure it can be operated safely.

Wellhead data was taken from the field, to be exact, it was from one of production well owned by PT. Geo Dipa Energy unit Dieng which is called HCE-30A. Wellhead operating pressure was 550 psi, operating temperature was 300°C, and steam production capacity is around 42 tonne/hour. Simulation had been done by increasing pressure on wellhead gradually until von Mises stress reached permitted stress of wellhead's material.

From simulation, by using simulated operating pressure of 6,067 MPa (880 psi), it resulted in von Mises stress which nearing permitted stress, in this case, it is the yield strength of wellhead's material. The result value is 455 MPa (66000 psi) at 300°C.

Keywords: GPP, wellhead, well killing, stress analysis, thermal analysis