ABSTRACT

PRARANCANGAN PABRIK DISODIUM FOSFAT ANHIDRAT DARI SODIUM KARBONAT DAN ASAM FOSFAT KAPASITAS 28.000 TON/TAHUN (PERANCANGAN *DOUBLE EFFECT EVAPORATOR* (EV-201 & EV-202))

By

Rangga Radika Prihandana

Indonesia needs to Disodium Phosphate Unydrate, Mainly as a cleaning agent in several industries such as soap and detergent industry and electroplating industry. Disodium Phosphate Unydrate is generally used, because of its water-soluble and Disodium Phosphate Unydrate often mixed with flour to prevent clumping of food. Examples of its use as additive in milk powder and additives in food that serves as regulator of acidity and reagent in boiler feed water treatment, used as a source of alkalinity to prevent corrosion and the formation of scale.

Needs Disodium Phosphate Unydrate in Indonesia is increasing every year and this time the material needs are imported from abroad. In addition, the needs of the world Disodium Phosphate Unydrate also increasing industrial development – industrial users Disodium Phosphate Unydrate . Disodium Phosphate Unydrate plant so it is necessary to support the development of the industry at home and abroad.

Disodium Phosphate Unydrate manufacture on a large scale, carried out on pra-design of Disodium Phosphate Unydratewith a capacity of 28.000 tons/year with sodium carbonate obtained from PT Aneka Kimia Inti, Jawa Timur and Phosphoric Acid derived from Petrokimia Gresik.

Disodium Phosphate Unydrate is produced by reacting Sodium Carbonate and Phosphoric Acid in a CSTR at 90 ^{o}C and a pressure 1 atm with convesion of 85,64%. The result of the reactor in the from of a solution of Disodium Phosphate Unydrate then flowed into the Evaporator for concentrated and then crystallized by the crystallizer and separated from its mother liquor in a centrifuge and then dried crystals Disodium Phosphate Unydrate use Rotary Dryer up to 98% purity.

The production capacity of the plant is palnned 28.000 tons/year with 330 working days within 1 year. What's planned factory was established in Lampongan Wast Java Province. Labor needed as many as 125 people with a form of business entity Limited Liability Company (PT), which is headed by a Director who is assisted by the Director of Production and Director of Finance with line and staff organizational structure.

Provision needs such as utility plants and water treatmen systems, steam supply system, Ammonia Refrigerant, instrument air supply systems and power generation systems.

Analysis of Pra-Design of Disodium Phosphate Unydrate Plant as follows:

Fixed Capital Investment (FCI) = Rp 162.935.690.789,-

Working Capital Investment (WCI) = Rp 28.753.357.198,-

Total Capital Investment (TCI) = Rp 191.689.047.988,-

Break Even Point (BEP) = 48,92%

Pay Out Time before Taxes $(POT)_b$ = 1,74 tahun
Pay Out Time after Taxes $(POT)_a$ = 2,08 tahun
Return on Investment before Taxes $(ROI)_b$ = 40,35%
Return on Investment after Taxes $(ROI)_a$ = 32,28%
Discounted Cash Flow (DCF) = 42,09%
Shut Down Point (SDP) = 20%

Considering the above summary, it is proper establishment Disodium Phosphate Unydrate plant is studied further, because it is a profitable factory and have propects.