ABSTRACT

Reverse osmosis is the process of water purifying by giving hydrostatic pressure to the flowing water so it passes the permeable membrane and producing pure water. In the reverse osmosis system there are many equipment such as catridge filter and high pressure reverse osmosis primary pump (HPP Primary RO). Catridge filters are used to filter out any dirt or substance that filters in the activated carbon filters that can damage or clog up the RO membrane. While HPP Primary RO is used to drain raw water from catridge to primary RO. Problems are occurring while switching filter on catridge A while at the same time that pump which is ready to operate is the Primary HPP RO B due to Primary HPP RO A damaged or being repaired the otherwise when the filter on catridge B changed the pump that ready to operate is HPP primary RO A. Problem that happens when the filter in the catridge was changed it caused the production of demin water must be stopped because the reverse osmosis system must stop.

The interconnection pipeline that designed is calculated the cost of manufacture, the head loss on the reverse osmosis piping system, and the profit that the company receives after the interconnection pipeline.

Based on the analysis that has been done, after the added interconnection pipes in the reverse osmosis system increases the reliability and can provide financial benefits of Rp. 755.134.500,00 because demin water production still operation when filter changed on catridge.

Keyword : Reverse osmosis, Catridge filter, Interconnection pipe

INTISARI

Reverse osmosis adalah proses pemurnian air dengan cara memberikan tekanan *hydrostatic* pada air umpan sehingga mampu menembus sel *membrane permeable* dan menghasilkan air murni. Di dalam *reverse osmosis system* terdapat banyak peralatan yang digunakan antara lain yaitu *catridge filter* dan *high pressure pump primary reverse osmosis* (HPP *Primary* RO). *Catridge filter* digunakan untuk menyaring kotoran atau partikel yang terdapat dalam air keluaran *actived carbon filter* yang dapat merusak atau menyumbat *membrane* RO. Sedangkan HPP *Primary* RO digunakan untuk mengalirkan *raw water* dari *catridge* ke *primary* RO. Masalah terjadi saat pergantian *filter* pada *catridge* A sedangkan disaat bersamaan pompa yang siap beroperasi HPP *primary* RO B dikarenakan HPP *primary* RO A mengalami kerusakan atau sedang mengalami perbaikan begitu juga sebaliknya pada saat pergantian *filter* pada *catridge* B pompa yang siap beroperasi HPP *primary* RO A. Masalah yang ditimbulkan saat pergantian *filter* pada *catridge* tersebut meyebabkan produksi air *demin* harus terhenti karena *reverse osmosis* sistem harus *stop*.

Perancangan interconnection pipe yang dilakukan yaitu menghitung biaya pembuatan, *head losses* pada perpipaan sistem *reverse osmosis*, dan keuntungan yang didapat perusahaan setelah adanya *interconnection pipe*.

Berdasarkan analisa yang dilakukan, setelah ditambahkannya *interconnection pipe* pada sistem *reverse osmosis* dapat menambah kehandalan PLTU dan dapat memberikan manfaat finansial sebesar Rp. 755.134.500,00 karena produksi air *demin* tetap beroperasi ketika penggantian *filter* pada *catridge.*