

ABSTRACT

FACTORY DESIGN OF *HEXAMETHYLENETETRAMINE* FROM FORMALDEHYDE DAN AMMONIA CAPACITY 58,000 TONS/YEAR (Reactor Design (RE-201))

By

NINA BOENGA

Hexamethylenetetramine or also known as hexamine is a substance that has various uses in human life. Hexamethylenetetramine is widely used as raw material for the manufacture of *Royal Demolition Explosive* (RDX) which has a very high explosive power. In addition, Hexamethylenetetramine is also widely used in various fields, including health, industry, and others. The raw materials needed to produce Hexamethylenetetramine are formaldehyde and ammonia. Provision of plant utility needs in the form of water treatment and supply systems, steam supply systems, cooling water, and power generation systems.

The production capacity of the Hexamethylenetetramine plant is planned at 58,000 tons/year with 330 working days in 1 year. The location of the factory is planned to be established in the Kedayang area, Gresik, East Java. The workforce needed is 156 people in the form of a limited liability company (PT) with a line and staff organizational structure.

From the economic analysis, it is obtained that:

<i>Fixed Capital Investment</i>	(FCI)	= Rp 1.631.393.310.853
<i>Working Capital Investment</i>	(WCI)	= Rp 287.892.937.209
<i>Total Capital Investment</i>	(TCI)	= Rp 1.919.286.248.063
<i>Break Even Point</i>	(BEP)	= 38,05%
<i>Shut Down Point</i>	(SDP)	= 21,36%
<i>Pay Out Time after taxes</i>	(POT) _b	= 2,48 tahun
<i>Return on Investment after taxes</i>	(ROI) _a	= 32,2%
<i>Discounted cash flow</i>	(DCF)	= 33,3%

Based on some of the descriptions above, the establishment of the Hexamethylenetetramine plant deserves to be studied further in terms of the process and its economy because it is a profitable factory and has relatively good prospects.

ABSTRAK

PRARANCANGAN PABRIK *HEXAMETHYLENETETRAMINE* DARI FORMALDEHIDA DAN AMONIA KAPASITAS 58.000 TON/TAHUN (Prarancangan Reaktor (RE-201))

Oleh

NINA BOENGA

Hexamethylenetetramine atau bisa disebut juga *hexamine* merupakan suatu bahan yang memiliki berbagai kegunaan dalam kehidupan manusia. *Hexamethylenetetramine* banyak digunakan sebagai bahan baku pembuatan *Royal Demolition Explosive (RDX)* yang mempunyai daya ledak yang sangat tinggi. Selain itu, *Hexamethylenetetramine* juga banyak digunakan di berbagai bidang, antara lain bidang kesehatan, industri, dan lain-lain. Bahan baku yang diperlukan untuk memproduksi *Hexamethylenetetramine* adalah formaldehida dan amonia. Penyediaan kebutuhan utilitas pabrik berupa sistem pengolahan dan penyediaan air, sistem penyediaan *steam*, *cooling water*, dan sistem pembangkit tenaga listrik.

Kapasitas produksi pabrik *Hexamethylenetetramine* direncanakan 58.000 ton/tahun dengan 330 hari kerja dalam 1 tahun. Lokasi pabrik direncanakan didirikan di daerah Kedayang, Gresik, Jawa Timur. Tenaga kerja yang dibutuhkan sebanyak 156 orang dengan bentuk badan usaha Perseroan Terbatas (PT) dengan struktur organisasi *line and staff*.

Dari analisis ekonomi diperoleh:

<i>Fixed Capital Investment</i>	(FCI)	= Rp 1.631.393.310.853
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Berdasarkan beberapa uraian di atas, maka pendirian pabrik *Hexamethylenetetramine* ini layak untuk dikaji lebih lanjut dari segi proses maupun ekonominya karena merupakan pabrik yang menguntungkan dan mempunyai prospek yang relatif cukup baik.