

INTISARI

Fenomena *flooding* dapat terjadi pada peralatan-peralatan industri yang terdapat aliran dua fasa berlawanan arah, misalnya kondensor, evaporator, kolom destilasi, reaktor kimia gas cair dan reaktor nuklir pada saat terjadinya *LOCA*. *Flooding* ini akan mempengaruhi kinerja peralatan tersebut yang akhirnya merugikan industri. Penelitian ini bertujuan melihat sejauh mana pengaruh kemiringan dan obstraksi terhadap mekanisme inisiasi atau permulaan *flooding* aliran berlawanan arah air-udara.

Penelitian dilakukan dengan menggunakan pipa *plexyglass* berdiameter 32 mm, panjang pipa seksi uji 3000 mm, dengan *inlet* cairan berpori [*porous*] dan *outlet* tajam [*sharp*]. Variasi kemiringan saluran 80⁰, 70⁰ dan 60⁰. Obstraksi berbentuk cincin berpenampang persegi yang ujung bagian tajam di-*chamfer* [45⁰], berdiameter dalam 28 mm, dipasang dengan jarak 500 mm [$L/D = 15,625$] dan 2500 mm [$L/D = 78,125$] dari *inlet*.

Hasil penelitian menunjukkan bahwa pengaruh kemiringan saluran dan obstraksi sangat signifikan terhadap *flooding*. *Flooding* ditandai dengan naiknya gradien tekanan di atas *inlet* secara dratis. *Flooding* lebih awal terjadi pada kemiringan saluran yang lebih besar.

Kata kunci : *Flooding*; kemiringan saluran; obstraksi; aliran berlawanan arah.

ABSTRACT

Flooding phenomenon can occur in the industry's equipments if there is a two-phase flow, for example, condenser, evaporator, column destilation, chemical and nuclear reactor. Flooding will affect the performance of the equipment and tend to increase the industrial loss. This study aims at understanding the influence of slope and obstruction on initiation mechanism of flooding in the vertical counter-current flow of water-air.

The experiment was carried out by using the pipe plexyglass with diameter of 32 mm and 3000 mm length. The inlet pipe is porous and outlet is sharp. The channel slope were varied at 80^0 , 70^0 and 60^0 . Obstruction is made by a ring of square cross section installed at a distance of 500 mm [$L/D = 15,625$] and 2500 mm [$L/D = 78,125$] from the inlet pipe. The sharp edge of the ring is chamfered [45^0] with diameter in 28 mm.

Results of experiment shows that the influence of channel slope and obstruction on flooding is very significant. Flooding is indicated by sudden increase in pressure gradient. As the slope increase, the earlier flooding is observed.

Keywords : flooding; channel slope; obstruction; counter-current flow.