# ABSTRAK

## PRARANCANGAN PABRIK KLORIN DIOKSIDA DARI HIDROGEN PEROKSIDA, NATRIUM KLORAT, DAN ASAM SULFAT DENGAN KAPASITAS 30.000 TON/TAHUN (Perancangan Reaktor 201 (RE-201))

**Oleh**

**MUHAMMAD RIFQI FADHILAH IRSA**

Klorin dioksida merupakan senyawa anorganik yang digunakan sebagai *bleaching agent* dalam industri pulp, kertas dan tekstil menggantikan $Cl_2$, *chloride*, dan *hypocloride*. Klorin dioksdia dapat diproduksi dengan beberapa cara antara lain: 1) Proses Solvay 2) Proses Mathiesson dan 3) Proses *Hydrogen Peroxide-Atmosphere*. Penyediaan kebutuhan utilitas pabrik berupa sistem pengolahan dan penyediaan air, sistem penyediaan *steam*, *cooling water*, penyediaan udara, dan instrumentasi.

Kapasitas produksi pabrik klorin dioksida direncanakan sebesar 30.000 ton/tahun dengan 330 hari kerja dalam 1 tahun. Lokasi pabrik direncanakan didirikan di Karawang, Jawa Barat. Tenaga kerja yang dibutuhkan sebanyak 108 orang dengan bentuk badan usaha Perseroan Terbatas (PT) dengan struktur organisasi lini.

Dari analisis ekonomi diperoleh:

| | | | |
|---|---|---|---|
| *Fixed Capital Investment* | (FCI) | = | Rp 703.878.253.984 |
| *Working Capital Investment* | (WCI) | = | Rp 124.213.809.527 |
| *Total Capital Investment* | (TCI) | = | Rp 828.092.063.510 |
| *Break Even Point* | (BEP) | = | 45,25% |
| *Shut Down Point* | (SDP) | = | 13,84% |
| *Pay Out Time before taxes* | $(POT)_b$ | = | 2,80 tahun |
| *Pay Out Time after taxes* | $(POT)_a$ | = | 3,27 tahun |
| *Return on Investment before taxes* | $(ROI)_b$ | = | 33,60% |

| | | | |
|---|---|---|---|
| *Return on Investment after taxes* | $(ROI)_a$ | = | 26,88% |
| *Discounted cash flow* | (DCF) | = | 33,72% |

Berdasarkan beberapa paparan di atas, maka pendirian pabrik klorin dioksida ini layak untuk dikaji lebih lanjut, karena merupakan pabrik yang menguntungkan dari sisi ekonomi dan mempunyai prospek yang relatif baik.

## ABSTRACT

**PREDESIGN OF CHLORINE DIOXIDE FROM HYDROGEN PEROXIDE, SODIUM CHLORATE, AND SULFURIC ACID WITH CAPACITY 30.000 TONS/YEARS**

**(Reactor 201 Design (RE-201))**

**By**

**MUHAMMAD RIFQI FADHILAH IRSA**

Chlorine dioxide is an organic compound that is used as a bleaching agent in the pulp, paper and textile industries to replace $Cl_2$, chloride, and hypochloride. Chlorine dioxide can be produced in several ways, including: 1) Solvay Process 2) Mathiesson Process and 3) Hydrogen Peroxide-Atmosphere Process. Provision of utility plant needs a treatment system and water supply, steam supply system, cooling water, air, and instrumentation providers.

Capacity of the plant is planned to production chlorine dioxide is 30.000 tons/year with 330 working days in a year. The location of plant is planned in Karawang, West Java. Labor needed in this plant as many as 108 people with a business entity form Limited Liability Company (PT) with line organizational structure.

From the economic analysis are obtained :

| | | | |
|---|---|---|---|
| *Fixed Capital Investment* | (FCI) | = | Rp 703.878.253.984 |
| *Working Capital Investment* | (WCI) | = | Rp 124.213.809.527 |
| *Total Capital Investment* | (TCI) | = | Rp 828.092.063.510 |
| *Break Even Point* | (BEP) | = | 45,25% |
| *Shut Down Point* | (SDP) | = | 13,84% |
| *Pay Out Time before taxes* | $(POT)_b$ | = | 2,80 tahun |
| *Pay Out Time after taxes* | $(POT)_a$ | = | 3,27 tahun |

| | | | |
|---|---|---|---|
| *Return on Investment before taxes* | $(ROI)_b$ | = | 33,60% |
| *Return on Investment after taxes* | $(ROI)_a$ | = | 26,88% |
| *Discounted cash flow* | (DCF) | = | 33,72% |

By considering above the summary, it is proper establishment of chlorine dioxide plant for studied further, because the plant is profitable and has good prospects future.