

> Menghitung Q₁

Luas shell dan head tanpa isolasi (A₁)

$$A_1 = 2 \times \frac{\pi}{4} (1,22 \times 3,872)^2 + (\pi \times 3,872 \times 19,685)$$

$$= 274,366 \text{ ft}^2$$

$$Q = Q_1 = Q_2 = Q_3$$

$$Q_1 = K_B A_1 dT/dY$$

$$309.123,3175 = 22 \times 274,366 \times \frac{404,6 - T_2}{0,0212}$$

$$51,2128 = \frac{404,6 - T_2}{0,0212}$$

$$1,086 = 404,6 - T_2$$

$$T_2 = 403,514 \text{ } ^\circ\text{F}$$

> Menghitung Q₂

$$A_2 = 2 \times \frac{\pi}{4} (1,22 \times 3,914)^2 + (\pi \times 3,914 \times 19,685)$$

$$= 277,87 \text{ ft}^2$$

$$Q_2 = K_{is} \times A_2 \times dT / dY$$

$$309.123.3175 = 0,446 \times 277,87 \times \left[\frac{404,6 - T_2}{\Delta x} \right]$$

$$2494,337 = \left[\frac{404,6 - T_2}{\Delta x} \right]$$

$$\Delta x = 0,1618 - 4,01 \times 10^{-4} t_3 \dots\dots\dots(1)$$

Dimana Δx = tebal isolasi

> Menghitung Q₃

Untuk konveksi bebas dari silinder vertikal ke udara dipakai rumus:

$$hc = 0,19 (\Delta T)^{1/3} \quad (\text{mc,Adam, hal 173})$$

$$= 0,19 (T_3 - T_{ud})^{1/3}$$

$$A_3 = 2 \times \frac{\pi}{4} \times (1,22 \times (3,914 + 2 \Delta x))^2 + \pi \times (3,914 + \Delta x) (19,685)$$

$$= 1,57 \times (4,775 + 2,44 \Delta x)^2 + 241,928 + 123,622 \Delta x$$

$$Q_3 = hc \cdot A_3 \cdot \Delta T$$

$$= 0,19 (T_3 - T_{ud})^{1/3} [1,57 (4,775 + 2,44 \Delta x)^2 + 241,928 + 123,622 \Delta x]$$

$$(T_3 - T_{ud}) \dots\dots\dots(2)$$

Pers (1) &(2) diselesaikan dengan trial T sehingga didapatkan harga yang tepat.

Dari perhitungan didapat:

$$T_3 = 104,356 \text{ oF}$$

$$\Delta x = 0,119953 \text{ ft} = 0,0366 \text{ m} = 3,66 \text{ cm}$$

Tebal perancangan = 1,2 x tebal perhitungan
= 4,39 cm

Diameter Pipa Umpan dan Pipa Product

Jumlah umpan masuk = jumlah product keluar
= 4,1983 kg/det = 15113,9 kg/jam

Densitas gas = 32 kg/m³

Kecepatan volume gas = 472,31 m³/jam = 277,98 cuft/menit

Dari fig 13-2, Peter and Timer haus, hal 527 didapat,

Diameter optimum 23,7 inc

Dipilih :

Pipa dengan nominal pipe size = 24

Schedule number = 80

OD (diameter luar) = 24 inc

ID (diameter dalam) = 23,25 inc

Diameter pipa pendingin masuk dan keluar

Kecepatan volume = 19800 kg / j = 6,033 cuft/menit

Diameter optimum = 18,5 inc

Dipilih: Nominal pipe size = 20

Schedule number = 80

OD (diameter luar) = 20 inc

ID (diameter dalam) = 19,25 inc

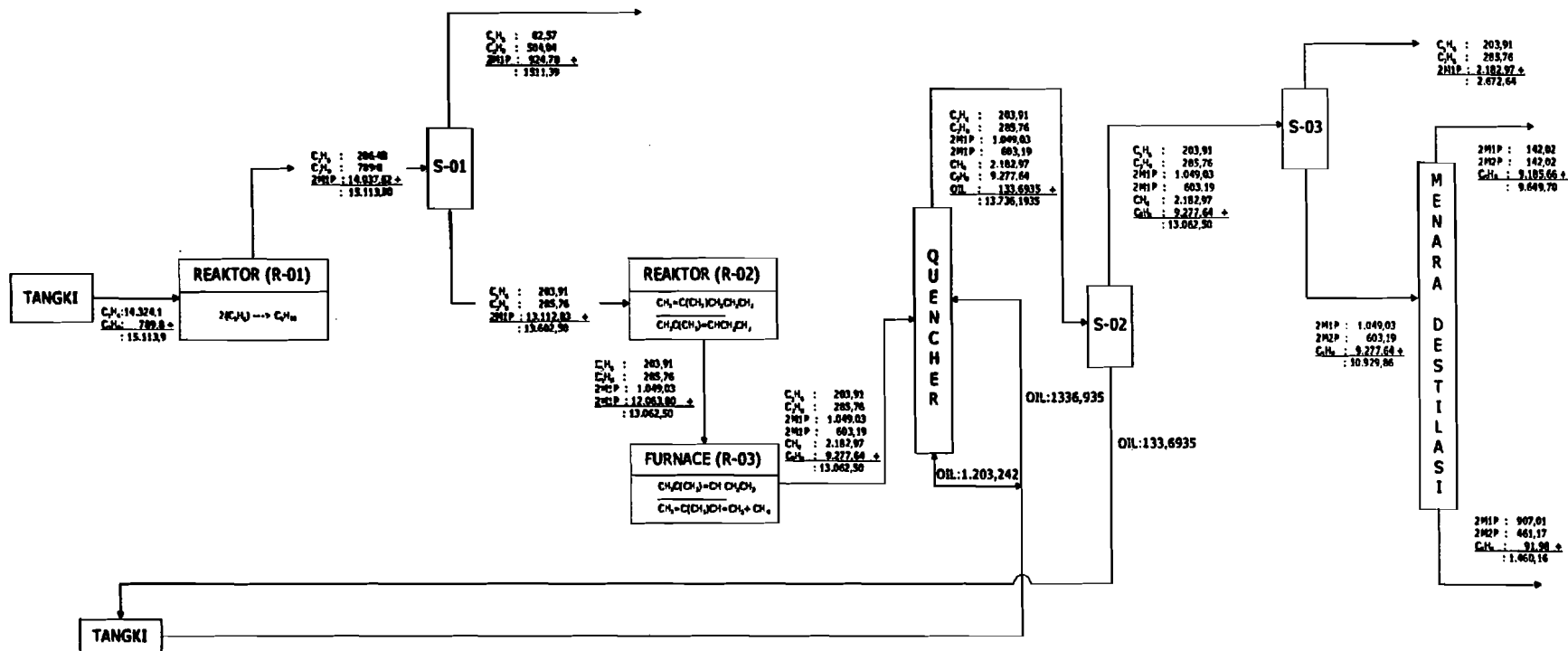


DIAGRAM ALIR KUANTITATIF PABRIK ISOPREN DARI PROPILLEN (KG/JAM)

KAPASITAS : 75.000 TON/TAHUN

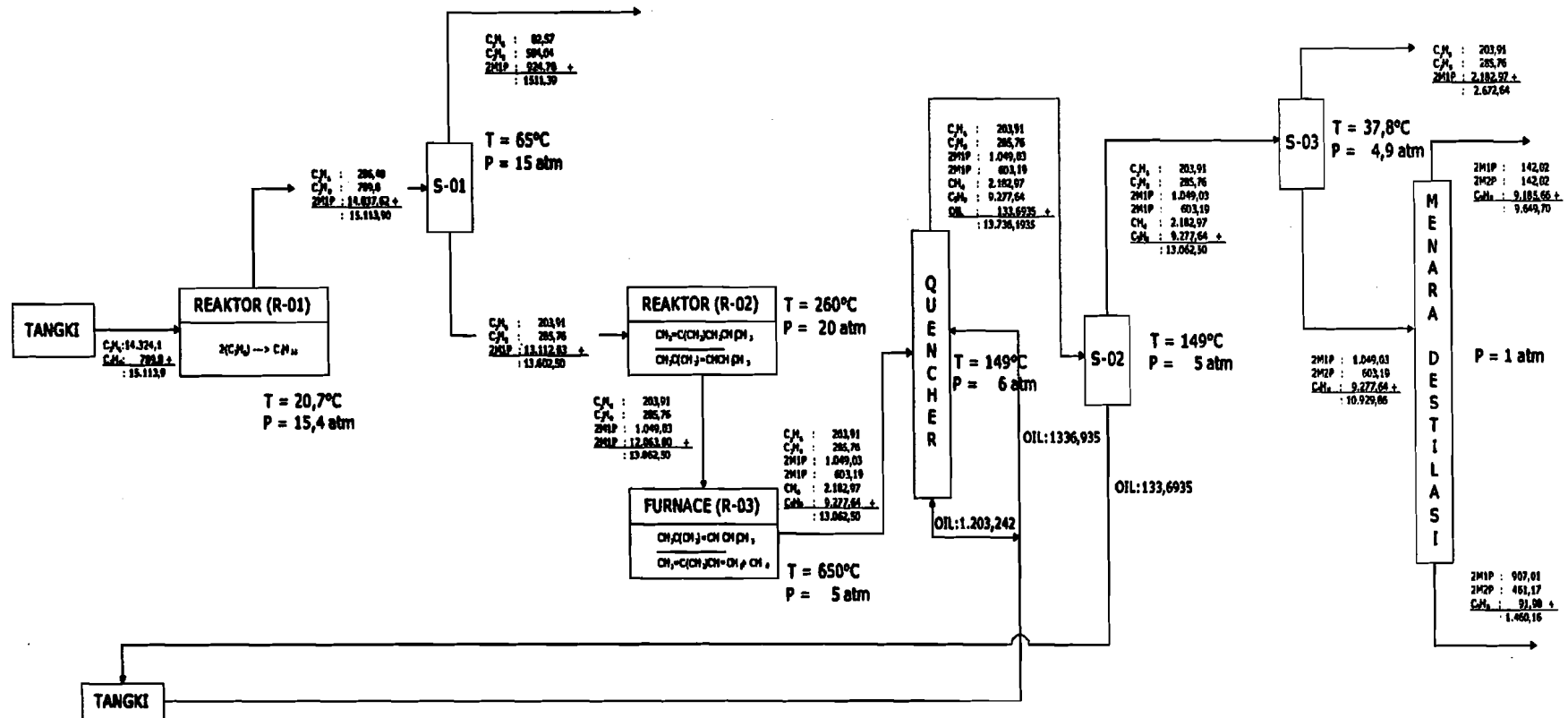
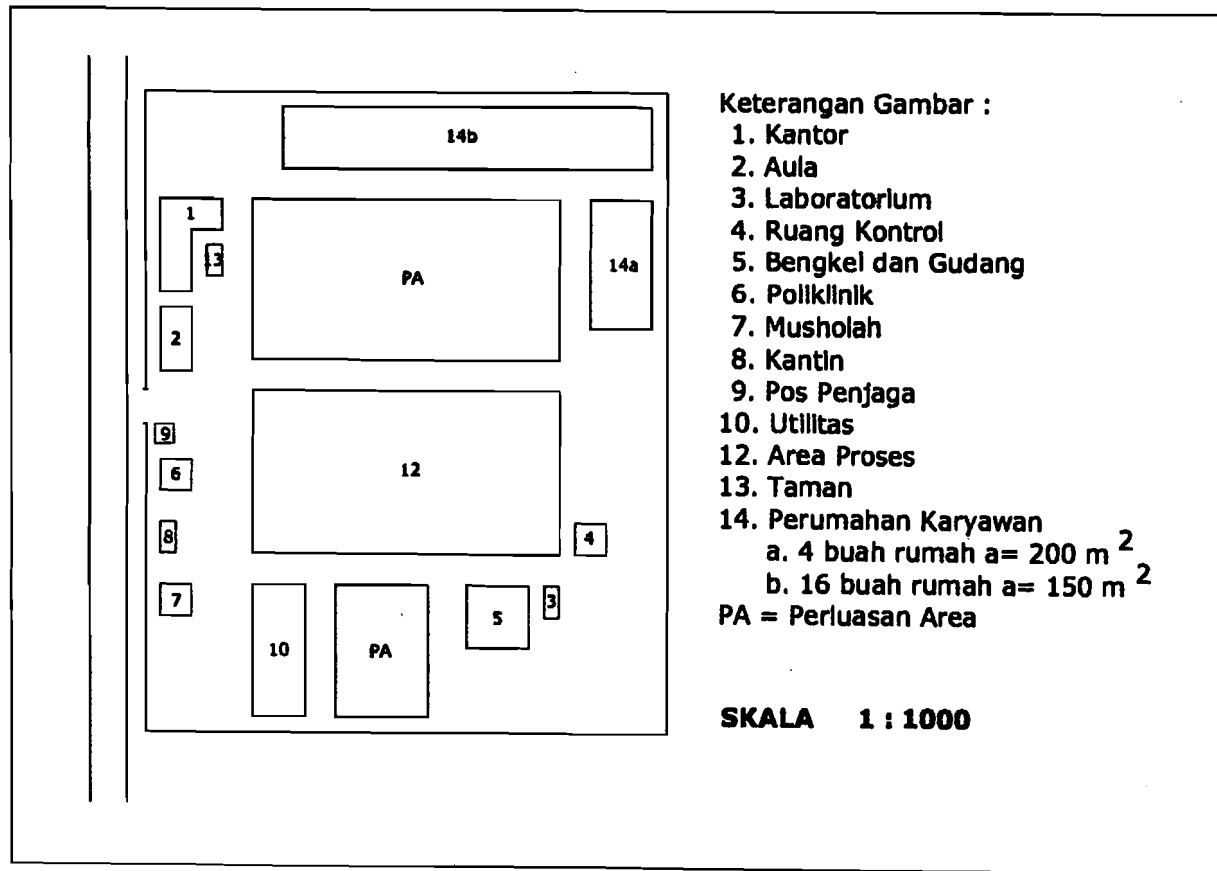


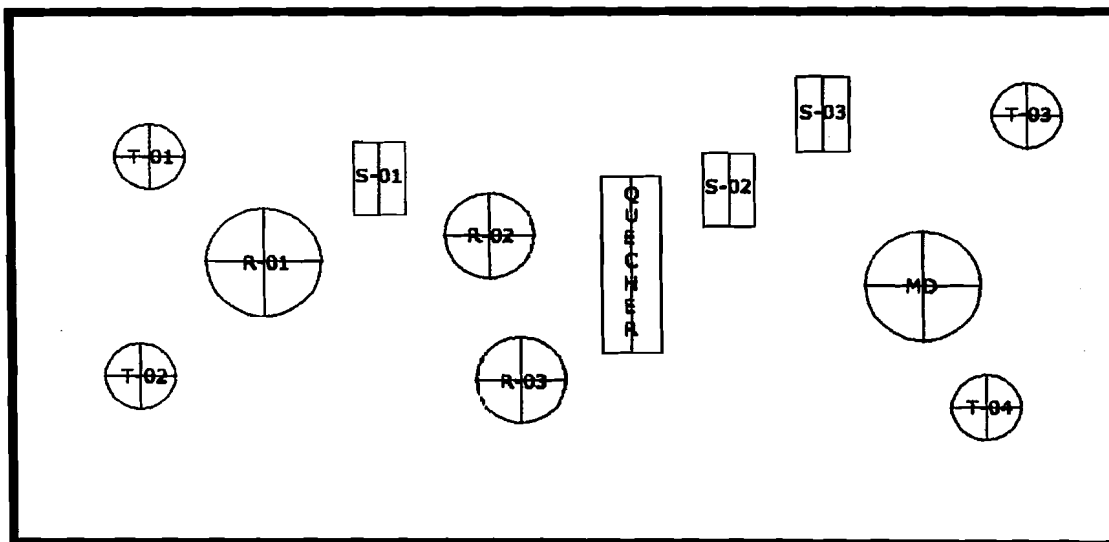
DIAGRAM ALIR KUALITATIF PABRIK ISOPREN DARI PROPYLEN (KG/JAM)

KAPASITAS : 75.000 TON/TAHUN



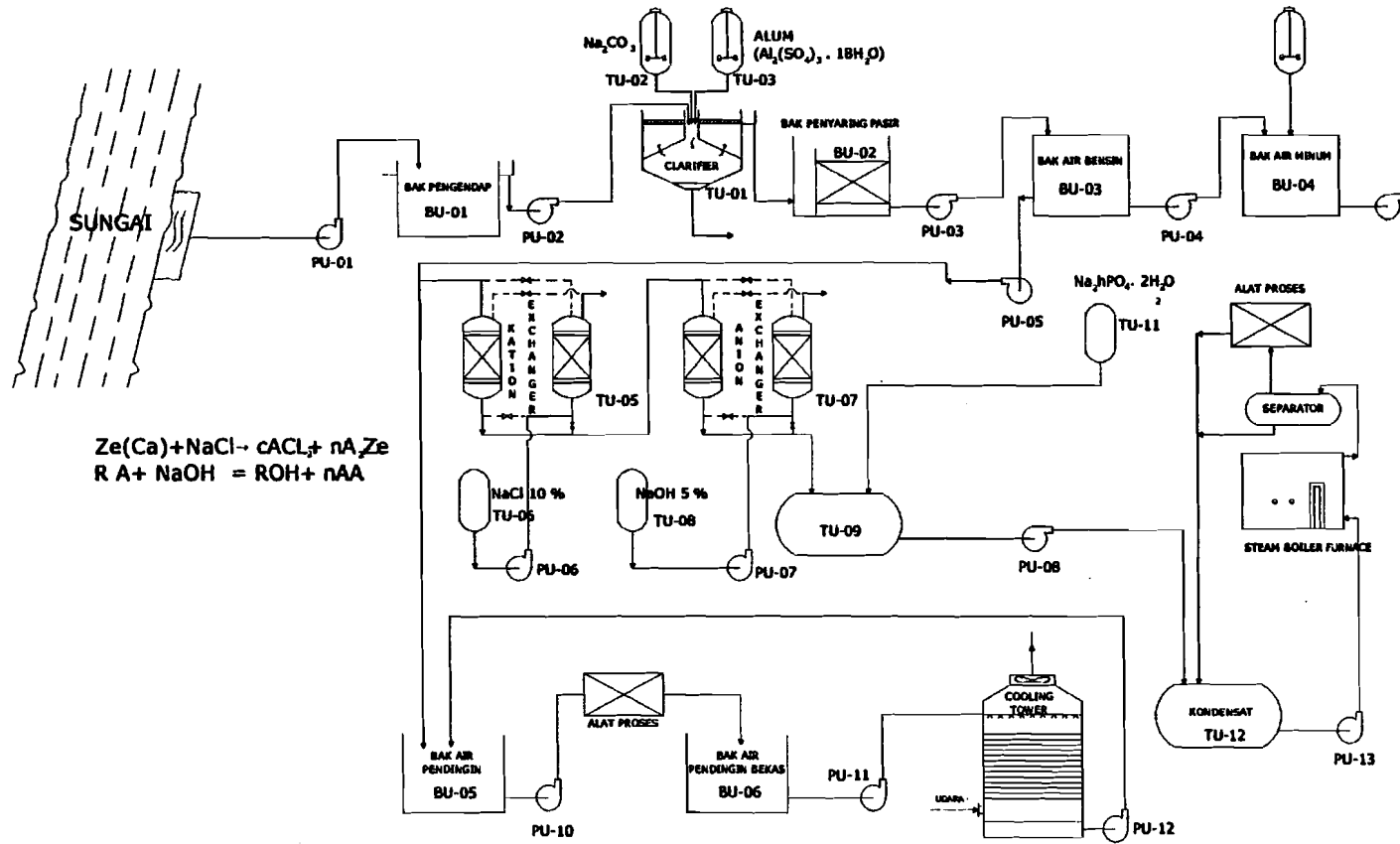
TATA LETAK ALAT PROSES

SKALA 1 : 150



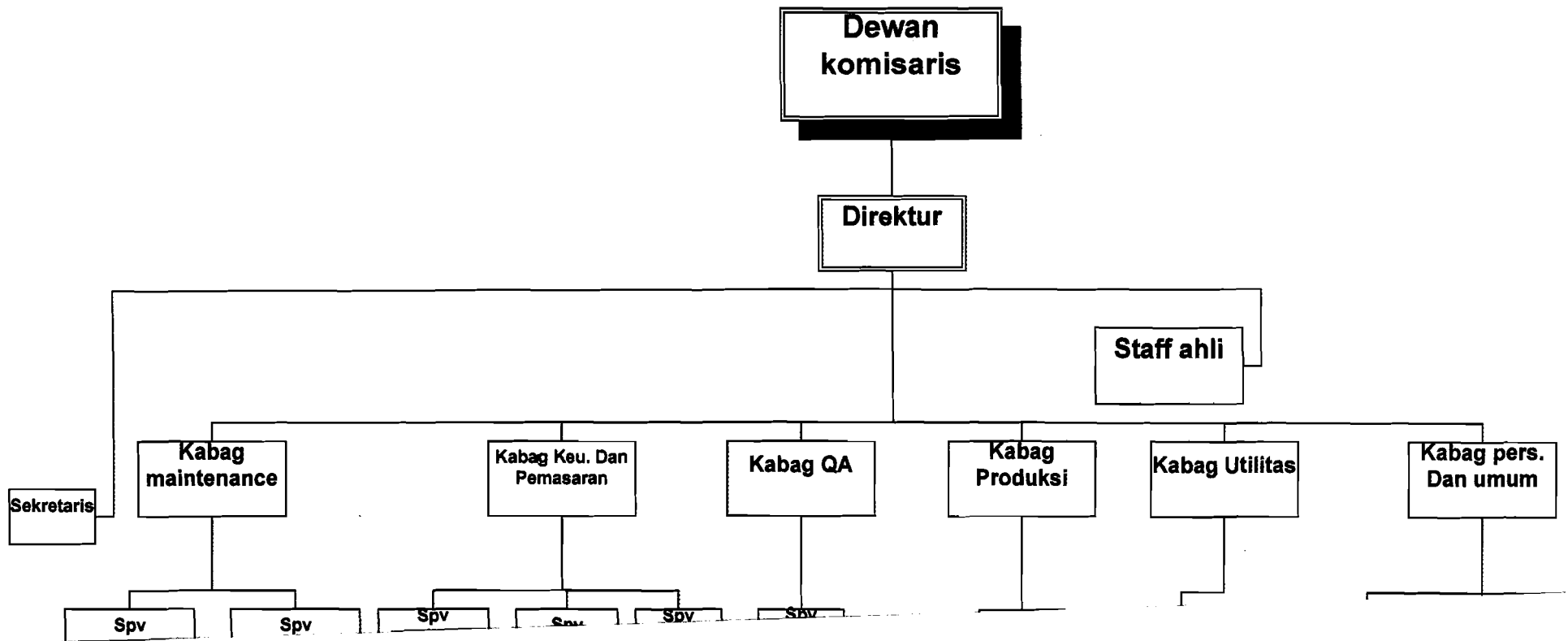
KETERANGAN :

R Reaktor
MD Menara Distilasi
S Separator
Q Quencher
T Tangki



PROSES PENGOLAHAN AIR

Struktur Organisasi Pabrik Isopren



GRAFIK BREAK EVENT POINT

