

SKRIPSI

**ANALISA STARTING MOTOR INDUKSI 3 PHASA 200 KW.
MENGGUNAKAN SIMULASI SOFTWARE ETAP POWERSTATION
DI P.G. KEBON AGUNG MALANG**



Disusun oleh :

**DWI HERMAWAN
01.12.133**

**INSTITUT TEKNOLOGI NASIONAL MALANG
FAKULTAS TEKNOLOGI INDUSTRI
JURUSAN TEKNIK ELEKTRO S-1
KONSENTRASI TEKNIK ENERGI LISTRIK**

Maret 2009

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LEMBAR PERSETUJUAN

**ANALISA STARTING MOTOR INDUKSI 3 PHASA 200 KW
MENGGUNAKAN SIMULASI SOFTWARE ETAP POWERSTATION
DI P.G. KEBON AGUNG MALANG**

SKRIPSI

*Disusun dan Diajukan Untuk Melengkapi dan Memenuhi Syarat-Syarat
Guna Mencapai Gelar Sarjana Teknik*

Disusun Oleh :
DWI HERMAWAN
01.12.133

Malang, Maret 2009
Diperiksa dan disetujui,

Mengetahui,
Ketua Jurusan Teknik Elektro S-1

Dosen Pembimbing

(Ir. F. Yudi Limpraptono, MT)
NIP. Y. 103 95 00274

(Ir. Yusuf Ismail Nakhoda, MT)
NIP.Y. 101 88 00189

**KONSENTRASI TEKNIK ENERGI LISTRIK
JURUSAN TEKNIK ELEKTRO S-1
FAKULTAS TEKNOLOGI INDUSTRI
INSTITUT TEKNOLOGI NASIONAL MALANG**

ABSTRAKSI

ANALISA STARTING MOTOR INDUKSI 3 PHASA 200KW MENGGUNAKAN SIMULASI SOFTWARE ETAP POWERSTATION DI P.G. KEBON AGUNG MALANG

(Dwi Hermawan)

Nim. 01.12.133

Dosen Pembimbing : Ir. Yusuf Ismail Nakhoda, MT
Jurusan Teknik Elektro/ Teknik Energi Listrik S-1

Dalam menjalankan atau mengoperasikan motor, hal yang paling utama adalah dengan memperhatikan arus *starting* motor. *Starting* motor pada P.G. Kebon Agung Malang dengan kapasitas daya 250 KW akan menarik arus yang cukup besar. Besarnya arus *starting* berkisar antara 4 sampai 7 kali arus beban penuh (FLA). Dalam hal ini, pengoperasian motor dengan *starting* tegangan penuh tidak diijinkan, karena arus *starting* yang ditarik motor yang cukup besar tersebut akan mengakibatkan *voltage dip* pada jaringan instalasi listrik pada pabrik tersebut. Arus *starting* yang tinggi juga mempengaruhi kinerja pada beban-beban yang lain.

Dengan menggunakan peralatan starting motor atau pengasutan motor, arus yang ditarik motor pada saat pengoperasian awal akan berkurang. Dalam pengasutan motor hal yang paling utama adalah memperhatikan arus dan torsi asut. Dimana arus pengasutan yang kecil akan berdampak pada torsi *starting* yang kecil juga. Pengoperasian motor dengan pengasutan hendaknya dengan tetap menjaga torsi *starting* motor masih sedikit kuat untuk mendorong beban. Sehingga motor dapat beraccelerasi dengan cepat.

Dari hasil simulasi *software ETAP Powerstation*, *starting* motor tanpa pengasutan atau dengan pengoperasian tegangan penuh, arus pada saat *starting* sebesar 552,208% dari FLA, dimana FLA sebesar 251,9A. Maka besarnya arus *starting* motor adalah 1391,012A. Dengan menggunakan pengasutan *auto-trafo* dengan Tap 50%, arus *starting* yang ditarik motor sebesar 151,326% dari FLA, atau sama dengan 381,19A. Sedangkan dengan pengasutan motor menggunakan resistor dengan Tap 50%, besarnya adalah 298,142% dari FLA, maka besarnya arus adalah 751,019A. Dengan menggunakan pengasutan *reactor* dengan Tap 50%, maka arus yang ditarik motor sebesar 293,455% dari FLA, maka besarnya arus adalah 739,213A. Dari hasil pengamatan pada P.G. Kebon Agung Malang arus *starting* motor menggunakan pengasutan *star-delta* (Y- Δ) adalah 755 A. Dari hasil percobaan simulasi *starting* motor dengan menggunakan *software ETAP Powerstation*, maka didapatkan peralatan *starting* motor yang terbaik, yaitu dengan menggunakan pengasutan *auto-trafo*, besarnya arus pada saat *start* adalah 381,19A.

Kata kunci : *Starting Motor*, FLA (*Full Load Ampere*), Pengasutan.

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Malang, Maret 2009

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BAB I

PENDAHULUAN

1.1. Latar Belakang

Motor induksi banyak digunakan di industri maupun pada peralatan rumah tangga sebagai penggerak atau penghasil tenaga mekanis. Untuk kebanyakan motor, arus awal yang ditarik oleh motor pada saat *starting* adalah 4 sampai 7 kali besarnya arus nominal, dan untuk motor – motor dengan beban yang besar hal ini tidak dapat diijinkan.^[3]

Starting tegangan penuh yang dilakukan pada beban inersia tinggi akan menyebabkan motor menarik arus yang sangat besar, dimana hal tersebut tidak dapat diijinkan karena akan merusak jaringan. Disamping itu pula torsi *starting* yang tinggi juga dihasilkan pada *starting* tegangan penuh, dimana torsi *starting* yang terlalu tinggi dapat menyebabkan kerusakan sistem mekanik pada motor.

Pada P.G. Kebon Agung Malang diperlukan pengoperasian motor yang tepat, guna kelancaran dalam proses penggilingan tebu. Pada stasiun *injection* motor induksi 3 phasa di P.G. Kebon Agung Malang dengan menggunakan pengasutan *star-delta* (Y- Δ) menarik arus *starting* motor sebesar 755 A.

Dengan menggunakan bantuan simulasi *software ETAP Powerstation*, penulis mencoba menganalisis *starting* motor induksi untuk mengurangi arus

starting dan torsi *starting* yang besar yang mengakibatkan kerusakan sistem jaringan dan kerusakan pada motor itu sendiri.

1.2. Rumusan Masalah

Dari latar belakang yang diuraikan diatas, maka permasalahan yang timbul adalah bagaimana menurunkan arus yang besar pada saat *starting* dengan tetap menjaga kondisi tegangan tidak mengalami penurunan kritis pada Pabrik Gula Kebon Agung Malang? Bagaimana menganalisa arus *starting* motor induksi 200 KW pada Pabrik Gula Kebon Agung Malang menggunakan *software ETAP Power Station*?

1.3. Tujuan

Tujuan pembahasan skripsi ini adalah untuk menganalisa *starting* motor induksi 3 phasa dengan pengasutan menggunakan *auto-trafo*, resistor dan *reactor* serta membandingkan dengan pengasutan menggunakan pengubah hubungan *star-delta* sehingga didapatkan peralatan *starting* motor yang tepat dengan nilai arus *starting* terkecil pada Pabrik Gula Kebon Agung Malang menggunakan simulasi *Software ETAP Powerstation*.

1.4. Batasan Masalah

Latar belakang permasalahan yang telah diuraikan, maka penulis membuat batasan masalah sebagai berikut :

1. Hanya membahas masalah *starting* pada motor induksi tiga phasa.

2. Analisa dilakukan pada motor induksi tiga phasa rotor sangkar dengan data sebagai berikut:

Daya = 200 KW, V = 380/660 (Δ/Y) Volt, I = 365/210 Ampere,

f = 50 Hz, Cos φ = 0,87, p = 4 kutub, 1488 RPM.

3. Jenis pengasutan yang di pakai adalah jenis pengasutan :
 - Pengasutan *Auto-Trafo*.
 - Pengasutan *Resistor*.
 - Pengasutan *Reactor*.
5. Analisa *starting* motor disimulasikan menggunakan *software ETAP Powerstation*.
6. Pengasutan motor dilakukan di P.G. Kebon Agung Malang.

1.5. Metodologi Penelitian

Metodologi penelitian yang dilakukan dalam skripsi ini meliputi :

1. Studi Literatur

Yaitu kajian pustaka dengan mempelajari teori-teori yang terkait melalui literatur yang ada, yang berhubungan dengan permasalahan pada motor.

2. Pengumpulan Data

Pengumpulan data lapangan yang dipakai dalam objek penelitian yakni data motor pada P.G. Kebon Agung Malang.

- Data *kuantitatif* yaitu data yang dapat dihitung atau data yang berbentuk angka.

- Data *kualitatif* yaitu data yang berbentuk diagram. Dalam hal ini adalah *single line* diagram instalasi pabrik.

3. Melakukan analisa dengan menggunakan program simulasi *software ETAP Powerstation*.

- Analisa *starting* motor pada Pabrik Gula Kebon Agung Malang.
- Analisa penentuan peralatan *starting* motor dengan menggunakan pengasutan yang ada didalam fasilitas program simulasi *software ETAP Powerstation*.

1.6. Sistematika Penulisan

Pada penyusunan skripsi ini terdiri dari 5 bab, dengan sistematika pembahasan disusun sebagai berikut :

BAB I : PENDAHULUAN

Pada bab ini berisi pendahuluan yang meliputi latar belakang, permasalahan, batasan masalah, tujuan, metodologi serta sistematika pembahasan.

BAB II : TEORI DASAR

Pada bagian ini diuraikan mengenai motor induksi tiga phasa, aspek-aspek yang digunakan, prinsip kerja motor induksi, parameter-parameter yang ada dalam motor induksi, serta hal-hal yang berkaitan dengan perhitungan faktor daya dan efisiensi serta karakteristik motor induksi.

BAB III : ANALISA STARTING MOTOR DAN PEMODELAN SIMULASI SOFTWARE ETAP POWERSTATION

Pada bagian ini akan diuraikan mengenai analisa *starting* motor yang digunakan dengan menggunakan simulasi *software ETAP Power Station* pada Pabrik Gula Kebon Agung Malang.

BAB IV : ANALISA DAN HASIL SIMULASI STARTING MOTOR

Pada bab ini berisikan tentang hasil analisis simulasi *starting* motor dengan tampilan data berupa tabel-tabel dan grafik karakteristik untuk lebih memudahkan pengamatan.

BAB V : KESIMPULAN

Merupakan bab terakhir yang merupakan intisari dan hasil pembahasan berisikan kesimpulan.

1.7. Kontribusi Penelitian

Dalam skripsi ini diharapkan dapat memberikan informasi mengenai analisa penyelesaian persoalan *starting* motor sehingga didapatkan peralatan *starting* yang tepat yang dapat meminimalkan arus *starting* yang besar dan dapat meminimalkan dampak *starting* motor terhadap penurunan tegangan di dalam sistem dan pengaruh pada beban-beban yang lain, terutama pada instansi industri P.G. Kebon Agung Malang yang menggunakan motor induksi sebagai penggerak mekanik dalam proses produksi.

BAB II

TEORI DASAR

2.1. Teori Dasar Motor Induksi^[3]

Motor arus bolak-balik (Motor AC) adalah suatu mesin yang berfungsi untuk mengubah tenaga listrik menjadi tenaga mekanik atau tenaga gerak, dimana tenaga gerak ini berupa perputaran pada poros motor. Salah satu jenis motor AC ini adalah motor induksi atau motor tak serempak.

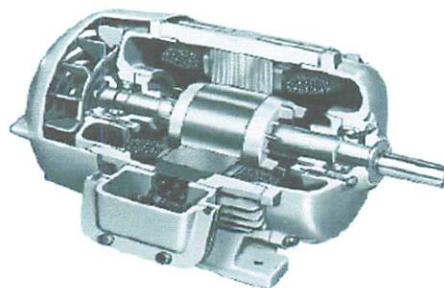
Dinamakan motor tak serempak (*asynchrone*) karena putaran poros motor tidak sama dengan putaran medan fluks magnet stator. Dengan kata lain, bahwa antara putaran rotor dan putaran fluks magnet terdapat selisih putaran yang disebut slip.

Motor induksi *polyphase* banyak dipakai dikalangan industri. Ini berkaitan dengan beberapa keuntungannya. yaitu

1. Sangat sederhana dan daya tahan kuat (konstruksi hampir tak pernah mengalami kerusakan, khususnya tipe rotor sangkar bajing).
2. Harga relatif murah dan perawatan mudah.
3. Efisiensi tinggi. Pada kondisi berputar normal, tidak dibutuhkan sikat dan karenanya rugi daya yang ditimbulkan dapat dikurangi (khususnya motor induksi rotor belitan).

2.2. Konstruksi Motor Induksi^[3]

Konstruksi motor induksi terdiri dari dua bagian utama yaitu stator dan rotor. Hal ini dapat dilihat pada gambar 2-1 di bawah ini :

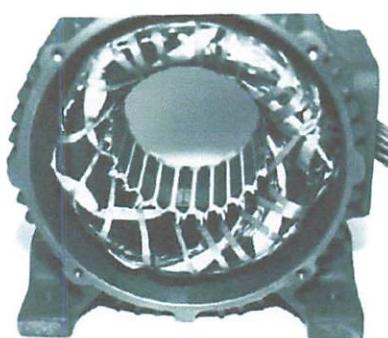


Gambar 2.1. Konstruksi Motor Induksi

2.2.1. Stator^[3]

Pada dasarnya konstruksi stator pada motor induksi mempunyai bentuk fisik yang sama dengan mesin sinkron, yang terdiri dari :

- Rumah stator terbuat dari besi tuang.
- Inti stator dari besi atau baja silikon.
- Alur dan gigi materialnya sama dengan inti, alur tempat meletakan belitan.
- Belitan stator dari tembaga.



Gambar 2.2. Stator Tiga-Phasa Motor Induksi

2.2.2. Rotor^[3]

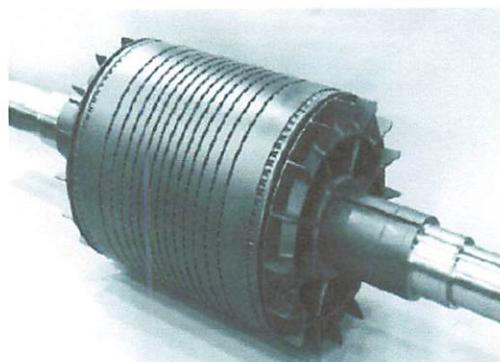
Konstruksi dari rotor motor induksi mempunyai dua bentuk, yaitu :

1. Rotor Belitan (*wound rotor* / rotor slip ring).

Motor induksi jenis ini mempunyai rotor dengan belitan kumparan tiga-fase sama seperti kumparan stator. Kumparan stator dan rotor juga mempunyai jumlah kutub yang sama.

2. Rotor sangkar (*squirrel cage rotor*).

Motor induksi jenis ini mempunyai rotor dengan kumparan yang terdiri atas beberapa batang konduktor yang disusun sedemikian rupa sehingga menyerupai sangkar tupai.



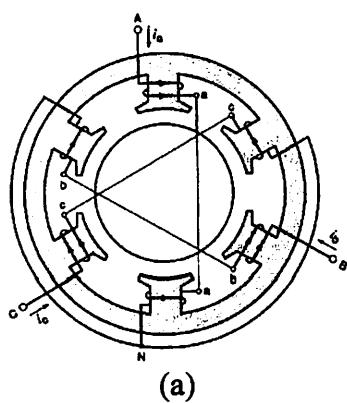
Gambar 2.3. Rotor Sangkar



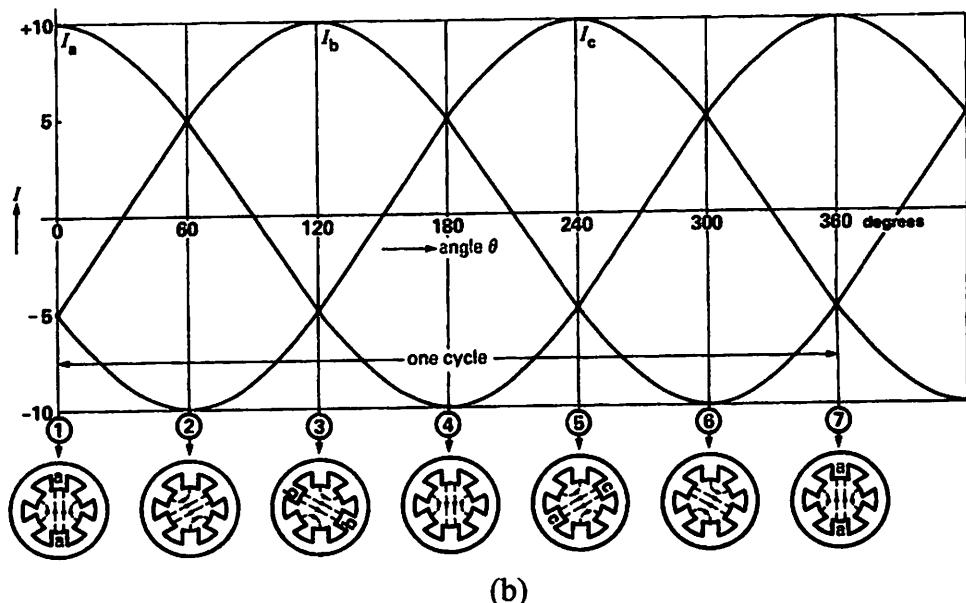
Gambar 2.4. Rotor Belitan

2.3. Medan Magnet Putar^[4]

Perputaran motor pada mesin arus bolak-balik ditimbulkan oleh adanya medan putar (fluks yang berputar) yang dihasilkan dalam kumparan statornya. Medan putar ini terjadi apabila kumparan stator dihubungkan dalam phasa banyak, umumnya tiga phasa. Hubungan dapat berupa hubungan bintang atau delta.



(a)



Gambar 2.5. Medan Putar Pada Motor Induksi^[4]

Medan putar terjadi apabila kumparan A-a, B-b, C-c dihubungkan tiga phasa dengan beda phasa masing-masing 120° (hubungan bintang, Y) dan dialiri arus sinusoida. Distribusi i_a , i_b , i_c sebagai fungsi waktu adalah seperti gambar 2-5b. Pada keadaan t_1 fluks resultan mempunyai arah yang sama dengan arah yang dihasilkan oleh kumparan A-a, sedangkan pada t_3 , fluks resultannya dihasilkan oleh kumparan B-b. Untuk t_4 , fluks resultannya berlawanan arah dengan fluks resultan yang dihasilkan pada t_1 . Dari gambar 2.5.b tersebut terlihat bahwa fluks resultan ini akan berputar satu kali.

2.4. Prinsip Kerja Motor Induksi^[4]

Berputarnya rotor pada motor induksi ditimbulkan oleh adanya medan putar yang dihasilkan dalam kumparan statornya. Medan putar ini akan terjadi apabila kumparan stator dihubungkan dengan suatu sumber tegangan tiga fasa. Prinsip kerjanya diuraikan sebagai berikut:

1. Apabila sumber tegangan tiga fasa dipasang pada kumparan stator akan timbul medan putar dengan kecepatan:

$$n_s = \frac{120f}{P} \text{ rpm} \quad \dots \dots \dots \quad (2.1)$$

2. Medan putar stator tersebut akan memotong batang konduktor pada rotor sehingga pada kumparan rotor timbul tegangan induksi (GGL Induksi).
 3. Karena kumparan rotor merupakan rangkaian tertutup, maka akan mengalir arus (I). Kawat penghantar (kumparan rotor) yang dialiri arus yang berada dalam medan magnet akan menimbulkan gaya (F) pada rotor.

4. Bila kopel mula yang dihasilkan oleh gaya (F) pada rotor cukup besar untuk memikul kopel beban, maka rotor akan berputar searah dengan medan putar stator.
 5. Seperti halnya telah dijelaskan bahwa tegangan induksi akan timbul karena adanya terpotongnya batang konduktor (rotor) oleh medan putar stator. Artinya agar tegangan terinduksi diperlukan adanya perbedaan relatif antara kecepatan medan putar stator (n_s) dan kecepatan medan putar rotor (n_r).
 6. Perbedaan kecepatan antara n_r dan n_s disebut slip (S) dinyatakan dengan:

$$S = \frac{n_s - n_r}{n_r} \times 100\% \quad \dots \dots \dots \quad (2.2)$$

7. bila $n_r = n_s$ tegangan tidak akan terinduksi dan arus tidak mengalir pada kumparan jangkar rotor, dengan demikian tidak dihasilkan kopel. Kopel motor ditimbulkan apabila n_r lebih kecil dari n_s .
 8. Dilihat dari cara kerjanya motor induksi disebut juga motor tak serempak atau *asinkron*.

2.4.1. Slip dan Frekuensi Arus Rotor^[4]

Slip diidentifikasi sebagai bagian dari kecepatan sinkron n_s dan kecepatan aktual rotor n_r . Slip dirumuskan sebagai berikut :

Pada keadaan diam medan magnet putar yang dihasilkan oleh stator mempunyai kecepatan relatif yang sama dengan kumparan rotor. Pada saat ini frekuensi dari arus rotor sama dengan frekuensi stator ($f_r = f_s$). Frekuensi rotor f_r adalah nol ketika motor berputar pada kecepatan sinkron. Pada saat tersebut tidak terdapat gerakan (putaran) relatif antara medan putar dan rotor. Pada kecepatan yang lain, frekuensi rotor proporsional dengan slip (s). Hubungan antara slip dan frekuensi dapat dilihat dari persamaan berikut ini.

$$n_s = \frac{120f_s}{p} \quad \text{atau} \quad f_s = \frac{p \cdot n_s}{120} \quad \dots \dots \dots \quad (2.4)$$

dimana : p = jumlah kutub

f_s = frekuensi stator

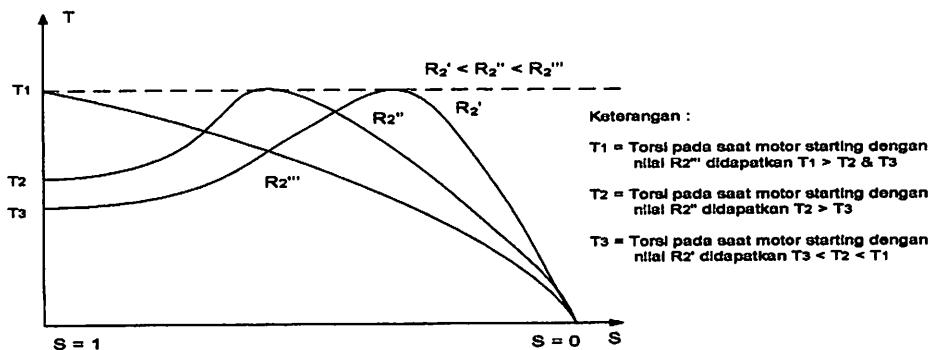
Pada rotor berlaku hubungan :

$$\begin{aligned} f_r &= \frac{(n_s - n_r) \cdot p}{120} = \frac{(n_s - n_r) \cdot n_s \cdot p}{n_s \cdot 120} \\ s &= \frac{n_s - n_r}{n_s} \quad \text{dan} \quad f_s = \frac{p \cdot n_s}{120} \end{aligned} \quad \dots \dots \dots \quad (2.5)$$

Maka :

$$f_r = s \cdot f_s \quad \dots \dots \dots \quad (2.6)$$

2.4.2. Karakteristik T – S



Gambar 2.6. Kurva $T \sim S$

$$T = \frac{3}{\omega} \cdot V_1^2 \cdot \frac{S_a^2 R_2}{(a^2 R^2)^2 + S^2 (a^2 X_2)^2} \quad \dots \dots \dots (2.7)$$

Harga S untuk mendapatkan T maksimum adalah bila $dT/dS = 0$. Dari diferensi $dT/dS = 0$ diperoleh harga T maksimum pada saat

$$S = \pm R_2 / X_2 \quad \dots \dots \dots (2.8)$$

$$T_{maks} = \pm 3V_1^2 / 2\omega a^2 X_2 \quad \dots \dots \dots (2.9)$$

Dari ketiga persamaan tersebut dapat ditarik beberapa kesimpulan. Dari persamaan (2.7) diketahui bahwa untuk harga S kecil di mana $S^2(a^2 X^2)^2$ dapat diabaikan. Maka kopel sebanding dengan S ($T \sim S$). Dari persamaan (2.8) diketahui bahwa untuk memperoleh kopel maksimum pada saat *start* ($S = 1$) ialah dengan membuat $R_2 = X_2$. Harga kopel maksimum dapat diubah dengan mengatur harga X_2 atau tegangan sumber V_1 (lihat persamaan (2.9)). Dari persamaan (2.7) diketahui bahwa kopel akan menjadi nol ketika $S = \pm \infty$. Persamaan (2.7) dan (2.8) menunjukkan bahwa R_2 tidak mengubah harga kopel maksimum, melainkan hanya mengubah harga S pada saat kopel maksimum terjadi. Perubahan R_2 dalam hubungannya dengan kopel (T) dan slip (S) dapat dilihat dari kurva diatas.

2.5. Rangkaian Ekivalen^[2]

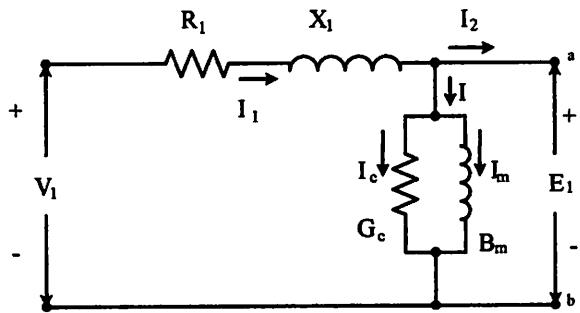
Suatu rangkaian ekivalen motor induksi tiga phasa diperlukan untuk membantu analisis operasi dan untuk memudahkan penghitungan kinerja. Rangkaian ekivalen tersebut mengasumsikan suatu bentuk yang identik rangkaian ekivalen transformator. Proses penurunannya serupa dengan model dengan modifikasi-modifikasi baru seperlunya untuk menghitung kumparan sekunder (rotor) dalam hal ini berputar dan menghasilkan daya mekanik. Kerja motor induksi seperti juga kerja pada transformator adalah berdasarkan prinsip induksi elektromagnetik. Oleh karena itu motor induksi dipandang sebagai transformator yang mempunyai ciri-ciri khusus, yaitu :

1. Stator sebagai sisi primer.
2. Rotor sebagai sisi sekunder yang penghantar-penghantarnya dihubung-singkat dan berputar.
3. Kopling antara sisi primer dan sisi sekunder dipisahkan oleh celah udara (*air gap*).

2.5.1. Rangkaian Ekivalen Stator^[2]

Apabila kumparan stator diberikan tegangan catu dari jala-jala sebesar V_L , maka akan mengalir arus putar tiga phasa pada kumparan stator yang membangkitkan medan magnet tiga phasa. Arus stator (I_1) bercabang menjadi dua komponen arus yaitu :

1. Komponen arus beban (I_2)
2. Komponen arus eksitasi (I_0)



Gambar 2.7. Rangkaian Ekivalen Stator

Dimana : V_1 = Tegangan terminal per-phasa

R_1 = Resistansi kumparan stator per-phasa

X_1 = Reaktansi bocor kumparan stator per-phasa

E_1 = Tegangan induksi (ggl) per-phasa di dalam kumparan stator

G_c = Konduktansi rugi-rugi inti stator per-phasa

B_m = Suseptansi magnetisasi stator per-phasa

2.5.2. Rangkaian Ekivalen Rotor^[2]

Pada saat rotor diam, medan putar stator akan memotong batang konduktor rotor dengan kecepatan putar sinkron (n_s), sehingga frekuensi arus rotor sama dengan frekuensi arus stator ($f_s = f_r$) dan slip sama dengan satu ($s = 1$).

Dengan mengetahui bahwa frekuensi arus / tegangan rotor adalah frekuensi slip, maka reaktansi bocor rotor (*leakage reactance*) per phasa adalah:

$$X_2' = sX_2 \quad \dots \dots \dots \quad (2.10)$$

$$X_2 = 2\pi f_s L_2 \quad \dots \dots \dots \quad (2.11)$$

dimana X_2' merupakan reaktansi rotor pada *start* atau diam.

Tegangan induksi pada rotor :

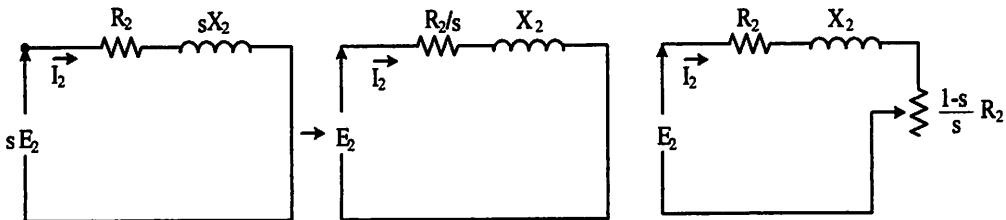
$$E_2 = 4,44 f_2 N_2 \Phi_m \quad \dots \dots \dots \quad (2.12)$$

Pada slip, s , frekuensi rotor menjadi $s f_s$, maka tegangan induksi pada rotor (E_2') pada slip, s , adalah :

$$E_2' = 4,44 s f_1 N_2 \Phi_m \quad \dots \dots \dots \quad (2.13)$$

Dengan memasukkan persamaan (2.12) ke (2.13) maka didapat persamaan :

$$E_2' = s E_2 \quad \dots \dots \dots \quad (2.14)$$



Gambar 2.8. Rangkaian Ekivalen Rotor

Dimana :

S = Slip

E_2 = Tegangan induksi perphasa didalam rotor keadaan diam

R_2' = Resistansi kumparan rotor per-phasa berpatokan pada stator

X_2' = Reaktansi bocor rotor per-phasa berpatokan pada stator

Berdasarkan persamaan (2.11) dan (2.14) maka diperoleh rangkaian ekivalen rotor seperti pada gambar 2.8.

Besar arus rotor (I_2) saat berputar adalah :

$$I_2 = \frac{s E_2}{\sqrt{R_2^2 + (s X_2)^2}} \quad \dots \dots \dots \quad (2.15)$$

Atau $I_2 = \frac{E_2}{\sqrt{\left(\frac{R_2}{s}\right)^2 + X_2^2}} \dots\dots\dots(2.16)$

Sedangkan torsi untuk motor induksi dapat dihitung dengan menggunakan rumus:

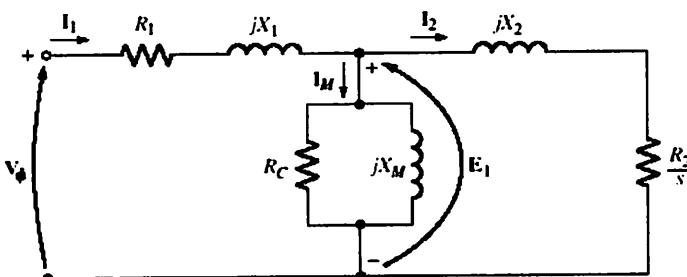
$$P_o = T_o \cdot \omega_s \dots\dots\dots(2.17)$$

$$T_o = \frac{P_o}{\omega_s} \dots\dots\dots(2.18)$$

$$\omega_s = \frac{2 \cdot \pi \cdot n_s}{60} \dots\dots\dots(2.19)$$

$$P_{in} = \sqrt{3} \cdot V_L \cdot I \cdot \cos \varphi \dots\dots\dots(2.20)$$

Jadi rangkaian ekivalen secara keseluruhan ketika motor berjalan adalah sebagai berikut:



Gambar 2.9. Rangkaian Ekivalen Motor Induksi

Dimana:

V_L = Tegangan terminal (Volt)

R_1 = Resistansi kumparan stator (Ohm)

X_1 = Reaktansi kumparan stator (Ohm)

X_m = Reaktansi magnetik (Ohm)

I_1 = Arus input (Amp)

I_2 = Arus rotor (Amp)

I_m = Arus magnetisasi (Amp)

E_1 = Tegangan induksi (ggl) di dalam kumparan stator (Volt)

S = Slip

R_2 = Resistansi kumparan rotor (Ohm)

X_2 = Reaktansi bocor rotor(Ohm)

R_c = Resistansi rugi inti (Ohm)

P_o = Daya *output* (Watt)

P_{in} = Daya *input* (Watt)

T_o = Torsi mekanik (N-m)

ω_r = Kecepatan sudut rotor (rad/sec)

Pada umumnya pada sebuah motor induksi telah terdapat informasi pada *name plate* dimana data informasi itu merupakan dasar dalam pengoperasian motor tersebut. Data tersebut berupa:

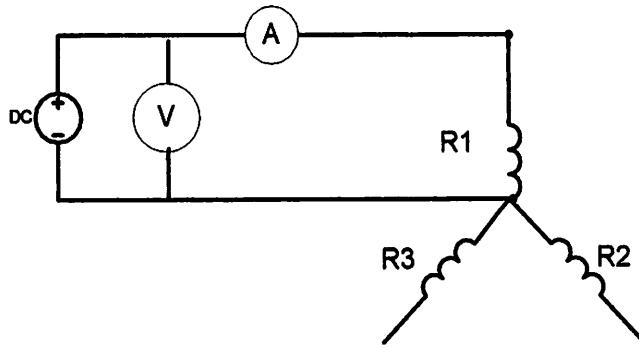
- Daya Output (Hp/KW)
- Tegangan Nominal $V_{Y-\Delta}$ (Volt)
- Arus Nominal (Amp)
- Power Faktor
- Kecepatan (rpm)
- Jumlah Kutub

2.6. Pengujian Motor Induksi Tiga Phasa

Untuk menganalisis motor diperlukan *inputan* parameter motor yang dapat diperoleh dengan melakukan pengujian.

2.6.1. Pengujian Arus Searah (*DC Test*)

Tujuan dari pengujian arus searah (*DC Test*) adalah untuk menentukan nilai resistansi stator. Diagram pengukuran ditunjukkan pada gambar 2.10.



Gambar 2.10. Pengujian Arus Searah (*DC Test*)

Kumparan stator terhubung bintang (Y) dan bila sumber DC disuplai melalui kumparan kumparan 1, dengan kumparan ke tiga (kumparan c) dalam keadaan terbuka (*open circuit*), maka nilai dari resistansi ekivalen (R_{dc}) :

untuk nilai resistansi kumparan a dan b :

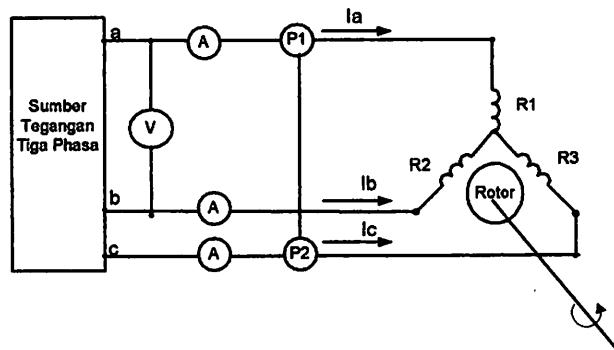
$$R_{ab} = R_1 = \frac{V_{DC}}{I_{DC}} \text{ Ohm} \quad \dots \dots \dots \quad (2.21)$$

Dalam pengujian arus searah dijaga agar arus DC (I_{DC}) tidak melampaui nilai dari arus nominal motor induksi.

2.6.2. Pengujian Tanpa Beban (*No-Load Test*)^[2]

Pengujian Tanpa Beban (*No-Load Test*) bertujuan untuk menentukan nilai resistansi rugi-rugi inti (R_c) dan reaktansi pemagnetan (X_m). Pada pengujian

ini motor induksi disuplai pada tegangan dan frekuensi nominalnya, serta rotor berputar tanpa terhubung dengan peralatan beban dimana harga slip sangat kecil.



Gambar 2.11. Rangkaian Pengujian Tanpa Beban (*No Load Test*)

$P_{3-\Phi}$, daya total yang terukur dari P_1 dan P_2 :

$$P_{3-\Phi} = P_1 + P_2 \text{ Watt}$$

$$P_{nl} \text{ daya per phasa } P_{nl} = \frac{P_{3-\Phi}}{3} \text{ Watt/phasa}$$

Dengan asumsi bahwa tegangan antar phasa stator seimbang, maka tegangan phasa stator :

$$V_{nl} = \frac{V_{ab}}{\sqrt{3}} \text{ Volt/phasa} \quad \dots \dots \dots \quad (2.22)$$

Untuk arus pada no load

$$I_{nl} = \frac{I_a + I_b + I_c}{3} \text{ Ampere} \quad \dots \dots \dots \quad (2.23)$$

$$Z_{nl} = \frac{V_{nl}}{I_{nl}} \text{ Ohm} \quad \dots \dots \dots \quad (2.24)$$

$$R_{nl} = \frac{P_{3\Phi}}{3I_0} \text{ Ohm} \quad \dots \dots \dots \quad (2.25)$$

$$X_{nl} = \sqrt{Z_{nl}^2 - R_{nl}^2} \text{ Ohm} \quad \dots \dots \dots \quad (2.26)$$

R_c , resistansi rugi-rugi inti :

$$P_c = P_{nl} - P_{rs} \quad \dots \dots \dots \quad (2.27)$$

$$R_c = \frac{E_a^2}{P_c} \text{ Ohm/phasa} \quad \dots \dots \dots \quad (2.28)$$

Rugi Rugi Stator

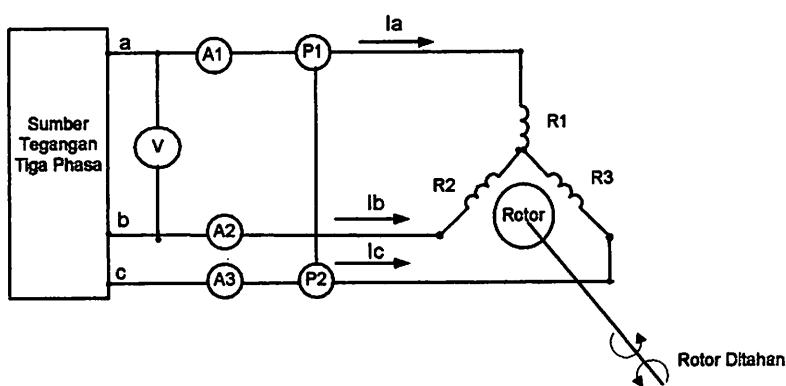
$$P_{rs} = 3I_{nl}^2 \cdot R_s \text{ Watt} \quad \dots \dots \dots \quad (2.29)$$

Rugi Gesek, angin, rugi besi :

$$P_{fwc} = P_{nl} - P_{rs} \text{ Watt} \quad \dots \dots \dots \quad (2.30)$$

2.6.3. Pengujian Rotor Tertahan (*Blocked Rotor Test*)^[2]

Tujuan pengujian rotor tertahan adalah untuk menentukan resistansi rotor pada motor induksi. Pada saat pengujian ini perputaran rotor motor induksi dikunci / diblok sehingga slip (s) sama dengan satu. Suplai tegangan tiga phasa motor induksi adalah tegangan yang nilainya di bawah tegangan nominalnya, yakni tegangan yang dapat menghasilkan arus nominalnya. Sebagai pendekatan, diasumsikan bahwa arus pemagnetan (I_m) cukup kecil akibat penurunan suplai tegangan serta motor dalam keadaan tidak berputar ($s = 1$) sehingga rugi-rugi inti dapat diabaikan.



Gambar 2.12. Rangkaian Pengujian Rotor Tertahan (*Blocked Rotor*)

$P_{3-\varnothing}$, daya total yang terukur dari W_a dan W_b :

$$P_{3-\varnothing} = P_1 + P_2 \text{ Watt} \quad \dots \dots \dots \quad (2.31)$$

Daya total tiga-phasa merupakan rugi-rugi tembaga stator dan rotor, karena motor tidak berputar maka rugi-rugi inti diabaikan.

I_{br} , rugi-rugi daya per phasa :

$$P_{br} = \frac{P_{3-\varnothing}}{3} \text{ Watt/phasa} \quad \dots \dots \dots \quad (2.32)$$

Dengan asumsi bahwa tegangan antar phasa stator seimbang, maka tegangan phasa stator :

$$V_{br} = \frac{V_{ab}}{\sqrt{3}} \text{ Volt/phasa} \quad \dots \dots \dots \quad (2.33)$$

I_{br} , arus phasa stator :

$$I_{br} = \frac{I_a + I_b + I_c}{3} \text{ Ampere} \quad \dots \dots \dots \quad (2.34)$$

R_{ek} , resistansi ekivalen :

$$R_{ek} = \frac{P_{br}}{I_{br}^2} \text{ Ohm/phasa} \quad \dots \dots \dots \quad (2.35)$$

Untuk R_r' , resistansi rotor berpatokan pada stator :

$$R_r' = R_{ek} - R_s \text{ Ohm/phasa} \quad \dots \dots \dots \quad (2.36)$$

Z_{br} , Impedansi rotor tertahan :

$$Z_{br} = \frac{V_{br}}{I_{br}} \text{ Ohm/phasa} \quad \dots \dots \dots \quad (2.37)$$

X_{ek} , reaktansi ekivalen :

$$X_{ek} = \sqrt{(Z_{br}^2 + R_{ek}^2)} \text{ Ohm/phasa} \quad (2.38)$$

Dimana motor induksi yang dipakai adalah motor induksi dengan rotor sangkar tunggal. Secara umum X_s dan X_r' diasumsikan sama, sehingga ;

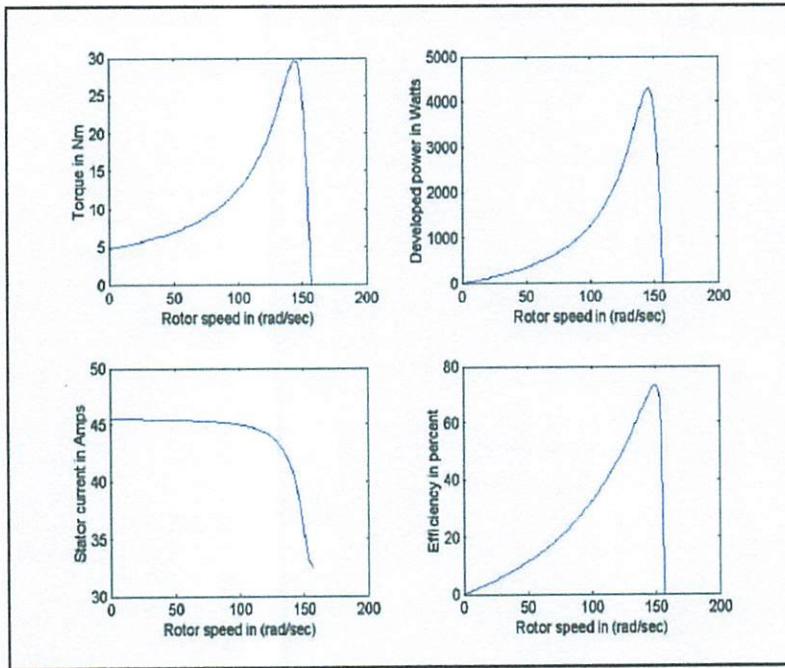
$$X_s = X_r' = 0,5 X_{ek} \text{ Ohm/phasa}$$

2.7. Operasional Motor Induksi

Menjalankan motor induksi 3 phasa akan mengalami dua keadaan yaitu keadaan *transient* (peralihan) dan keadaan *steady state* (mantap).

2.7.1. Performa *Steady State*

Kondisi motor dalam keadaan *steady state* adalah kondisi dimana motor dalam keadaaan mantap dimana hampir tidak ada perubahan arus, torsi maupun tegangan serta kecepatan sehingga motor dikatakan telah bekerja sesuai dengan *name plate*. Keadaan *steady state* ini merupakan gambaran secara keseluruhan dari motor tersebut yang dapat dijadikan acuan untuk penggunaanya.

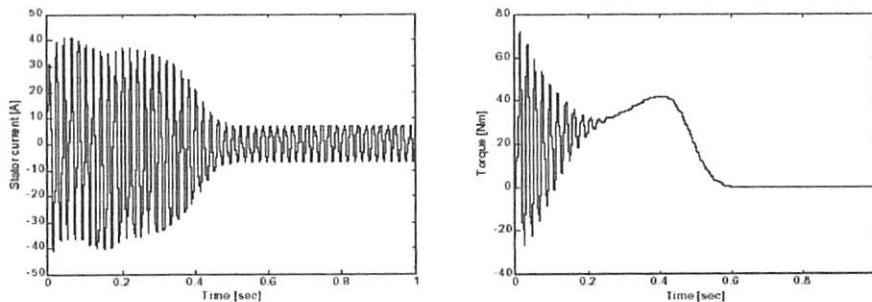


Gambar 2.13. Karakteristik Motor Induksi keadaan *steady state* [8]

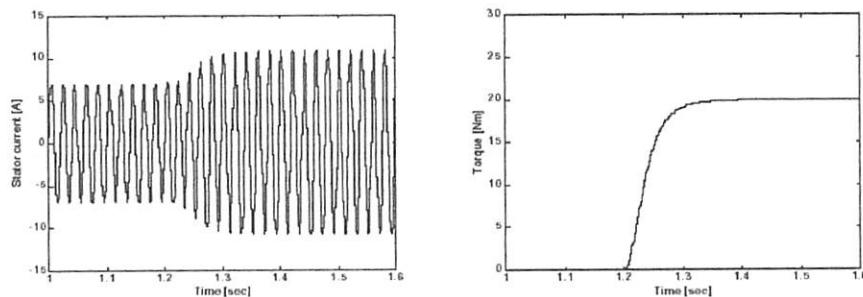
2.7.2. Performa *Transient*

Keadaan *transient* atau peralihan merupakan kondisi motor sesaat dimana keadaan berubah-ubah dan dapat menentukan beberapa faktor penting dalam pengendalian motor, sedangkan keadaan *steady state* adalah kondisi dimana motor dalam keadaan mantap.

Kondisi pada awal atau *start*, penggereman, perubahan kecepatan akan mengalami keadaan *transient* pada motor induksi. Misalnya pada keadaan *start* motor induksi dengan kapasitas besar akan menghasilkan arus *starting* yang besar dimana besarnya 4 sampai 7 kali arus nominal yang tertera pada *name plate* motor.



Gambar 2.14. *Transient Respons Starting Motor Induksi*



Gambar 2.15. Karakteristik Torsi Motor Keadaan Berubah

Beban motor induksi merupakan faktor yang penting dalam stabilitas *power* sistem karena adanya beberapa alasan yaitu:

- Perubahan yang cepat dari penambahan beban
- Untuk beban dengan power faktor rendah akan meminta daya reaktif yang tinggi
- Akan menyebabkan tegangan turun ketika beban pada motor ditambah

Perubahan arus torsi dan tegangan yang terjadi misalnya pada keadaan penambahan torsi beban yang berubah-ubah merupakan informasi yang diperlukan oleh teknisi di bidang kontrol sehingga dapat menentukan jenis pengaman yang akan digunakan dan peralatan kontrol yang mana akan digunakan.

Keadaan *transient* berlangsung dalam waktu yang cukup singkat tetapi jika diperhatikan secara baik akan menyebabkan bahaya pada motor tersebut. Jadi adanya *transient respons* ini sangat berhubungan dengan waktu..

Perubahan torsi beban pada motor akan mempengaruhi, arus stator, tegangan dan fluks rotor. Tidak semua motor dijalankan pada torsi yang konstan misalnya suatu motor dijalankan pada 0,5 dari torsi rata-rata pada awal dan torsi penuh setalah motor berjalan beberapa detik. Faktor-faktor dalam ini merupakan suatu gejala peralihan ketika motor dioperasikan dengan beban ataupun torsi yang berubah-ubah. Perubahan ini juga akan mengakibatkan pada arus dan flux rotor. Ketika motor pertama kali dijalankan atau pada kondisi *start up* dapat diketahui akan mengalami *transient respons* adanya gejala naik turun arus, tegangan, kecepatan dan flux sebelum motor tersebut beroperasi dalam kondisi *steady state*.

BAB III

ANALISA **STARTING** MOTOR DAN PEMODELAN SIMULASI **SOFTWARE ETAP POWERSTATION**

3.1. Analisa **Starting** Motor^[3]

Permasalahan dalam menjalankan motor induksi tiga phasa adalah timbulnya arus awal (arus *starting*) yang cukup besar. Arus *starting* pada sebagian besar motor induksi arus bolak-balik memiliki besar beberapa kali besar arus nominal. Arus yang ditarik pada saat *starting* mencapai 4 sampai dengan 7 kali arus nominal. Pada motor induksi berkapasitas besar hal ini tidak dapat diijinkan. Karena akan mengganggu jaringan listrik lagi pula dapat merusak motor induksi itu sendiri.



Gambar 3.1. Motor Induksi 3 Phasa

1. *Explanatory notes* (continued)

2. *Notes on the history of the language* (continued)

3. *Notes on the grammar* (continued)

4. *Notes on the lexicography* (continued)

5. *Notes on the phonetics* (continued)

6. *Notes on the orthography* (continued)

7. *Notes on the morphology* (continued)

8. *Notes on the syntax* (continued)

9. *Notes on the semantics* (continued)

10. *Notes on the pragmatics* (continued)

11. *Notes on the lexicography* (continued)

12. *Notes on the phonetics* (continued)

13. *Notes on the orthography* (continued)

14. *Notes on the morphology* (continued)

15. *Notes on the syntax* (continued)

16. *Notes on the semantics* (continued)

17. *Notes on the pragmatics* (continued)

18. *Notes on the lexicography* (continued)

19. *Notes on the phonetics* (continued)

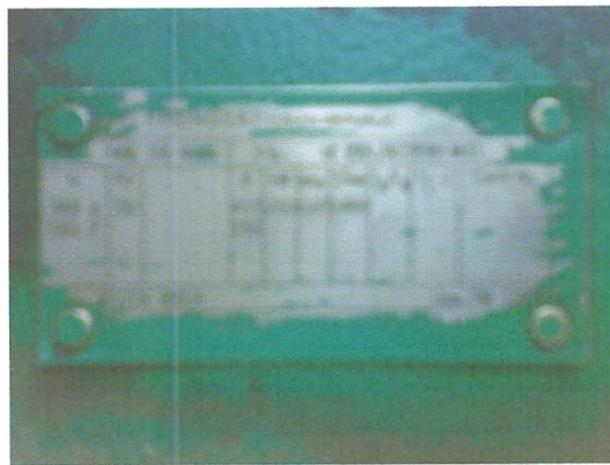
20. *Notes on the orthography* (continued)

21. *Notes on the morphology* (continued)

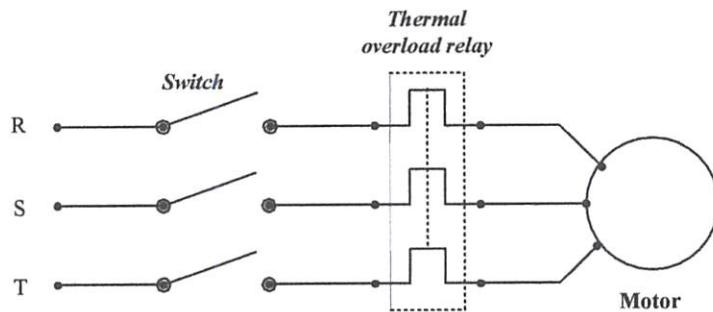
22. *Notes on the syntax* (continued)

23. *Notes on the semantics* (continued)

24. *Notes on the pragmatics* (continued)



Gambar 3.2. *Name Plate Motor*



Gambar 3.3. *Starting Tegangan Penuh*

Peralatan *starting* motor induksi rotor sangkar yang paling sederhana adalah *starting* tegangan penuh, dimana terdiri dari saklar (*switch*) dan *relay* pengaman *overload*. Saklarnya dapat dioperasikan manual dan dapat juga menggunakan kontaktor elektromagnetik yang dapat dilepas dengan *thermal overload relay*. Secara umum, sebagian kontaktor dioperasikan sebagai tombol *start* dan *stop* dan sebagian lagi digunakan untuk menahan hubungan (*contact*).

Pada saat *start*, kontaktor ditutup untuk mengaplikasikan tegangan penuh dengan kumparan motor. Motor akan menarik arus yang besar dalam waktu yang singkat. Pada saat motor berakselerasi, secara berangsur-angsur arus akan

mulai turun sampai motor akan mencapai kecepatan penuh. Arus *starting* awalnya sangat besar, kira-kira 4 sampai tujuh kali arus beban penuh, sedangkan torsi *starting*nya adalah 0,75 sampai 2 kali torsi beban penuh.

Starting tegangan penuh akan menghasilkan arus dan torsi yang tinggi, sehingga dapat menyebabkan jatuh tegangan yang tinggi. Untuk menghindari jatuh tegangan yang tinggi maka metode *starting* ini hanya dilakukan pada motor berkapasitas kecil.

Rumus arus *starting* adalah :

$$I_{st} = 4 \sqrt{d} \cdot I_{fl} \quad \dots \dots \dots \quad (3.1)$$

$$I_{fl} = \frac{P}{\sqrt{3} \cdot V \cdot \cos \theta \cdot \eta} \quad \dots \dots \dots \quad (3.2)$$

Slip = 1

$$I_2 = \frac{E_{20}}{\sqrt{R_2^2 + X_2^2}} \quad \dots \dots \dots \quad (3.3)$$

Dengan memperhatikan rumus arus *starting* diatas, dapat disimpulkan, bahwa salah satu cara untuk dapat menurunkan arus *starting* adalah menurunkan tegangan sumber atau tegangan apit (E_{20}), dengan menggunakan peralatan pengasutan motor.

3.2. Analisa Menggunakan Pengasutan Motor^[7]

Cara yang paling mudah untuk menurunkan arus *starting* adalah dengan menurunkan tegangan terminal menggunakan peralatan *starting* motor. Ketika motor *distart* pada tegangan penuh, arus yang ditarik dari *line* daya umumnya adalah 600% dari arus beban penuh.

Arus *starting* yang besar dari motor dapat menyebabkan penurunan tegangan. Tambahan pula dengan arus awal yang tinggi, motor juga menghasilkan torsi awal yang lebih tinggi dibandingkan torsi beban penuh. Pada beberapa aplikasi, torsi awal ini menyebabkan kerusakan sistem mekanis. Misalnya pada *belt* (sabuk), rantai atau kopling. Ketika tegangan pada motor dikurangi maka arus yang ditarik oleh motor dan torsi yang dihasilkan motor menurun. Pada tabel 3-1, menunjukkan hubungan tegangan, arus dan torsi untuk motor desain B-NEMA.

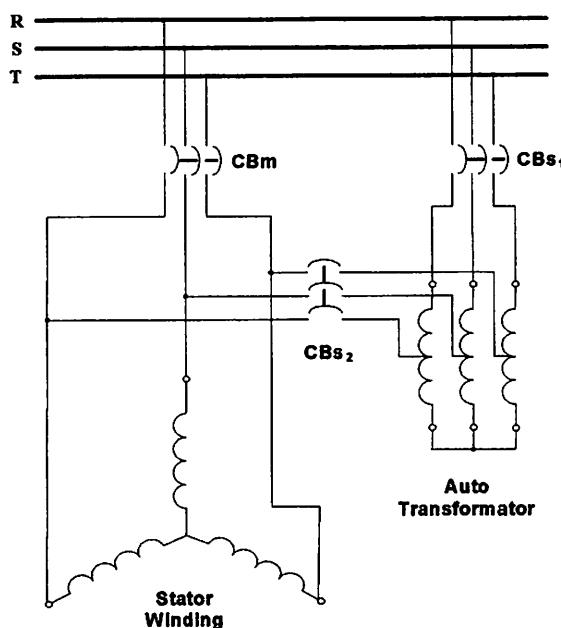
Tabel 3-1
Karakteristik Tegangan, Arus, Dan Torsi Untuk Motor Desain B NEMA.

Metode Pengasutan	Persentase tegangan pada terminal motor	Arus Pengasutan Motor dalam %		Arus lin dalam %		Torsi Pengasutan motor dalam %	
		Arus rotor ditahan	Arus beban penuh	Arus rotor ditahan	Arus beban penuh	Torsi rotor ditahan	Torsi beban penuh
Tegangan penuh	100	100	600	100	600	100	180
Auto-Trafo							
80% tap	80	80	480	64	307	64	115
65% tap	65	65	380	42	164	42	76
50% tap	50	50	300	25	75	25	45
Lilitan-bagian	100	65	390	65	390	50	90
Star-delta	100	33	198	33	198	33	60
Solid-state	0-100	0-100	0-600	0-100	0-600	0-100	0-180

Pembatasan arus *utility*, dan juga kapasitas rel pada pabrik, dapat memerlukan motor yang diatas power tertentu diasut dengan tegangan yang dikurangi. Beban kinerja tinggi dapat memerlukan kontrol akselerasi motor beban. Jika beban yang

digerakkan atau sistem distribusi daya tidak dapat menerima pengasutan beban penuh, beberapa jenis tegangan yang dikurangi meliputi pengasutan tahanan primer, *auto-transformator*, *start-delta*, pengasutan bagian lilitan dan *solid-state*

3.2.1. Pengasutan Motor Menggunakan *Auto-Transformer*^[6]



Gambar 3.4. Pengasutan *Auto-Transformer*

Untuk menurunkan arus *pengasutan* dapat dilakukan dengan cara menggunakan pengasutan *auto-transformator*. Motor terlebih dahulu secara permanen dihubungkan dengan hubungan *star-delta*, dimana pertama kali di *switch* dengan tap *auto-transformator* dengan penurun tegangan sampai pada keadaan stabil kemudian di *switch* ke posisi *running* atau tegangan penuh. Pada prinsipnya metode pengasutan ini hampir sama dengan pengasutan *star-delta*. Keuntungan dari metode ini dimana arus dan torsi pengasutan dapat diatur sesuai dengan nilai yang dibutuhkan.

Rangkaian pengasutan *auto-transformator* dapat pada gambar 3.4.

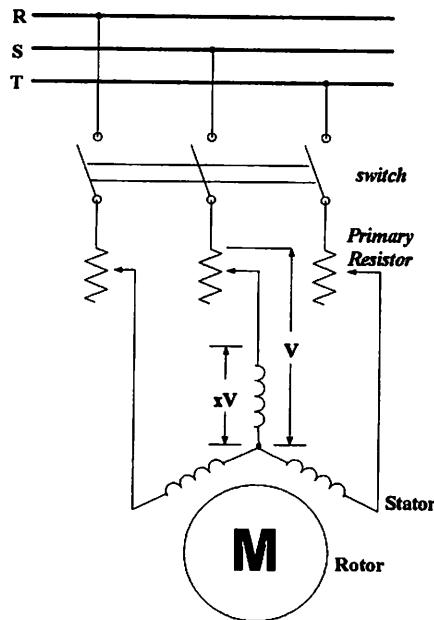
Pertama CB_s ditutup kemudian diikuti oleh CB_{s2} , kemudian setelah motor berakselerasi maka CB_{s2} ditutup. Terakhir, CB_{s1} dibuka untuk melepaskan hubungan *Auto-Transformator* dari jaringan.

Misalkan pada saat motor dihubungkan dengan 50% dari tap *Auto-Trafo*, tegangan terminal motor akan menjadi 50%. Diasumsikan LRA = 600% maka arus yang mengalir pada motor menjadi 300%. Sehingga untuk arus dan torsi *startingnya* menjadi:

$$I_{st} = \frac{V_s \cdot (\%Tap)}{\sqrt{\left(R_s + \frac{R_r}{s}\right)^2 + (X_s + X_r)^2}} \dots\dots\dots (3.4)$$

$$T_{st} = \frac{3}{\omega_s} \cdot \frac{V_s \cdot (\%Tap) \cdot R_r}{(R_s + R_r)^2 + (X_s + X_r)^2} \dots\dots\dots (3.5)$$

3.2.2. Pengasutan Motor Menggunakan *Resistor*^[5]

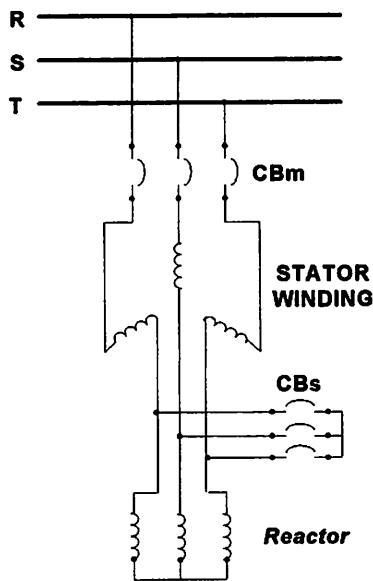


Gambar 3.5. Pengasutan *Resistor*

Gambar 3.5. menunjukkan susunan pengasutan resistor. Pengasutan resistor menambah resistor pada rangkaian stator selama periode pengasutan. Jadi mengurangi arus yang ditarik dari line. Penutupan kontak pada A menghubungkan motor dengan *suplay* melalui resistor yang memberikan penurunan tegangan untuk mengurangi tegangan pengasut yang ada pada motor.

Nilai tahanan dipilih untuk menghasilkan torsi pengasutan yang cukup sambil mengurangi arus *starting*. Arus “*inrush*” motor menurun selama akselerasi, sehingga mengurangi penurunan tegangan pada resistor dan memberikan torsi yang lebih besar. Hal ini mengakibatkan akselerasi yang lembut. Sesudah beberapa periode waktu, *switch* dibuka dan resistor di “*shorted*” untuk menghubungkan motor pada tegangan penuh.

3.2.3. Pengasutan Motor Menggunakan *Reactor*⁶⁾



Gambar 3.6. Pengasutan *Reactor*

Cara lain untuk menurunkan arus awal adalah dengan menggunakan *reactor*. Pada gambar 3.6. Semua *reactor* dihubungkan seri pada rangkaian stator yang terhubung dengan CBs yang tersambung dengan jaringan tiga phasa. Pada saat *start* seluruh *reactor* terpasang pada rangkaian stator, sehingga impedansi stator dilihat dari jaringan menjadi tinggi, yang menyebabkan arus stator menjadi rendah. Beberapa waktu saat *start*, arus awal agak menurun. Kemudian setelah motor berakselerasi, maka saklar dilepas sehingga arus awal naik lagi dalam waktu sebentar kemudian motor berputar sesuai dengan arus nominalnya.

$$I_{st} = X_L \cdot I_{sc} \quad \dots \dots \dots \quad (3.9)$$

$$T_{st} = X_L^2 \cdot T_{sc} \quad \dots \dots \dots \quad (3.10)$$

$$\frac{T_{st}}{T_f} = \left(\frac{I_{st}}{I_f} \right)^2 \cdot s_f = \left(\frac{x_L I_{sc}}{I_f} \right)^2 \cdot s_f = x_L^2 \left(\frac{I_{sc}}{I_f} \right)^2 \cdot s_f \quad \dots \dots \dots \quad (3.11)$$

3.3. Lama Waktu Start^[3]

Waktu yang diperlukan sebuah motor untuk mulai dari *start* sampai mencapai putaran nominal pada suatu beban tertentu adalah sangatlah penting. Bilamana T_d adalah momen dorong dari motor, T_b adalah momen beban, maka ΔT adalah kelebihan momen, yang memberi percepatan kepada motor. Sehingga dapat dituliskan:

$$\Delta T = T_d - T_b = J \frac{d\omega}{dt} \dots \dots \dots (3.12)$$

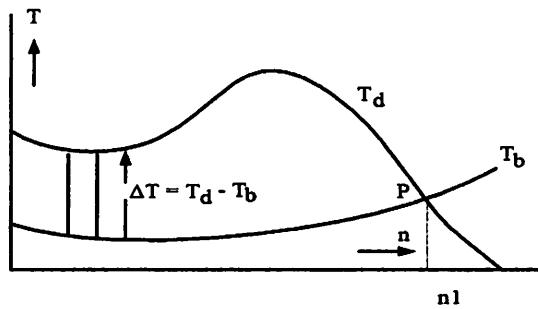
Dimana:

$$J = m R^2 = m D^2 / 4 \dots \dots \dots (3.13)$$

= momen lembam poler

$$= \int r^2 dm \dots \dots \dots (3.14)$$

Gambar 3.7. Memperlihatkan secara grafis kopel dorong T_d , kopel beban T_b , dan selisih kopel dorong dan kopel beban tersebut, sampai motor mencapai titik P pada putaran n , dimana terdapat keseimbangan antara kopel dorong dan kopel beban.



Gambar 3.7. Grafis Kopel Terhadap Putaran

Selanjutnya dapat dituliskan pula:

$$\Delta T = m R^2 \frac{2\pi}{60} \frac{dn}{dt} \quad \dots \dots \dots \quad (3.15)$$

Atau:

$$dt = \frac{\pi}{120} m D^2 \frac{dn}{\Delta T} \quad \dots \dots \dots \quad (3.16)$$

Bilamana motor memerlukan waktu sejumlah t_1 detik untuk mencapai putaran nominal n_1 maka dapat ditulis:

$$\int_0^{t_1} dt = \frac{\pi}{120} m D^2 \int_0^{n_1} \frac{1}{\Delta T} dn \quad \dots \dots \dots \quad (3.17)$$

Atau:

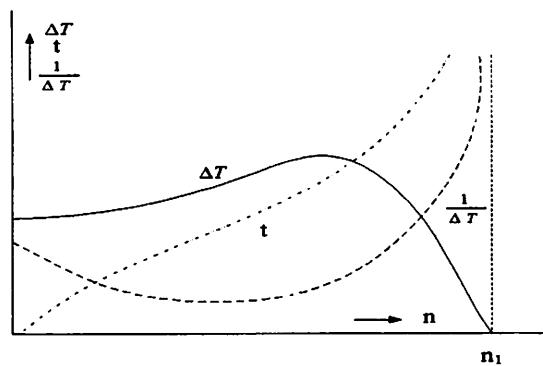
$$t_1 = \frac{\pi}{120} m D^2 \int_0^{n_1} \frac{1}{\Delta T} dn \quad \dots \dots \dots \quad (3.18)$$

Sehingga:

$$t_1 = \infty \quad \dots \dots \dots \quad (3.19)$$

Jadi putaran nominal n_1 dicapai motor dalam waktu yang tak terhingga.

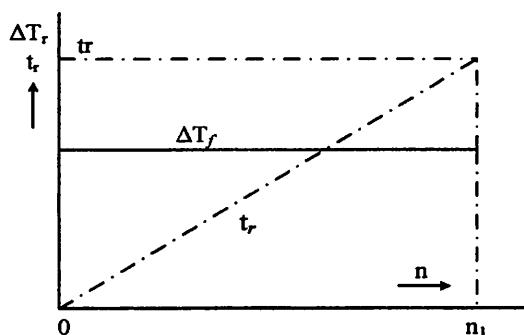
Gambar 3.8. memperlihatkan kelebihan kopel ΔT sebagai fungsi putaran n , yaitu $\Delta T = T_d - T_b$, yang setelah mencapai putaran nominal n_1 menjadi nol.



Gambar 3.8. Kopel ΔT Sebagai Fungsi Putaran n

Dalam gambar 3.8. juga diperlihatkan kebalikan dari ΔT , yaitu $1/\Delta T$ sebagai fungsi putaran n . dengan sendirinya, pada waktu ΔT mencapai maksimum, maka $1/\Delta T$ mencapai minimum. Sebaliknya, pada putaran n_1 nilai ΔT menjadi nol, sedangkan $1/\Delta T$ menjadi tak terhingga. Pada gambar 3.8. juga dilukiskan waktu t sebagai fungsi dari putaran n . dengan sendirinya fungsi t ini pada $n = 0$, untuk kemudian mencapai nilai tak terhingga pada waktu $n = n_1$.

Bilamana kini dilakukan peyederhanaan. Dimisalkan untuk fungsi ΔT diambil ΔT rata-rata, atau ΔT_r , yang merupakan nilai rata-rata ΔT mulai dari nol hingga mencapai putaran n_1 . Fungsi ini terlihat pada gambar 3.9.



Gambar 3.9. Fungsi t Rata-Rata Mencapai Nilai n_1

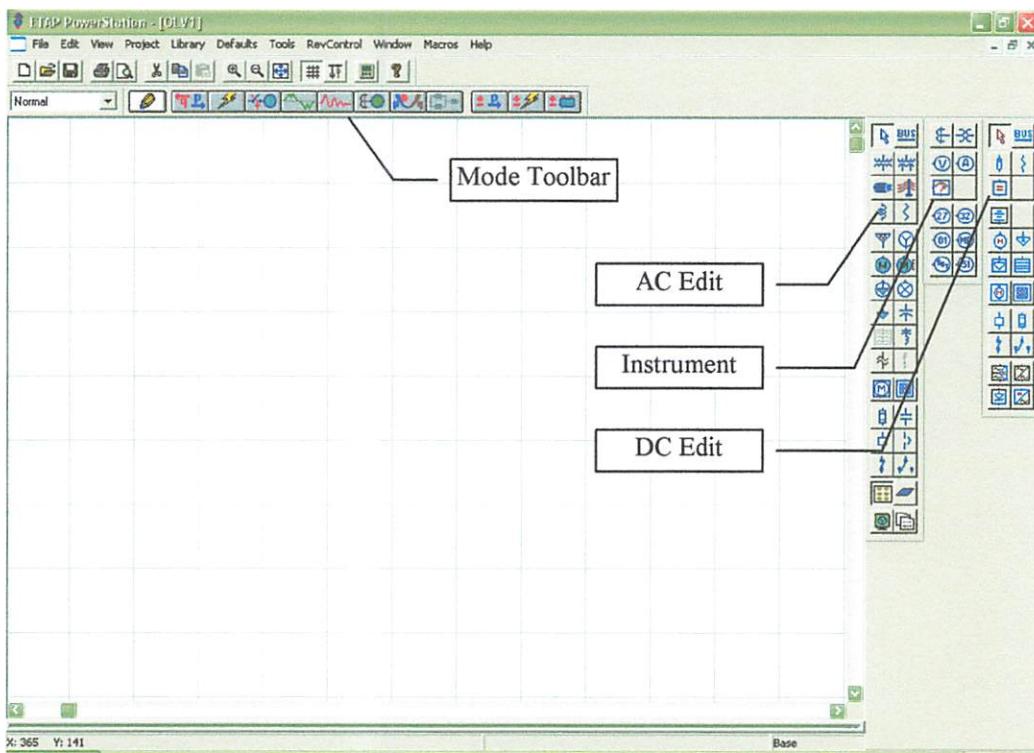
Bilamana hal ini dilakukan, maka untuk t_1 diperoleh nilai praktis:

$$t_1 \approx \frac{\pi}{120} \frac{mD^2}{\Delta T_r} n_1 \quad \dots \dots \dots \quad (3.20)$$

Pada gambar diatas terlihat fungsi t rata-rata, yang secara linear mulai dari putaran $n = 0$ mencapai nilai t_1 tersebut diatas pada putaran nominal n_1 .

3.4. Simulasi Software ETAP Powerstation

ETAP Powerstation merupakan program untuk menganalisa kondisi *transient* suatu sistem kelistrikan. *ETAP Powerstation* memungkinkan antar muka secara grafis dan komputasi yang sempurna dan secara langsung kita dapat menggambar *single line diagram*. Tampilan utama *software ETAP Powerstation* pada gambar 3.10. berikut ini.



Gambar 3.10. Tampilan Model Utama Simulasi *Software ETAP Powerstation*

Program ini didesain berdasarkan tiga konsep, yaitu:

3.4.1. Operasi Nyata Secara Virtual (*Virtual Reality Operation*)

Pengoperasian program mirip dengan pengoperasian listrik secara nyata. Seperti ketika menutup atau membuka CB, membuat suatu elemen keluar dari rangkaian, mengganti status operasi motor dan lain sebagainya. *ETAP*

Powerstation memiliki konsep-konsep baru dalam menentukan koordinasi peralatan pengaman secara langsung dari *single line diagram*.

3.4.2. Data Gabungan Total (*Total Integration of Data*)

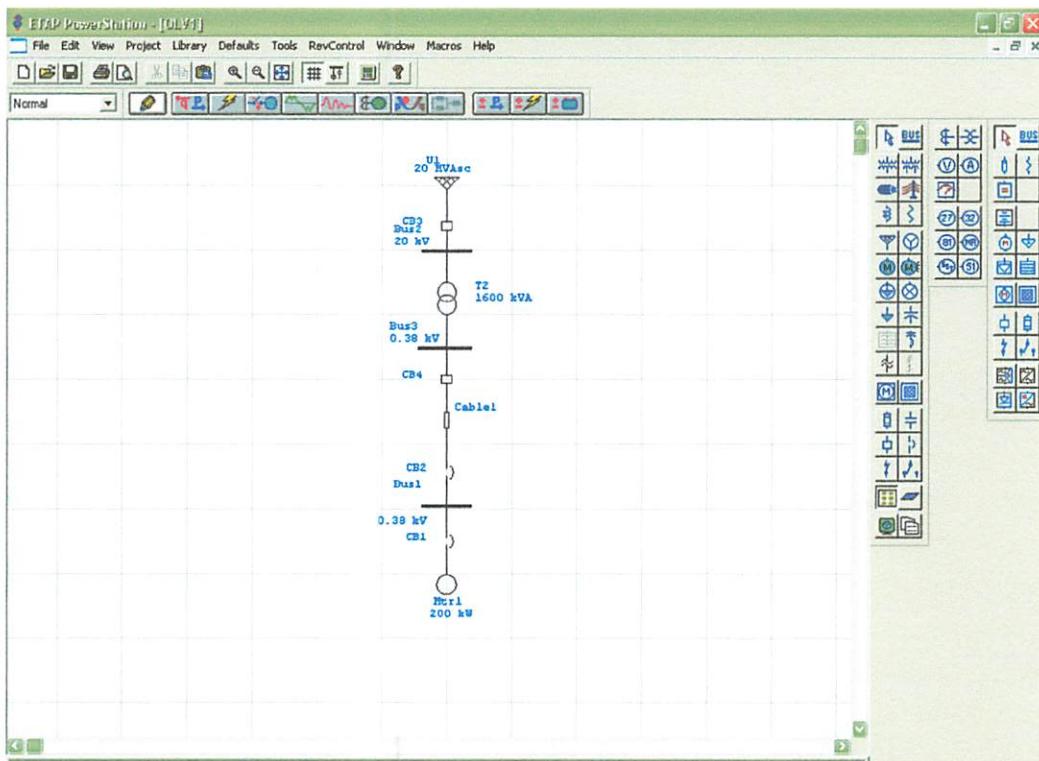
ETAP Powerstation menggabungkan konsep elektrik, logika, mekanik dan fisik dari suatu elemen sistem dalam *data base* yang sama. Sebagai contoh: sebuah kabel, tidak hanya terdiri dari data sifat-sifat listrik dan dimensi fisik, tetapi juga informasi yang mengindikasikan jalur yang dilalui. Gabungan data-data ini menentukan konsistensi sistem secara keseluruhan dan menghindarkan dari pemasukan data yang berulang-ulang untuk element yang sama.

3.4.3. Kesederhanaan Dalam Memasukkan Data

ETAP Powerstation menggunakan data lengkap dan setiap peralatan listrik yang kadang hanya membutuhkan semua jenis pemasukan data. Data editor dapat mempercepat proses memasukkan data dengan membutuhkan data minimum.

Standart yang digunakan *ETAP Powerstation* versi 4.0.0 ada dua yaitu IEEE JEC. Hal ini berdasarkan kenyataan bahwa dalam sistem tenaga di dunia terbagi dalam dua satuan umum. Pada gambar 3.10. terdapat *toolbar AC Edit, DC Edit* dan *Instrument* yang merupakan kumpulan dari alat-alat ukur. *AC Edit* digunakan untuk menggambar jaringan AC, *DC Edit* digunakan untuk menggambar rangkaian DC. Dimana setiap kelompok *tools* tersebut terdapat bus, kabel, CB, *fuse*, beban dan lain sebagainya. *Mode Toolbar* digunakan untuk me-

running program. Analisa yang dapat dilakukan antara lain adalah analisa aliran daya, hubung singkat, motor *starting*, harmonisa, stabilitas *transient*, koordinasi relay dan lain sebagainya. Komponen diletakan pada modul dengan cara *click* kiri sekali pada salah satu *tool* yang diinginkan, lalu diletakkan pada modul dengan *click* kiri. Kemudian melakukan pengisian data dengan cara *double click* salah satu peralatan yang ada di modul yang telah dipilih untuk pengisian data parameter maupun keterangan secara lengkap. Pemodelan simulasi *starting* motor menggunakan *software ETAP Powerstation* terlihat pada gambar 3.11. dibawah ini.



Gambar 3.11. Tampilan Pemodelan *Singgle Line Diagram* Simulasi *Software ETAP Powerstation*

3.5. Algoritma Program

3.5.1. Algoritma Pemecahan Masalah Starting Motor Menggunakan Simulasi Software ETAP Powerstation

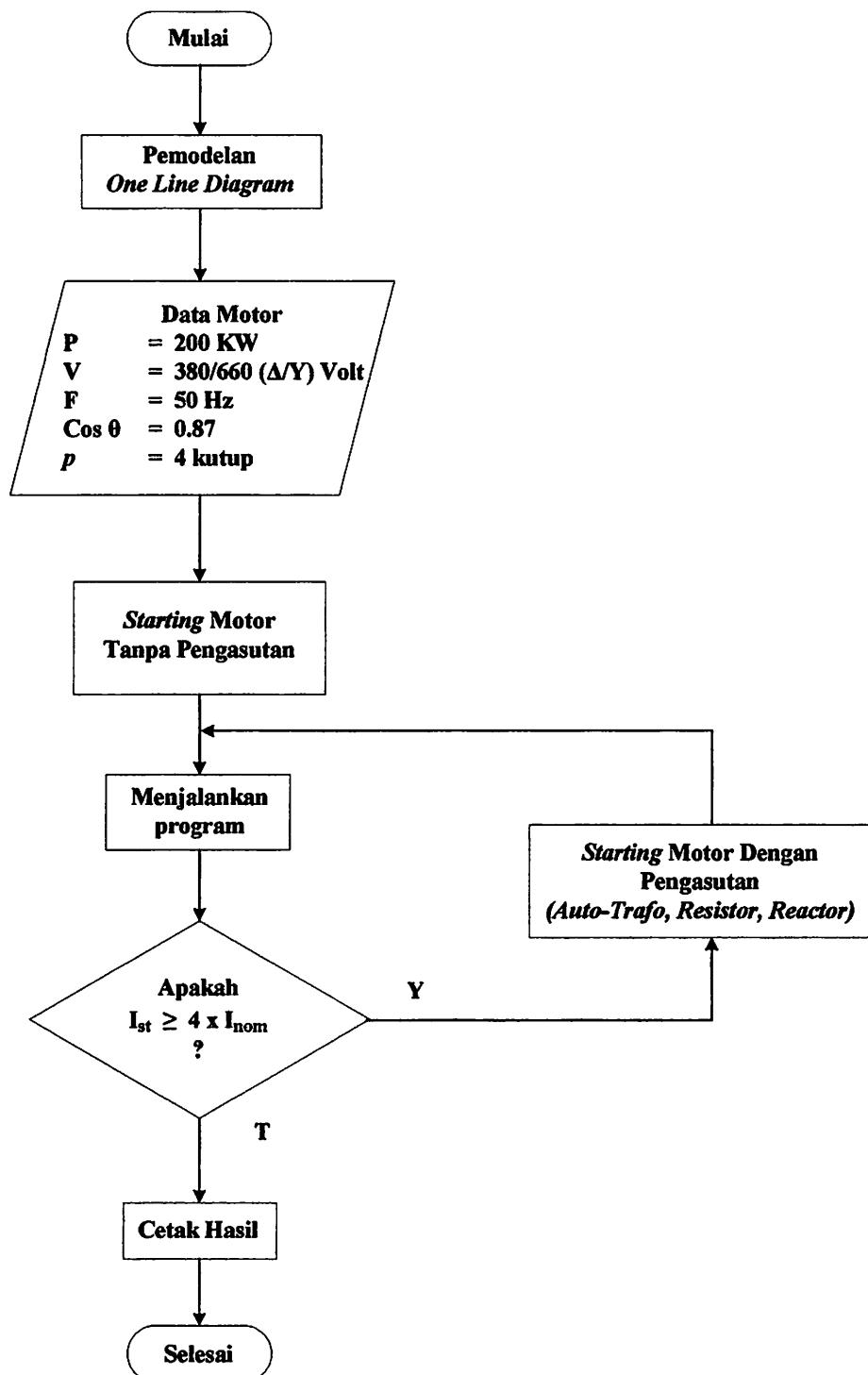
1. Mulai
2. Membuat *one line diagram* simulasi
3. Memasukkan data motor P, V, I, f, Cos φ , p
4. Melakukan *starting* motor tanpa pengasutan
5. Menjalankan program
6. Apakah $I_{start} \geq 4 \times I_{nominal}$

Jika Ya, maka motor di *start* menggunakan pengasutan
(*Auto-Trafo, Resistor, Reactor*)

Jika Tidak, lanjutkan ke step berikutnya

7. Tampilkan hasil simulasi program
8. Selesai

3.5.2. Flowchart Pemecahan Masalah Starting Motor Menggunakan Simulasi Software ETAP Powerstation



Gambar 3.12. *Flowchart Starting Motor Menggunakan Simulasi Software ETAP Powerstation*

BAB IV

ANALISA DAN HASIL SIMULASI *STARTING MOTOR*

4.1. Data Motor Induksi Pada P.G. Kebon Agung Malang

Data yang diambil dari stasiun *injection* pada P.G. Kebon Agung Malang adalah data motor di stasiun *injection* pabrik tengah. Kemudian dari data yang didapat dimodelkan ke dalam *software ETAP Powerstation*. Kemudian dilakukan *running dinamik motor starting* untuk mengetahui besarnya arus yang ditarik motor pada waktu pengoperasian motor.

Tabel 4.1.
Data Motor Induksi Pada Stasiun *Injection*

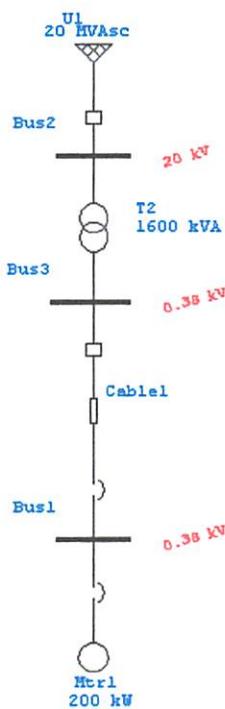
Daya	200 KW
Tegangan	380/660 (Δ/Y) Volt
Arus	365/210 Ampere
Frekuensi	50 Hz
Pole	4 kutup
Putaran	1488 rpm
$\text{Cos } \theta$	0.87

Stasiun *injection* pada P.G. Kebon Agung Malang digunakan untuk menyerap panas dari buangan limbah *steam* yang telah digunakan untuk memanaskan nira pada *evaporator* dan pan masak. Sehingga menjadi air

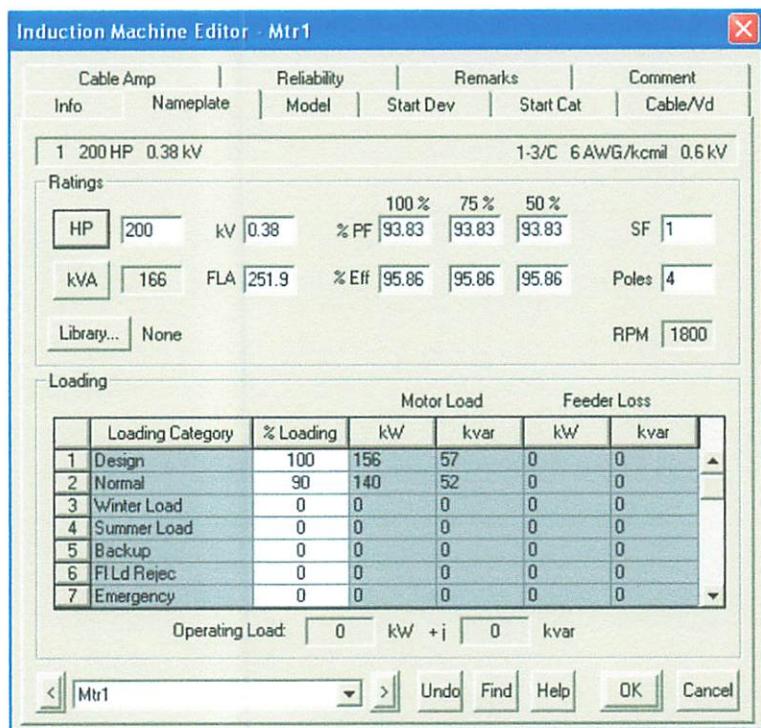
kondensat setelah menyerap panas suhu air menjadi 60°C . Untuk menurunkan air tersebut digunakan *spraypond*. dan suhu akan turun sampai 30° kemudian dipompa ke jet kondensor lagi.

4.2. Pemodelan Kedalam *Software ETAP Powerstation*.

Dengan bantuan *software ETAP Powerstation* maka simulasi *one-line diagram* yang terlihat dalam gambar 4.1. Dengan memasukkan data *name plate* motor didalam *menu induction machine editor program ETAP Powerstation*. Kemudian memilih peralatan *starting* motor yang akan digunakan untuk menganalisa. Dengan mensetting waktu *start* dan total simulasi pada menu motor *starting study case*, kemudian menjalankan program *Run Dinamic Motor Starting* yang terletak di pojok kanan atas dalam tampilan menu program.

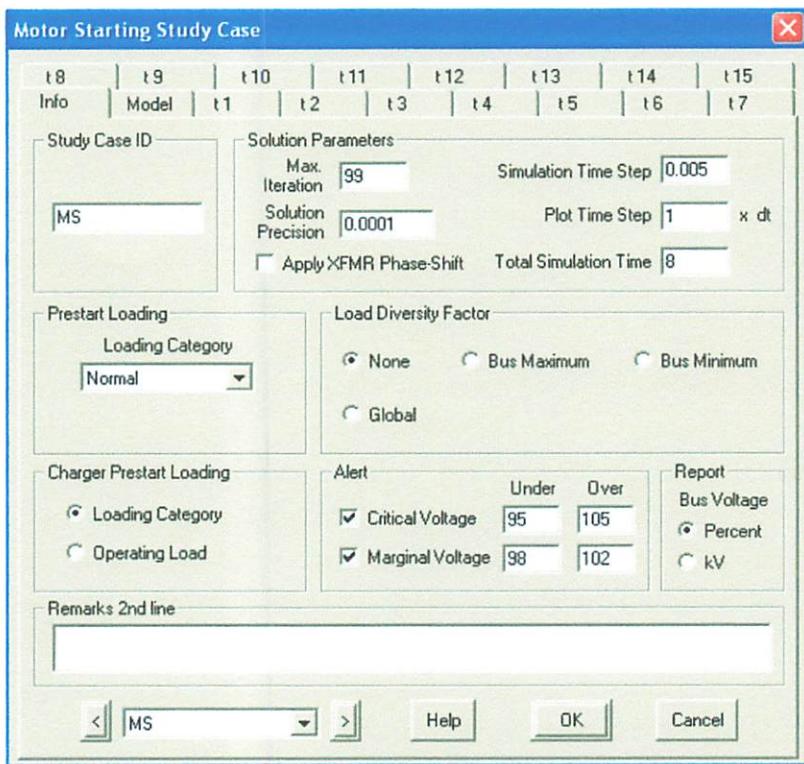


Gambar 4.1. Pemodelan *One-Line Diagram* Simulasi P.G. Kebon Agung



Gambar 4.2. *Inputan Data Name Plate Motor ke dalam Software ETAP Powerstation*

Pada gambar 4.2. menampilkan *inputan* data *name plate* motor induksi dan pemasukan model kelas motor sehingga didapatkan karakteristik parameter motor induksi. Dalam pengoperasian motor juga dapat dipilih peralatan *starting* motor dari *Start Dev Induction Machine Editor* dan juga kita dapat menentukan karakteristik torsi beban motor. Selanjutnya dilakukan *setting* waktu *start* dan durasi total simulasi waktu *running program* pada menu motor *starting study case* seperti yang terlihat pada gambar 4.3. Pada menu motor *starting study case* ini kita dapat mengoperasikan beberapa motor dalam pengaturan waktu yang berbeda-beda sehingga pada saat *start*, motor dapat berjalan sesuai dengan *setting* waktu yang telah ditentukan.



Gambar 4.3. *Menu Tools Motor Starting Study Case*

Kemudian setelah mensetting waktu pada *Motor Starting Study Case*, maka kita dapat menjalankan *starting* motor dengan menu *Run Dinamic Motor Starting* dan untuk mengetahui hasil simulasi *starting* motor dengan mengklik *Plot Kurva Analisis starting motor* maka akan didapatkan hasil simulasi program *starting* motor induksi.

4.3. Analisa Dan Hasil Simulasi *Starting Motor*

Analisa ini bertujuan untuk mengetahui besarnya arus pada saat motor dijalankan tanpa menggunakan pengasutan motor.

Setelah memasukkan data motor dan pemodelan *one-line diagram* pada program *ETAP Powerstation* maka motor dijalankan dengan menggunakan

fasilitas peralatan *starting* motor. Sehingga dapat mengamati karakteristik motor pada saat dijalankan. Kemudian dapat diamati pula hasil komputasi program pada menu *motor starting report manager*. Data hasil simulasi juga dapat diamati dengan mengklik gambar kurva simulasi *starting* motor.

4.3.1. Analisa Perhitungan *Starting Motor*

Dengan memasukkan data motor dan desain model kelas motor maka didapatkan circuit parameter motor induksi.

Tabel 4-2
Circuit Parameters

Rs	Xs	Xm	Rr	Rr'	Xr	Xr'
0,028	0,109	2,974	0,01	0,022	0,156	0,043

$$210 = \frac{200000}{\sqrt{3} \cdot 380 \cdot 0,87 \cdot \eta}$$

$$\eta = \frac{200000}{\sqrt{3} \cdot 380 \cdot 210 \cdot 0,87} = 1,66$$

$$I_{L-L} = \sqrt{3} \cdot 210 = 363,73 \text{ A}$$

$$n_s = \frac{120 \cdot 50}{4} = 1500 \text{ rpm}$$

$$S = \frac{1500 - 1488}{1500} = 0,008$$

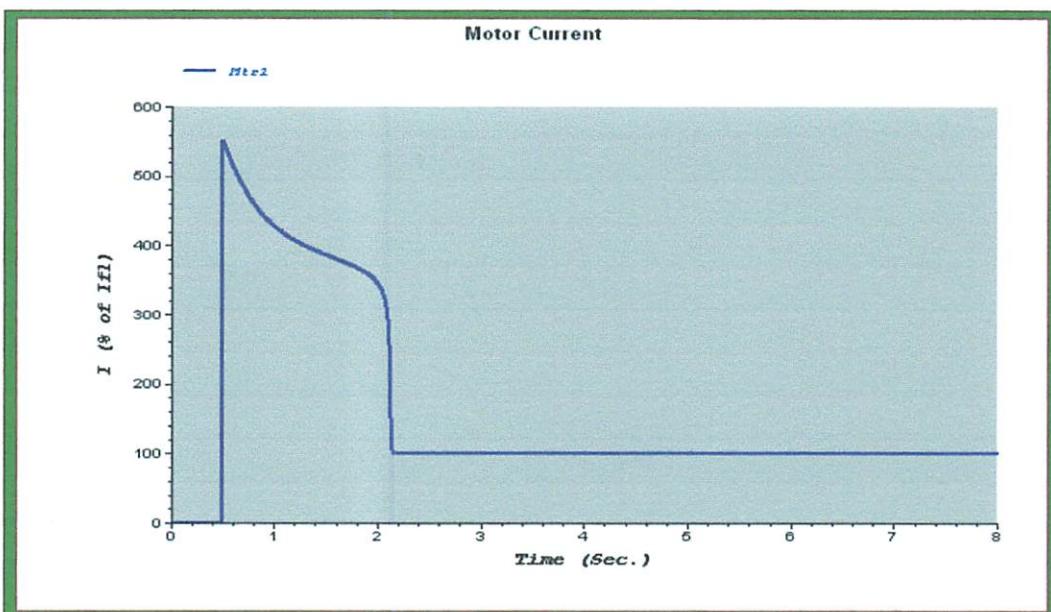
$$\omega_s = \frac{2 \cdot 3,14 \cdot 1500}{60} = 157 \text{ rad/s}$$

$$I_{st} = \frac{380/\sqrt{3}}{\sqrt{(0,028+0,022)^2 + (0,109+0,043)^2}} = 1371,099 \text{ A}$$

$$T_{st} = \frac{200000}{157} = 1273,885 \text{ N-m}$$

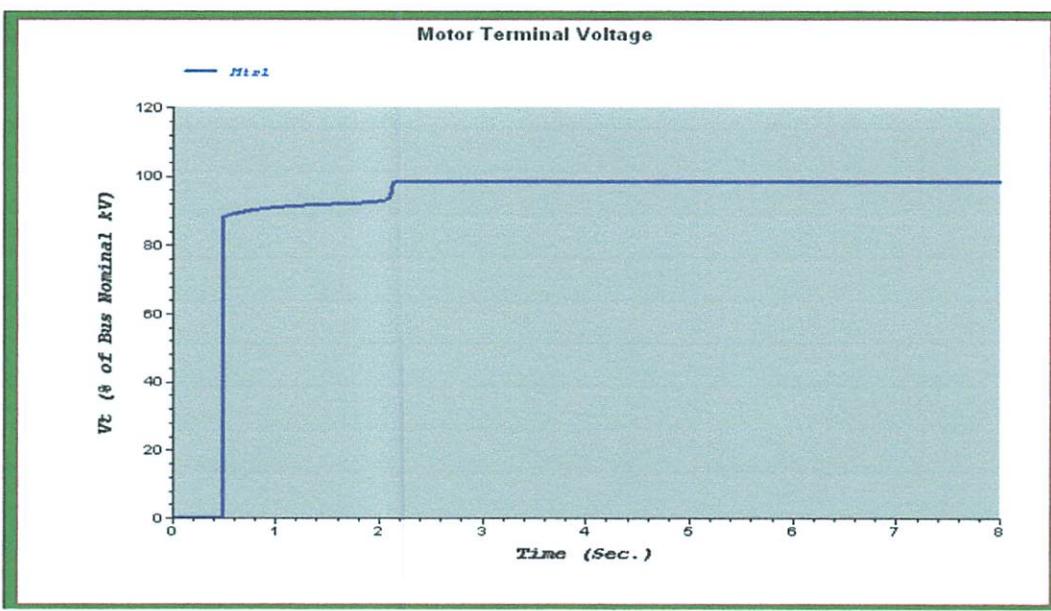
4.3.2. Tampilan Hasil Simulasi Starting Motor Tanpa Pengasutan

Tampilan hasil simulasi *starting* motor adalah untuk mengetahui besarnya arus yang ditarik motor pada saat motor dijalankan. Pada saat *start*, motor menarik arus yang cukup besar. Besarnya arus yang ditarik motor berkisar antara 4 sampai 7 kali arus beban penuh. Seperti yang terlihat pada gambar 4.4. dibawah ini.



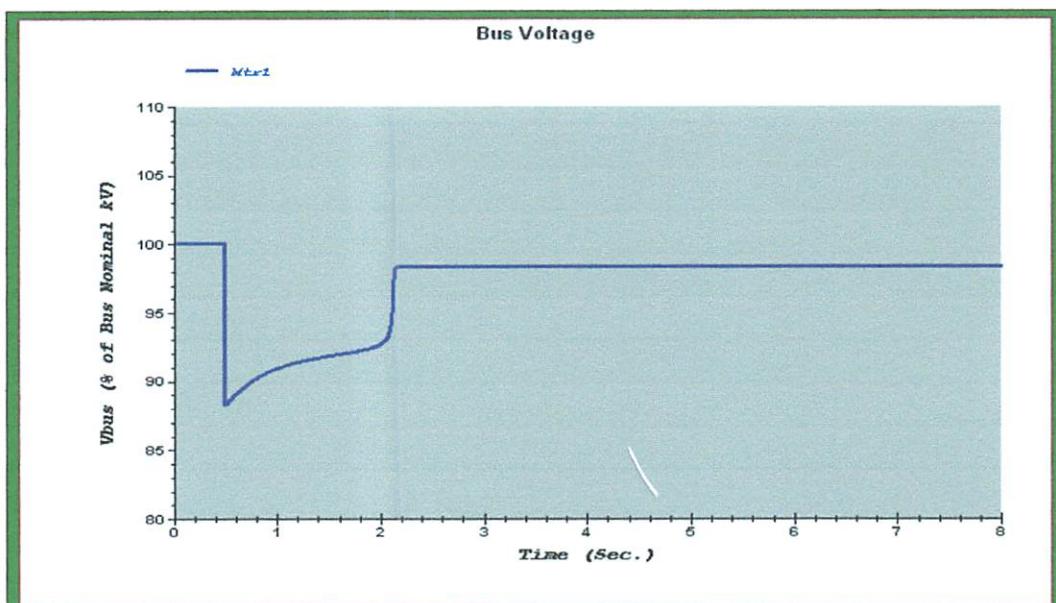
Gambar 4.4. Kurva Arus *Starting* Motor (A) Terhadap Waktu (s)

Pada saat *starting* motor tanpa pengasutan, pada gambar 4.4. pada setting waktu $t = 0,5$ s motor menarik arus awal yang cukup besar yaitu 552,208 % dari FLA, sedangkan arus pada kondisi mantap pada saat $t = 2,195$ s sebesar 100,386% dari FLA.



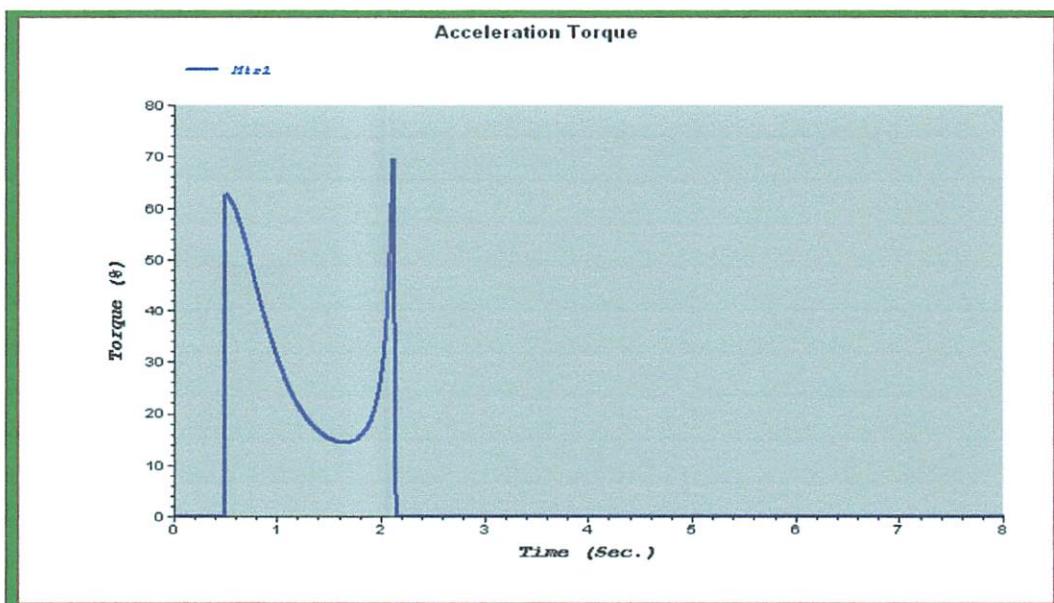
Gambar 4.5. Kurva Tegangan Terminal Motor (V) Terhadap Waktu (s)

Pada gambar 4.5. tegangan terminal motor besarnya pada saat *start* adalah 88,3039 % dari V_t , sedangkan tegangan terminal pada kondisi mantap pada saat $t = 2,185$ s sebesar 98,3821 % dari V_t .



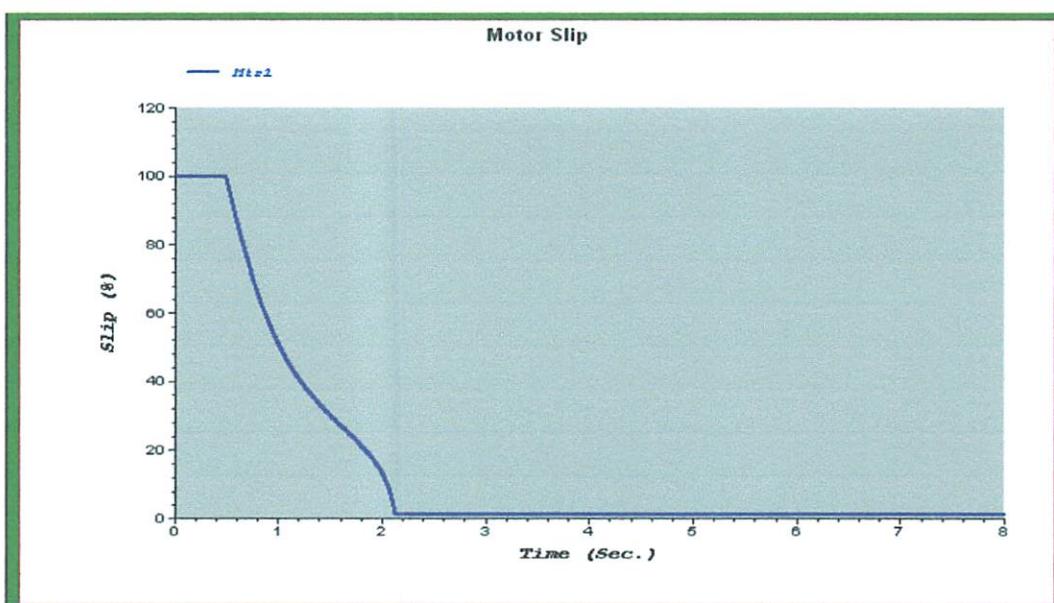
Gambar 4.6. Kurva Bus Tegangan (V) Terhadap Waktu (s)

Pada gambar 4.6. *starting* motor tanpa pengasutan mempengaruhi penurunan tegangan sesaat pada bus sebesar 88,3039 % dari V_t , sedangkan tegangan bus pada kondisi mantap pada saat $t = 2,185$ s sebesar 98,3821 % dari V_t .



Gambar 4.7. Kurva Torsi (%) Terhadap Waktu (s)

Dan pada gambar 4.7. torsi *start* besarnya adalah 62,5577 % dari T_{sc} dan torsi pada kondisi mantap pada saat $t = 2,23$ s sebesar 0 % dari T_{sc} .



Gambar 4.8. Kurva Slip (%) Terhadap Waktu (s)

Sedangkan pada gambar 4.8. slip beban penuh besarnya adalah 99,3741% dan slip pada kondisi mantap pada saat $t = 2,195$ s sebesar 1,07034%.

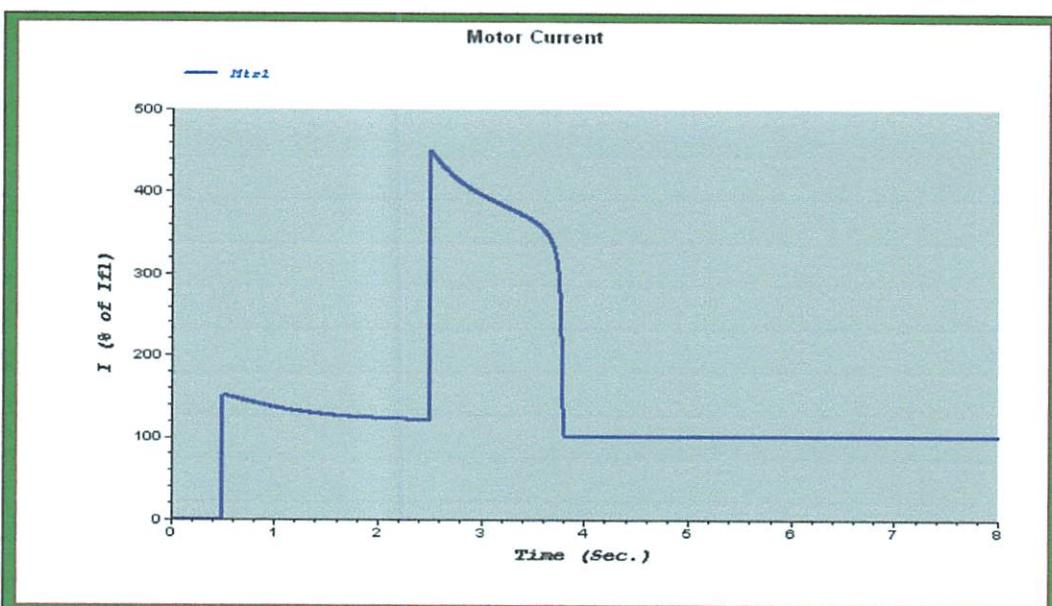
4.4. Analisa Dan Hasil Simulasi Pengasutan Motor

Untuk menurunkan arus *starting* pada saat pengoperasian motor adalah dengan menurunkan tegangan terminal motor dengan menggunakan peralatan *starting* motor diantaranya adalah:

1. Pengasutan *Auto-Trafo*
2. Pengasutan Resistor
3. Pengasutan *Reactor*

4.4.1. Hasil Simulasi Pengasutan *Auto-Trafo*

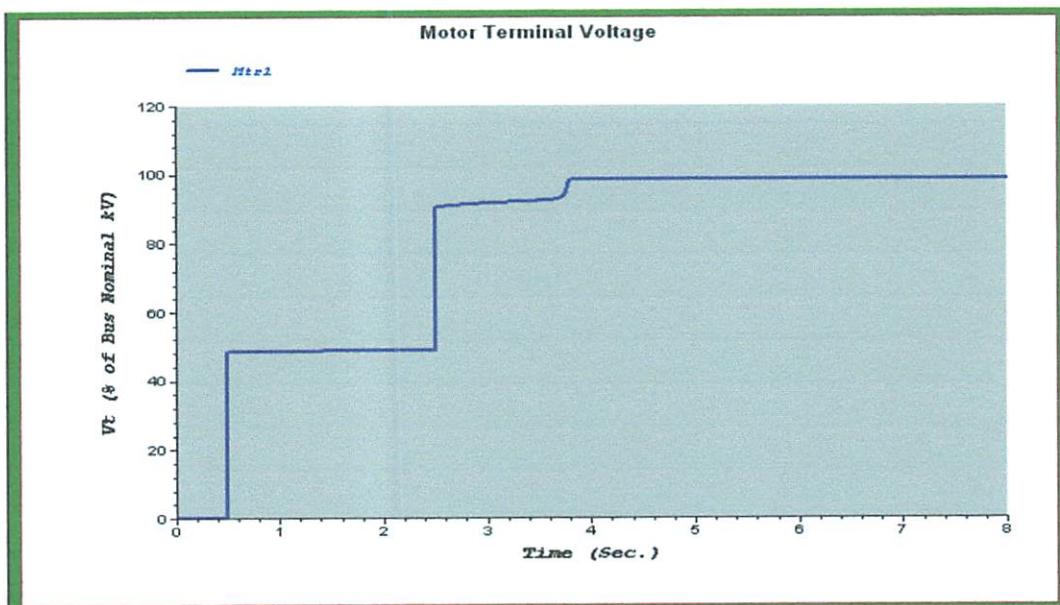
Tampilan hasil simulasi *software ETAP Powerstation* dengan pengasutan *Auto-trafo* Tap 50 %.



Gambar 4.9. Kurva Arus Pengasutan *Auto-Trafo* (A) Terhadap Waktu (s)

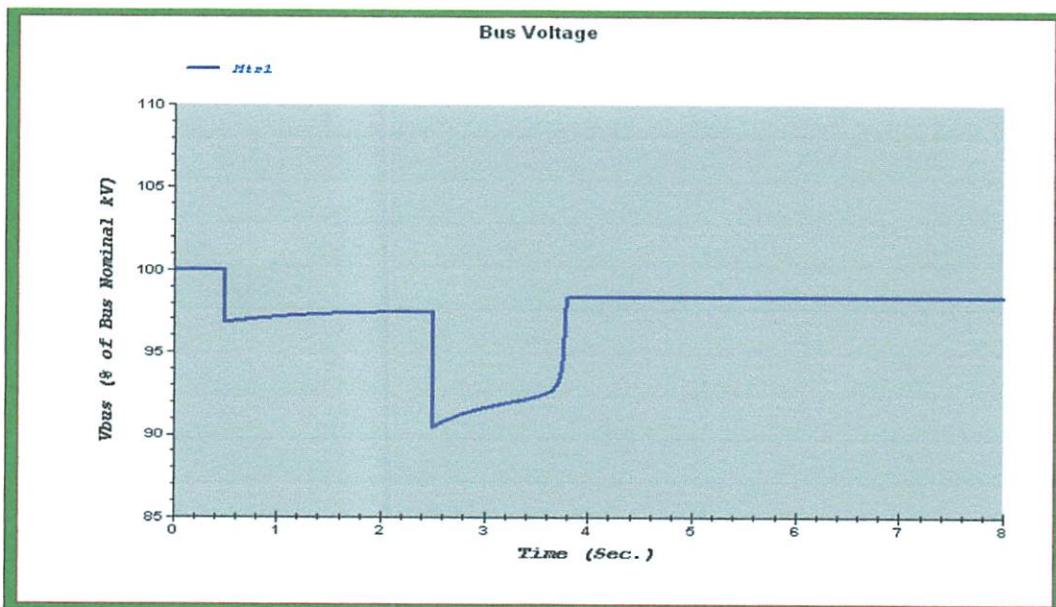
Pada gambar 4.9. dengan menggunakan pengasutan *Auto-trafo* dengan Tap 50% dengan *switch off* $t = 2$ s maka arus *starting* motor naik saat $t = 0,5$ s

menjadi 151,326 % dari FLA, dengan *setting* waktu pelepasan *auto-trafo* $t = 2,505$ s maka arus naik sebesar 450,415 % dari FLA, dan arus kondisi mantap saat $t = 3,85$ s sebesar 100,386 % dari FLA.



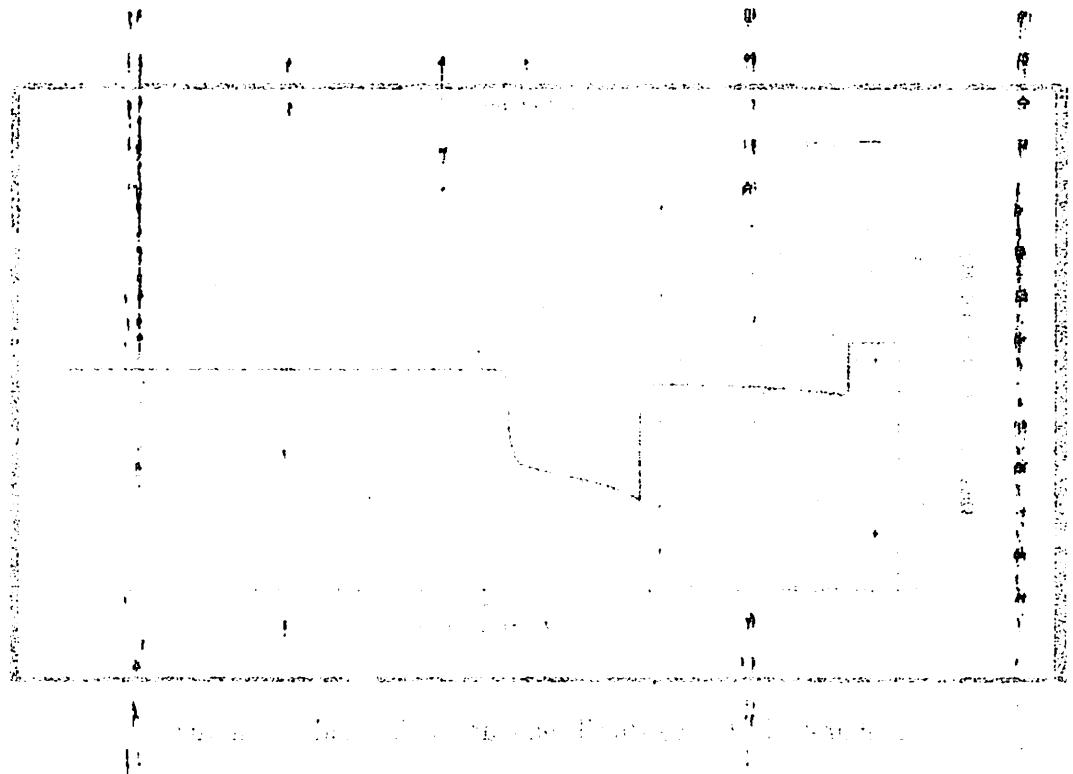
Gambar 4.10. Kurva Tegangan Terminal Motor (V) Terhadap Waktu (s)

Pada gambar 4.10. tegangan terminal motor besarnya pada saat *start* adalah 48,3974 % dari V_t, dengan *setting* waktu pelepasan *auto-trafo* $t = 2,505$ s maka tegangan terminal motor naik sebesar 90,4658 % dari FLA, sedangkan tegangan teminal pada kondisi mantap pada saat $t = 3,835$ s sebesar 98,3821 % dari V_t.

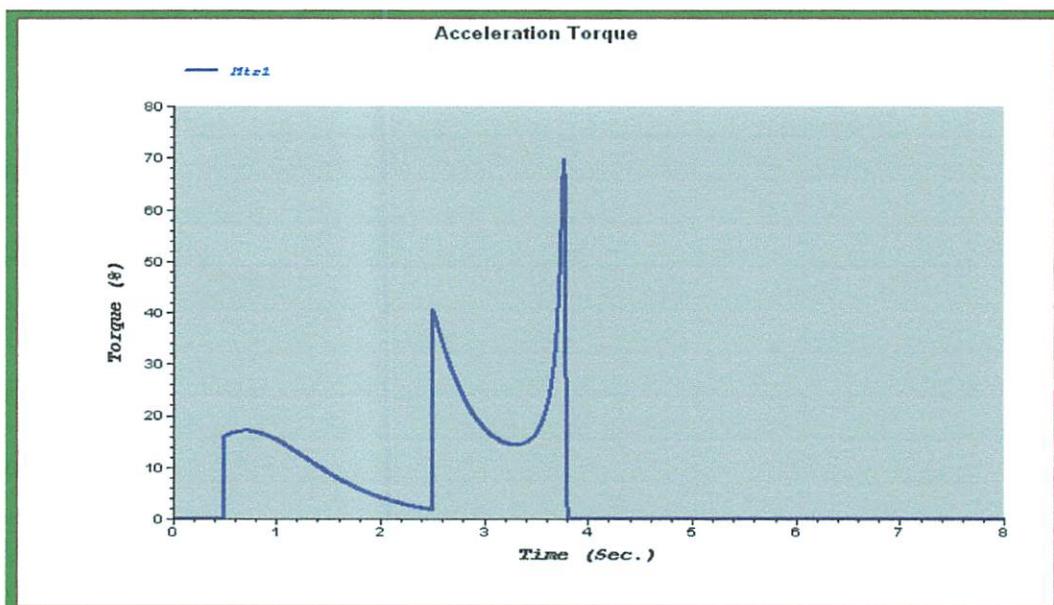


Gambar 4.11. Kurva Bus Tegangan (V) Terhadap Waktu (s)

Pada gambar 4.11. *starting* motor dengan pengasutan *auto-trafo* mempengaruhi penurunan tegangan sesaat pada bus sebesar 96,7948 % dari V_t , dengan *setting* waktu pelepasan *auto-trafo* $t = 2,505$ s maka tegangan bus turun sebesar 90,4658 % dari FLA, sedangkan tegangan bus pada kondisi mantap pada saat $t = 3,835$ s sebesar 98,3821 % dari V_t .

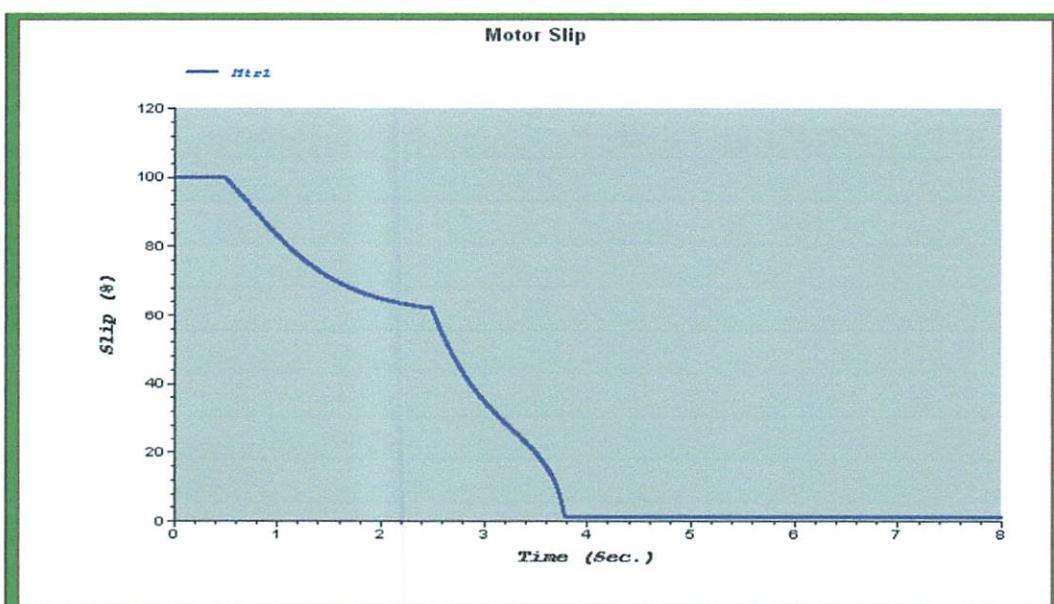


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Gambar 4.12. Kurva Torsi (%) Terhadap Waktu (s)

Pada gambar 4.12. Torsi *starting* motor sebesar 16,1381 % dari T_{sc} , dengan *setting* waktu pelepasan *auto-trafo* $t = 2,505$ s maka torsi naik sebesar 40,8566 % dari T_{sc} .

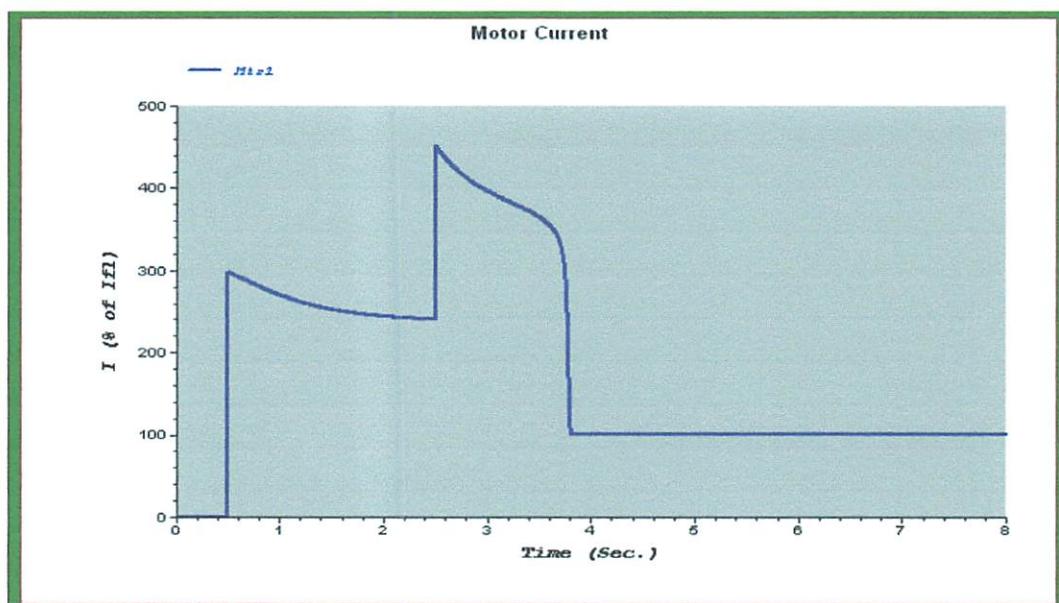


Gambar 4.13. Kurva Slip (%) Terhadap Waktu (s)

Dan pada gambar 4.13. Besarnya slip adalah 99,8385 % dan slip pada kondisi mantap pada saat $t = 3,845$ s sebesar 1,07034%..

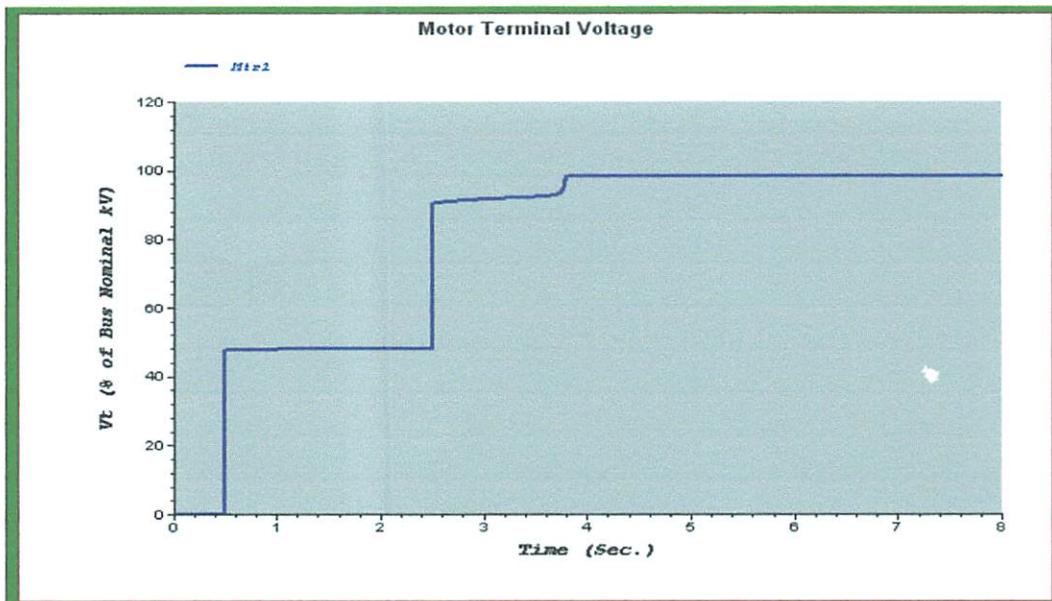
4.4.2. Hasil Simulasi Pengasutan Resistor

Tampilan hasil simulasi *software ETAP Powerstation* dengan pengasutan Resistor Tap 50 %.



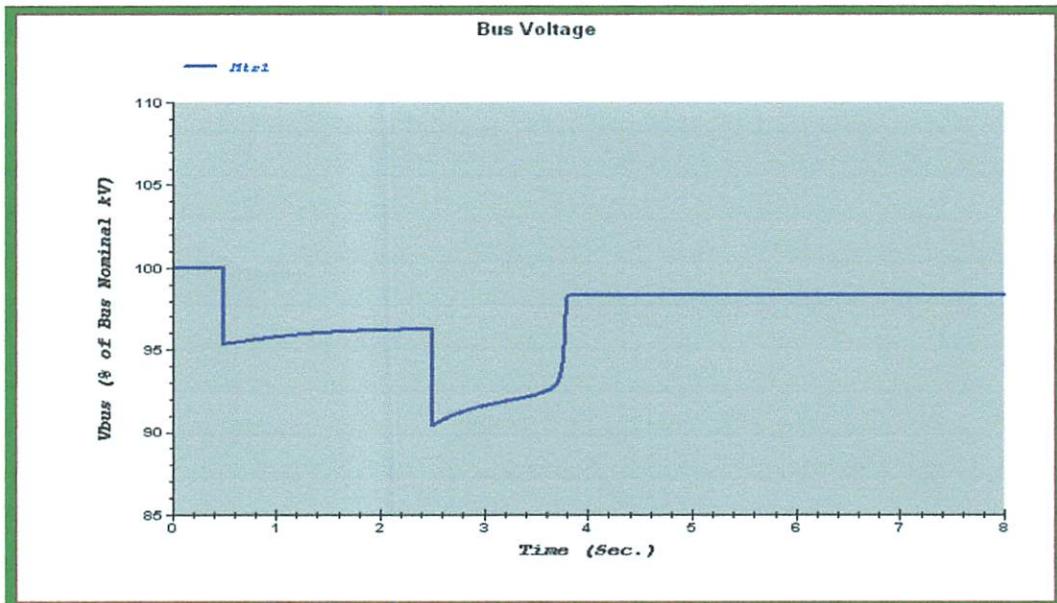
Gambar 4.14. Kurva Arus Pengasutan Resistor (A) Terhadap Waktu (s)

Pada gambar 4.14. dengan menggunakan pengasutan *resistor* dengan Tap 50% dengan *switch off* $t = 2$ s maka arus *starting* motor turun saat $t = 0,5$ s menjadi 298,142 % dari FLA, dengan *setting* waktu pelepasan resistor $t = 2,505$ s maka arus naik sebesar 451,521 % dari FLA, dan arus kondisi mantap saat $t = 3,855$ s sebesar 100,386 % dari FLA.



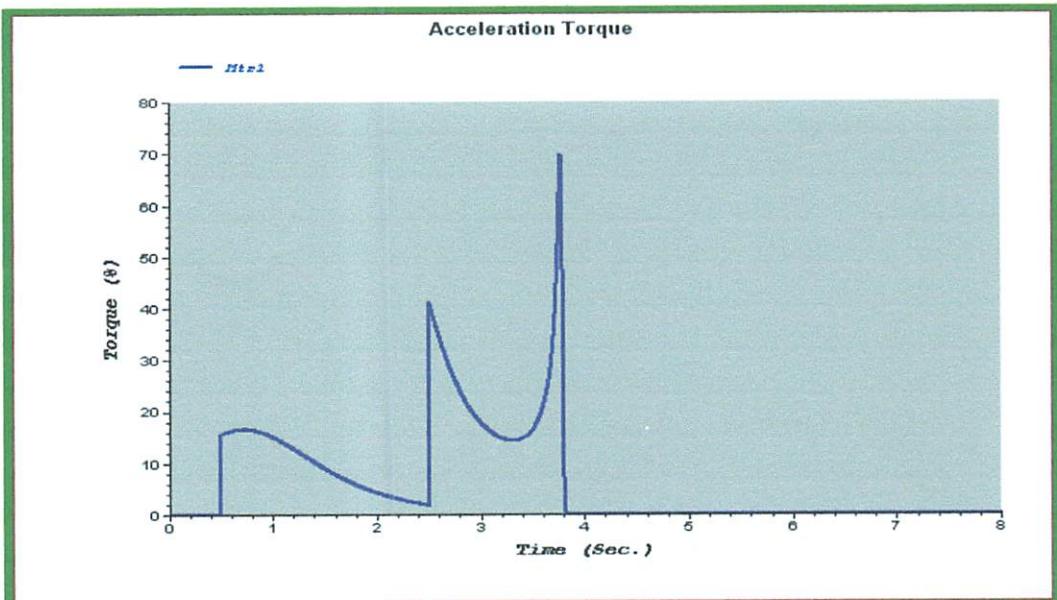
Gambar 4.15. Kurva Tegangan Terminal Motor (V) Terhadap Waktu (s)

Pada gambar 4.15. tegangan terminal motor besarnya pada saat *start* adalah 47,6762 % dari V_t, dengan *setting* waktu pelepasan resistor t = 2,505 s maka tegangan terminal motor naik sebesar 90,4404 % dari FLA, sedangkan tegangan terminal pada kondisi mantap pada saat t = 3,845 s sebesar 98,3821 % dari V_t.



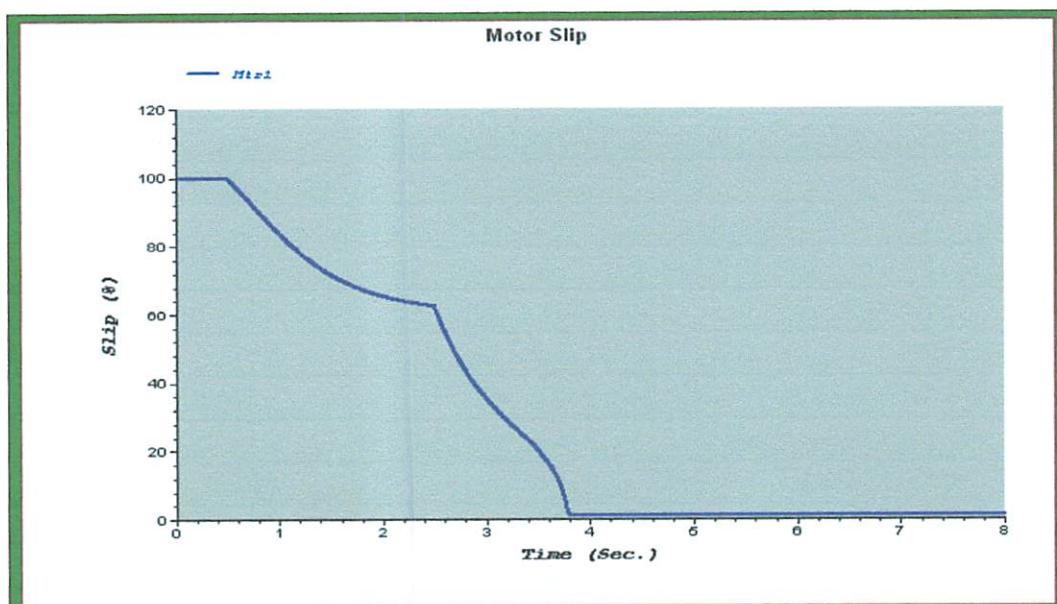
Gambar 4.16. Kurva Bus Tegangan (V) Terhadap Waktu (s)

Pada gambar 4.16. *starting* motor dengan pengasutan resistor mempengaruhi penurunan tegangan sesaat pada bus sebesar 95,3524 % dari V_t, dengan *setting* waktu pelepasan resistor $t = 2,505$ s maka tegangan bus turun sebesar 90,4404 % dari FLA, sedangkan tegangan bus pada kondisi mantap pada saat $t = 3,845$ s sebesar 98,3821 % dari V_t.



Gambar 4.17. Kurva Torsi (%) Terhadap Waktu (s)

Pada gambar 4.17. Torsi *starting* motor sebesar 15,5485 % dari T_{sc} , dengan *setting* waktu pelepasan resistor $t = 2,505$ s maka torsi naik sebesar 41,3144 % dari T_{sc} .

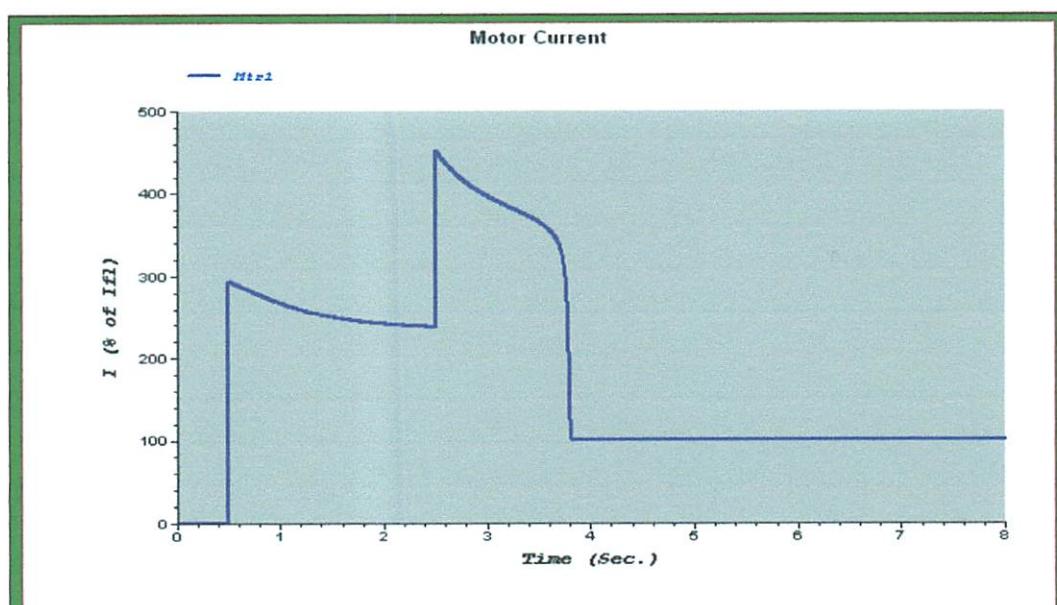


Gambar 4.18. Kurva Slip (%) Terhadap Waktu (s)

Dan pada gambar 4.18. Besarnya slip adalah 99,8444 % dan slip pada kondisi mantap pada saat $t = 3,85$ s sebesar 1,07034%..

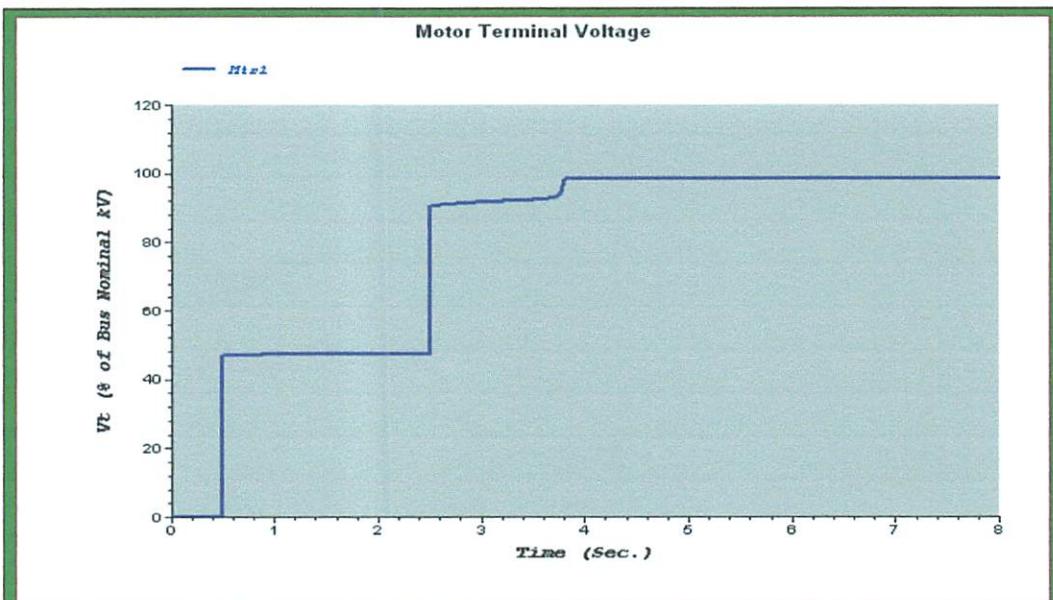
4.4.3. Hasil Simulasi Pengasutan *Reactor*

Tampilan Hasil Simulasi *software ETAP Powerstation* pengasutan motor menggunakan *Reactor* dengan Tap 50 %.



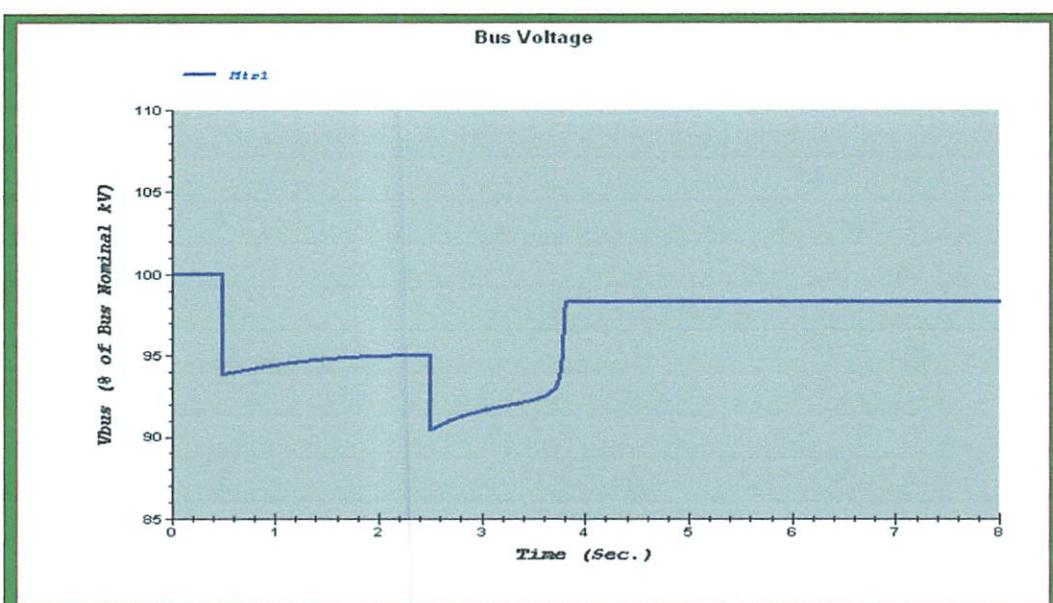
Gambar 4.19. Kurva Arus Pengasutan *Reactor* (A) Terhadap Waktu (s)

Pada gambar 4.19. dengan menggunakan pengasutan *reactor* dengan Tap 50% dengan *switch off* $t = 2$ s maka arus *starting* motor naik saat $t = 0,5$ s menjadi 293,455 % dari FLA, dengan *setting* waktu pelepasan *reactor* $t = 2,505$ s maka arus naik sebesar 452,687 % dari FLA, dan arus kondisi mantap saat $t = 3,86$ s sebesar 100,386 % dari FLA.



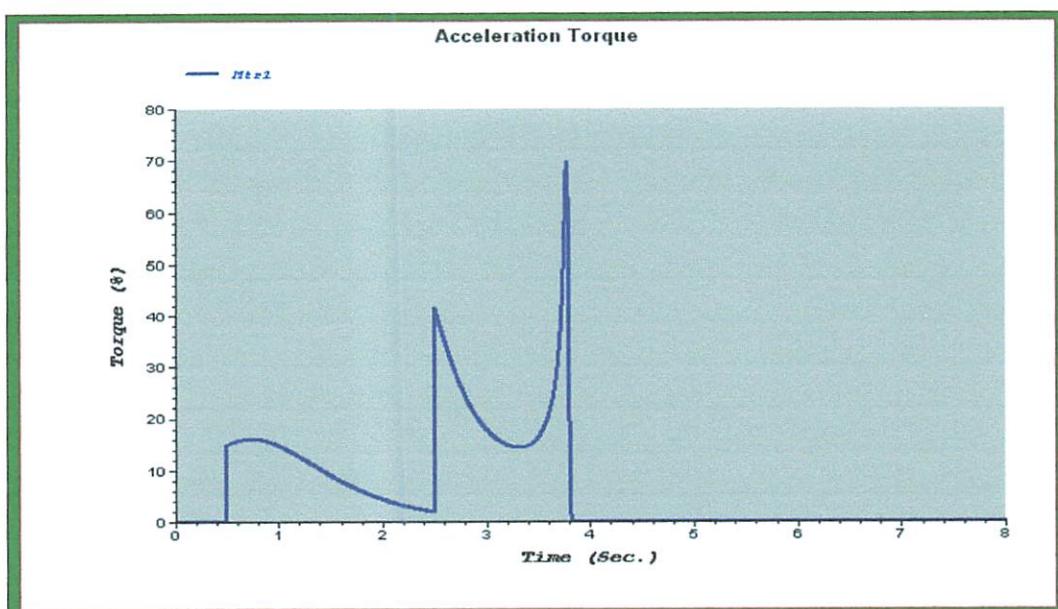
Gambar 4.20. Kurva Tegangan Terminal Motor (V) Terhadap Waktu (s)

Pada gambar 4.20. tegangan terminal motor besarnya pada saat *start* adalah 46,9267 % dari V_t, dengan *setting* waktu pelepasan *reactor* t = 2,505 s maka tegangan terminal naik sebesar 90,4171 % dari V_t, sedangkan tegangan terminal pada kondisi mantap pada saat t = 3,85 s sebesar 98,3821 % dari V_t.



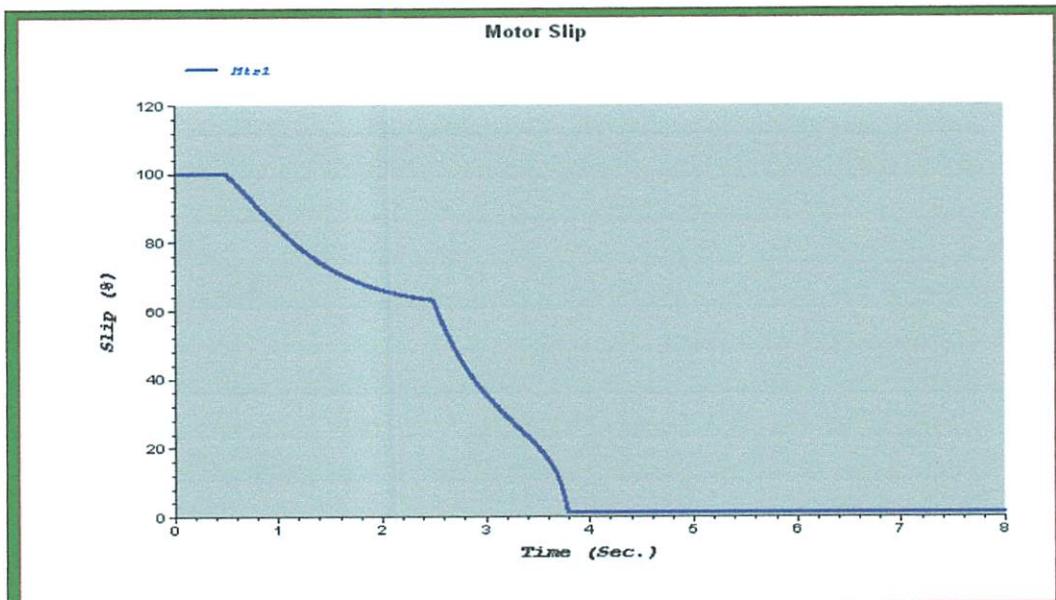
Gambar 4.21. Kurva Bus Tegangan (V) Terhadap Waktu (s)

Pada gambar 4.21. *starting* motor dengan pengasutan *reactor* mempengaruhi penurunan tegangan sesaat pada bus sebesar 93,8533 % dari V_t , dengan *setting* waktu pelepasan *reactor* $t = 2,505$ s maka tegangan bus turun sebesar 90,4171 % dari V_t , sedangkan tegangan bus pada kondisi mantap pada saat $t = 3.85$ s sebesar 98,3821 % dari V_t .



Gambar 4.22. Kurva Torsi (%) Terhadap Waktu (s)

Pada gambar 4.22. Torsi *starting* motor sebesar 14,9451 % dari T_{sc} , dengan *setting* waktu pelepasan resistor $t = 2,505$ s maka torsi naik sebesar 41,7838 % dari T_{sc} .



Gambar 4.23. Kurva Slip (%) Terhadap Waktu (s)

Dan pada gambar 4.23. Besarnya slip adalah 99,8505 % dan slip pada kondisi mantap pada saat $t = 3,855$ s sebesar 1,07034%.

4.5. Hasil Komputasi Simulasi *Software ETAP Powerstation*

Dari semua hasil percobaan *starting* motor maka didapatkan peralatan *starting* yang tepat dalam menurunkan arus *starting* motor.

4.5.1. Hasil Komputasi Peralatan *Starting Motor* Menggunakan *Software ETAP Powerstation*

Dari hasil komputasi *software ETAP powerstation*, Dalam menu motor *starting study case* dengan mensetting waktu *start* $t = 0,5$ s, total simulasi $t = 8$ s dan merunning program maka didapatkan hasil yang terlihat pada tabel 4.3.

Tabel 4.3.
Hasil Analisa Komputasi Simulasi Peralatan *Starting Motor*

Data Hasil Komputasi ETAP	Starting Motor Tanpa Pengasutan	Pengasutan <i>Auto-Trafo</i> Tap 50%	Pengasutan Resistor Tap 50%	Pengasutan <i>Reactor</i> Tap 50%
Arus % dari FLA (A)	552,208	151,326	198,142	293,455
Tegangan Terminal % dari Vt (V)	88,3039	48,3974	47,6762	46,9267
Bus Tegangan % dari Vt (V)	88,3039	96,7948	95,3524	93,8533
Torsi % dari T_{sc} (N-m)	62,5577	16,1381	15,8485	14,9451
Slip (%)	99,3741	99,8385	99,8444	99,8505

Pada saat motor dijalankan tanpa menggunakan peralatan pengasutan motor, maka arus yang ditarik motor sebesar 552,208 % dari FLA. Hal ini tidak diijinkan karena akan berdampak pada penurunan tegangan pada bus, sehingga dapat mengganggu pada beban-beban yang lain. Selain itu, motor akan rusak karena torsi *starting* yang tinggi akan mempengaruhi sistem mekanik pada motor itu sendiri.

Sedangkan menggunakan pengasutan *auto-trafo* dengan Tap 50 % sebagai penurun tegangan, maka arus yang ditarik motor menjadi kecil, besarnya adalah 151,326 % dari FLA. Akan tetapi penurunan arus *starting* berdampak pada penurunan torsi *starting*. Dimana torsi *starting* tersebut besarnya adalah 16,1381% dari T_{sc} . Sehingga motor berakselerasi menjadi lambat.

Sedangkan menggunakan pengasutan resistor dengan Tap 50 %, arus *starting* yang ditarik motor sebesar 298,142 % dari FLA. Maka torsi juga mengalami penurunan sebesar 15,5485 % dari T_{sc} . Sehingga akselerasi motor juga menjadi lambat.

Dengan menggunakan pengasutan *reactor* dengan Tap 50 % akselerasi motor juga mengalami penurunan karena torsi *starting* sebesar 14,9451 % dari T_{sc} , dan arus *starting* sebesar 293,455 % dari FLA.

Dari beberapa percobaan *starting* motor, maka peralatan *starting* yang paling optimal adalah dengan menggunakan pengasutan *auto-trafo*, dimana arus *starting*nya sebesar 151,326 % dari FLA.

4.5.2. Analisa Perhitungan Hasil Komputasi Starting Motor Tanpa Pengasutan Menggunakan Software ETAP Powerstation

Diketahui : FLA = 251,9 A, V_t = 380 V

$$I_{st} = \frac{552,208}{100} \times 251,9 = 1391,012 \text{ A}$$

$$V_t = \frac{88,3039}{100} \times 380 = 335,555 \text{ V}$$

$$V_{bus} = \frac{88,3039}{100} \times 380 = 335,555 \text{ V}$$

$$T_{st} = \frac{62,5577}{100} \times 1273,885 = 796,913 \text{ N-m}$$

$$S = \frac{99,3741}{100} = 0,9937$$

4.5.3. Analisa Perhitungan Hasil Komputasi Pengasutan Auto-Trafo

Menggunakan *Software ETAP Powerstation*

Diketahui : FLA = 251,9 A, Vt = 380 V, Tap = 50%

$$I_{st} = \frac{151,326}{100} \times 251,9 = 381,19 \text{ A}$$

$$V_t = \frac{48,3974}{100} \times 380 = 183,91 \text{ V}$$

$$V_{bus} = \frac{96,7948}{100} \times 380 = 367,82 \text{ V}$$

$$T_{st} = \frac{16,1381}{100} \times 1273,885 = 205,581 \text{ N-m}$$

$$S = \frac{99,8385}{100} = 0,9983$$

4.5.4. Analisa Perhitungan Hasil Komputasi Pengasutan Resistor

Menggunakan *Software ETAP Powerstation*

Diketahui : FLA = 251,9 A, Vt = 380 V, Tap = 50%

$$I_{st} = \frac{298,142}{100} \times 251,9 = 751,019 \text{ A}$$

$$V_t = \frac{47,6762}{100} \times 380 = 181,169 \text{ V}$$

$$V_{bus} = \frac{95,3524}{100} \times 380 = 362,339 \text{ V}$$

$$T_{st} = \frac{15,5485}{100} \times 1273,885 = 198,07 \text{ N-m}$$

$$S = \frac{99,8444}{100} = 0,9984$$

4.5.5. Analisa Perhitungan Hasil Komputasi Pengasutan *Reactor*

Menggunakan Software *ETAP Powerstation*

Diketahui : FLA = 251,9 A, V_t = 380 V, Tap = 50%

$$I_{st} = \frac{293,455}{100} \times 251,9 = 739,213 \text{ A}$$

$$V_t = \frac{46,9267}{100} \times 380 = 178,321 \text{ V}$$

$$V_{bus} = \frac{93,8533}{100} \times 380 = 356,642 \text{ V}$$

$$T_{st} = \frac{14,9451}{100} \times 1273,885 = 190,383 \text{ N-m}$$

$$S = \frac{99,8505}{100} = 0,9985$$

Tabel 4.4.
Analisa Perhitungan Hasil Komputasi *ETAP Powerstation*

Data Hasil Komputasi ETAP	Starting Motor Tanpa Pengasutan	Metode Pengasutan		
		Pengasutan Auto-Trafo Tap 50%	Pengasutan Resistor Tap 50%	Pengasutan Reactor Tap 50%
I _{st} (Ampere)	1391,012	381,19	751,019	739,213
V _t (Volt)	335,555	183,91	181,169	178,321
V _{bus} (Volt)	335,555	367,82	362,339	356,642
T _{st} (N-m)	796,913	205,581	198,07	190,383
Slip (pu)	0,9937	0,9983	0,9984	0,9985

Dari hasil simulasi dengan menggunakan *software ETAP Power Station*, pada saat motor dijalankan tanpa menggunakan peralatan pengasutan motor, maka arus yang ditarik motor sebesar 1391,012 A. Hal ini tidak diijinkan karena akan berdampak pada penurunan tegangan pada bus sebesar 335,555 V, sehingga dapat mengganggu pada beban-beban yang lain. Selain itu, motor akan rusak karena torsi *starting* yang tinggi akan mempengaruhi sistem mekanik pada motor itu sendiri.

Sedangkan menggunakan pengasutan *auto-trafo* dengan Tap 50 % sebagai penurun tegangan, maka arus yang ditarik motor menjadi kecil, besarnya adalah 381,19 A. Akan tetapi penurunan arus *starting* berdampak pada penurunan torsi *starting*. Dimana torsi *starting* tersebut besarnya adalah 205,581 N-m. Sehingga motor berakselerasi menjadi lambat.

Sedangkan menggunakan pengasutan resistor dengan Tap 50 %, arus *starting* yang ditarik motor sebesar 751,019 A. Maka torsi juga mengalami penurunan sebesar 198,07 N-m. Sehingga akselerasi motor juga menjadi lambat.

Dengan menggunakan pengasutan *reactor* dengan Tap 50 % akselerasi motor juga mengalami penurunan karena torsi *starting* sebesar 190,383 N-m, dan arus *starting* sebesar 739,213 A.

Dari beberapa percobaan *starting* motor, maka peralatan *starting* yang paling optimal adalah dengan menggunakan pengasutan *auto-trafo*, dimana arus *starting*nya sebesar 381,19 A.

Tabel 4.5.
Hasil Analisa Starting Motor

Metode <i>Starting</i>	Arus <i>Starting</i> (Ampere)	Arus <i>Steady State</i> (Ampere)
Tanpa Pengasutan	1391,012	252,872
Pengasutan <i>Star-delta</i>	755	250
Pengasutan <i>Auto-trafo</i>	381,19	252,872
Pengasutan Resistor	751,019	252,872
Pengasutan <i>Reactor</i>	739,213	252,872

Dari hasil observasi pada P.G. Kebon Agung Malang, motor induksi 3 phasa 200 KW menggunakan *starting* dengan pengasutan pengubah hubungan *start-delta* ($Y-\Delta$) didapatkan arus *starting* sebesar 755A dan arus *steady state* sebesar 250A. Sedangkan setelah disimulasikan ke dalam program *ETAP Power Station* didapatkan peralatan pengasutan yang terbaik menggunakan pengasutan *auto-trafo*, arus *starting* turun menjadi 381,19 A dan arus *steady state* menjadi 252,872 A.

BAB V

PENUTUP

5.1. Kesimpulan

1. *Starting* motor tanpa menggunakan pengasutan mengakibatkan jatuh tegangan pada bus sebesar 335,555 V, karena arus yang ditarik sangat tinggi 6,6 kali arus nominal atau sama dengan 1391,012 A. Dan torsi *starting* sebesar 796,913 N·m.
2. Pengoperasian motor dengan peralatan pengasutan *Auto-trafo* dapat menurunkan arus *starting*, tetapi penurunan arus *starting* juga berdampak pada penurunan tegangan bus sebesar 367,82 V, dimana jika tegangan diturunkan menggunakan *Auto-Trafo* Tap 50% maka didapat arus *starting* sebesar 1,8 kali arus beban penuh atau sama dengan 381,19 A. Maka torsi *starting* juga mengalami penurunan 205,581 N·m.
3. Dengan menggunakan pengasutan *resistor*, tap 50%, maka didapat arus *starting* sebesar 3,57 kali arus nominal atau sama dengan 751,019 A, dan penurunan tegangan bus sebesar 362,339 V. Torsi *starting* besarnya adalah 198,07 N·m.
4. Pengasutan *reactor* dengan tap 50% maka didapat arus *starting* yang hampir sama dengan pengasutan resistor yaitu sebesar 3,5 kali arus nominal atau sama dengan 739,213 A, penurunan tegangan bus sebesar 356,642 V. Torsi pengasutan sebesar 190,383 N·m.

5. Sedangkan hasil observasi pada P.G. Kebon Agung, motor induksi 3 phasa 200 KW menggunakan *starting* dengan pengasutan pengubah hubungan *start-delta* (Y- Δ) didapatkan arus *starting* sebesar 755 A dan arus *steady state* sebesar 250 A.
6. Dari hasil semua pengasutan dengan menggunakan *software ETAP Power Station*, maka didapatkan pengasutan yang terbaik adalah dengan menggunakan pengasutan *auto-trafo*, dengan arus *starting* sebesar 381,19A dan arus *steady state* sebesar 252,872 A.

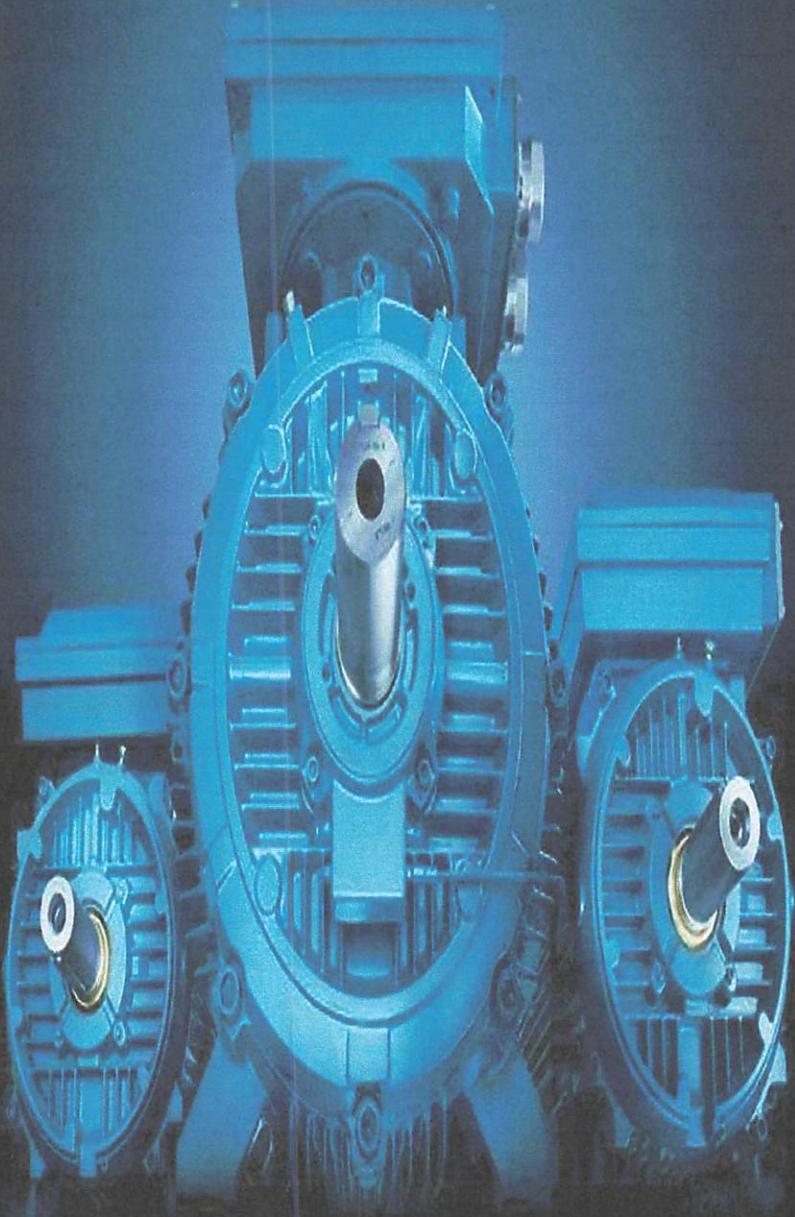
5.2. Saran

Dalam pengoperasian motor sebaiknya digunakan peralatan starting atau pengasutan motor, dimana motor pada saat asut menarik arus yang sangat besar sehingga dapat merusak jaringan instalasi pabrik, serta dapat mempengaruhi beban-beban yang lain dan juga dapat merusak motor itu sendiri seperti roda gigi, dan juga sistem mekanik yang lainnya.

DAFTAR PUSTAKA

- [1]. Jimenez, Pedro. and Vera, Luiz. 2006. “*Motor Starting Study for Large Motor*”. Case: VALCOR PDVSA Project, Venezuela: IEEE PES Transmission and Distribution Conference and Exposition Latin Amerika.
- [2]. Achyanto, Djoko. 1997. “*Mesin-Mesin Listrik*”. Edisi Keempat Penerbit Erlangga.
- [3]. Kadir, Abdul. 2003. “*Mesin Induksi*” . Penerbit Djambatan.
- [4]. Zuhal. 1991. “*Dasar Tenaga Listrik*”. Bandung: Penerbit ITB.
- [5]. Theraja, B. L. “*Electrical Technology*”. RAM NAGAR, NEW DELHI-110055: Publycation Division of Nirja Construction and Development Co. (P) LTD.
- [6]. Dubey, G. K. 1995. “*Fundamentals of Electrical Drives*”. Kanpur India: Toppan Company DTE. LTD.
- [7]. Petruzella, Frank D. 2001. “*Elektronik Industri*”. Yogyakarta: Edisi Bahasa Indonesia Penerbit Andi.
- [8]. GUPTA, B. R. 2001. “*Principles of Electrical Engineering*”. RAM NAGAR, NEW DELHI-110055: S. Chand and Company LTD.
- [9]. Ir. Purnomo, Heri. 2005. “*Mesin Listrik II*”. Malang: Jurusan Teknik Elektro, ITN.

Lampiran I





INSTITUT TEKNOLOGI NASIONAL MALANG
FAKULTAS TEKNOLOGI INDUSTRI
JURUSAN TEKNIK ELEKTRO S-1
KONSENTRASI TEKNIK ENERGI LISTRIK

BERITA ACARA UJIAN SKRIPSI FAKULTAS TEKNOLOGI INDUSTRI

1. Nama : DWI HERMAWAN
2. NIM : 01.12.133
3. Jurusan : Teknik Elektro S-1
4. Konsentrasi : Teknik Energi Listrik
5. Judul Skripsi : ANALISA STARTING MOTOR INDUKSI 3 PHASA 200 KW MENGGUNAKAN SIMULASI ETAP POWERSTATION DI P.G. KEBON AGUNG MALANG

Dipertahankan dihadapan Majelis Penguji Skripsi Jenjang Strata Satu (S-1) pada :

Hari : Selasa
Tanggal : 17 Maret 2009
Dengan Nilai : 87 (A) *Bey*



Ketua Majelis Penguji
Ir. Sidik Noertjahjono, MT.
NIP. Y. 102 87 00163



Sekretaris Majelis Penguji
Ir. F. Yudi Limpraptono, MT.
NIP. Y. 103 95 00274

Anggota Penguji

Penguji Pertama

Ir. H. Choirul Saleh, MT.
NIP. Y. 101 88 00190

Penguji Kedua

Bambang Prio Hartono, ST.MT.
NIP. Y. 102 84 00082



INSTITUT TEKNOLOGI NASIONAL MALANG
FAKULTAS TEKNOLOGI INDUSTRI
JURUSAN TEKNIK ELEKTRO S-1
KONSENTRASI TEKNIK ENERGI LISTRIK

PERSETUJUAN PERBAIKAN SKRIPSI

Dari hasil ujian skripsi Jurusan Teknik Elektro jenjang strata satu (S-1) yang diselenggarakan pada :

Hari : Selasa
Tanggal : 17 Maret 2009

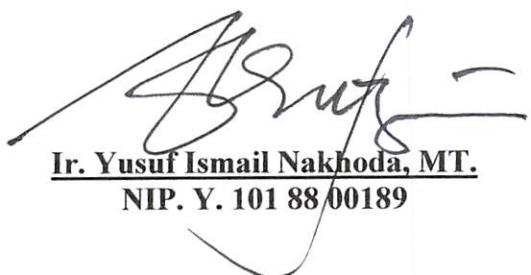
Telah dilakukan perbaikan skripsi oleh :

1. Nama : DWI HERMAWAN
2. NIM : 01.12.133
3. Jurusan : Teknik Elektro S-1
4. Konsentrasi : Teknik Energi Listrik
5. Judul Skripsi : ANALISA STARTING MOTOR INDUKSI 3 PHASA 200 KW MENGGUNAKAN SIMULASI SOFTWARE ETAP POWERSTATION DI P.G. KEBON AGUNG MALANG

Perbaikan meliputi :

No.	Materi Perbaikan	Ket
1.	Latar belakang tolong diganti, jangan lupa diberi indeks daftar pustaka.	b
2.	Gambar 4.4. s/d 4.23 diberi penjelasan.	b
3.	Tabel 4.4. dan 4.5. diberi penjelasan.	b
4.	Kesimpulan disempurnakan.	b

Dosen Pembimbing


Ir. Yusuf Ismail Nakhoda, MT.
NIP. Y. 101 88 00189

Anggota Pengaji


Bambang Prio Hartono, ST.MT.
NIP. Y. 102 84 00082



PERMOHONAN PERSETUJUAN SKRIPSI

Yang betanda tangan dibawah ini :

Nama : DWI HERMANAWAN
NIM : 01.12.133
Semester :
Fakultas : Teknologi Industri
Jurusan : Teknik Elektro S-1
Konsentrasi : **TEKNIK ELEKTRONIKA**
TEKNIK ENERGI LISTRIK
TEKNIK KOMPUTER DAN INFORMATIKA
Alamat :

Dengan ini kami mengajukan permohonan untuk mendapatkan persetujuan untuk membuat **SKRIPSI Tingkat Sarjana**. Untuk melengkapi permohonan tersebut, bersama kami lampirkan persyaratan-persyaratan yang harus dipenuhi.

Adapun persyaratan-persyaratan pengambilan **SKRIPSI** adalah sebagai berikut :

1. Telah melaksanakan semua praktikum sesuai dengan konsentrasinya (.....)
2. Telah lulus dan menyerahkan Laporan Praktek Kerja (.....)
3. Telah lulus seluruh mata kuliah keahlian (MKB) sesuai konsentrasinya (.....)
4. Telah menempuh mata kuliah ≥ 134 sks dengan IPK ≥ 2 dan tidak ada nilai E (.....)
5. Telah mengikuti secara aktif kegiatan seminar skripsi yang diadakan Jurusan (.....)
6. Memenuhi persyaratan administrasi (.....)

Demikian permohonan ini untuk mendapatkan penyelesaian lebih lanjut dan atas perhatiannya kami ucapan terima kasih.

Telah diteliti kebenaran data tersebut diatas
Recording Teknik Elektro

(... DWI HERMANAWAN ...)

Malang, ... October 2008
Pemohon

(... DWI HERMANAWAN ...)

Disetujui
Ketua Jurusan Teknik Elektro

Irf. F. Yudi Lijpraptono, MT
NIP. Y. 1039500274

Mengetahui
Dosen Wali

(... Irf. F. Yudi Lijpraptono, MT ...)

Catatan :

Bagi mahasiswa yang telah memenuhi persyaratan mengambil SKRIPSI agar membuat proposal dan mendapat persetujuan dari Ketua Jurusan/Sekretaris Jurusan T. Elektro S-1

1. I.P.K. 4.67 / 3.38
2. Praktikum lengkap
3. Persyaratan administrasi



LEMBAR PENGAJUAN JUDUL SKRIPSI JURUSAN TEKNIK ELEKTRO S-1

Konsentrasi : Teknik Energi Listrik/Teknik Elektronika/Teknik Komputer & Informatika*)

1.	Nama Mahasiswa: DWI HERMAWAN			Nim: Q112183
2.	Waktu Pengajuan	Tanggal: 16	Bulan: 09	Tahun: 2008
3.	Spesifikasi Judul (berilah tanda silang)**) <input checked="" type="checkbox"/> a. Sistem Tenaga Elektrik <input checked="" type="checkbox"/> b. Energi & Konversi Energi <input type="checkbox"/> c. Tegangan Tinggi & Pengukuran <input type="checkbox"/> d. Sistem Kendali Industri <input type="checkbox"/> e. Elektronika & Komponen <input type="checkbox"/> f. Elektronika Digital & Komputer <input type="checkbox"/> g. Elektronika Komunikasi <input type="checkbox"/> h. lainnya			
4.	Konsultasikan judul sesuai materi bidang ilmu kepada Dosen*) <i>Ir. Yusuf Ismail Nakhooda, MT</i>	Ketua Jurusan <i>F. Yudi Limpraptono, MT</i> Ir. F. Yudi Limpraptono, MT NIP. P. 1039500274		
5.	Judul yang diajukan mahasiswa:	ANALISA STARTING MOTOR PADA PABRIK GULA KERON AGUNG MALANG MENGGUNAKAN SIMULASI SOFTWARE ETAP POWERSTATION		
6.	Perubahan judul yang disetujui Dosen sesuai materi bidang ilmu	ANALISA STARTING MOTOR INDUKSI 3 PHASA 200 KW MENGGUNAKAN SIMULASI SOFTWARE ETAP POWERSTATION PADA PG KERON AGUNG MALANG		
7.	Catatan:	Disetujui Dosen 200 <i>Ismail Nakhooda, MT</i> NIP. Y. 1018800189		

Perhatian:

1. Formulir pengajuan ini harap dikembalikan kepada jurusan paling lambat satu minggu setelah disetujui kelompok dosen keahlian dengan dilampirkan proposal skripsi beserta persyaratan skripsi sesuai form S-1
2. Keterangan: *) Coret yang tidak perlu

**) dilingkari a, b, c, atau g sesuai bidang keahlian



INSTITUT TEKNOLOGI NASIONAL MALANG
FAKULTAS TEKNOLOGI INDUSTRI
JURUSAN TEKNIK ELEKTRO

Lampiran : 1 (Satu) Berkas
Perihal : Kesediaan Sebagai
Dosen Pembimbing

Kepada : Yth. Bapak Ir. Yusuf Ismail Nakhoda, MT.
Dosen Institut Teknologi Nasional
M A L A N G

Yang bertandatangan di bawah ini :

Nama : Dwi Hermawan
Nim : 01.12.133
Jurusan : Teknik Elektro S-1
Konsentrasi : Teknik Energi Listrik

Dengan ini mengajukan permohonan, kiranya Bapak/Ibu bersedia menjadi Dosen Pembimbing Utama / Pendamping *), untuk penyusunan Skripsi dengan judul (proposal terlampir) :

**" ANALISA STARTING MOTOR INDUKSI 3 PHASA 200 KW
MENGGUNAKAN SIMULASI SOFTWARE ETAP POWER
STATION PADA P.G. KEBON AGUNG MALANG "**

Adapun Tugas tersebut sebagai salah satu syarat untuk menempuh Ujian Akhir Sajana Teknik.

Demikian permohonan kami dan atas kesediaan Bapak/Ibu kami ucapan terima kasih.

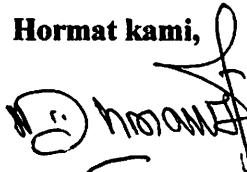
Malang, 29 Oktober 2008

Mengetahui
Ketua Jurusan Teknik Elektro



Ir. F. Yudi Limpraptono, MT

NIP.Y.1039500274

Hormat kami,


Dwi Hermawan
Nim : 01.12.133

*) coret yang tidak perlu



INSTITUT TEKNOLOGI NASIONAL MALANG
FAKULTAS TEKNOLOGI INDUSTRI
JURUSAN TEKNIK ELEKTRO

PERNYATAAN KESEDIAAN SEBAGAI DOSEN PEMBIMBING SKRIPSI

Sesuai dengan Permohonan Mahasiswa :

Nama : Dwi Hermawan
Nim : 01.12.133
Jurusan : Teknik Elektro S-1
Konsentrasi : Teknik Energi Listrik

Dengan ini menyatakan bersedia / tidak bersedia *) menjadi Dosen Pembimbing Utama / Pendamping *) untuk penyusunan Skripsi Mahasiswa tersebut dengan judul :

**" ANALISA STARTING MOTOR INDUKSI 3 PHASA 200 KW
MENGGUNAKAN SIMULASI SOFTWARE ETAP POWER
STATION PADA P.G. KEBON AGUNG MALANG "**

Demikian surat Pernyataan ini kami buat agar dapat dipergunakan seperlunya.

Malang, 29 Oktober 2008

Kami yang membuat pernyataan,

Ir. Yusuff Ismail Nakhoda, MT.
NIP.Y. 1018800189

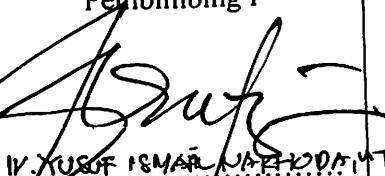
Catatan :

Setelah disetujui agar formulir ini diserahkan mahasiswa/i yang bersangkutan kepada jurusan untuk diproses lebih lanjut.

*) Coret yang tidak perlu



BERITA ACARA SEMINAR PROPOSAL SKRIPSI PROGRAM STUDI TEKNIK ELEKTRO S1

KONSENTRASI		TEKNIK ELEKTRO ENERGI LISTRIK		
1.	Nama Mahasiswa	Dwi HERMANAWAN		NIM
2.	Keterangan	Tanggal	Waktu	Tempat / Ruang
	Pelaksanaan	06 - 11 - 2008		R. Seminar L. 1.
Spesifikasi Judul (berilah tanda silang) *				
3.	i. Sistem Tenaga Elektrik	e. Embedded System	i. Sistem Informasi	
	(b) Konversi Energi	f. Antar Muka	j. Jaringan Komputer	
	c. Sistem Kendali	g. Elektronika Telekomunikasi	k. Web	
	d. Tegangan Tinggi	h. Elektronika Instrumentasi	l. Algoritma Cerdas	
4. Judul Proposal yang diseminarkan Mahasiswa		ANALISA STARTING MOTOR INDUKSI 3 PHASE 200 KW MENGGUNAKAN SIMULASI SOFTWARE STEP POWERSTATION PADA P.G. KEBON AGUNG MALANG		
5. Perubahan Judul yang diusulkan oleh Kelompok Dosen Keahlian			
Persetujuan Judul Skripsi				
Disetujui, Dosen Keahlian I		Disetujui, Dosen Keahlian II 		
Mengetahui, Ketua Jurusan  <u>Ir. F. Yudi Limpraptono, MT</u> NIP. Y. 1039500274		Disetujui, Calon Dosen Pembimbing Pembimbing I  <u>IV. Yusof Ismail Kartika</u> Pembimbing II		



PERKUMPULAN PENGELOLA PENDIDIKAN UMUM DAN TEKNOLOGI NASIONAL MALANG

INSTITUT TEKNOLOGI NASIONAL MALANG

FAKULTAS TEKNOLOGI INDUSTRI

FAKULTAS TEKNIK SIPIL DAN PERENCANAAN

PROGRAM PASCASARJANA MAGISTER TEKNIK

PERSERO) MALANG
NIAGA MALANG

Kampus I : Jl. Bendungan Sigura-gura No.2 Telp (0341) 51431(Hunting), Fax. (0341) 553015 Malang 65145
Kampus II : Jl. Raya Karanglo, Km 2 Telp.(0341)417636 Fax.(0341)417634 Malang

Malang, 21 November 2008

Nomer : ITN-211/I.TA/2/08

Lampiran : -

Perihal : **BIMBINGAN SKRIPSI**

Kepada : Yth. Sdr. Ir. Yusuf Ismail Nakhoda, MT.

Dosen Institut Teknologi Nasional

di

Malang

Dengan Hormat,

Sesuai dengan permohonan dan persetujuan dalam proposal skripsi melalui seminar proposal yang telah dilakukan untuk mahasiswa :

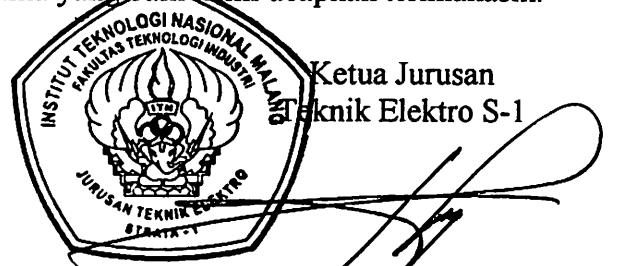
Nama	:	Dwi Hermawan
Nim	:	01.12.133
Fakultas	:	Teknologi Industri
Jurusan	:	Teknik Elektro S-1
Konsentrasi	:	Teknik Energi Listrik

Dengan ini pembimbingan skripsi tersebut kami serahkan sepenuhnya kepada saudara/ i selama masa waktu 6 (enam) bulan terhitung mulai tanggal :

5 November 2008 s/d 5 Mei 2009

Adapun tugas tersebut merupakan salah satu syarat untuk memperoleh gelar Sarjana Teknik, Jurusan Teknik Elektro.

Demikian atas perhatian serta kerjasama yang ~~banyak~~ kami ucapkan terimakasih.



Tindasan :

1. Mahasiswa yang bersangkutan
2. Arsip

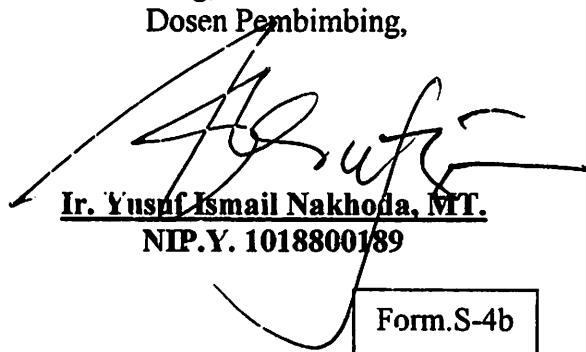
Form. S-4a

FORMULIR BIMBINGAN SKRIPSI

Nama : DWI HERMAWAN
Nim : 01.12.133
Masa Bimbingan : 5 November 2008 s/d 5 Mei 2009
Judul Skripsi : ANALISA STARTING MOTOR INDUKSI 3 PHASA 200 KW MENGGUNAKAN SIMULASI SOFTWARE ETAP POWERSTATION DI P.G. KEBON AGUNG MALANG

Tanggal	Uraian	Parap Pembimbing
03-12-2008	Konsultasi bab I, II, III, IV.	
17-12-2008	Perbaiki sistematika penulisan dan isi tujuan sesuaikan dengan pembahasan.	
07-01-2009	Perjelas gambar flowchart dan grafik.	
21-01-2009	Tinjau kembali hasil program yang digunakan.	
04-02-2009	Konsultasi perbaikan bab IV dan kesimpulan.	
18-02-2009	Periksa kembali format penulisan makalah seminar dan perbaikan abstrak.	
25-02-2009	Acc. makalah seminar hasil.	
14-02-2009	Konsultasi seluruh bab dan acc ujian skripsi.	

Malang, 18 Maret 2009
Dosen Pembimbing,


Ir. Yusuf Ismail Nakhoda, MT.
NIP.Y. 1018800189

INSTITUT TEKNOLOGI NASIONAL MALANG
FAKULTAS TEKNOLOGI INDUSTRI
JURUSAN TEKNIK ELEKTRO

Formulir Perbaikan Ujian Skripsi

Dalam pelaksanaan Ujian Skripsi Janjang Strata 1 Jurusan Teknik Elektro Konsentrasi T. Energi Listrik / T. Elektronika / T. Infokom, maka perlu adanya perbaikan skripsi untuk mahasiswa :

NAMA : Dwi Hermawati
NIM : 0112133
Perbaikan meliputi :

- Lafaz Belakang. Sama dg Eric Tobing diganti Jangon super di bari.
- Gambar 4.2 - 4.23 Aihai Penjelasan ?
- Total 4.9: 4.5 dibenarkan ?
- Kesiungulan disengajakan.

Malang, 17 - 3 - 2009 .

(_____)



PERKUMPULAN PENGELOLA PENDIDIKAN UMUM DAN TEKNOLOGI NASIONAL MALANG
INSTITUT TEKNOLOGI NASIONAL MALANG

**FAKULTAS TEKNOLOGI INDUSTRI
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
PROGRAM PASCASARJANA MAGISTER TEKNIK**

BNI (PERSERO) MALANG
BANK NIAGA MALANG

Kampus I : Jl. Bendungan Sigura-gura No. 2 Telp. (0341) 551431 (Hunting). Fax. (0341) 553015 Malang 65145
Kampus II : Jl. Raya Karanglo, Km 2 Telp. (0341) 417636 Fax. (0341) 417634 Malang

Nomor : ITN- 028 /III.TA-2/2/08
Lampiran : -
Perihal : Survey

Malang, 23 September 2008

Kepada : Yth. Pimpinan
PABRIK GULA KEBON AGUNG
Jl. Raya Kebon Agung
Di – Malang

Bersama ini dengan hormat kami mohon kebijaksanaan Saudara agar Mahasiswa kami dari Fakultas Teknologi Industri Jurusan Teknik Elektro S-1 Konsentrasi Teknik Energi Listrik dapat diijinkan untuk melaksanakan survey pada PABRIK GULA KEBON AGUNG yang Saudara pimpin untuk mendapatkan data – data guna penyusunan Skripsi :

Mahasiswa tersebut Adalah :

Dwi Hermawan NIM. 01.12.133

Adapun lamanya Survey adalah : 30 Hari

Demikian agar maklum dan atas perhatian serta bantuannya kami ucapkan terima kasih.



D E K A N
Fakultas Teknologi Industri

Jr. Mochtar Asroni, MSME *[Signature]*
Nip. Y.1018100036



LABORATORIUM KONVERSI ENERGI ELEKTRIK
INSTITUT TEKNOLOGI NASIONAL MALANG
KAMPUS II : Jl. Karanglo Km 2 Telp.(0341) 417636 Ext 604

SURAT PERMOHONAN

Dengan Hormat,

Yang bertanda tangan sebagai pemohon, saya mahasiswa dengan identitas sebagai berikut :

Nama : Dwi Hermawan
NIM : 01.12.133
Jurusan : Teknik Energi Listrik S-1
Fakultas : Teknologi Industri
Keperluan : Pengambilan Data
Waktu : 23 – 27 September 2008

Mengajukan permohonan peminjaman dan penggunaan alat untuk keperluan sebagaimana yang tercantum diatas.

Daftar perlatan yang dipinjam

No.	NO. SERIE	Nama Alat	Trade Mark
1	3286-20	CLAMP ON METER	HIOKI

Cataian : 1. Apabila terjadi kerusakan pada alat yang digunakan saya sanggup mengganti
2. Beresedia mematuhi segala peraturan yang berlaku di Laboratorium Konversi Energi Elektrik.

Demikian surat permohonan ini saya buat dengan sebenarnya dan dapat dipertanggung jawabkan, terima kasih.

Mengetahui,

Ka. Lab. Konversi Energi Elektrik

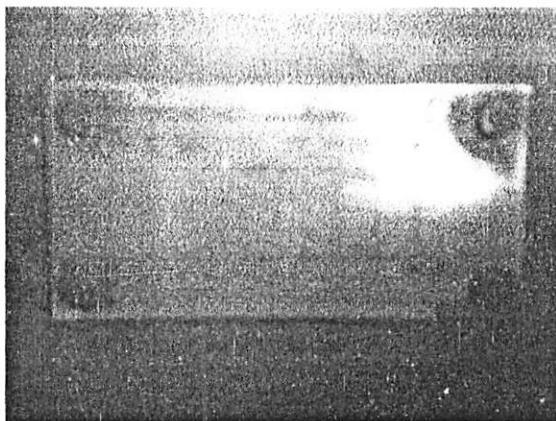
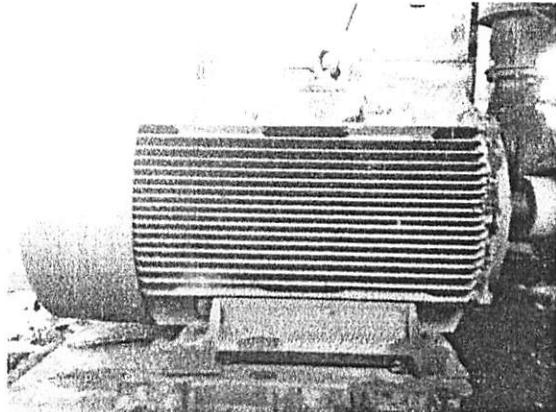


Ir. M. Abdul Hamid, M.T.
NIP. Y. 1018800188

Pemohon

Dwi Hermawan
Nim. 0112133

DATA MOTOR INDUKSI 3 PHASA PADA PG. KEBON AGUNG MALANG



TEGANGAN	:	380/660 (Δ/Y) VOLT
ARUS	:	365/210 AMPERE
COS φ	:	0.87
FREKUENSI	:	50 HZ
DAYA	:	200 KW
PUTARAN	:	1488 RPM
KUTUB	:	4 KUTUB

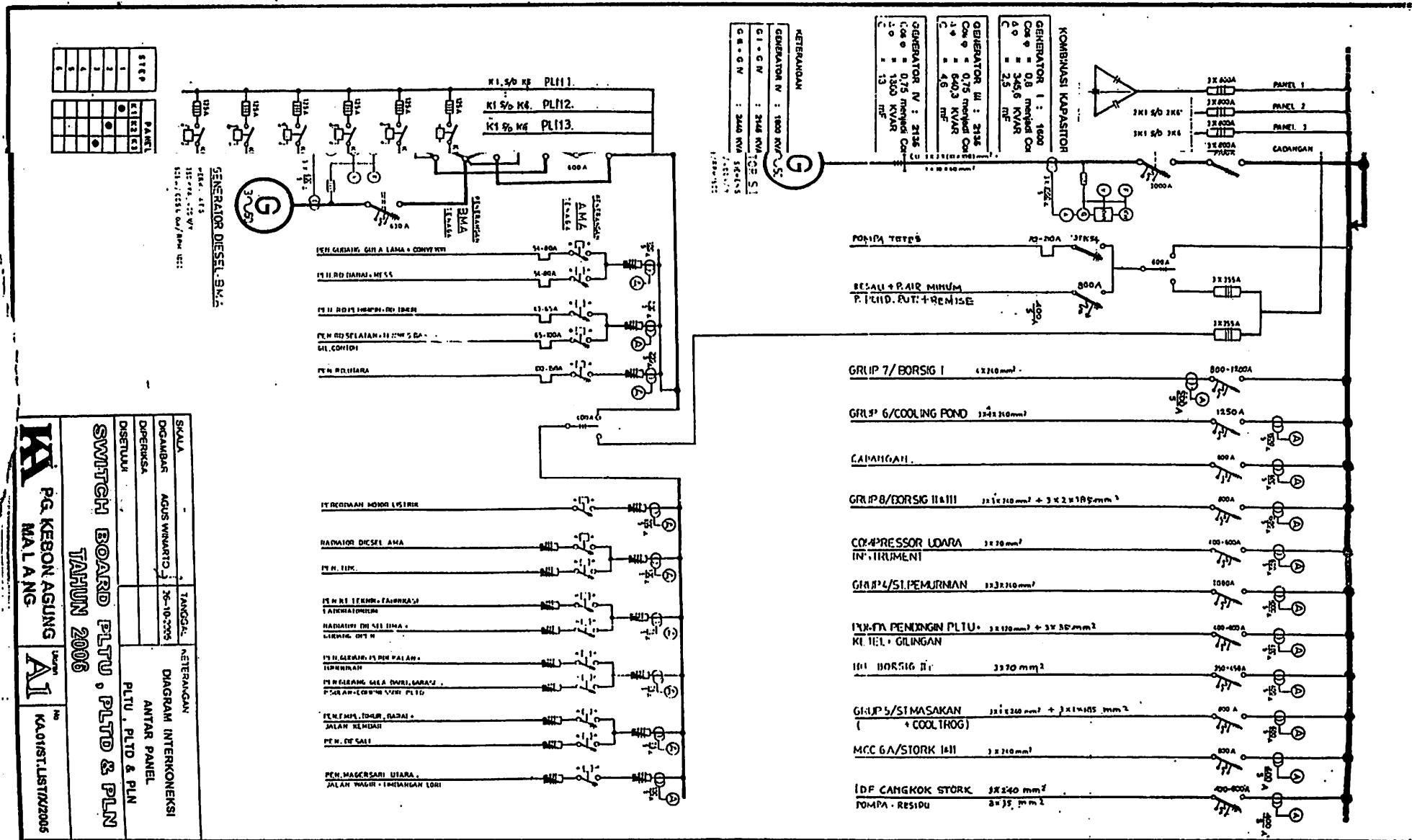
Arus starting = 755 Ampere
Arus stady state = 290 Ampere
Jenis beban = WATER PUMP

Malang, Oktober 2008

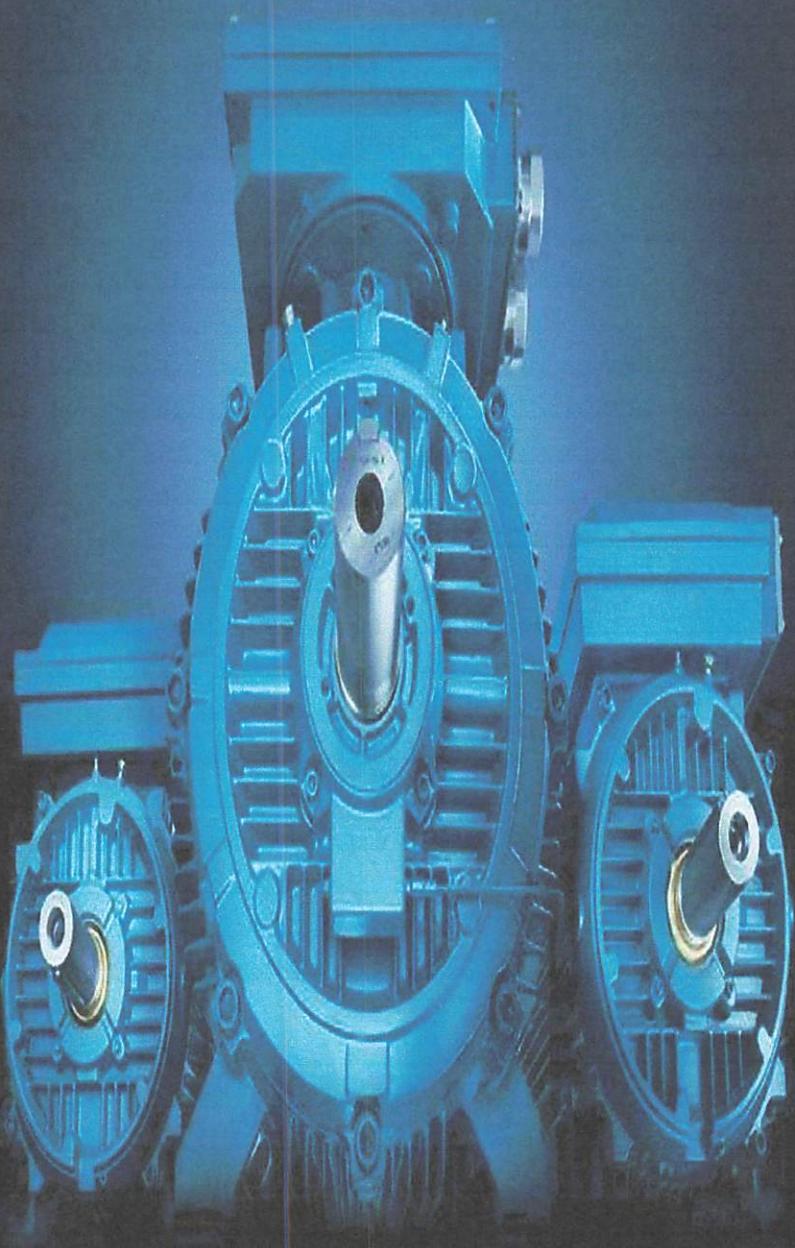
Pembimbing TA / PKN
P.G. Kebon Agung

PT KEBON AGUNG
PG KEBON AGUNG

Heru Cahyono, S.T.



Lampiran 2



ct:	Starting Motor	ETAP PowerStation	Page:	7
ion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
act:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
eer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

SWITCHING MOTORS

Motor		Nameplate							Starting Device					Switch Off	Equipment Cable ID
ID	Type	Qty	HP/kW	kV	RPM	FLA	%PF	%Eff	H*	Type	%Tap	kvar	%Ws	Sec.	
	Ind.	1	200.0	0.380	1800	251.9	93.8	95.9	0.25	None				2.00	

total inertia constant of the shaft in MW-Sec/MVA

SWITCHING MOTORS

Motor	Motor Model				Equipment Parameters				Circuit Parameters						
	ID	Type	Class	ID	X/R	Xlr	Xoc	Td0'	Rs	Xs	Xm	Rrl	Rr2	Xrl	Xr2
M1		SGL2	HV-LS-HT	LV100HP2P					2.8	10.9	297.4	1.0	2.2	15.6	4.3

reactances are in percent (machine base) and time constants are in seconds.

- L1: Double-Cage model with integrated cages
- L2: Double-Cage model with independent cages
- L1: Single-Cage model
- L2: Single-Cage model with deep-bar effect
- C: Torque Slip Characteristic

MOTOR MECHANICAL LOAD

Motor	Load Torque ($= a_0 + a_1 W + a_2 W^2 + a_3 W^3$)					
	ID	Model ID	a0	a1	a2	
Mtr1		OPEN VALVE	4.0	-48.0	247.0	-116.0

ct:	Starting Motor	ETAP PowerStation	Page:	12
ion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
act:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
eer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

MOTOR ACCELERATION

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
0.000	100.00	0.00	0.00	100.00	0.00	0.005	100.00	0.00	0.00	100.00	0.00
0.010	100.00	0.00	0.00	100.00	0.00	0.015	100.00	0.00	0.00	100.00	0.00
0.020	100.00	0.00	0.00	100.00	0.00	0.025	100.00	0.00	0.00	100.00	0.00
0.030	100.00	0.00	0.00	100.00	0.00	0.035	100.00	0.00	0.00	100.00	0.00
0.040	100.00	0.00	0.00	100.00	0.00	0.045	100.00	0.00	0.00	100.00	0.00
0.050	100.00	0.00	0.00	100.00	0.00	0.055	100.00	0.00	0.00	100.00	0.00
0.060	100.00	0.00	0.00	100.00	0.00	0.065	100.00	0.00	0.00	100.00	0.00
0.070	100.00	0.00	0.00	100.00	0.00	0.075	100.00	0.00	0.00	100.00	0.00
0.080	100.00	0.00	0.00	100.00	0.00	0.085	100.00	0.00	0.00	100.00	0.00
0.090	100.00	0.00	0.00	100.00	0.00	0.095	100.00	0.00	0.00	100.00	0.00
0.100	100.00	0.00	0.00	100.00	0.00	0.105	100.00	0.00	0.00	100.00	0.00
0.110	100.00	0.00	0.00	100.00	0.00	0.115	100.00	0.00	0.00	100.00	0.00
0.120	100.00	0.00	0.00	100.00	0.00	0.125	100.00	0.00	0.00	100.00	0.00
0.130	100.00	0.00	0.00	100.00	0.00	0.135	100.00	0.00	0.00	100.00	0.00
0.140	100.00	0.00	0.00	100.00	0.00	0.145	100.00	0.00	0.00	100.00	0.00
0.150	100.00	0.00	0.00	100.00	0.00	0.155	100.00	0.00	0.00	100.00	0.00
0.160	100.00	0.00	0.00	100.00	0.00	0.165	100.00	0.00	0.00	100.00	0.00
0.170	100.00	0.00	0.00	100.00	0.00	0.175	100.00	0.00	0.00	100.00	0.00
0.180	100.00	0.00	0.00	100.00	0.00	0.185	100.00	0.00	0.00	100.00	0.00
0.190	100.00	0.00	0.00	100.00	0.00	0.195	100.00	0.00	0.00	100.00	0.00
0.200	100.00	0.00	0.00	100.00	0.00	0.205	100.00	0.00	0.00	100.00	0.00
0.210	100.00	0.00	0.00	100.00	0.00	0.215	100.00	0.00	0.00	100.00	0.00
0.220	100.00	0.00	0.00	100.00	0.00	0.225	100.00	0.00	0.00	100.00	0.00
0.230	100.00	0.00	0.00	100.00	0.00	0.235	100.00	0.00	0.00	100.00	0.00
0.240	100.00	0.00	0.00	100.00	0.00	0.245	100.00	0.00	0.00	100.00	0.00
0.250	100.00	0.00	0.00	100.00	0.00	0.255	100.00	0.00	0.00	100.00	0.00
0.260	100.00	0.00	0.00	100.00	0.00	0.265	100.00	0.00	0.00	100.00	0.00
0.270	100.00	0.00	0.00	100.00	0.00	0.275	100.00	0.00	0.00	100.00	0.00
0.280	100.00	0.00	0.00	100.00	0.00	0.285	100.00	0.00	0.00	100.00	0.00
0.290	100.00	0.00	0.00	100.00	0.00	0.295	100.00	0.00	0.00	100.00	0.00
0.300	100.00	0.00	0.00	100.00	0.00	0.305	100.00	0.00	0.00	100.00	0.00
0.310	100.00	0.00	0.00	100.00	0.00	0.315	100.00	0.00	0.00	100.00	0.00
0.320	100.00	0.00	0.00	100.00	0.00	0.325	100.00	0.00	0.00	100.00	0.00
0.330	100.00	0.00	0.00	100.00	0.00	0.335	100.00	0.00	0.00	100.00	0.00

ct:	Starting Motor	ETAP PowerStation	Page:	13
ion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
ract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
0.340	100.00	0.00	0.00	100.00	0.00	0.345	100.00	0.00	0.00	100.00	0.00
0.350	100.00	0.00	0.00	100.00	0.00	0.355	100.00	0.00	0.00	100.00	0.00
0.360	100.00	0.00	0.00	100.00	0.00	0.365	100.00	0.00	0.00	100.00	0.00
0.370	100.00	0.00	0.00	100.00	0.00	0.375	100.00	0.00	0.00	100.00	0.00
0.380	100.00	0.00	0.00	100.00	0.00	0.385	100.00	0.00	0.00	100.00	0.00
0.390	100.00	0.00	0.00	100.00	0.00	0.395	100.00	0.00	0.00	100.00	0.00
0.400	100.00	0.00	0.00	100.00	0.00	0.405	100.00	0.00	0.00	100.00	0.00
0.410	100.00	0.00	0.00	100.00	0.00	0.415	100.00	0.00	0.00	100.00	0.00
0.420	100.00	0.00	0.00	100.00	0.00	0.425	100.00	0.00	0.00	100.00	0.00
0.430	100.00	0.00	0.00	100.00	0.00	0.435	100.00	0.00	0.00	100.00	0.00
0.440	100.00	0.00	0.00	100.00	0.00	0.445	100.00	0.00	0.00	100.00	0.00
0.450	100.00	0.00	0.00	100.00	0.00	0.455	100.00	0.00	0.00	100.00	0.00
0.460	100.00	0.00	0.00	100.00	0.00	0.465	100.00	0.00	0.00	100.00	0.00
0.470	100.00	0.00	0.00	100.00	0.00	0.475	100.00	0.00	0.00	100.00	0.00
0.480	100.00	0.00	0.00	100.00	0.00	0.485	100.00	0.00	0.00	100.00	0.00
0.490	100.00	0.00	0.00	100.00	0.00	0.495	100.00	0.00	0.00	100.00	0.00
0.500	99.37	552.21	88.30	88.30	62.56	0.505	98.75	550.17	88.35	88.35	62.51
0.510	98.12	548.15	88.39	88.39	62.44	0.515	97.50	546.15	88.43	88.43	62.37
0.520	96.88	544.16	88.47	88.47	62.28	0.525	96.25	542.19	88.52	88.52	62.18
0.530	95.63	540.24	88.56	88.56	62.06	0.535	95.01	538.31	88.60	88.60	61.94
0.540	94.40	536.39	88.64	88.64	61.80	0.545	93.78	534.49	88.68	88.68	61.65
0.550	93.16	532.61	88.72	88.72	61.49	0.555	92.55	530.74	88.76	88.76	61.32
0.560	91.94	528.90	88.80	88.80	61.13	0.565	91.33	527.07	88.84	88.84	60.94
0.570	90.72	525.26	88.87	88.87	60.74	0.575	90.12	523.47	88.91	88.91	60.53
0.580	89.51	521.69	88.95	88.95	60.30	0.585	88.91	519.94	88.99	88.99	60.07
0.590	88.31	518.20	89.02	89.02	59.83	0.595	87.72	516.48	89.06	89.06	59.58
0.600	87.12	514.78	89.10	89.10	59.32	0.605	86.53	513.10	89.13	89.13	59.05
0.610	85.94	511.43	89.17	89.17	58.77	0.615	85.36	509.78	89.20	89.20	58.49
0.620	84.78	508.16	89.24	89.24	58.20	0.625	84.20	506.54	89.27	89.27	57.90
0.630	83.62	504.95	89.31	89.31	57.59	0.635	83.05	503.38	89.34	89.34	57.28
0.640	82.48	501.82	89.37	89.37	56.96	0.645	81.91	500.28	89.41	89.41	56.64
0.650	81.35	498.76	89.44	89.44	56.31	0.655	80.79	497.26	89.47	89.47	55.97
0.660	80.23	495.77	89.50	89.50	55.63	0.665	79.68	494.30	89.53	89.53	55.28
0.670	79.13	492.85	89.56	89.56	54.93	0.675	78.58	491.42	89.59	89.59	54.57
0.680	78.04	490.00	89.62	89.62	54.21	0.685	77.50	488.60	89.65	89.65	53.85
0.690	76.97	487.22	89.68	89.68	53.48	0.695	76.43	485.85	89.71	89.71	53.11

2: Starting Motor
ion: PGK KEBON AGUNG
act: Starting Tanpa Pengasutan
eer: DWI HERMAWAN
ame: kebon_agung

ETAP PowerStation 4.0.0.C

Page: 14

Date: 03-17-2009

SN: KLGCCONSULT

Study Case: MS

Revision: Base

Config.: Normal

Motor ID : Mu1

	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
0.700	75.91	484.50	89.74	89.74	52.74	0.705	75.38	483.17	89.77	89.77	52.36	
0.710	74.86	481.85	89.80	89.80	51.98	0.715	74.35	480.55	89.82	89.82	51.60	
0.720	73.83	479.27	89.85	89.85	51.22	0.725	73.33	478.00	89.88	89.88	50.83	
0.730	72.82	476.75	89.91	89.91	50.44	0.735	72.32	475.51	89.93	89.93	50.05	
0.740	71.82	474.29	89.96	89.96	49.66	0.745	71.33	473.08	89.98	89.98	49.27	
0.750	70.84	471.89	90.01	90.01	48.88	0.755	70.36	470.72	90.03	90.03	48.48	
0.760	69.87	469.55	90.06	90.06	48.09	0.765	69.40	468.41	90.08	90.08	47.70	
0.770	68.92	467.27	90.11	90.11	47.30	0.775	68.45	466.16	90.13	90.13	46.91	
0.780	67.99	465.05	90.15	90.15	46.51	0.785	67.53	463.96	90.18	90.18	46.12	
0.790	67.07	462.89	90.20	90.20	45.72	0.795	66.62	461.82	90.22	90.22	45.33	
0.800	66.17	460.77	90.24	90.24	44.94	0.805	65.72	459.74	90.27	90.27	44.55	
0.810	65.28	458.71	90.29	90.29	44.16	0.815	64.84	457.70	90.31	90.31	43.77	
0.820	64.41	456.71	90.33	90.33	43.38	0.825	63.98	455.72	90.35	90.35	43.00	
0.830	63.55	454.75	90.37	90.37	42.61	0.835	63.13	453.79	90.39	90.39	42.23	
0.840	62.71	452.84	90.41	90.41	41.85	0.845	62.30	451.90	90.43	90.43	41.47	
0.850	61.88	450.98	90.45	90.45	41.09	0.855	61.48	450.07	90.47	90.47	40.71	
0.860	61.07	449.17	90.49	90.49	40.34	0.865	60.67	448.28	90.51	90.51	39.97	
0.870	60.28	447.40	90.53	90.53	39.60	0.875	59.88	446.53	90.55	90.55	39.23	
0.880	59.50	445.67	90.56	90.56	38.87	0.885	59.11	444.82	90.58	90.58	38.51	
0.890	58.73	443.99	90.60	90.60	38.15	0.895	58.35	443.16	90.62	90.62	37.79	
0.900	57.98	442.35	90.64	90.64	37.44	0.905	57.60	441.54	90.65	90.65	37.09	
0.910	57.24	440.74	90.67	90.67	36.74	0.915	56.87	439.96	90.69	90.69	36.39	
0.920	56.51	439.18	90.70	90.70	36.05	0.925	56.15	438.41	90.72	90.72	35.71	
0.930	55.80	437.66	90.73	90.73	35.38	0.935	55.45	436.91	90.75	90.75	35.04	
0.940	55.10	436.17	90.77	90.77	34.71	0.945	54.76	435.44	90.78	90.78	34.38	
0.950	54.42	434.72	90.80	90.80	34.06	0.955	54.08	434.00	90.81	90.81	33.74	
0.960	53.75	433.30	90.83	90.83	33.42	0.965	53.41	432.60	90.84	90.84	33.10	
0.970	53.09	431.91	90.86	90.86	32.79	0.975	52.76	431.23	90.87	90.87	32.48	
0.980	52.44	430.56	90.88	90.88	32.17	0.985	52.12	429.89	90.90	90.90	31.87	
0.990	51.81	429.24	90.91	90.91	31.57	0.995	51.49	428.59	90.93	90.93	31.27	
1.020	49.97	425.45	90.99	90.99	29.84	1.025	49.68	424.84	91.01	91.01	29.56	
1.000	51.18	427.95	90.94	90.94	30.98	1.005	50.88	427.31	90.95	90.95	30.69	
1.010	50.57	426.68	90.97	90.97	30.40	1.015	50.27	426.06	90.98	90.98	30.12	
1.030	49.38	424.24	91.02	91.02	29.29	1.035	49.69	423.65	91.03	91.03	29.01	
1.040	48.80	423.06	91.04	91.04	28.75	1.045	48.52	422.48	91.06	91.06	28.48	
1.050	48.24	421.91	91.07	91.07	28.22	1.055	47.96	421.34	91.08	91.08	27.96	

ct:	Starting Motor	ETAP PowerStation						Page:	15
ion:	PG. KEBON AGUNG	4.0.0C						Date:	03-17-2009
act:	Starting Tanpa Pengasutan							SN:	KLGCONSULT
neer:	DWI HERMAWAN							Revision:	Base
ame:	kebon_agung	Study Case: MS						Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
1.060	47.68	420.78	91.09	91.09	27.70	1.065	47.41	420.22	91.10	91.10	27.45
1.070	47.13	419.67	91.11	91.11	27.20	1.075	46.86	419.13	91.13	91.13	26.95
1.080	46.60	418.59	91.14	91.14	26.71	1.085	46.33	418.06	91.15	91.15	26.47
1.090	46.07	417.53	91.16	91.16	26.23	1.095	45.81	417.01	91.17	91.17	26.00
1.100	45.55	416.49	91.18	91.18	25.77	1.105	45.30	415.98	91.19	91.19	25.54
1.110	45.04	415.48	91.20	91.20	25.31	1.115	44.79	414.98	91.21	91.21	25.09
1.120	44.54	414.48	91.22	91.22	24.87	1.125	44.30	413.99	91.23	91.23	24.65
1.130	44.05	413.50	91.25	91.25	24.44	1.135	43.81	413.02	91.26	91.26	24.23
1.140	43.57	412.54	91.27	91.27	24.02	1.145	43.33	412.07	91.28	91.28	23.81
1.150	43.09	411.60	91.29	91.29	23.61	1.155	42.86	411.14	91.29	91.29	23.41
1.160	42.63	410.68	91.30	91.30	23.21	1.165	42.40	410.23	91.31	91.31	23.02
1.170	42.17	409.78	91.32	91.32	22.83	1.175	41.94	409.33	91.33	91.33	22.64
1.180	41.72	408.89	91.34	91.34	22.45	1.185	41.49	408.45	91.35	91.35	22.27
1.190	41.27	408.01	91.36	91.36	22.09	1.195	41.05	407.58	91.37	91.37	21.91
1.200	40.84	407.16	91.38	91.38	21.73	1.205	40.62	406.73	91.39	91.39	21.56
1.210	40.41	406.31	91.40	91.40	21.39	1.215	40.20	405.90	91.41	91.41	21.22
1.220	39.98	405.49	91.41	91.41	21.05	1.225	39.78	405.08	91.42	91.42	20.89
1.230	39.57	404.67	91.43	91.43	20.73	1.235	39.36	404.27	91.44	91.44	20.57
1.240	39.16	403.87	91.45	91.45	20.41	1.245	38.96	403.47	91.46	91.46	20.26
1.250	38.75	403.08	91.46	91.46	20.11	1.255	38.55	402.69	91.47	91.47	19.96
1.260	38.36	402.30	91.48	91.48	19.81	1.265	38.16	401.92	91.49	91.49	19.66
1.270	37.96	401.54	91.50	91.50	19.52	1.275	37.77	401.16	91.51	91.51	19.38
1.280	37.58	400.79	91.51	91.51	19.24	1.285	37.39	400.41	91.52	91.52	19.11
1.290	37.20	400.04	91.53	91.53	18.97	1.295	37.01	399.68	91.54	91.54	18.84
1.300	36.82	399.31	91.54	91.54	18.71	1.305	36.64	398.95	91.55	91.55	18.59
1.310	36.45	398.59	91.56	91.56	18.46	1.315	36.27	398.23	91.57	91.57	18.34
1.320	36.08	397.88	91.57	91.57	18.22	1.325	35.90	397.52	91.58	91.58	18.10
1.330	35.72	397.17	91.59	91.59	17.98	1.335	35.54	396.83	91.60	91.60	17.87
1.340	35.37	396.48	91.60	91.60	17.76	1.345	35.19	396.14	91.61	91.61	17.65
1.350	35.01	395.79	91.62	91.62	17.54	1.355	34.84	395.45	91.63	91.63	17.43
1.360	34.67	395.12	91.63	91.63	17.33	1.365	34.49	394.78	91.64	91.64	17.22
1.370	34.32	394.45	91.65	91.65	17.12	1.375	34.15	394.11	91.65	91.65	17.02
1.380	33.98	393.78	91.66	91.66	16.93	1.385	33.82	393.45	91.67	91.67	16.83
1.390	33.65	393.13	91.67	91.67	16.74	1.395	33.48	392.80	91.68	91.68	16.65
1.400	33.32	392.48	91.69	91.69	16.56	1.405	33.15	392.16	91.69	91.69	16.47
1.410	32.99	391.83	91.70	91.70	16.39	1.415	32.82	391.52	91.71	91.71	16.30

ect:	Starting Motor	ETAP PowerStation	Page:	16
tion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
tract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
1.420	32.66	391.20	91.71	91.71	16.22	1.425	32.50	390.88	91.72	91.72	16.14
1.430	32.34	390.57	91.73	91.73	16.06	1.435	32.18	390.25	91.73	91.73	15.98
1.440	32.02	389.94	91.74	91.74	15.91	1.445	31.86	389.63	91.75	91.75	15.84
1.450	31.70	389.32	91.75	91.75	15.77	1.455	31.55	389.01	91.76	91.76	15.70
1.460	31.39	388.70	91.77	91.77	15.63	1.465	31.23	388.40	91.77	91.77	15.56
1.470	31.08	388.09	91.78	91.78	15.50	1.475	30.93	387.79	91.79	91.79	15.44
1.480	30.77	387.48	91.79	91.79	15.38	1.485	30.62	387.18	91.80	91.80	15.32
1.490	30.47	386.88	91.81	91.81	15.26	1.495	30.31	386.57	91.81	91.81	15.20
1.500	30.16	386.27	91.82	91.82	15.15	1.505	30.01	385.97	91.82	91.82	15.10
1.510	29.86	385.68	91.83	91.83	15.05	1.515	29.71	385.38	91.84	91.84	15.00
1.520	29.56	385.08	91.84	91.84	14.95	1.525	29.41	384.78	91.85	91.85	14.91
1.530	29.26	384.48	91.86	91.86	14.86	1.535	29.11	384.19	91.86	91.86	14.82
1.540	28.97	383.89	91.87	91.87	14.78	1.545	28.82	383.60	91.88	91.88	14.74
1.550	28.67	383.30	91.88	91.88	14.71	1.555	28.53	383.01	91.89	91.89	14.67
1.560	28.38	382.71	91.89	91.89	14.64	1.565	28.23	382.42	91.90	91.90	14.61
1.570	28.09	382.12	91.91	91.91	14.58	1.575	27.94	381.83	91.91	91.91	14.55
1.580	27.80	381.53	91.92	91.92	14.53	1.585	27.65	381.24	91.92	91.92	14.50
1.590	27.51	380.95	91.93	91.93	14.48	1.595	27.36	380.65	91.94	91.94	14.46
1.600	27.22	380.36	91.94	91.94	14.44	1.605	27.07	380.06	91.95	91.95	14.43
1.610	26.93	379.77	91.96	91.96	14.41	1.615	26.78	379.47	91.96	91.96	14.40
1.620	26.64	379.18	91.97	91.97	14.39	1.625	26.50	378.88	91.97	91.97	14.38
1.630	26.35	378.58	91.98	91.98	14.37	1.635	26.21	378.29	91.99	91.99	14.37
1.640	26.06	377.99	91.99	91.99	14.37	1.645	25.92	377.69	92.00	92.00	14.37
1.650	25.78	377.39	92.01	92.01	14.37	1.655	25.63	377.09	92.01	92.01	14.37
1.660	25.49	376.79	92.02	92.02	14.38	1.665	25.35	376.49	92.03	92.03	14.39
1.670	25.20	376.19	92.03	92.03	14.40	1.675	25.06	375.88	92.04	92.04	14.41
1.680	24.91	375.58	92.05	92.05	14.42	1.685	24.77	375.27	92.05	92.05	14.44
1.690	24.62	374.97	92.06	92.06	14.46	1.695	24.48	374.66	92.06	92.06	14.48
1.700	24.33	374.35	92.07	92.07	14.51	1.705	24.19	374.04	92.08	92.08	14.54
1.710	24.04	373.72	92.08	92.08	14.57	1.715	23.90	373.41	92.09	92.09	14.60
1.720	23.75	373.09	92.10	92.10	14.63	1.725	23.60	372.78	92.11	92.11	14.67
1.730	23.46	372.46	92.11	92.11	14.71	1.735	23.31	372.13	92.12	92.12	14.76
1.740	23.16	371.81	92.13	92.13	14.80	1.745	23.01	371.48	92.13	92.13	14.85
1.750	22.86	371.15	92.14	92.14	14.91	1.755	22.71	370.82	92.15	92.15	14.96
1.760	22.56	370.49	92.15	92.15	15.02	1.765	22.41	370.15	92.16	92.16	15.09
1.770	22.26	369.81	92.17	92.17	15.15	1.775	22.11	369.47	92.18	92.18	15.22

Project:	Starting Motor	ETAP PowerStation					Page:	17
Location:	PG. KEBON AGUNG	4.0.0C					Date:	03-17-2009
Contract:	Starting Tanpa Pengasutan						SN:	KLGCONSULT
Designer:	DWI HERMAWAN						Revision:	Base
Name:	kebon_agung	Study Case: MS					Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
1.780	21.95	369.12	92.18	92.18	15.30	1.785	21.80	368.77	92.19	92.19	15.38
1.790	21.65	368.42	92.20	92.20	15.46	1.795	21.49	368.06	92.21	92.21	15.55
1.800	21.33	367.70	92.21	92.21	15.64	1.805	21.18	367.34	92.22	92.22	15.73
1.810	21.02	366.97	92.23	92.23	15.83	1.815	20.86	366.60	92.24	92.24	15.94
1.820	20.70	366.22	92.25	92.25	16.05	1.825	20.54	365.84	92.26	92.26	16.17
1.830	20.37	365.45	92.26	92.26	16.29	1.835	20.21	365.05	92.27	92.27	16.42
1.840	20.04	364.66	92.28	92.28	16.55	1.845	19.88	364.25	92.29	92.29	16.69
1.850	19.71	363.84	92.30	92.30	16.84	1.855	19.54	363.42	92.31	92.31	16.99
1.860	19.37	363.00	92.32	92.32	17.15	1.865	19.19	362.57	92.33	92.33	17.32
1.870	19.02	362.13	92.34	92.34	17.49	1.875	18.84	361.68	92.35	92.35	17.68
1.880	18.66	361.22	92.36	92.36	17.87	1.885	18.48	360.76	92.37	92.37	18.07
1.890	18.30	360.28	92.38	92.38	18.28	1.895	18.11	359.80	92.39	92.39	18.51
1.900	17.93	359.30	92.40	92.40	18.74	1.905	17.74	358.79	92.41	92.41	18.98
1.910	17.54	358.27	92.42	92.42	19.24	1.915	17.35	357.74	92.43	92.43	19.51
1.920	17.15	357.19	92.45	92.45	19.79	1.925	16.95	356.63	92.46	92.46	20.09
1.930	16.74	356.05	92.47	92.47	20.40	1.935	16.54	355.46	92.49	92.49	20.73
1.940	16.33	354.85	92.50	92.50	21.08	1.945	16.11	354.22	92.51	92.51	21.45
1.950	15.89	353.56	92.53	92.53	21.84	1.955	15.67	352.89	92.55	92.55	22.25
1.960	15.44	352.19	92.56	92.56	22.68	1.965	15.21	351.47	92.58	92.58	23.14
1.970	14.98	350.71	92.60	92.60	23.62	1.975	14.73	349.93	92.61	92.61	24.13
1.980	14.49	349.11	92.63	92.63	24.68	1.985	14.23	348.25	92.65	92.65	25.26
1.990	13.98	347.36	92.67	92.67	25.88	1.995	13.71	346.42	92.70	92.70	26.54
2.000	13.44	345.43	92.72	92.72	27.25	2.005	13.16	344.38	92.75	92.75	28.01
2.010	12.87	343.28	92.77	92.77	28.82	2.015	12.57	342.10	92.80	92.80	29.69
2.020	12.27	340.85	92.83	92.83	30.63	2.025	11.95	339.51	92.86	92.86	31.64
2.030	11.62	338.07	92.90	92.90	32.74	2.035	11.28	336.51	92.94	92.94	33.92
2.040	10.93	334.82	92.98	92.98	35.22	2.045	10.56	332.98	93.03	93.03	36.62
2.050	10.18	330.96	93.08	93.08	38.16	2.055	9.78	328.73	93.13	93.13	39.85
2.060	9.37	326.23	93.20	93.20	41.70	2.065	8.93	323.43	93.27	93.27	43.75
2.070	8.47	320.25	93.35	93.35	46.00	2.075	7.98	316.59	93.45	93.45	48.48
2.080	7.47	312.33	93.56	93.56	51.22	2.085	6.93	307.29	93.70	93.70	54.22
2.090	6.35	301.25	93.86	93.86	57.48	2.095	5.74	293.86	94.06	94.06	60.92
2.100	5.10	284.64	94.31	94.31	64.40	2.105	4.42	272.93	94.62	94.62	67.54
2.110	3.73	257.80	95.03	95.03	69.61	2.115	3.03	238.18	95.53	95.53	69.28
2.120	2.39	213.28	96.15	96.15	64.58	2.125	1.85	183.80	96.82	96.82	53.79
2.130	1.47	153.67	97.45	97.45	37.88	2.135	1.25	129.12	97.91	97.91	21.84

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tion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
ract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
2.140	1.15	113.73	98.17	98.17	10.54	2.145	1.10	106.01	98.29	98.29	4.53
2.150	1.08	102.64	98.35	98.35	1.83	2.155	1.07	101.27	98.37	98.37	0.72
2.160	1.07	100.73	98.38	98.38	0.28	2.165	1.07	100.52	98.38	98.38	0.11
2.170	1.07	100.44	98.38	98.38	0.04	2.175	1.07	100.41	98.38	98.38	0.02
2.180	1.07	100.39	98.38	98.38	0.01	2.185	1.07	100.39	98.38	98.38	0.00
2.190	1.07	100.39	98.38	98.38	0.00	2.195	1.07	100.39	98.38	98.38	0.00
2.200	1.07	100.39	98.38	98.38	0.00	2.205	1.07	100.39	98.38	98.38	0.00
2.210	1.07	100.39	98.38	98.38	0.00	2.215	1.07	100.39	98.38	98.38	0.00
2.220	1.07	100.39	98.38	98.38	0.00	2.225	1.07	100.39	98.38	98.38	0.00
2.230	1.07	100.39	98.38	98.38	0.00	2.235	1.07	100.39	98.38	98.38	0.00
2.240	1.07	100.39	98.38	98.38	0.00	2.245	1.07	100.39	98.38	98.38	0.00
2.250	1.07	100.39	98.38	98.38	0.00	2.255	1.07	100.39	98.38	98.38	0.00
2.260	1.07	100.39	98.38	98.38	0.00	2.265	1.07	100.39	98.38	98.38	0.00
2.270	1.07	100.39	98.38	98.38	0.00	2.275	1.07	100.39	98.38	98.38	0.00
2.280	1.07	100.39	98.38	98.38	0.00	2.285	1.07	100.39	98.38	98.38	0.00
2.290	1.07	100.39	98.38	98.38	0.00	2.295	1.07	100.39	98.38	98.38	0.00
2.300	1.07	100.39	98.38	98.38	0.00	2.305	1.07	100.39	98.38	98.38	0.00
2.310	1.07	100.39	98.38	98.38	0.00	2.315	1.07	100.39	98.38	98.38	0.00
2.320	1.07	100.39	98.38	98.38	0.00	2.325	1.07	100.39	98.38	98.38	0.00
2.330	1.07	100.39	98.38	98.38	0.00	2.335	1.07	100.39	98.38	98.38	0.00
2.340	1.07	100.39	98.38	98.38	0.00	2.345	1.07	100.39	98.38	98.38	0.00
2.350	1.07	100.39	98.38	98.38	0.00	2.355	1.07	100.39	98.38	98.38	0.00
2.360	1.07	100.39	98.38	98.38	0.00	2.365	1.07	100.39	98.38	98.38	0.00
2.370	1.07	100.39	98.38	98.38	0.00	2.375	1.07	100.39	98.38	98.38	0.00
2.380	1.07	100.39	98.38	98.38	0.00	2.385	1.07	100.39	98.38	98.38	0.00
2.390	1.07	100.39	98.38	98.38	0.00	2.395	1.07	100.39	98.38	98.38	0.00
2.400	1.07	100.39	98.38	98.38	0.00	2.405	1.07	100.39	98.38	98.38	0.00
2.410	1.07	100.39	98.38	98.38	0.00	2.415	1.07	100.39	98.38	98.38	0.00
2.420	1.07	100.39	98.38	98.38	0.00	2.425	1.07	100.39	98.38	98.38	0.00
2.430	1.07	100.39	98.38	98.38	0.00	2.435	1.07	100.39	98.38	98.38	0.00
2.440	1.07	100.39	98.38	98.38	0.00	2.445	1.07	100.39	98.38	98.38	0.00
2.450	1.07	100.39	98.38	98.38	0.00	2.455	1.07	100.39	98.38	98.38	0.00
2.460	1.07	100.39	98.38	98.38	0.00	2.465	1.07	100.39	98.38	98.38	0.00
2.470	1.07	100.39	98.38	98.38	0.00	2.475	1.07	100.39	98.38	98.38	0.00
2.480	1.07	100.39	98.38	98.38	0.00	2.485	1.07	100.39	98.38	98.38	0.00
2.490	1.07	100.39	98.38	98.38	0.00	2.495	1.07	100.39	98.38	98.38	0.00

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ion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
ract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
2.500	1.07	100.39	98.38	98.38	0.00	2.505	1.07	100.39	98.38	98.38	0.00
2.510	1.07	100.39	98.38	98.38	0.00	2.515	1.07	100.39	98.38	98.38	0.00
2.520	1.07	100.39	98.38	98.38	0.00	2.525	1.07	100.39	98.38	98.38	0.00
2.530	1.07	100.39	98.38	98.38	0.00	2.535	1.07	100.39	98.38	98.38	0.00
2.540	1.07	100.39	98.38	98.38	0.00	2.545	1.07	100.39	98.38	98.38	0.00
2.550	1.07	100.39	98.38	98.38	0.00	2.555	1.07	100.39	98.38	98.38	0.00
2.560	1.07	100.39	98.38	98.38	0.00	2.565	1.07	100.39	98.38	98.38	0.00
2.570	1.07	100.39	98.38	98.38	0.00	2.575	1.07	100.39	98.38	98.38	0.00
2.580	1.07	100.39	98.38	98.38	0.00	2.585	1.07	100.39	98.38	98.38	0.00
2.590	1.07	100.39	98.38	98.38	0.00	2.595	1.07	100.39	98.38	98.38	0.00
2.600	1.07	100.39	98.38	98.38	0.00	2.605	1.07	100.39	98.38	98.38	0.00
2.610	1.07	100.39	98.38	98.38	0.00	2.615	1.07	100.39	98.38	98.38	0.00
2.620	1.07	100.39	98.38	98.38	0.00	2.625	1.07	100.39	98.38	98.38	0.00
2.630	1.07	100.39	98.38	98.38	0.00	2.635	1.07	100.39	98.38	98.38	0.00
2.640	1.07	100.39	98.38	98.38	0.00	2.645	1.07	100.39	98.38	98.38	0.00
2.650	1.07	100.39	98.38	98.38	0.00	2.655	1.07	100.39	98.38	98.38	0.00
2.660	1.07	100.39	98.38	98.38	0.00	2.665	1.07	100.39	98.38	98.38	0.00
2.670	1.07	100.39	98.38	98.38	0.00	2.675	1.07	100.39	98.38	98.38	0.00
2.680	1.07	100.39	98.38	98.38	0.00	2.685	1.07	100.39	98.38	98.38	0.00
2.690	1.07	100.39	98.38	98.38	0.00	2.695	1.07	100.39	98.38	98.38	0.00
2.700	1.07	100.39	98.38	98.38	0.00	2.705	1.07	100.39	98.38	98.38	0.00
2.710	1.07	100.39	98.38	98.38	0.00	2.715	1.07	100.39	98.38	98.38	0.00
2.720	1.07	100.39	98.38	98.38	0.00	2.725	1.07	100.39	98.38	98.38	0.00
2.730	1.07	100.39	98.38	98.38	0.00	2.735	1.07	100.39	98.38	98.38	0.00
2.740	1.07	100.39	98.38	98.38	0.00	2.745	1.07	100.39	98.38	98.38	0.00
2.750	1.07	100.39	98.38	98.38	0.00	2.755	1.07	100.39	98.38	98.38	0.00
2.760	1.07	100.39	98.38	98.38	0.00	2.765	1.07	100.39	98.38	98.38	0.00
2.770	1.07	100.39	98.38	98.38	0.00	2.775	1.07	100.39	98.38	98.38	0.00
2.780	1.07	100.39	98.38	98.38	0.00	2.785	1.07	100.39	98.38	98.38	0.00
2.790	1.07	100.39	98.38	98.38	0.00	2.795	1.07	100.39	98.38	98.38	0.00
2.800	1.07	100.39	98.38	98.38	0.00	2.805	1.07	100.39	98.38	98.38	0.00
2.810	1.07	100.39	98.38	98.38	0.00	2.815	1.07	100.39	98.38	98.38	0.00
2.820	1.07	100.39	98.38	98.38	0.00	2.825	1.07	100.39	98.38	98.38	0.00
2.830	1.07	100.39	98.38	98.38	0.00	2.835	1.07	100.39	98.38	98.38	0.00
2.840	1.07	100.39	98.38	98.38	0.00	2.845	1.07	100.39	98.38	98.38	0.00
2.850	1.07	100.39	98.38	98.38	0.00	2.855	1.07	100.39	98.38	98.38	0.00

Project:	Starting Motor	ETAP PowerStation	Page:	20
Location:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
Contract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
Designer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
Name:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
2.860	1.07	100.39	98.38	98.38	0.00	2.865	1.07	100.39	98.38	98.38	0.00
2.870	1.07	100.39	98.38	98.38	0.00	2.875	1.07	100.39	98.38	98.38	0.00
2.880	1.07	100.39	98.38	98.38	0.00	2.885	1.07	100.39	98.38	98.38	0.00
2.890	1.07	100.39	98.38	98.38	0.00	2.895	1.07	100.39	98.38	98.38	0.00
2.900	1.07	100.39	98.38	98.38	0.00	2.905	1.07	100.39	98.38	98.38	0.00
2.910	1.07	100.39	98.38	98.38	0.00	2.915	1.07	100.39	98.38	98.38	0.00
2.920	1.07	100.39	98.38	98.38	0.00	2.925	1.07	100.39	98.38	98.38	0.00
2.930	1.07	100.39	98.38	98.38	0.00	2.935	1.07	100.39	98.38	98.38	0.00
2.940	1.07	100.39	98.38	98.38	0.00	2.945	1.07	100.39	98.38	98.38	0.00
2.950	1.07	100.39	98.38	98.38	0.00	2.955	1.07	100.39	98.38	98.38	0.00
2.960	1.07	100.39	98.38	98.38	0.00	2.965	1.07	100.39	98.38	98.38	0.00
2.970	1.07	100.39	98.38	98.38	0.00	2.975	1.07	100.39	98.38	98.38	0.00
2.980	1.07	100.39	98.38	98.38	0.00	2.985	1.07	100.39	98.38	98.38	0.00
2.990	1.07	100.39	98.38	98.38	0.00	2.995	1.07	100.39	98.38	98.38	0.00
3.000	1.07	100.39	98.38	98.38	0.00	3.005	1.07	100.39	98.38	98.38	0.00
3.010	1.07	100.39	98.38	98.38	0.00	3.015	1.07	100.39	98.38	98.38	0.00
3.020	1.07	100.39	98.38	98.38	0.00	3.025	1.07	100.39	98.38	98.38	0.00
3.030	1.07	100.39	98.38	98.38	0.00	3.035	1.07	100.39	98.38	98.38	0.00
3.040	1.07	100.39	98.38	98.38	0.00	3.045	1.07	100.39	98.38	98.38	0.00
3.050	1.07	100.39	98.38	98.38	0.00	3.055	1.07	100.39	98.38	98.38	0.00
3.060	1.07	100.39	98.38	98.38	0.00	3.065	1.07	100.39	98.38	98.38	0.00
3.070	1.07	100.39	98.38	98.38	0.00	3.075	1.07	100.39	98.38	98.38	0.00
3.080	1.07	100.39	98.38	98.38	0.00	3.085	1.07	100.39	98.38	98.38	0.00
3.090	1.07	100.39	98.38	98.38	0.00	3.095	1.07	100.39	98.38	98.38	0.00
3.100	1.07	100.39	98.38	98.38	0.00	3.105	1.07	100.39	98.38	98.38	0.00
3.110	1.07	100.39	98.38	98.38	0.00	3.115	1.07	100.39	98.38	98.38	0.00
3.120	1.07	100.39	98.38	98.38	0.00	3.125	1.07	100.39	98.38	98.38	0.00
3.130	1.07	100.39	98.38	98.38	0.00	3.135	1.07	100.39	98.38	98.38	0.00
3.140	1.07	100.39	98.38	98.38	0.00	3.145	1.07	100.39	98.38	98.38	0.00
3.150	1.07	100.39	98.38	98.38	0.00	3.155	1.07	100.39	98.38	98.38	0.00
3.160	1.07	100.39	98.38	98.38	0.00	3.165	1.07	100.39	98.38	98.38	0.00
3.170	1.07	100.39	98.38	98.38	0.00	3.175	1.07	100.39	98.38	98.38	0.00
3.180	1.07	100.39	98.38	98.38	0.00	3.185	1.07	100.39	98.38	98.38	0.00
3.190	1.07	100.39	98.38	98.38	0.00	3.195	1.07	100.39	98.38	98.38	0.00
3.200	1.07	100.39	98.38	98.38	0.00	3.205	1.07	100.39	98.38	98.38	0.00
3.210	1.07	100.39	98.38	98.38	0.00	3.215	1.07	100.39	98.38	98.38	0.00

ct:	Starting Motor	ETAP PowerStation	Page:	21
tion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
ract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
3.220	1.07	100.39	98.38	98.38	0.00	3.225	1.07	100.39	98.38	98.38	0.00
3.230	1.07	100.39	98.38	98.38	0.00	3.235	1.07	100.39	98.38	98.38	0.00
3.240	1.07	100.39	98.38	98.38	0.00	3.245	1.07	100.39	98.38	98.38	0.00
3.250	1.07	100.39	98.38	98.38	0.00	3.255	1.07	100.39	98.38	98.38	0.00
3.260	1.07	100.39	98.38	98.38	0.00	3.265	1.07	100.39	98.38	98.38	0.00
3.270	1.07	100.39	98.38	98.38	0.00	3.275	1.07	100.39	98.38	98.38	0.00
3.280	1.07	100.39	98.38	98.38	0.00	3.285	1.07	100.39	98.38	98.38	0.00
3.290	1.07	100.39	98.38	98.38	0.00	3.295	1.07	100.39	98.38	98.38	0.00
3.300	1.07	100.39	98.38	98.38	0.00	3.305	1.07	100.39	98.38	98.38	0.00
3.310	1.07	100.39	98.38	98.38	0.00	3.315	1.07	100.39	98.38	98.38	0.00
3.320	1.07	100.39	98.38	98.38	0.00	3.325	1.07	100.39	98.38	98.38	0.00
3.330	1.07	100.39	98.38	98.38	0.00	3.335	1.07	100.39	98.38	98.38	0.00
3.340	1.07	100.39	98.38	98.38	0.00	3.345	1.07	100.39	98.38	98.38	0.00
3.350	1.07	100.39	98.38	98.38	0.00	3.355	1.07	100.39	98.38	98.38	0.00
3.360	1.07	100.39	98.38	98.38	0.00	3.365	1.07	100.39	98.38	98.38	0.00
3.370	1.07	100.39	98.38	98.38	0.00	3.375	1.07	100.39	98.38	98.38	0.00
3.380	1.07	100.39	98.38	98.38	0.00	3.385	1.07	100.39	98.38	98.38	0.00
3.390	1.07	100.39	98.38	98.38	0.00	3.395	1.07	100.39	98.38	98.38	0.00
3.400	1.07	100.39	98.38	98.38	0.00	3.405	1.07	100.39	98.38	98.38	0.00
3.410	1.07	100.39	98.38	98.38	0.00	3.415	1.07	100.39	98.38	98.38	0.00
3.420	1.07	100.39	98.38	98.38	0.00	3.425	1.07	100.39	98.38	98.38	0.00
3.430	1.07	100.39	98.38	98.38	0.00	3.435	1.07	100.39	98.38	98.38	0.00
3.440	1.07	100.39	98.38	98.38	0.00	3.445	1.07	100.39	98.38	98.38	0.00
3.450	1.07	100.39	98.38	98.38	0.00	3.455	1.07	100.39	98.38	98.38	0.00
3.460	1.07	100.39	98.38	98.38	0.00	3.465	1.07	100.39	98.38	98.38	0.00
3.470	1.07	100.39	98.38	98.38	0.00	3.475	1.07	100.39	98.38	98.38	0.00
3.480	1.07	100.39	98.38	98.38	0.00	3.485	1.07	100.39	98.38	98.38	0.00
3.490	1.07	100.39	98.38	98.38	0.00	3.495	1.07	100.39	98.38	98.38	0.00
3.500	1.07	100.39	98.38	98.38	0.00	3.505	1.07	100.39	98.38	98.38	0.00
3.510	1.07	100.39	98.38	98.38	0.00	3.515	1.07	100.39	98.38	98.38	0.00
3.520	1.07	100.39	98.38	98.38	0.00	3.525	1.07	100.39	98.38	98.38	0.00
3.530	1.07	100.39	98.38	98.38	0.00	3.535	1.07	100.39	98.38	98.38	0.00
3.540	1.07	100.39	98.38	98.38	0.00	3.545	1.07	100.39	98.38	98.38	0.00
3.550	1.07	100.39	98.38	98.38	0.00	3.555	1.07	100.39	98.38	98.38	0.00
3.560	1.07	100.39	98.38	98.38	0.00	3.565	1.07	100.39	98.38	98.38	0.00
3.570	1.07	100.39	98.38	98.38	0.00	3.575	1.07	100.39	98.38	98.38	0.00

ect:	Starting Motor	ETAP PowerStation	Page:	22
ation:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
tract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
3.580	1.07	100.39	98.38	98.38	0.00	3.585	1.07	100.39	98.38	98.38	0.00
3.590	1.07	100.39	98.38	98.38	0.00	3.595	1.07	100.39	98.38	98.38	0.00
3.600	1.07	100.39	98.38	98.38	0.00	3.605	1.07	100.39	98.38	98.38	0.00
3.610	1.07	100.39	98.38	98.38	0.00	3.615	1.07	100.39	98.38	98.38	0.00
3.620	1.07	100.39	98.38	98.38	0.00	3.625	1.07	100.39	98.38	98.38	0.00
3.630	1.07	100.39	98.38	98.38	0.00	3.635	1.07	100.39	98.38	98.38	0.00
3.640	1.07	100.39	98.38	98.38	0.00	3.645	1.07	100.39	98.38	98.38	0.00
3.650	1.07	100.39	98.38	98.38	0.00	3.655	1.07	100.39	98.38	98.38	0.00
3.660	1.07	100.39	98.38	98.38	0.00	3.665	1.07	100.39	98.38	98.38	0.00
3.670	1.07	100.39	98.38	98.38	0.00	3.675	1.07	100.39	98.38	98.38	0.00
3.680	1.07	100.39	98.38	98.38	0.00	3.685	1.07	100.39	98.38	98.38	0.00
3.690	1.07	100.39	98.38	98.38	0.00	3.695	1.07	100.39	98.38	98.38	0.00
3.700	1.07	100.39	98.38	98.38	0.00	3.705	1.07	100.39	98.38	98.38	0.00
3.710	1.07	100.39	98.38	98.38	0.00	3.715	1.07	100.39	98.38	98.38	0.00
3.720	1.07	100.39	98.38	98.38	0.00	3.725	1.07	100.39	98.38	98.38	0.00
3.730	1.07	100.39	98.38	98.38	0.00	3.735	1.07	100.39	98.38	98.38	0.00
3.740	1.07	100.39	98.38	98.38	0.00	3.745	1.07	100.39	98.38	98.38	0.00
3.750	1.07	100.39	98.38	98.38	0.00	3.755	1.07	100.39	98.38	98.38	0.00
3.760	1.07	100.39	98.38	98.38	0.00	3.765	1.07	100.39	98.38	98.38	0.00
3.770	1.07	100.39	98.38	98.38	0.00	3.775	1.07	100.39	98.38	98.38	0.00
3.780	1.07	100.39	98.38	98.38	0.00	3.785	1.07	100.39	98.38	98.38	0.00
3.790	1.07	100.39	98.38	98.38	0.00	3.795	1.07	100.39	98.38	98.38	0.00
3.800	1.07	100.39	98.38	98.38	0.00	3.805	1.07	100.39	98.38	98.38	0.00
3.810	1.07	100.39	98.38	98.38	0.00	3.815	1.07	100.39	98.38	98.38	0.00
3.820	1.07	100.39	98.38	98.38	0.00	3.825	1.07	100.39	98.38	98.38	0.00
3.830	1.07	100.39	98.38	98.38	0.00	3.835	1.07	100.39	98.38	98.38	0.00
3.840	1.07	100.39	98.38	98.38	0.00	3.845	1.07	100.39	98.38	98.38	0.00
3.850	1.07	100.39	98.38	98.38	0.00	3.855	1.07	100.39	98.38	98.38	0.00
3.860	1.07	100.39	98.38	98.38	0.00	3.865	1.07	100.39	98.38	98.38	0.00
3.870	1.07	100.39	98.38	98.38	0.00	3.875	1.07	100.39	98.38	98.38	0.00
3.880	1.07	100.39	98.38	98.38	0.00	3.885	1.07	100.39	98.38	98.38	0.00
3.890	1.07	100.39	98.38	98.38	0.00	3.895	1.07	100.39	98.38	98.38	0.00
3.900	1.07	100.39	98.38	98.38	0.00	3.905	1.07	100.39	98.38	98.38	0.00
3.910	1.07	100.39	98.38	98.38	0.00	3.915	1.07	100.39	98.38	98.38	0.00
3.920	1.07	100.39	98.38	98.38	0.00	3.925	1.07	100.39	98.38	98.38	0.00
3.930	1.07	100.39	98.38	98.38	0.00	3.935	1.07	100.39	98.38	98.38	0.00

ect:	Starting Motor	ETAP PowerStation	Page:	23
tion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
ract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
3.940	1.07	100.39	98.38	98.38	0.00	3.945	1.07	100.39	98.38	98.38	0.00
3.950	1.07	100.39	98.38	98.38	0.00	3.955	1.07	100.39	98.38	98.38	0.00
3.960	1.07	100.39	98.38	98.38	0.00	3.965	1.07	100.39	98.38	98.38	0.00
3.970	1.07	100.39	98.38	98.38	0.00	3.975	1.07	100.39	98.38	98.38	0.00
3.980	1.07	100.39	98.38	98.38	0.00	3.985	1.07	100.39	98.38	98.38	0.00
3.990	1.07	100.39	98.38	98.38	0.00	3.995	1.07	100.39	98.38	98.38	0.00
4.000	1.07	100.39	98.38	98.38	0.00	4.005	1.07	100.39	98.38	98.38	0.00
4.010	1.07	100.39	98.38	98.38	0.00	4.015	1.07	100.39	98.38	98.38	0.00
4.020	1.07	100.39	98.38	98.38	0.00	4.025	1.07	100.39	98.38	98.38	0.00
4.030	1.07	100.39	98.38	98.38	0.00	4.035	1.07	100.39	98.38	98.38	0.00
4.040	1.07	100.39	98.38	98.38	0.00	4.045	1.07	100.39	98.38	98.38	0.00
4.050	1.07	100.39	98.38	98.38	0.00	4.055	1.07	100.39	98.38	98.38	0.00
4.060	1.07	100.39	98.38	98.38	0.00	4.065	1.07	100.39	98.38	98.38	0.00
4.070	1.07	100.39	98.38	98.38	0.00	4.075	1.07	100.39	98.38	98.38	0.00
4.080	1.07	100.39	98.38	98.38	0.00	4.085	1.07	100.39	98.38	98.38	0.00
4.090	1.07	100.39	98.38	98.38	0.00	4.095	1.07	100.39	98.38	98.38	0.00
4.100	1.07	100.39	98.38	98.38	0.00	4.105	1.07	100.39	98.38	98.38	0.00
4.110	1.07	100.39	98.38	98.38	0.00	4.115	1.07	100.39	98.38	98.38	0.00
4.120	1.07	100.39	98.38	98.38	0.00	4.125	1.07	100.39	98.38	98.38	0.00
4.130	1.07	100.39	98.38	98.38	0.00	4.135	1.07	100.39	98.38	98.38	0.00
4.140	1.07	100.39	98.38	98.38	0.00	4.145	1.07	100.39	98.38	98.38	0.00
4.150	1.07	100.39	98.38	98.38	0.00	4.155	1.07	100.39	98.38	98.38	0.00
4.160	1.07	100.39	98.38	98.38	0.00	4.165	1.07	100.39	98.38	98.38	0.00
4.170	1.07	100.39	98.38	98.38	0.00	4.175	1.07	100.39	98.38	98.38	0.00
4.180	1.07	100.39	98.38	98.38	0.00	4.185	1.07	100.39	98.38	98.38	0.00
4.190	1.07	100.39	98.38	98.38	0.00	4.195	1.07	100.39	98.38	98.38	0.00
4.200	1.07	100.39	98.38	98.38	0.00	4.205	1.07	100.39	98.38	98.38	0.00
4.210	1.07	100.39	98.38	98.38	0.00	4.215	1.07	100.39	98.38	98.38	0.00
4.220	1.07	100.39	98.38	98.38	0.00	4.225	1.07	100.39	98.38	98.38	0.00
4.230	1.07	100.39	98.38	98.38	0.00	4.235	1.07	100.39	98.38	98.38	0.00
4.240	1.07	100.39	98.38	98.38	0.00	4.245	1.07	100.39	98.38	98.38	0.00
4.250	1.07	100.39	98.38	98.38	0.00	4.255	1.07	100.39	98.38	98.38	0.00
4.260	1.07	100.39	98.38	98.38	0.00	4.265	1.07	100.39	98.38	98.38	0.00
4.270	1.07	100.39	98.38	98.38	0.00	4.275	1.07	100.39	98.38	98.38	0.00
4.280	1.07	100.39	98.38	98.38	0.00	4.285	1.07	100.39	98.38	98.38	0.00
4.290	1.07	100.39	98.38	98.38	0.00	4.295	1.07	100.39	98.38	98.38	0.00

Project:	Starting Motor	ETAP PowerStation	Page:	24
Location:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
Contract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
Designer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
Name:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
4.300	1.07	100.39	98.38	98.38	0.00	4.305	1.07	100.39	98.38	98.38	0.00
4.310	1.07	100.39	98.38	98.38	0.00	4.315	1.07	100.39	98.38	98.38	0.00
4.320	1.07	100.39	98.38	98.38	0.00	4.325	1.07	100.39	98.38	98.38	0.00
4.330	1.07	100.39	98.38	98.38	0.00	4.335	1.07	100.39	98.38	98.38	0.00
4.340	1.07	100.39	98.38	98.38	0.00	4.345	1.07	100.39	98.38	98.38	0.00
4.350	1.07	100.39	98.38	98.38	0.00	4.355	1.07	100.39	98.38	98.38	0.00
4.360	1.07	100.39	98.38	98.38	0.00	4.365	1.07	100.39	98.38	98.38	0.00
4.370	1.07	100.39	98.38	98.38	0.00	4.375	1.07	100.39	98.38	98.38	0.00
4.380	1.07	100.39	98.38	98.38	0.00	4.385	1.07	100.39	98.38	98.38	0.00
4.390	1.07	100.39	98.38	98.38	0.00	4.395	1.07	100.39	98.38	98.38	0.00
4.400	1.07	100.39	98.38	98.38	0.00	4.405	1.07	100.39	98.38	98.38	0.00
4.410	1.07	100.39	98.38	98.38	0.00	4.415	1.07	100.39	98.38	98.38	0.00
4.420	1.07	100.39	98.38	98.38	0.00	4.425	1.07	100.39	98.38	98.38	0.00
4.430	1.07	100.39	98.38	98.38	0.00	4.435	1.07	100.39	98.38	98.38	0.00
4.440	1.07	100.39	98.38	98.38	0.00	4.445	1.07	100.39	98.38	98.38	0.00
4.450	1.07	100.39	98.38	98.38	0.00	4.455	1.07	100.39	98.38	98.38	0.00
4.460	1.07	100.39	98.38	98.38	0.00	4.465	1.07	100.39	98.38	98.38	0.00
4.470	1.07	100.39	98.38	98.38	0.00	4.475	1.07	100.39	98.38	98.38	0.00
4.480	1.07	100.39	98.38	98.38	0.00	4.485	1.07	100.39	98.38	98.38	0.00
4.490	1.07	100.39	98.38	98.38	0.00	4.495	1.07	100.39	98.38	98.38	0.00
4.500	1.07	100.39	98.38	98.38	0.00	4.505	1.07	100.39	98.38	98.38	0.00
4.510	1.07	100.39	98.38	98.38	0.00	4.515	1.07	100.39	98.38	98.38	0.00
4.520	1.07	100.39	98.38	98.38	0.00	4.525	1.07	100.39	98.38	98.38	0.00
4.530	1.07	100.39	98.38	98.38	0.00	4.535	1.07	100.39	98.38	98.38	0.00
4.540	1.07	100.39	98.38	98.38	0.00	4.545	1.07	100.39	98.38	98.38	0.00
4.550	1.07	100.39	98.38	98.38	0.00	4.555	1.07	100.39	98.38	98.38	0.00
4.560	1.07	100.39	98.38	98.38	0.00	4.565	1.07	100.39	98.38	98.38	0.00
4.570	1.07	100.39	98.38	98.38	0.00	4.575	1.07	100.39	98.38	98.38	0.00
4.580	1.07	100.39	98.38	98.38	0.00	4.585	1.07	100.39	98.38	98.38	0.00
4.590	1.07	100.39	98.38	98.38	0.00	4.595	1.07	100.39	98.38	98.38	0.00
4.600	1.07	100.39	98.38	98.38	0.00	4.605	1.07	100.39	98.38	98.38	0.00
4.610	1.07	100.39	98.38	98.38	0.00	4.615	1.07	100.39	98.38	98.38	0.00
4.620	1.07	100.39	98.38	98.38	0.00	4.625	1.07	100.39	98.38	98.38	0.00
4.630	1.07	100.39	98.38	98.38	0.00	4.635	1.07	100.39	98.38	98.38	0.00
4.640	1.07	100.39	98.38	98.38	0.00	4.645	1.07	100.39	98.38	98.38	0.00
4.650	1.07	100.39	98.38	98.38	0.00	4.655	1.07	100.39	98.38	98.38	0.00

ct:	Starting Motor	ETAP PowerStation	Page:	25
tion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
ract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
4.660	1.07	100.39	98.38	98.38	0.00	4.665	1.07	100.39	98.38	98.38	0.00
4.670	1.07	100.39	98.38	98.38	0.00	4.675	1.07	100.39	98.38	98.38	0.00
4.680	1.07	100.39	98.38	98.38	0.00	4.685	1.07	100.39	98.38	98.38	0.00
4.690	1.07	100.39	98.38	98.38	0.00	4.695	1.07	100.39	98.38	98.38	0.00
4.700	1.07	100.39	98.38	98.38	0.00	4.705	1.07	100.39	98.38	98.38	0.00
4.710	1.07	100.39	98.38	98.38	0.00	4.715	1.07	100.39	98.38	98.38	0.00
4.720	1.07	100.39	98.38	98.38	0.00	4.725	1.07	100.39	98.38	98.38	0.00
4.730	1.07	100.39	98.38	98.38	0.00	4.735	1.07	100.39	98.38	98.38	0.00
4.740	1.07	100.39	98.38	98.38	0.00	4.745	1.07	100.39	98.38	98.38	0.00
4.750	1.07	100.39	98.38	98.38	0.00	4.755	1.07	100.39	98.38	98.38	0.00
4.760	1.07	100.39	98.38	98.38	0.00	4.765	1.07	100.39	98.38	98.38	0.00
4.770	1.07	100.39	98.38	98.38	0.00	4.775	1.07	100.39	98.38	98.38	0.00
4.780	1.07	100.39	98.38	98.38	0.00	4.785	1.07	100.39	98.38	98.38	0.00
4.790	1.07	100.39	98.38	98.38	0.00	4.795	1.07	100.39	98.38	98.38	0.00
4.800	1.07	100.39	98.38	98.38	0.00	4.805	1.07	100.39	98.38	98.38	0.00
4.810	1.07	100.39	98.38	98.38	0.00	4.815	1.07	100.39	98.38	98.38	0.00
4.820	1.07	100.39	98.38	98.38	0.00	4.825	1.07	100.39	98.38	98.38	0.00
4.830	1.07	100.39	98.38	98.38	0.00	4.835	1.07	100.39	98.38	98.38	0.00
4.840	1.07	100.39	98.38	98.38	0.00	4.845	1.07	100.39	98.38	98.38	0.00
4.850	1.07	100.39	98.38	98.38	0.00	4.855	1.07	100.39	98.38	98.38	0.00
4.860	1.07	100.39	98.38	98.38	0.00	4.865	1.07	100.39	98.38	98.38	0.00
4.870	1.07	100.39	98.38	98.38	0.00	4.875	1.07	100.39	98.38	98.38	0.00
4.880	1.07	100.39	98.38	98.38	0.00	4.885	1.07	100.39	98.38	98.38	0.00
4.890	1.07	100.39	98.38	98.38	0.00	4.895	1.07	100.39	98.38	98.38	0.00
4.900	1.07	100.39	98.38	98.38	0.00	4.905	1.07	100.39	98.38	98.38	0.00
4.910	1.07	100.39	98.38	98.38	0.00	4.915	1.07	100.39	98.38	98.38	0.00
4.920	1.07	100.39	98.38	98.38	0.00	4.925	1.07	100.39	98.38	98.38	0.00
4.930	1.07	100.39	98.38	98.38	0.00	4.935	1.07	100.39	98.38	98.38	0.00
4.940	1.07	100.39	98.38	98.38	0.00	4.945	1.07	100.39	98.38	98.38	0.00
4.950	1.07	100.39	98.38	98.38	0.00	4.955	1.07	100.39	98.38	98.38	0.00
4.960	1.07	100.39	98.38	98.38	0.00	4.965	1.07	100.39	98.38	98.38	0.00
4.970	1.07	100.39	98.38	98.38	0.00	4.975	1.07	100.39	98.38	98.38	0.00
4.980	1.07	100.39	98.38	98.38	0.00	4.985	1.07	100.39	98.38	98.38	0.00
4.990	1.07	100.39	98.38	98.38	0.00	4.995	1.07	100.39	98.38	98.38	0.00
5.000	1.07	100.39	98.38	98.38	0.00	5.005	1.07	100.39	98.38	98.38	0.00
5.010	1.07	100.39	98.38	98.38	0.00	5.015	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Starting Tanpa Pengasutan
 Engineer: DWI HERMAWAN
 Name: kebon_agung

ETAP PowerStation

4.0 OC

Page: 26
 Date: 03-17-2009
 SN: KLGCCONSULT
 Revision: Base
 Config.: Normal

Motor ID: Mtr1

	Time (Sec)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
5.020	1.07	100.39	98.38	98.38	0.00	5.025	1.07	100.39	98.38	98.38	0.00	0.00
5.030	1.07	100.39	98.38	98.38	0.00	5.035	1.07	100.39	98.38	98.38	0.00	0.00
5.040	1.07	100.39	98.38	98.38	0.00	5.045	1.07	100.39	98.38	98.38	0.00	0.00
5.050	1.07	100.39	98.38	98.38	0.00	5.055	1.07	100.39	98.38	98.38	0.00	0.00
5.060	1.07	100.39	98.38	98.38	0.00	5.065	1.07	100.39	98.38	98.38	0.00	0.00
5.070	1.07	100.39	98.38	98.38	0.00	5.075	1.07	100.39	98.38	98.38	0.00	0.00
5.080	1.07	100.39	98.38	98.38	0.00	5.085	1.07	100.39	98.38	98.38	0.00	0.00
5.090	1.07	100.39	98.38	98.38	0.00	5.095	1.07	100.39	98.38	98.38	0.00	0.00
5.100	1.07	100.39	98.38	98.38	0.00	5.105	1.07	100.39	98.38	98.38	0.00	0.00
5.110	1.07	100.39	98.38	98.38	0.00	5.115	1.07	100.39	98.38	98.38	0.00	0.00
5.120	1.07	100.39	98.38	98.38	0.00	5.125	1.07	100.39	98.38	98.38	0.00	0.00
5.130	1.07	100.39	98.38	98.38	0.00	5.135	1.07	100.39	98.38	98.38	0.00	0.00
5.140	1.07	100.39	98.38	98.38	0.00	5.145	1.07	100.39	98.38	98.38	0.00	0.00
5.150	1.07	100.39	98.38	98.38	0.00	5.155	1.07	100.39	98.38	98.38	0.00	0.00
5.160	1.07	100.39	98.38	98.38	0.00	5.165	1.07	100.39	98.38	98.38	0.00	0.00
5.170	1.07	100.39	98.38	98.38	0.00	5.175	1.07	100.39	98.38	98.38	0.00	0.00
5.180	1.07	100.39	98.38	98.38	0.00	5.185	1.07	100.39	98.38	98.38	0.00	0.00
5.190	1.07	100.39	98.38	98.38	0.00	5.195	1.07	100.39	98.38	98.38	0.00	0.00
5.200	1.07	100.39	98.38	98.38	0.00	5.205	1.07	100.39	98.38	98.38	0.00	0.00
5.210	1.07	100.39	98.38	98.38	0.00	5.215	1.07	100.39	98.38	98.38	0.00	0.00
5.220	1.07	100.39	98.38	98.38	0.00	5.225	1.07	100.39	98.38	98.38	0.00	0.00
5.230	1.07	100.39	98.38	98.38	0.00	5.235	1.07	100.39	98.38	98.38	0.00	0.00
5.240	1.07	100.39	98.38	98.38	0.00	5.245	1.07	100.39	98.38	98.38	0.00	0.00
5.250	1.07	100.39	98.38	98.38	0.00	5.255	1.07	100.39	98.38	98.38	0.00	0.00
5.260	1.07	100.39	98.38	98.38	0.00	5.265	1.07	100.39	98.38	98.38	0.00	0.00
5.270	1.07	100.39	98.38	98.38	0.00	5.275	1.07	100.39	98.38	98.38	0.00	0.00
5.280	1.07	100.39	98.38	98.38	0.00	5.285	1.07	100.39	98.38	98.38	0.00	0.00
5.290	1.07	100.39	98.38	98.38	0.00	5.295	1.07	100.39	98.38	98.38	0.00	0.00
5.300	1.07	100.39	98.38	98.38	0.00	5.305	1.07	100.39	98.38	98.38	0.00	0.00
5.310	1.07	100.39	98.38	98.38	0.00	5.315	1.07	100.39	98.38	98.38	0.00	0.00
5.320	1.07	100.39	98.38	98.38	0.00	5.325	1.07	100.39	98.38	98.38	0.00	0.00
5.330	1.07	100.39	98.38	98.38	0.00	5.335	1.07	100.39	98.38	98.38	0.00	0.00
5.340	1.07	100.39	98.38	98.38	0.00	5.345	1.07	100.39	98.38	98.38	0.00	0.00
5.350	1.07	100.39	98.38	98.38	0.00	5.355	1.07	100.39	98.38	98.38	0.00	0.00
5.360	1.07	100.39	98.38	98.38	0.00	5.365	1.07	100.39	98.38	98.38	0.00	0.00
5.370	1.07	100.39	98.38	98.38	0.00	5.375	1.07	100.39	98.38	98.38	0.00	0.00

ect:	Starting Motor	ETAP PowerStation	Page:	27
tion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
tract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
5.380	1.07	100.39	98.38	98.38	0.00	5.385	1.07	100.39	98.38	98.38	0.00
5.390	1.07	100.39	98.38	98.38	0.00	5.395	1.07	100.39	98.38	98.38	0.00
5.400	1.07	100.39	98.38	98.38	0.00	5.405	1.07	100.39	98.38	98.38	0.00
5.410	1.07	100.39	98.38	98.38	0.00	5.415	1.07	100.39	98.38	98.38	0.00
5.420	1.07	100.39	98.38	98.38	0.00	5.425	1.07	100.39	98.38	98.38	0.00
5.430	1.07	100.39	98.38	98.38	0.00	5.435	1.07	100.39	98.38	98.38	0.00
5.440	1.07	100.39	98.38	98.38	0.00	5.445	1.07	100.39	98.38	98.38	0.00
5.450	1.07	100.39	98.38	98.38	0.00	5.455	1.07	100.39	98.38	98.38	0.00
5.460	1.07	100.39	98.38	98.38	0.00	5.465	1.07	100.39	98.38	98.38	0.00
5.470	1.07	100.39	98.38	98.38	0.00	5.475	1.07	100.39	98.38	98.38	0.00
5.480	1.07	100.39	98.38	98.38	0.00	5.485	1.07	100.39	98.38	98.38	0.00
5.490	1.07	100.39	98.38	98.38	0.00	5.495	1.07	100.39	98.38	98.38	0.00
5.500	1.07	100.39	98.38	98.38	0.00	5.505	1.07	100.39	98.38	98.38	0.00
5.510	1.07	100.39	98.38	98.38	0.00	5.515	1.07	100.39	98.38	98.38	0.00
5.520	1.07	100.39	98.38	98.38	0.00	5.525	1.07	100.39	98.38	98.38	0.00
5.530	1.07	100.39	98.38	98.38	0.00	5.535	1.07	100.39	98.38	98.38	0.00
5.540	1.07	100.39	98.38	98.38	0.00	5.545	1.07	100.39	98.38	98.38	0.00
5.550	1.07	100.39	98.38	98.38	0.00	5.555	1.07	100.39	98.38	98.38	0.00
5.560	1.07	100.39	98.38	98.38	0.00	5.565	1.07	100.39	98.38	98.38	0.00
5.570	1.07	100.39	98.38	98.38	0.00	5.575	1.07	100.39	98.38	98.38	0.00
5.580	1.07	100.39	98.38	98.38	0.00	5.585	1.07	100.39	98.38	98.38	0.00
5.590	1.07	100.39	98.38	98.38	0.00	5.595	1.07	100.39	98.38	98.38	0.00
5.600	1.07	100.39	98.38	98.38	0.00	5.605	1.07	100.39	98.38	98.38	0.00
5.610	1.07	100.39	98.38	98.38	0.00	5.615	1.07	100.39	98.38	98.38	0.00
5.620	1.07	100.39	98.38	98.38	0.00	5.625	1.07	100.39	98.38	98.38	0.00
5.630	1.07	100.39	98.38	98.38	0.00	5.635	1.07	100.39	98.38	98.38	0.00
5.640	1.07	100.39	98.38	98.38	0.00	5.645	1.07	100.39	98.38	98.38	0.00
5.650	1.07	100.39	98.38	98.38	0.00	5.655	1.07	100.39	98.38	98.38	0.00
5.660	1.07	100.39	98.38	98.38	0.00	5.665	1.07	100.39	98.38	98.38	0.00
5.670	1.07	100.39	98.38	98.38	0.00	5.675	1.07	100.39	98.38	98.38	0.00
5.680	1.07	100.39	98.38	98.38	0.00	5.685	1.07	100.39	98.38	98.38	0.00
5.690	1.07	100.39	98.38	98.38	0.00	5.695	1.07	100.39	98.38	98.38	0.00
5.700	1.07	100.39	98.38	98.38	0.00	5.705	1.07	100.39	98.38	98.38	0.00
5.710	1.07	100.39	98.38	98.38	0.00	5.715	1.07	100.39	98.38	98.38	0.00
5.720	1.07	100.39	98.38	98.38	0.00	5.725	1.07	100.39	98.38	98.38	0.00
5.730	1.07	100.39	98.38	98.38	0.00	5.735	1.07	100.39	98.38	98.38	0.00

ct: Starting Motor
 ion: PG. KEBON AGUNG
 tract: Starting Tanpa Pengasutan
 eer: DWI HERMAWAN
 name: kebon_agung

ETAP PowerStation

4.0.C

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Date: 03-17-2009

SN: KLGCNSULT

Revision: Base

Config.: Normal

Motor ID: Mu1

	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
5.740	1.07	100.39	98.38	98.38	98.00	5.745	1.07	100.39	98.38	98.38	98.38	0.00
5.750	1.07	100.39	98.38	98.38	98.00	5.755	1.07	100.39	98.38	98.38	98.38	0.00
5.760	1.07	100.39	98.38	98.38	98.00	5.765	1.07	100.39	98.38	98.38	98.38	0.00
5.770	1.07	100.39	98.38	98.38	98.00	5.775	1.07	100.39	98.38	98.38	98.38	0.00
5.780	1.07	100.39	98.38	98.38	98.00	5.785	1.07	100.39	98.38	98.38	98.38	0.00
5.790	1.07	100.39	98.38	98.38	98.00	5.795	1.07	100.39	98.38	98.38	98.38	0.00
5.800	1.07	100.39	98.38	98.38	98.00	5.805	1.07	100.39	98.38	98.38	98.38	0.00
5.810	1.07	100.39	98.38	98.38	98.00	5.815	1.07	100.39	98.38	98.38	98.38	0.00
5.820	1.07	100.39	98.38	98.38	98.00	5.825	1.07	100.39	98.38	98.38	98.38	0.00
5.830	1.07	100.39	98.38	98.38	98.00	5.835	1.07	100.39	98.38	98.38	98.38	0.00
5.840	1.07	100.39	98.38	98.38	98.00	5.845	1.07	100.39	98.38	98.38	98.38	0.00
5.850	1.07	100.39	98.38	98.38	98.00	5.855	1.07	100.39	98.38	98.38	98.38	0.00
5.860	1.07	100.39	98.38	98.38	98.00	5.865	1.07	100.39	98.38	98.38	98.38	0.00
5.870	1.07	100.39	98.38	98.38	98.00	5.875	1.07	100.39	98.38	98.38	98.38	0.00
5.880	1.07	100.39	98.38	98.38	98.00	5.885	1.07	100.39	98.38	98.38	98.38	0.00
5.890	1.07	100.39	98.38	98.38	98.00	5.895	1.07	100.39	98.38	98.38	98.38	0.00
5.900	1.07	100.39	98.38	98.38	98.00	5.905	1.07	100.39	98.38	98.38	98.38	0.00
5.910	1.07	100.39	98.38	98.38	98.00	5.915	1.07	100.39	98.38	98.38	98.38	0.00
5.920	1.07	100.39	98.38	98.38	98.00	5.925	1.07	100.39	98.38	98.38	98.38	0.00
5.930	1.07	100.39	98.38	98.38	98.00	5.935	1.07	100.39	98.38	98.38	98.38	0.00
5.940	1.07	100.39	98.38	98.38	98.00	5.945	1.07	100.39	98.38	98.38	98.38	0.00
5.950	1.07	100.39	98.38	98.38	98.00	5.955	1.07	100.39	98.38	98.38	98.38	0.00
5.960	1.07	100.39	98.38	98.38	98.00	5.965	1.07	100.39	98.38	98.38	98.38	0.00
5.970	1.07	100.39	98.38	98.38	98.00	5.975	1.07	100.39	98.38	98.38	98.38	0.00
5.980	1.07	100.39	98.38	98.38	98.00	5.985	1.07	100.39	98.38	98.38	98.38	0.00
5.990	1.07	100.39	98.38	98.38	98.00	5.995	1.07	100.39	98.38	98.38	98.38	0.00
6.000	1.07	100.39	98.38	98.38	98.00	6.005	1.07	100.39	98.38	98.38	98.38	0.00
6.010	1.07	100.39	98.38	98.38	98.00	6.015	1.07	100.39	98.38	98.38	98.38	0.00
6.020	1.07	100.39	98.38	98.38	98.00	6.025	1.07	100.39	98.38	98.38	98.38	0.00
6.030	1.07	100.39	98.38	98.38	98.00	6.035	1.07	100.39	98.38	98.38	98.38	0.00
6.040	1.07	100.39	98.38	98.38	98.00	6.045	1.07	100.39	98.38	98.38	98.38	0.00
6.050	1.07	100.39	98.38	98.38	98.00	6.055	1.07	100.39	98.38	98.38	98.38	0.00
6.060	1.07	100.39	98.38	98.38	98.00	6.065	1.07	100.39	98.38	98.38	98.38	0.00
6.070	1.07	100.39	98.38	98.38	98.00	6.075	1.07	100.39	98.38	98.38	98.38	0.00
6.080	1.07	100.39	98.38	98.38	98.00	6.085	1.07	100.39	98.38	98.38	98.38	0.00
6.090	1.07	100.39	98.38	98.38	98.00	6.095	1.07	100.39	98.38	98.38	98.38	0.00

Project:	Starting Motor	ETAP PowerStation	Page:	29
Location:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
Contract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
Designer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
Name:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
6.100	1.07	100.39	98.38	98.38	0.00	6.105	1.07	100.39	98.38	98.38	0.00
6.110	1.07	100.39	98.38	98.38	0.00	6.115	1.07	100.39	98.38	98.38	0.00
6.120	1.07	100.39	98.38	98.38	0.00	6.125	1.07	100.39	98.38	98.38	0.00
6.130	1.07	100.39	98.38	98.38	0.00	6.135	1.07	100.39	98.38	98.38	0.00
6.140	1.07	100.39	98.38	98.38	0.00	6.145	1.07	100.39	98.38	98.38	0.00
6.150	1.07	100.39	98.38	98.38	0.00	6.155	1.07	100.39	98.38	98.38	0.00
6.160	1.07	100.39	98.38	98.38	0.00	6.165	1.07	100.39	98.38	98.38	0.00
6.170	1.07	100.39	98.38	98.38	0.00	6.175	1.07	100.39	98.38	98.38	0.00
6.180	1.07	100.39	98.38	98.38	0.00	6.185	1.07	100.39	98.38	98.38	0.00
6.190	1.07	100.39	98.38	98.38	0.00	6.195	1.07	100.39	98.38	98.38	0.00
6.200	1.07	100.39	98.38	98.38	0.00	6.205	1.07	100.39	98.38	98.38	0.00
6.210	1.07	100.39	98.38	98.38	0.00	6.215	1.07	100.39	98.38	98.38	0.00
6.220	1.07	100.39	98.38	98.38	0.00	6.225	1.07	100.39	98.38	98.38	0.00
6.230	1.07	100.39	98.38	98.38	0.00	6.235	1.07	100.39	98.38	98.38	0.00
6.240	1.07	100.39	98.38	98.38	0.00	6.245	1.07	100.39	98.38	98.38	0.00
6.250	1.07	100.39	98.38	98.38	0.00	6.255	1.07	100.39	98.38	98.38	0.00
6.260	1.07	100.39	98.38	98.38	0.00	6.265	1.07	100.39	98.38	98.38	0.00
6.270	1.07	100.39	98.38	98.38	0.00	6.275	1.07	100.39	98.38	98.38	0.00
6.280	1.07	100.39	98.38	98.38	0.00	6.285	1.07	100.39	98.38	98.38	0.00
6.290	1.07	100.39	98.38	98.38	0.00	6.295	1.07	100.39	98.38	98.38	0.00
6.300	1.07	100.39	98.38	98.38	0.00	6.305	1.07	100.39	98.38	98.38	0.00
6.310	1.07	100.39	98.38	98.38	0.00	6.315	1.07	100.39	98.38	98.38	0.00
6.320	1.07	100.39	98.38	98.38	0.00	6.325	1.07	100.39	98.38	98.38	0.00
6.330	1.07	100.39	98.38	98.38	0.00	6.335	1.07	100.39	98.38	98.38	0.00
6.340	1.07	100.39	98.38	98.38	0.00	6.345	1.07	100.39	98.38	98.38	0.00
6.350	1.07	100.39	98.38	98.38	0.00	6.355	1.07	100.39	98.38	98.38	0.00
6.360	1.07	100.39	98.38	98.38	0.00	6.365	1.07	100.39	98.38	98.38	0.00
6.370	1.07	100.39	98.38	98.38	0.00	6.375	1.07	100.39	98.38	98.38	0.00
6.380	1.07	100.39	98.38	98.38	0.00	6.385	1.07	100.39	98.38	98.38	0.00
6.390	1.07	100.39	98.38	98.38	0.00	6.395	1.07	100.39	98.38	98.38	0.00
6.400	1.07	100.39	98.38	98.38	0.00	6.405	1.07	100.39	98.38	98.38	0.00
6.410	1.07	100.39	98.38	98.38	0.00	6.415	1.07	100.39	98.38	98.38	0.00
6.420	1.07	100.39	98.38	98.38	0.00	6.425	1.07	100.39	98.38	98.38	0.00
6.430	1.07	100.39	98.38	98.38	0.00	6.435	1.07	100.39	98.38	98.38	0.00
6.440	1.07	100.39	98.38	98.38	0.00	6.445	1.07	100.39	98.38	98.38	0.00
6.450	1.07	100.39	98.38	98.38	0.00	6.455	1.07	100.39	98.38	98.38	0.00

ect:	Starting Motor	ETAP PowerStation	Page:	30
tion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
tract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
6.460	1.07	100.39	98.38	98.38	0.00	6.465	1.07	100.39	98.38	98.38	0.00
6.470	1.07	100.39	98.38	98.38	0.00	6.475	1.07	100.39	98.38	98.38	0.00
6.480	1.07	100.39	98.38	98.38	0.00	6.485	1.07	100.39	98.38	98.38	0.00
6.490	1.07	100.39	98.38	98.38	0.00	6.495	1.07	100.39	98.38	98.38	0.00
6.500	1.07	100.39	98.38	98.38	0.00	6.505	1.07	100.39	98.38	98.38	0.00
6.510	1.07	100.39	98.38	98.38	0.00	6.515	1.07	100.39	98.38	98.38	0.00
6.520	1.07	100.39	98.38	98.38	0.00	6.525	1.07	100.39	98.38	98.38	0.00
6.530	1.07	100.39	98.38	98.38	0.00	6.535	1.07	100.39	98.38	98.38	0.00
6.540	1.07	100.39	98.38	98.38	0.00	6.545	1.07	100.39	98.38	98.38	0.00
6.550	1.07	100.39	98.38	98.38	0.00	6.555	1.07	100.39	98.38	98.38	0.00
6.560	1.07	100.39	98.38	98.38	0.00	6.565	1.07	100.39	98.38	98.38	0.00
6.570	1.07	100.39	98.38	98.38	0.00	6.575	1.07	100.39	98.38	98.38	0.00
6.580	1.07	100.39	98.38	98.38	0.00	6.585	1.07	100.39	98.38	98.38	0.00
6.590	1.07	100.39	98.38	98.38	0.00	6.595	1.07	100.39	98.38	98.38	0.00
6.600	1.07	100.39	98.38	98.38	0.00	6.605	1.07	100.39	98.38	98.38	0.00
6.610	1.07	100.39	98.38	98.38	0.00	6.615	1.07	100.39	98.38	98.38	0.00
6.620	1.07	100.39	98.38	98.38	0.00	6.625	1.07	100.39	98.38	98.38	0.00
6.630	1.07	100.39	98.38	98.38	0.00	6.635	1.07	100.39	98.38	98.38	0.00
6.640	1.07	100.39	98.38	98.38	0.00	6.645	1.07	100.39	98.38	98.38	0.00
6.650	1.07	100.39	98.38	98.38	0.00	6.655	1.07	100.39	98.38	98.38	0.00
6.660	1.07	100.39	98.38	98.38	0.00	6.665	1.07	100.39	98.38	98.38	0.00
6.670	1.07	100.39	98.38	98.38	0.00	6.675	1.07	100.39	98.38	98.38	0.00
6.680	1.07	100.39	98.38	98.38	0.00	6.685	1.07	100.39	98.38	98.38	0.00
6.690	1.07	100.39	98.38	98.38	0.00	6.695	1.07	100.39	98.38	98.38	0.00
6.700	1.07	100.39	98.38	98.38	0.00	6.705	1.07	100.39	98.38	98.38	0.00
6.710	1.07	100.39	98.38	98.38	0.00	6.715	1.07	100.39	98.38	98.38	0.00
6.720	1.07	100.39	98.38	98.38	0.00	6.725	1.07	100.39	98.38	98.38	0.00
6.730	1.07	100.39	98.38	98.38	0.00	6.735	1.07	100.39	98.38	98.38	0.00
6.740	1.07	100.39	98.38	98.38	0.00	6.745	1.07	100.39	98.38	98.38	0.00
6.750	1.07	100.39	98.38	98.38	0.00	6.755	1.07	100.39	98.38	98.38	0.00
6.760	1.07	100.39	98.38	98.38	0.00	6.765	1.07	100.39	98.38	98.38	0.00
6.770	1.07	100.39	98.38	98.38	0.00	6.775	1.07	100.39	98.38	98.38	0.00
6.780	1.07	100.39	98.38	98.38	0.00	6.785	1.07	100.39	98.38	98.38	0.00
6.790	1.07	100.39	98.38	98.38	0.00	6.795	1.07	100.39	98.38	98.38	0.00
6.800	1.07	100.39	98.38	98.38	0.00	6.805	1.07	100.39	98.38	98.38	0.00
6.810	1.07	100.39	98.38	98.38	0.00	6.815	1.07	100.39	98.38	98.38	0.00

Start: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Starting Tanpa Pengasutan
 Engineer: DWI HERMAWAN
 Name: kebon_agung

ETAP PowerStation

4.0 OC

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Date: 03-17-2009

SN: KLGCONSULT

Revision: Base

Config.: Normal

Motor ID - M1r1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Time (Sec.)	Ship (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Bus Acc Torq (%)
6.820	1.07	100.39	98.38	98.38	6.825	1.07	100.39	98.38	98.38	0.00	0.00
6.830	1.07	100.39	98.38	98.38	6.835	1.07	100.39	98.38	98.38	0.00	0.00
6.840	1.07	100.39	98.38	98.38	6.845	1.07	100.39	98.38	98.38	0.00	0.00
6.850	1.07	100.39	98.38	98.38	6.855	1.07	100.39	98.38	98.38	0.00	0.00
6.860	1.07	100.39	98.38	98.38	6.865	1.07	100.39	98.38	98.38	0.00	0.00
6.870	1.07	100.39	98.38	98.38	6.875	1.07	100.39	98.38	98.38	0.00	0.00
6.880	1.07	100.39	98.38	98.38	6.885	1.07	100.39	98.38	98.38	0.00	0.00
6.890	1.07	100.39	98.38	98.38	6.895	1.07	100.39	98.38	98.38	0.00	0.00
6.900	1.07	100.39	98.38	98.38	6.905	1.07	100.39	98.38	98.38	0.00	0.00
6.910	1.07	100.39	98.38	98.38	6.915	1.07	100.39	98.38	98.38	0.00	0.00
6.920	1.07	100.39	98.38	98.38	6.925	1.07	100.39	98.38	98.38	0.00	0.00
6.930	1.07	100.39	98.38	98.38	6.935	1.07	100.39	98.38	98.38	0.00	0.00
6.940	1.07	100.39	98.38	98.38	6.945	1.07	100.39	98.38	98.38	0.00	0.00
6.950	1.07	100.39	98.38	98.38	6.955	1.07	100.39	98.38	98.38	0.00	0.00
6.960	1.07	100.39	98.38	98.38	6.965	1.07	100.39	98.38	98.38	0.00	0.00
6.970	1.07	100.39	98.38	98.38	6.975	1.07	100.39	98.38	98.38	0.00	0.00
6.980	1.07	100.39	98.38	98.38	6.985	1.07	100.39	98.38	98.38	0.00	0.00
6.990	1.07	100.39	98.38	98.38	6.995	1.07	100.39	98.38	98.38	0.00	0.00
7.000	1.07	100.39	98.38	98.38	7.005	1.07	100.39	98.38	98.38	0.00	0.00
7.010	1.07	100.39	98.38	98.38	7.015	1.07	100.39	98.38	98.38	0.00	0.00
7.020	1.07	100.39	98.38	98.38	7.025	1.07	100.39	98.38	98.38	0.00	0.00
7.030	1.07	100.39	98.38	98.38	7.035	1.07	100.39	98.38	98.38	0.00	0.00
7.040	1.07	100.39	98.38	98.38	7.045	1.07	100.39	98.38	98.38	0.00	0.00
7.050	1.07	100.39	98.38	98.38	7.055	1.07	100.39	98.38	98.38	0.00	0.00
7.060	1.07	100.39	98.38	98.38	7.065	1.07	100.39	98.38	98.38	0.00	0.00
7.070	1.07	100.39	98.38	98.38	7.075	1.07	100.39	98.38	98.38	0.00	0.00
7.080	1.07	100.39	98.38	98.38	7.085	1.07	100.39	98.38	98.38	0.00	0.00
7.090	1.07	100.39	98.38	98.38	7.095	1.07	100.39	98.38	98.38	0.00	0.00
7.100	1.07	100.39	98.38	98.38	7.105	1.07	100.39	98.38	98.38	0.00	0.00
7.110	1.07	100.39	98.38	98.38	7.115	1.07	100.39	98.38	98.38	0.00	0.00
7.120	1.07	100.39	98.38	98.38	7.125	1.07	100.39	98.38	98.38	0.00	0.00
7.130	1.07	100.39	98.38	98.38	7.135	1.07	100.39	98.38	98.38	0.00	0.00
7.140	1.07	100.39	98.38	98.38	7.145	1.07	100.39	98.38	98.38	0.00	0.00
7.150	1.07	100.39	98.38	98.38	7.155	1.07	100.39	98.38	98.38	0.00	0.00
7.160	1.07	100.39	98.38	98.38	7.165	1.07	100.39	98.38	98.38	0.00	0.00
7.170	1.07	100.39	98.38	98.38	7.175	1.07	100.39	98.38	98.38	0.00	0.00

ect:	Starting Motor	ETAP PowerStation	Page:	32
tion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
tract:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
7.180	1.07	100.39	98.38	98.38	0.00	7.185	1.07	100.39	98.38	98.38	0.00
7.190	1.07	100.39	98.38	98.38	0.00	7.195	1.07	100.39	98.38	98.38	0.00
7.200	1.07	100.39	98.38	98.38	0.00	7.205	1.07	100.39	98.38	98.38	0.00
7.210	1.07	100.39	98.38	98.38	0.00	7.215	1.07	100.39	98.38	98.38	0.00
7.220	1.07	100.39	98.38	98.38	0.00	7.225	1.07	100.39	98.38	98.38	0.00
7.230	1.07	100.39	98.38	98.38	0.00	7.235	1.07	100.39	98.38	98.38	0.00
7.240	1.07	100.39	98.38	98.38	0.00	7.245	1.07	100.39	98.38	98.38	0.00
7.250	1.07	100.39	98.38	98.38	0.00	7.255	1.07	100.39	98.38	98.38	0.00
7.260	1.07	100.39	98.38	98.38	0.00	7.265	1.07	100.39	98.38	98.38	0.00
7.270	1.07	100.39	98.38	98.38	0.00	7.275	1.07	100.39	98.38	98.38	0.00
7.280	1.07	100.39	98.38	98.38	0.00	7.285	1.07	100.39	98.38	98.38	0.00
7.290	1.07	100.39	98.38	98.38	0.00	7.295	1.07	100.39	98.38	98.38	0.00
7.300	1.07	100.39	98.38	98.38	0.00	7.305	1.07	100.39	98.38	98.38	0.00
7.310	1.07	100.39	98.38	98.38	0.00	7.315	1.07	100.39	98.38	98.38	0.00
7.320	1.07	100.39	98.38	98.38	0.00	7.325	1.07	100.39	98.38	98.38	0.00
7.330	1.07	100.39	98.38	98.38	0.00	7.335	1.07	100.39	98.38	98.38	0.00
7.340	1.07	100.39	98.38	98.38	0.00	7.345	1.07	100.39	98.38	98.38	0.00
7.350	1.07	100.39	98.38	98.38	0.00	7.355	1.07	100.39	98.38	98.38	0.00
7.360	1.07	100.39	98.38	98.38	0.00	7.365	1.07	100.39	98.38	98.38	0.00
7.370	1.07	100.39	98.38	98.38	0.00	7.375	1.07	100.39	98.38	98.38	0.00
7.380	1.07	100.39	98.38	98.38	0.00	7.385	1.07	100.39	98.38	98.38	0.00
7.390	1.07	100.39	98.38	98.38	0.00	7.395	1.07	100.39	98.38	98.38	0.00
7.400	1.07	100.39	98.38	98.38	0.00	7.405	1.07	100.39	98.38	98.38	0.00
7.410	1.07	100.39	98.38	98.38	0.00	7.415	1.07	100.39	98.38	98.38	0.00
7.420	1.07	100.39	98.38	98.38	0.00	7.425	1.07	100.39	98.38	98.38	0.00
7.430	1.07	100.39	98.38	98.38	0.00	7.435	1.07	100.39	98.38	98.38	0.00
7.440	1.07	100.39	98.38	98.38	0.00	7.445	1.07	100.39	98.38	98.38	0.00
7.450	1.07	100.39	98.38	98.38	0.00	7.455	1.07	100.39	98.38	98.38	0.00
7.460	1.07	100.39	98.38	98.38	0.00	7.465	1.07	100.39	98.38	98.38	0.00
7.470	1.07	100.39	98.38	98.38	0.00	7.475	1.07	100.39	98.38	98.38	0.00
7.480	1.07	100.39	98.38	98.38	0.00	7.485	1.07	100.39	98.38	98.38	0.00
7.490	1.07	100.39	98.38	98.38	0.00	7.495	1.07	100.39	98.38	98.38	0.00
7.500	1.07	100.39	98.38	98.38	0.00	7.505	1.07	100.39	98.38	98.38	0.00
7.510	1.07	100.39	98.38	98.38	0.00	7.515	1.07	100.39	98.38	98.38	0.00
7.520	1.07	100.39	98.38	98.38	0.00	7.525	1.07	100.39	98.38	98.38	0.00
7.530	1.07	100.39	98.38	98.38	0.00	7.535	1.07	100.39	98.38	98.38	0.00

ct:	Starting Motor	ETAP PowerStation	Page:	33
ion:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
act:	Starting Tanpa Pengasutan		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ame:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
7.540	1.07	100.39	98.38	98.38	0.00	7.545	1.07	100.39	98.38	98.38	0.00
7.550	1.07	100.39	98.38	98.38	0.00	7.555	1.07	100.39	98.38	98.38	0.00
7.560	1.07	100.39	98.38	98.38	0.00	7.565	1.07	100.39	98.38	98.38	0.00
7.570	1.07	100.39	98.38	98.38	0.00	7.575	1.07	100.39	98.38	98.38	0.00
7.580	1.07	100.39	98.38	98.38	0.00	7.585	1.07	100.39	98.38	98.38	0.00
7.590	1.07	100.39	98.38	98.38	0.00	7.595	1.07	100.39	98.38	98.38	0.00
7.600	1.07	100.39	98.38	98.38	0.00	7.605	1.07	100.39	98.38	98.38	0.00
7.610	1.07	100.39	98.38	98.38	0.00	7.615	1.07	100.39	98.38	98.38	0.00
7.620	1.07	100.39	98.38	98.38	0.00	7.625	1.07	100.39	98.38	98.38	0.00
7.630	1.07	100.39	98.38	98.38	0.00	7.635	1.07	100.39	98.38	98.38	0.00
7.640	1.07	100.39	98.38	98.38	0.00	7.645	1.07	100.39	98.38	98.38	0.00
7.650	1.07	100.39	98.38	98.38	0.00	7.655	1.07	100.39	98.38	98.38	0.00
7.660	1.07	100.39	98.38	98.38	0.00	7.665	1.07	100.39	98.38	98.38	0.00
7.670	1.07	100.39	98.38	98.38	0.00	7.675	1.07	100.39	98.38	98.38	0.00
7.680	1.07	100.39	98.38	98.38	0.00	7.685	1.07	100.39	98.38	98.38	0.00
7.690	1.07	100.39	98.38	98.38	0.00	7.695	1.07	100.39	98.38	98.38	0.00
7.700	1.07	100.39	98.38	98.38	0.00	7.705	1.07	100.39	98.38	98.38	0.00
7.710	1.07	100.39	98.38	98.38	0.00	7.715	1.07	100.39	98.38	98.38	0.00
7.720	1.07	100.39	98.38	98.38	0.00	7.725	1.07	100.39	98.38	98.38	0.00
7.730	1.07	100.39	98.38	98.38	0.00	7.735	1.07	100.39	98.38	98.38	0.00
7.740	1.07	100.39	98.38	98.38	0.00	7.745	1.07	100.39	98.38	98.38	0.00
7.750	1.07	100.39	98.38	98.38	0.00	7.755	1.07	100.39	98.38	98.38	0.00
7.760	1.07	100.39	98.38	98.38	0.00	7.765	1.07	100.39	98.38	98.38	0.00
7.770	1.07	100.39	98.38	98.38	0.00	7.775	1.07	100.39	98.38	98.38	0.00
7.780	1.07	100.39	98.38	98.38	0.00	7.785	1.07	100.39	98.38	98.38	0.00
7.790	1.07	100.39	98.38	98.38	0.00	7.795	1.07	100.39	98.38	98.38	0.00
7.800	1.07	100.39	98.38	98.38	0.00	7.805	1.07	100.39	98.38	98.38	0.00
7.810	1.07	100.39	98.38	98.38	0.00	7.815	1.07	100.39	98.38	98.38	0.00
7.820	1.07	100.39	98.38	98.38	0.00	7.825	1.07	100.39	98.38	98.38	0.00
7.830	1.07	100.39	98.38	98.38	0.00	7.835	1.07	100.39	98.38	98.38	0.00
7.840	1.07	100.39	98.38	98.38	0.00	7.845	1.07	100.39	98.38	98.38	0.00
7.850	1.07	100.39	98.38	98.38	0.00	7.855	1.07	100.39	98.38	98.38	0.00
7.860	1.07	100.39	98.38	98.38	0.00	7.865	1.07	100.39	98.38	98.38	0.00
7.870	1.07	100.39	98.38	98.38	0.00	7.875	1.07	100.39	98.38	98.38	0.00
7.880	1.07	100.39	98.38	98.38	0.00	7.885	1.07	100.39	98.38	98.38	0.00
7.890	1.07	100.39	98.38	98.38	0.00	7.895	1.07	100.39	98.38	98.38	0.00

ETAP PowerStation

4.0.0C

Page:

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Date:

03-17-2009

SN:

KLGCONSULT

Revision:

Base

Config.:

Normal

Set:
Starting Motor
PG KEBON AGUNG
Contract:
Starting Tanda Pengasutan
Owner:
DWI HERMAWAN
Name:
kebon agung

Study Case: MS

Motor ID : M01

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
7.900	1.07	100.39	98.38	98.38	0.00	7.915	1.07	100.39	98.38	98.38	0.00
7.910	1.07	100.39	98.38	98.38	0.00	7.915	1.07	100.39	98.38	98.38	0.00
7.920	1.07	100.39	98.38	98.38	0.00	7.925	1.07	100.39	98.38	98.38	0.00
7.930	1.07	100.39	98.38	98.38	0.00	7.935	1.07	100.39	98.38	98.38	0.00
7.940	1.07	100.39	98.38	98.38	0.00	7.945	1.07	100.39	98.38	98.38	0.00
7.950	1.07	100.39	98.38	98.38	0.00	7.955	1.07	100.39	98.38	98.38	0.00
7.960	1.07	100.39	98.38	98.38	0.00	7.965	1.07	100.39	98.38	98.38	0.00
7.970	1.07	100.39	98.38	98.38	0.00	7.975	1.07	100.39	98.38	98.38	0.00
7.980	1.07	100.39	98.38	98.38	0.00	7.985	1.07	100.39	98.38	98.38	0.00
7.990	1.07	100.39	98.38	98.38	0.00	7.995	1.07	100.39	98.38	98.38	0.00
8.000	1.07	100.39	98.38	98.38	0.00						

project:	Starting Motor	ETAP PowerStation	Page:	7
location:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
Contract:	Pengasutan Auto-trafo		SN:	KLGCONSULT
Engineer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
filename:	kebon_agung		Config.:	Normal

SWITCHING MOTORS

Motor	Nameplate										Starting Device				Switch Off	Equipment Cable ID
	ID	Type	Qty	HP/kW	kV	RPM	FLA	%PF	%Eff	H*	Type	%Tap	kvar	%Ws	Sec.	
Mtr1		Ind	1	200.0	0.380	1800	251.9	93.8	95.9	0.25	Auto-xfrm	50.00			2.00	

H is total inertia constant of the shaft in MW-Sec/MVA

SWITCHING MOTORS

Motor	Motor Model				Equipment Parameters				Circuit Parameters					Xr1	Xr2
	ID	Type	Class	ID	X/R	Xlr	Xoc	Td0'	Rs	Xs	Xm	Rr1	Rr2		
Mtr1		SGL2	HV-LS-HT	LV100HP2P					2.8	10.9	297.4	1.0	2.2	15.6	4.3

All reactances are in percent (machine base) and time constants are in seconds.

- DBL1: Double-Cage model with integrated cages
- DBL2: Double-Cage model with independent cages
- SGL1: Single-Cage model
- SGL2: Single-Cage model with deep-bar effect
- TSC: Torque Slip Characteristic

MOTOR MECHANICAL LOAD

Motor	Load Torque ($= a_0 + a_1 W + a_2 W^2 + a_3 W^3$)					
	ID	Model ID	a0	a1	a2	
Mtr1		OPEN VALVE	4.0	-48.0	247.0	-116.0

MOTOR ACCELERATION

Motor ID : Mrl1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc. Torq (%)	Time (Sec.)		Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc. Torq (%)
						0.005	100.00					
0.000	100.00	0.00	0.00	100.00	0.00	0.005	100.00	0.00	0.00	100.00	0.00	0.00
0.010	100.00	0.00	0.00	100.00	0.00	0.015	100.00	0.00	0.00	100.00	0.00	0.00
0.020	100.00	0.00	0.00	100.00	0.00	0.025	100.00	0.00	0.00	100.00	0.00	0.00
0.030	100.00	0.00	0.00	100.00	0.00	0.035	100.00	0.00	0.00	100.00	0.00	0.00
0.040	100.00	0.00	0.00	100.00	0.00	0.045	100.00	0.00	0.00	100.00	0.00	0.00
0.050	100.00	0.00	0.00	100.00	0.00	0.055	100.00	0.00	0.00	100.00	0.00	0.00
0.060	100.00	0.00	0.00	100.00	0.00	0.065	100.00	0.00	0.00	100.00	0.00	0.00
0.070	100.00	0.00	0.00	100.00	0.00	0.075	100.00	0.00	0.00	100.00	0.00	0.00
0.080	100.00	0.00	0.00	100.00	0.00	0.085	100.00	0.00	0.00	100.00	0.00	0.00
0.090	100.00	0.00	0.00	100.00	0.00	0.095	100.00	0.00	0.00	100.00	0.00	0.00
0.100	100.00	0.00	0.00	100.00	0.00	0.105	100.00	0.00	0.00	100.00	0.00	0.00
0.110	100.00	0.00	0.00	100.00	0.00	0.115	100.00	0.00	0.00	100.00	0.00	0.00
0.120	100.00	0.00	0.00	100.00	0.00	0.125	100.00	0.00	0.00	100.00	0.00	0.00
0.130	100.00	0.00	0.00	100.00	0.00	0.135	100.00	0.00	0.00	100.00	0.00	0.00
0.140	100.00	0.00	0.00	100.00	0.00	0.145	100.00	0.00	0.00	100.00	0.00	0.00
0.150	100.00	0.00	0.00	100.00	0.00	0.155	100.00	0.00	0.00	100.00	0.00	0.00
0.160	100.00	0.00	0.00	100.00	0.00	0.165	100.00	0.00	0.00	100.00	0.00	0.00
0.170	100.00	0.00	0.00	100.00	0.00	0.175	100.00	0.00	0.00	100.00	0.00	0.00
0.180	100.00	0.00	0.00	100.00	0.00	0.185	100.00	0.00	0.00	100.00	0.00	0.00
0.190	100.00	0.00	0.00	100.00	0.00	0.195	100.00	0.00	0.00	100.00	0.00	0.00
0.200	100.00	0.00	0.00	100.00	0.00	0.205	100.00	0.00	0.00	100.00	0.00	0.00
0.210	100.00	0.00	0.00	100.00	0.00	0.215	100.00	0.00	0.00	100.00	0.00	0.00
0.220	100.00	0.00	0.00	100.00	0.00	0.225	100.00	0.00	0.00	100.00	0.00	0.00
0.230	100.00	0.00	0.00	100.00	0.00	0.235	100.00	0.00	0.00	100.00	0.00	0.00
0.240	100.00	0.00	0.00	100.00	0.00	0.245	100.00	0.00	0.00	100.00	0.00	0.00
0.250	100.00	0.00	0.00	100.00	0.00	0.255	100.00	0.00	0.00	100.00	0.00	0.00
0.260	100.00	0.00	0.00	100.00	0.00	0.265	100.00	0.00	0.00	100.00	0.00	0.00
0.270	100.00	0.00	0.00	100.00	0.00	0.275	100.00	0.00	0.00	100.00	0.00	0.00
0.280	100.00	0.00	0.00	100.00	0.00	0.285	100.00	0.00	0.00	100.00	0.00	0.00
0.290	100.00	0.00	0.00	100.00	0.00	0.295	100.00	0.00	0.00	100.00	0.00	0.00
0.300	100.00	0.00	0.00	100.00	0.00	0.305	100.00	0.00	0.00	100.00	0.00	0.00
0.310	100.00	0.00	0.00	100.00	0.00	0.315	100.00	0.00	0.00	100.00	0.00	0.00
0.320	100.00	0.00	0.00	100.00	0.00	0.325	100.00	0.00	0.00	100.00	0.00	0.00
0.330	100.00	0.00	0.00	100.00	0.00	0.335	100.00	0.00	0.00	100.00	0.00	0.00

project: Starting Motor
location: PG. KEBON AGUNG
contract: Pengasutan Auto-tatio
engineer: DWI HERMAWAN
filename: kebon_agung

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)						
						Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
0.340	100.00	0.00	0.00	100.00	0.00	0.345	100.00	0.00	0.00	100.00	0.00
0.350	100.00	0.00	0.00	100.00	0.00	0.355	100.00	0.00	0.00	100.00	0.00
0.360	100.00	0.00	0.00	100.00	0.00	0.365	100.00	0.00	0.00	100.00	0.00
0.370	100.00	0.00	0.00	100.00	0.00	0.375	100.00	0.00	0.00	100.00	0.00
0.380	100.00	0.00	0.00	100.00	0.00	0.385	100.00	0.00	0.00	100.00	0.00
0.390	100.00	0.00	0.00	100.00	0.00	0.395	100.00	0.00	0.00	100.00	0.00
0.400	100.00	0.00	0.00	100.00	0.00	0.405	100.00	0.00	0.00	100.00	0.00
0.410	100.00	0.00	0.00	100.00	0.00	0.415	100.00	0.00	0.00	100.00	0.00
0.420	100.00	0.00	0.00	100.00	0.00	0.425	100.00	0.00	0.00	100.00	0.00
0.430	100.00	0.00	0.00	100.00	0.00	0.435	100.00	0.00	0.00	100.00	0.00
0.440	100.00	0.00	0.00	100.00	0.00	0.445	100.00	0.00	0.00	100.00	0.00
0.450	100.00	0.00	0.00	100.00	0.00	0.455	100.00	0.00	0.00	100.00	0.00
0.460	100.00	0.00	0.00	100.00	0.00	0.465	100.00	0.00	0.00	100.00	0.00
0.470	100.00	0.00	0.00	100.00	0.00	0.475	100.00	0.00	0.00	100.00	0.00
0.480	100.00	0.00	0.00	100.00	0.00	0.485	100.00	0.00	0.00	100.00	0.00
0.490	100.00	0.00	0.00	100.00	0.00	0.495	100.00	0.00	0.00	100.00	0.00
0.500	99.84	151.33	48.40	96.79	16.14	0.505	99.68	151.17	48.40	96.80	16.18
0.510	99.51	151.01	48.40	96.80	16.22	0.515	99.35	150.85	48.40	96.80	16.27
0.520	99.19	150.69	48.40	96.81	16.31	0.525	99.02	150.53	48.41	96.81	16.35
0.530	98.86	150.38	48.41	96.81	16.39	0.535	98.70	150.22	48.41	96.82	16.42
0.540	98.53	150.06	48.41	96.82	16.46	0.545	98.37	149.90	48.41	96.82	16.50
0.550	98.20	149.74	48.41	96.83	16.53	0.555	98.04	149.58	48.42	96.83	16.56
0.560	97.87	149.42	48.42	96.84	16.60	0.565	97.70	149.27	48.42	96.84	16.63
0.570	97.54	149.11	48.42	96.84	16.66	0.575	97.37	148.95	48.42	96.85	16.69
0.580	97.20	148.79	48.42	96.85	16.72	0.585	97.03	148.63	48.43	96.85	16.74
0.590	96.87	148.47	48.43	96.86	16.77	0.595	96.70	148.31	48.43	96.86	16.79
0.600	96.53	148.16	48.43	96.86	16.82	0.605	96.36	148.00	48.43	96.87	16.84
0.610	96.19	147.84	48.43	96.87	16.86	0.615	96.02	147.68	48.44	96.87	16.88
0.620	95.86	147.52	48.44	96.88	16.90	0.625	95.69	147.37	48.44	96.88	16.92
0.630	95.52	147.21	48.44	96.88	16.94	0.635	95.35	147.05	48.44	96.89	16.95
0.640	95.18	146.90	48.44	96.89	16.97	0.645	95.01	146.74	48.45	96.89	16.98
0.650	94.84	146.58	48.45	96.90	17.00	0.655	94.67	146.43	48.45	96.90	17.01
0.660	94.50	146.27	48.45	96.90	17.02	0.665	94.33	146.11	48.45	96.91	17.03
0.670	94.16	145.96	48.45	96.91	17.03	0.675	93.99	145.80	48.46	96.91	17.04
0.680	93.81	145.65	48.46	96.92	17.05	0.685	93.64	145.49	48.46	96.92	17.05
0.690	93.47	145.34	48.46	96.92	17.06	0.695	93.30	145.18	48.46	96.92	17.06

project: Starting Motor

location: PG. KEBON AGUNG

contract: Pengasutan Auto-trafo

engineer: DWI HERMAWAN

filename: kebon_agung

ETAP PowerStation

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Date: 03-17-2009

SN: KLGCONSULT

Revision: Base

Config: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
0.700	93.13	145.03	48.46	96.93	17.06	0.705	92.96	144.88	48.47	96.93	17.06
0.710	92.79	144.72	48.47	96.93	17.06	0.715	92.62	144.57	48.47	96.94	17.06
0.720	92.45	144.42	48.47	96.94	17.05	0.725	92.28	144.26	48.47	96.94	17.05
0.730	92.11	144.11	48.47	96.95	17.05	0.735	91.94	143.96	48.48	96.95	17.04
0.740	91.77	143.81	48.48	96.95	17.03	0.745	91.60	143.66	48.48	96.96	17.02
0.750	91.43	143.51	48.48	96.96	17.01	0.755	91.26	143.36	48.48	96.96	17.00
0.760	91.09	143.21	48.48	96.97	16.99	0.765	90.92	143.06	48.48	96.97	16.98
0.770	90.75	142.91	48.49	96.97	16.97	0.775	90.58	142.76	48.49	96.98	16.95
0.780	90.41	142.61	48.49	96.98	16.93	0.785	90.24	142.46	48.49	96.98	16.92
0.790	90.07	142.32	48.49	96.99	16.90	0.795	89.90	142.17	48.49	96.99	16.88
0.800	89.73	142.02	48.50	96.99	16.86	0.805	89.56	141.88	48.50	97.00	16.84
0.810	89.40	141.73	48.50	97.00	16.82	0.815	89.23	141.59	48.50	97.00	16.79
0.820	89.06	141.44	48.50	97.00	16.77	0.825	88.89	141.30	48.50	97.01	16.75
0.830	88.72	141.15	48.51	97.01	16.72	0.835	88.56	141.01	48.51	97.01	16.69
0.840	88.39	140.87	48.51	97.02	16.67	0.845	88.22	140.73	48.51	97.02	16.64
0.850	88.06	140.59	48.51	97.02	16.61	0.855	87.89	140.44	48.51	97.03	16.58
0.860	87.73	140.30	48.51	97.03	16.54	0.865	87.56	140.16	48.52	97.03	16.51
0.870	87.40	140.03	48.52	97.03	16.48	0.875	87.23	139.89	48.52	97.04	16.44
0.880	87.07	139.75	48.52	97.04	16.41	0.885	86.90	139.61	48.52	97.04	16.37
0.890	86.74	139.47	48.52	97.05	16.34	0.895	86.58	139.34	48.52	97.05	16.30
0.900	86.42	139.20	48.53	97.05	16.26	0.905	86.25	139.07	48.53	97.05	16.22
0.910	86.09	138.93	48.53	97.06	16.18	0.915	85.93	138.80	48.53	97.06	16.14
0.920	85.77	138.66	48.53	97.06	16.10	0.925	85.61	138.53	48.53	97.07	16.06
0.930	85.45	138.40	48.53	97.07	16.01	0.935	85.29	138.27	48.54	97.07	15.97
0.940	85.13	138.14	48.54	97.07	15.93	0.945	84.97	138.00	48.54	97.08	15.88
0.950	84.81	137.87	48.54	97.08	15.83	0.955	84.65	137.75	48.54	97.08	15.79
0.960	84.50	137.52	48.54	97.09	15.74	0.965	84.34	137.49	48.54	97.09	15.69
0.970	84.18	137.36	48.55	97.09	15.64	0.975	84.03	137.23	48.55	97.09	15.59
0.980	83.87	137.11	48.55	97.10	15.54	0.985	83.72	136.98	48.55	97.10	15.49
0.990	83.56	136.86	48.55	97.10	15.44	0.995	83.41	136.73	48.55	97.10	15.39
1.000	83.25	136.61	48.55	97.11	15.34	1.005	83.10	136.49	48.55	97.11	15.28
1.010	82.95	136.36	48.56	97.11	15.23	1.015	82.80	136.24	48.56	97.11	15.18
1.020	82.64	136.12	48.56	97.12	15.12	1.025	82.49	136.00	48.56	97.12	15.07
1.030	82.34	135.88	48.56	97.12	15.01	1.035	82.19	135.76	48.56	97.12	14.96
1.040	82.05	135.64	48.56	97.13	14.90	1.045	81.90	135.52	48.56	97.13	14.84
1.050	81.75	135.41	48.57	97.13	14.78	1.055	81.60	135.29	48.57	97.13	14.73

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Auto-trafo
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation

4.0.0C

Date: 03-17-2009
 S/N: KLGCNSULT
 Revision: Base
 Config: Normal

Study Case: MS

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Date: 03-17-2009

S/N: KLGCNSULT

Revision: Base

Config: Normal

Motor ID: Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
1.060	81.45	135.17	48.57	97.14	14.67	1.065	81.31	135.06	48.57	97.14	14.61
1.070	81.16	134.94	48.57	97.14	14.55	1.075	81.02	134.83	48.57	97.14	14.49
1.080	80.87	134.72	48.57	97.15	14.43	1.085	80.73	134.60	48.57	97.15	14.37
1.090	80.59	134.49	48.58	97.15	14.31	1.095	80.44	134.38	48.58	97.15	14.24
1.100	80.30	134.27	48.58	97.16	14.18	1.105	80.16	134.16	48.58	97.16	14.12
1.110	80.02	134.05	48.58	97.16	14.06	1.115	79.88	133.94	48.58	97.16	14.00
1.120	79.74	133.83	48.58	97.17	13.93	1.125	79.60	133.73	48.58	97.17	13.87
1.130	79.46	133.62	48.59	97.17	13.81	1.135	79.33	133.51	48.59	97.17	13.74
1.140	79.19	133.41	48.59	97.17	13.68	1.145	79.05	133.30	48.59	97.18	13.61
1.150	78.92	133.20	48.59	97.18	13.55	1.155	78.78	133.09	48.59	97.18	13.48
1.160	78.65	132.99	48.59	97.18	13.42	1.165	78.52	132.89	48.59	97.19	13.35
1.170	78.38	132.79	48.59	97.19	13.29	1.175	78.25	132.69	48.60	97.19	13.22
1.180	78.12	132.59	48.60	97.19	13.16	1.185	77.99	132.49	48.60	97.19	13.09
1.190	77.86	132.39	48.60	97.20	13.02	1.195	77.73	132.29	48.60	97.20	12.96
1.200	77.60	132.19	48.60	97.20	12.89	1.205	77.47	132.09	48.60	97.20	12.82
1.210	77.34	132.00	48.60	97.20	12.76	1.215	77.22	131.90	48.60	97.21	12.69
1.220	77.09	131.81	48.60	97.21	12.62	1.225	76.96	131.71	48.61	97.21	12.56
1.230	76.84	131.62	48.61	97.21	12.49	1.235	76.71	131.52	48.61	97.21	12.42
1.240	76.59	131.43	48.61	97.22	12.35	1.245	76.47	131.34	48.61	97.22	12.29
1.250	76.35	131.25	48.61	97.22	12.22	1.255	76.22	131.16	48.61	97.22	12.15
1.260	76.10	131.07	48.61	97.22	12.08	1.265	75.98	130.98	48.61	97.23	12.02
1.270	75.86	130.89	48.61	97.23	11.95	1.275	75.74	130.80	48.62	97.23	11.88
1.280	75.63	130.71	48.62	97.23	11.81	1.285	75.51	130.63	48.62	97.23	11.75
1.290	75.39	130.54	48.62	97.24	11.68	1.295	75.28	130.45	48.62	97.24	11.61
1.300	75.16	130.37	48.62	97.24	11.54	1.305	75.05	130.28	48.62	97.24	11.47
1.310	74.93	130.20	48.62	97.24	11.41	1.315	74.82	130.12	48.62	97.24	11.34
1.320	74.71	130.03	48.62	97.25	11.27	1.325	74.59	129.95	48.62	97.25	11.21
1.330	74.48	129.87	48.63	97.25	11.14	1.335	74.37	129.79	48.63	97.25	11.07
1.340	74.26	129.71	48.63	97.25	11.00	1.345	74.15	129.63	48.63	97.26	10.94
1.350	74.04	129.55	48.63	97.26	10.87	1.355	73.93	129.47	48.63	97.26	10.80
1.360	73.83	129.39	48.63	97.26	10.74	1.365	73.72	129.31	48.63	97.26	10.67
1.370	73.61	129.23	48.63	97.26	10.60	1.375	73.51	129.16	48.63	97.27	10.54
1.380	73.40	129.08	48.63	97.27	10.47	1.385	73.30	129.01	48.63	97.27	10.40
1.390	73.20	128.93	48.63	97.27	10.34	1.395	73.09	128.86	48.64	97.27	10.27
1.400	72.99	128.78	48.64	97.27	10.21	1.405	72.89	128.71	48.64	97.27	10.14
1.410	72.79	128.64	48.64	97.28	10.08	1.415	72.69	128.57	48.64	97.28	10.01

project: Starting Motor
 location: PG. KEBON AGUNG
 contract: Pengasutan Auto-ratio
 engineer: DWI HERMAWAN
 filename: kebon_agung

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
1.420	72.59	128.49	48.64	97.28	9.95	1.425	72.49	128.42	48.64	97.28	9.88
1.430	72.39	128.35	48.64	97.28	9.82	1.435	72.29	128.28	48.64	97.28	9.75
1.440	72.20	128.21	48.64	97.29	9.69	1.445	72.10	128.14	48.64	97.29	9.62
1.450	72.01	128.08	48.64	97.29	9.56	1.455	71.91	128.01	48.64	97.29	9.50
1.460	71.82	127.94	48.65	97.29	9.43	1.465	71.72	127.87	48.65	97.29	9.37
1.470	71.63	127.81	48.65	97.29	9.31	1.475	71.54	127.74	48.65	97.30	9.24
1.480	71.45	127.68	48.65	97.30	9.18	1.485	71.35	127.61	48.65	97.30	9.12
1.490	71.26	127.55	48.65	97.30	9.06	1.495	71.17	127.48	48.65	97.30	8.99
1.500	71.08	127.42	48.65	97.30	8.93	1.505	71.00	127.36	48.65	97.30	8.87
1.510	70.91	127.29	48.65	97.30	8.81	1.515	70.82	127.23	48.65	97.31	8.75
1.520	70.73	127.17	48.65	97.31	8.69	1.525	70.65	127.11	48.65	97.31	8.63
1.530	70.56	127.05	48.65	97.31	8.57	1.535	70.48	126.99	48.66	97.31	8.51
1.540	70.39	126.93	48.66	97.31	8.45	1.545	70.31	126.87	48.66	97.31	8.39
1.550	70.22	126.81	48.66	97.32	8.33	1.555	70.14	126.76	48.66	97.32	8.27
1.560	70.06	126.70	48.66	97.32	8.21	1.565	69.98	126.64	48.66	97.32	8.15
1.570	69.90	126.58	48.66	97.32	8.09	1.575	69.82	126.53	48.66	97.32	8.03
1.580	69.74	126.47	48.66	97.32	7.98	1.585	69.66	126.42	48.66	97.32	7.92
1.590	69.58	126.36	48.66	97.32	7.86	1.595	69.50	126.31	48.66	97.33	7.80
1.600	69.42	126.25	48.66	97.33	7.75	1.605	69.35	126.20	48.66	97.33	7.69
1.610	69.27	126.15	48.66	97.33	7.64	1.615	69.19	126.09	48.67	97.33	7.58
1.620	69.12	126.04	48.67	97.33	7.52	1.625	69.04	125.99	48.67	97.33	7.47
1.630	68.97	125.94	48.67	97.33	7.41	1.635	68.90	125.89	48.67	97.33	7.36
1.640	68.82	125.84	48.67	97.34	7.30	1.645	68.75	125.79	48.67	97.34	7.25
1.650	68.68	125.74	48.67	97.34	7.20	1.655	68.61	125.69	48.67	97.34	7.14
1.660	68.54	125.64	48.67	97.34	7.09	1.665	68.47	125.59	48.67	97.34	7.04
1.670	68.40	125.54	48.67	97.34	6.98	1.675	68.33	125.49	48.67	97.34	6.93
1.680	68.26	125.45	48.67	97.34	6.88	1.685	68.19	125.40	48.67	97.35	6.83
1.690	68.12	125.35	48.67	97.35	6.77	1.695	68.05	125.31	48.67	97.35	6.72
1.720	67.73	125.08	48.68	97.35	6.47	1.725	67.66	125.04	48.68	97.35	6.42
1.730	67.60	124.99	48.68	97.35	6.37	1.735	67.53	124.95	48.68	97.35	6.32
1.740	67.47	124.91	48.68	97.36	6.27	1.745	67.41	124.86	48.68	97.36	6.23
1.750	67.35	124.82	48.68	97.36	6.18	1.755	67.29	124.78	48.68	97.36	6.13
1.760	67.23	124.74	48.68	97.36	6.08	1.765	67.16	124.70	48.68	97.36	6.04
1.770	67.10	124.66	48.68	97.36	5.99	1.775	67.05	124.62	48.68	97.36	5.94

project: Starting Motor
 .location: PG. KEBON AGUNG
 contract: Pengasutan Auto-trafo
 engineer: DWI HERMAWAN
 filename: kebon_agung

ETAP PowerStation

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Page: 17
 Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

Motor ID : M01

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (% of FLA)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
1.780	66.99	124.58	48.68	97.36	5.89	1.785	66.93	124.54	48.68	97.36	5.85
1.790	66.87	124.50	48.68	97.36	5.80	1.795	66.81	124.46	48.68	97.37	5.76
1.800	66.76	124.42	48.68	97.37	5.71	1.805	66.70	124.33	48.68	97.37	5.67
1.810	66.64	124.34	48.68	97.37	5.62	1.815	66.59	124.30	48.68	97.37	5.58
1.820	66.53	124.27	48.68	97.37	5.53	1.825	66.48	124.23	48.68	97.37	5.49
1.830	66.42	124.19	48.69	97.37	5.45	1.835	66.37	124.16	48.69	97.37	5.40
1.840	66.31	124.12	48.69	97.37	5.36	1.845	66.26	124.08	48.69	97.37	5.32
1.850	66.21	124.05	48.69	97.37	5.28	1.855	66.16	124.01	48.69	97.37	5.23
1.860	66.10	123.98	48.69	97.38	5.19	1.865	66.05	123.94	48.69	97.38	5.15
1.870	66.00	123.91	48.69	97.38	5.11	1.875	65.95	123.87	48.69	97.38	5.07
1.880	65.90	123.84	48.69	97.38	5.03	1.885	65.85	123.81	48.69	97.38	4.99
1.890	65.80	123.77	48.69	97.38	4.95	1.895	65.75	123.74	48.69	97.38	4.91
1.900	65.70	123.71	48.69	97.38	4.87	1.905	65.65	123.68	48.69	97.38	4.83
1.910	65.61	123.64	48.69	97.38	4.79	1.915	65.56	123.61	48.69	97.38	4.75
1.920	65.51	123.58	48.69	97.38	4.71	1.925	65.47	123.55	48.69	97.38	4.67
1.930	65.42	123.52	48.69	97.39	4.63	1.935	65.37	123.49	48.69	97.39	4.60
1.940	65.33	123.46	48.69	97.39	4.56	1.945	65.28	123.43	48.69	97.39	4.52
1.950	65.24	123.40	48.69	97.39	4.48	1.955	65.19	123.37	48.69	97.39	4.45
1.960	65.15	123.34	48.69	97.39	4.41	1.965	65.10	123.31	48.69	97.39	4.38
1.970	65.06	123.28	48.70	97.39	4.34	1.975	65.02	123.25	48.70	97.39	4.30
1.980	64.98	123.22	48.70	97.39	4.27	1.985	64.93	123.19	48.70	97.39	4.23
1.990	64.89	123.16	48.70	97.39	4.20	1.995	64.85	123.14	48.70	97.39	4.16
2.000	64.81	123.11	48.70	97.39	4.13	2.005	64.77	123.08	48.70	97.39	4.09
2.010	64.73	123.05	48.70	97.39	4.06	2.015	64.69	123.03	48.70	97.40	4.03
2.020	64.65	123.00	48.70	97.40	3.99	2.025	64.61	122.97	48.70	97.40	3.96
2.030	64.57	122.95	48.70	97.40	3.93	2.035	64.53	122.92	48.70	97.40	3.90
2.040	64.49	122.90	48.70	97.40	3.86	2.045	64.45	122.87	48.70	97.40	3.83
2.050	64.41	122.85	48.70	97.40	3.80	2.055	64.38	122.82	48.70	97.40	3.77
2.060	64.34	122.80	48.70	97.40	3.74	2.065	64.30	122.77	48.70	97.40	3.70
2.070	64.26	122.75	48.70	97.40	3.67	2.075	64.23	122.72	48.70	97.40	3.64
2.080	64.19	122.70	48.70	97.40	3.61	2.085	64.16	122.68	48.70	97.40	3.58
2.090	64.12	122.65	48.70	97.40	3.55	2.095	64.09	122.63	48.70	97.40	3.52
2.100	64.05	122.61	48.70	97.40	3.49	2.105	64.02	122.58	48.70	97.40	3.46
2.110	63.98	122.56	48.70	97.41	3.43	2.115	63.95	122.54	48.70	97.41	3.40
2.120	63.91	122.52	48.70	97.41	3.38	2.125	63.88	122.49	48.70	97.41	3.35
2.130	63.85	122.47	48.70	97.41	3.32	2.135	63.81	122.45	48.70	97.41	3.29

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
2.140	63.78	122.43	48.70	97.41	3.26	2.145	63.75	122.41	48.70	97.41	3.24
2.150	63.72	122.39	48.70	97.41	3.21	2.155	63.69	122.36	48.70	97.41	3.18
2.160	63.65	122.34	48.70	97.41	3.15	2.165	63.62	122.32	48.71	97.41	3.13
2.170	63.59	122.30	48.71	97.41	3.10	2.175	63.56	122.28	48.71	97.41	3.07
2.180	63.53	122.26	48.71	97.41	3.05	2.185	63.50	122.24	48.71	97.41	3.02
2.190	63.47	122.22	48.71	97.41	3.00	2.195	63.44	122.20	48.71	97.41	2.97
2.200	63.41	122.18	48.71	97.41	2.94	2.205	63.38	122.16	48.71	97.41	2.92
2.210	63.35	122.15	48.71	97.41	2.89	2.215	63.32	122.13	48.71	97.41	2.87
2.220	63.30	122.11	48.71	97.41	2.85	2.225	63.27	122.09	48.71	97.42	2.82
2.230	63.24	122.07	48.71	97.42	2.80	2.235	63.21	122.05	48.71	97.42	2.77
2.240	63.18	122.03	48.71	97.42	2.75	2.245	63.16	122.02	48.71	97.42	2.73
2.250	63.13	122.00	48.71	97.42	2.70	2.255	63.10	121.98	48.71	97.42	2.68
2.260	63.08	121.96	48.71	97.42	2.66	2.265	63.05	121.95	48.71	97.42	2.63
2.270	63.02	121.93	48.71	97.42	2.61	2.275	63.00	121.91	48.71	97.42	2.59
2.280	62.97	121.90	48.71	97.42	2.57	2.285	62.95	121.88	48.71	97.42	2.54
2.290	62.92	121.86	48.71	97.42	2.52	2.295	62.90	121.85	48.71	97.42	2.50
2.300	62.87	121.83	48.71	97.42	2.48	2.305	62.85	121.81	48.71	97.42	2.46
2.310	62.82	121.80	48.71	97.42	2.44	2.315	62.80	121.78	48.71	97.42	2.41
2.320	62.77	121.77	48.71	97.42	2.39	2.325	62.75	121.75	48.71	97.42	2.37
2.330	62.73	121.74	48.71	97.42	2.35	2.335	62.70	121.72	48.71	97.42	2.33
2.340	62.68	121.71	48.71	97.42	2.31	2.345	62.66	121.69	48.71	97.42	2.29
2.350	62.64	121.68	48.71	97.42	2.27	2.355	62.61	121.66	48.71	97.42	2.25
2.360	62.59	121.65	48.71	97.42	2.23	2.365	62.57	121.63	48.71	97.43	2.21
2.370	62.55	121.62	48.71	97.43	2.19	2.375	62.52	121.60	48.71	97.43	2.17
2.380	62.50	121.59	48.71	97.43	2.16	2.385	62.48	121.58	48.71	97.43	2.14
2.390	62.46	121.56	48.71	97.43	2.12	2.395	62.44	121.55	48.71	97.43	2.10
2.400	62.42	121.53	48.71	97.43	2.08	2.405	62.40	121.52	48.71	97.43	2.06
2.410	62.38	121.51	48.71	97.43	2.05	2.415	62.36	121.49	48.71	97.43	2.03
2.420	62.34	121.48	48.71	97.43	2.01	2.425	62.32	121.47	48.71	97.43	1.99
2.430	62.30	121.46	48.71	97.43	1.97	2.435	62.28	121.44	48.71	97.43	1.96
2.440	62.26	121.43	48.71	97.43	1.94	2.445	62.24	121.42	48.71	97.43	1.92
2.450	62.22	121.40	48.71	97.43	1.91	2.455	62.20	121.39	48.72	97.43	1.89
2.460	62.18	121.38	48.72	97.43	1.87	2.465	62.16	121.37	48.72	97.43	1.86
2.470	62.15	121.36	48.72	97.43	1.84	2.475	62.13	121.34	48.72	97.43	1.82
2.480	62.11	121.33	48.72	97.43	1.81	2.485	62.09	121.32	48.72	97.43	1.79
2.490	62.07	121.31	48.72	97.43	1.78	2.495	62.06	121.30	48.72	97.43	1.76

Project:	Starting Motor	ETAP PowerStation 4.0.0C				Page:	19
Location:	PG. KEBON AGUNG					Date:	03-17-2009
Contract:	Pengasutan Auto-trafo					SN:	KLGCONSULT
Engineer:	DWI HERMAWAN	Study Case: MS				Revision:	Base
Filename:	kebon_agung					Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
2.500	62.04	121.29	48.72	97.43	1.75	2.505	61.63	450.42	90.47	90.47	40.86
2.510	61.22	449.50	90.48	90.48	40.48	2.515	60.82	448.61	90.50	90.50	40.11
2.520	60.43	447.73	90.52	90.52	39.74	2.525	60.03	446.85	90.54	90.54	39.37
2.530	59.64	445.99	90.56	90.56	39.01	2.535	59.25	445.14	90.58	90.58	38.64
2.540	58.87	444.30	90.59	90.59	38.28	2.545	58.49	443.47	90.61	90.61	37.93
2.550	58.12	442.65	90.63	90.63	37.57	2.555	57.74	441.84	90.65	90.65	37.22
2.560	57.37	441.04	90.66	90.66	36.87	2.565	57.01	440.25	90.68	90.68	36.52
2.570	56.65	439.47	90.70	90.70	36.18	2.575	56.29	438.70	90.71	90.71	35.84
2.580	55.93	437.94	90.73	90.73	35.50	2.585	55.58	437.19	90.74	90.74	35.17
2.590	55.23	436.45	90.76	90.76	34.83	2.595	54.89	435.71	90.78	90.78	34.51
2.600	54.55	434.99	90.79	90.79	34.18	2.605	54.21	434.27	90.81	90.81	33.86
2.610	53.87	433.56	90.82	90.82	33.54	2.615	53.54	432.86	90.84	90.84	33.22
2.620	53.21	432.17	90.85	90.85	32.91	2.625	52.88	431.49	90.87	90.87	32.60
2.630	52.56	430.81	90.88	90.88	32.29	2.635	52.24	430.14	90.89	90.89	31.98
2.640	51.92	429.48	90.91	90.91	31.68	2.645	51.61	428.83	90.92	90.92	31.39
2.650	51.30	428.19	90.94	90.94	31.09	2.655	50.99	427.55	90.95	90.95	30.80
2.660	50.68	426.92	90.96	90.96	30.51	2.665	50.38	426.29	90.98	90.98	30.23
2.670	50.08	425.68	90.99	90.99	29.94	2.675	49.79	425.07	91.00	91.00	29.66
2.680	49.49	424.47	91.01	91.01	29.39	2.685	49.20	423.87	91.03	91.03	29.12
2.690	48.91	423.28	91.04	91.04	28.85	2.695	48.63	422.70	91.05	91.05	28.58
2.700	48.34	422.12	91.06	91.06	28.32	2.705	48.06	421.55	91.08	91.08	28.06
2.710	47.78	420.99	91.09	91.09	27.80	2.715	47.51	420.43	91.10	91.10	27.55
2.720	47.24	419.88	91.11	91.11	27.29	2.725	46.96	419.33	91.12	91.12	27.05
2.730	46.70	418.79	91.13	91.13	26.80	2.735	46.43	418.26	91.14	91.14	26.56
2.740	46.17	417.73	91.16	91.16	26.32	2.745	45.91	417.20	91.17	91.17	26.09
2.750	45.65	416.69	91.18	91.18	25.85	2.755	45.39	416.17	91.19	91.19	25.62
2.760	45.14	415.67	91.20	91.20	25.40	2.765	44.89	415.16	91.21	91.21	25.17
2.770	44.64	414.67	91.22	91.22	24.95	2.775	44.39	414.17	91.23	91.23	24.73
2.780	44.14	413.68	91.24	91.24	24.52	2.785	43.90	413.20	91.25	91.25	24.31
2.790	43.66	412.72	91.26	91.26	24.10	2.795	43.42	412.25	91.27	91.27	23.89
2.800	43.18	411.78	91.28	91.28	23.69	2.805	42.95	411.31	91.29	91.29	23.49
2.810	42.71	410.85	91.30	91.30	23.29	2.815	42.48	410.40	91.31	91.31	23.09
2.820	42.25	409.95	91.32	91.32	22.90	2.825	42.03	409.50	91.33	91.33	22.71
2.830	41.80	409.05	91.34	91.34	22.52	2.835	41.58	408.61	91.35	91.35	22.34
2.840	41.36	408.18	91.36	91.36	22.15	2.845	41.14	407.75	91.37	91.37	21.97
2.850	40.92	407.32	91.38	91.38	21.80	2.855	40.70	406.89	91.38	91.38	21.62

project:
Starting Motor
location:
PG. KEBON AGUNG
contract:
Pengasutan Auto-trafo
engineer:
DWI HERMAWAN
filename:
kebon_agung

ETAP PowerStation
4.0.0C
Study Case: MS
Motor ID.: Mtr1

Page: 20
Date: 03-17-2009
SN: KLGCONSULT
Revision: Base
Config.: Normal

Motor ID.: Mtr1							
Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)
							(% of FLA)
2.860	40.49	406.47	91.39	91.39	21.45	2.865	40.27
2.870	40.06	405.64	91.41	91.41	21.11	2.875	39.85
2.880	39.65	404.82	91.43	91.43	20.79	2.885	39.44
2.890	39.23	404.02	91.44	91.44	20.47	2.895	39.03
2.900	38.83	403.23	91.46	91.46	20.16	2.905	38.63
2.910	38.43	402.45	91.48	91.48	19.86	2.915	38.23
2.920	38.04	401.68	91.49	91.49	19.58	2.925	37.84
2.930	37.65	400.93	91.51	91.51	19.30	2.935	37.46
2.940	37.27	400.18	91.53	91.53	19.02	2.945	37.08
2.950	36.89	399.45	91.54	91.54	18.76	2.955	36.70
2.960	36.52	398.72	91.56	91.56	18.51	2.965	36.34
2.970	36.15	398.01	91.57	91.57	18.26	2.975	35.97
2.980	35.79	397.30	91.59	91.59	18.03	2.985	35.61
2.990	35.43	396.61	91.60	91.60	17.80	2.995	35.26
3.000	35.08	395.92	91.62	91.62	17.58	3.005	34.91
3.010	34.73	395.24	91.63	91.63	17.37	3.015	34.56
3.020	34.39	394.57	91.64	91.64	17.16	3.025	34.22
3.030	34.05	393.91	91.66	91.66	16.96	3.035	33.88
3.040	33.71	393.25	91.67	91.67	16.77	3.045	33.54
3.050	33.38	392.60	91.69	91.69	16.59	3.055	33.21
3.060	33.05	391.96	91.70	91.70	16.42	3.065	32.88
3.070	32.72	391.32	91.71	91.71	16.25	3.075	32.56
3.080	32.40	390.68	91.73	91.73	16.09	3.085	32.24
3.090	32.08	390.06	91.74	91.74	15.94	3.095	31.92
3.100	31.76	389.44	91.75	91.75	15.79	3.105	31.61
3.110	31.45	388.82	91.76	91.76	15.65	3.115	31.29
3.120	31.14	388.20	91.78	91.78	15.52	3.125	30.98
3.130	30.83	387.60	91.79	91.79	15.40	3.135	30.68
3.140	30.52	386.99	91.80	91.80	15.28	3.145	30.37
3.150	30.22	386.39	91.82	91.82	15.17	3.155	30.07
3.160	29.92	385.79	91.83	91.83	15.07	3.165	29.77
3.170	29.62	385.19	91.84	91.84	14.97	3.175	29.47
3.180	29.32	384.60	91.85	91.85	14.88	3.185	29.17
3.190	29.02	384.00	91.87	91.87	14.80	3.195	28.87
3.200	28.73	383.41	91.88	91.88	14.72	3.205	28.58
3.210	28.43	382.82	91.89	91.89	14.65	3.215	28.29

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Date: 03-17-2009

SN:

KLGCONSULT

Revision: Base

Config.: Normal

Project:	Starting Motor	ETAP PowerStation	Page:	21
Location:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
Contract:	Pengasutan Auto-trafo		SN:	KLGCONSULT
Engineer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
Filename:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
3.220	28.14	382.23	91.90	91.90	14.59	3.225	28.00	381.94	91.91	91.91	14.56
3.230	27.85	381.65	91.92	91.92	14.54	3.235	27.70	381.35	91.92	91.92	14.51
3.240	27.56	381.06	91.93	91.93	14.49	3.245	27.42	380.76	91.94	91.94	14.47
3.250	27.27	380.47	91.94	91.94	14.45	3.255	27.13	380.17	91.95	91.95	14.43
3.260	26.98	379.88	91.95	91.95	14.42	3.265	26.84	379.58	91.96	91.96	14.40
3.270	26.69	379.29	91.97	91.97	14.39	3.275	26.55	378.99	91.97	91.97	14.38
3.280	26.41	378.70	91.98	91.98	14.38	3.285	26.26	378.40	91.99	91.99	14.37
3.290	26.12	378.10	91.99	91.99	14.37	3.295	25.97	377.80	92.00	92.00	14.37
3.300	25.83	377.50	92.00	92.00	14.37	3.305	25.69	377.20	92.01	92.01	14.37
3.310	25.54	376.90	92.02	92.02	14.38	3.315	25.40	376.60	92.02	92.02	14.38
3.320	25.26	376.30	92.03	92.03	14.39	3.325	25.11	376.00	92.04	92.04	14.40
3.330	24.97	375.69	92.04	92.04	14.42	3.335	24.82	375.39	92.05	92.05	14.43
3.340	24.68	375.08	92.06	92.06	14.45	3.345	24.53	374.77	92.06	92.06	14.48
3.350	24.39	374.46	92.07	92.07	14.50	3.355	24.24	374.15	92.08	92.08	14.53
3.360	24.10	373.84	92.08	92.08	14.55	3.365	23.95	373.53	92.09	92.09	14.59
3.370	23.80	373.21	92.10	92.10	14.62	3.375	23.66	372.90	92.10	92.10	14.66
3.380	23.51	372.58	92.11	92.11	14.70	3.385	23.36	372.25	92.12	92.12	14.74
3.390	23.22	371.93	92.12	92.12	14.79	3.395	23.07	371.61	92.13	92.13	14.83
3.400	22.92	371.28	92.14	92.14	14.89	3.405	22.77	370.95	92.14	92.14	14.94
3.410	22.62	370.61	92.15	92.15	15.00	3.415	22.47	370.28	92.16	92.16	15.06
3.420	22.32	369.94	92.17	92.17	15.13	3.425	22.16	369.60	92.17	92.17	15.20
3.430	22.01	369.25	92.18	92.18	15.27	3.435	21.86	368.90	92.19	92.19	15.35
3.440	21.70	368.55	92.20	92.20	15.43	3.445	21.55	368.20	92.20	92.20	15.51
3.450	21.39	367.84	92.21	92.21	15.60	3.455	21.24	367.48	92.22	92.22	15.70
3.460	21.08	367.11	92.23	92.23	15.80	3.465	20.92	366.74	92.24	92.24	15.90
3.470	20.76	366.36	92.24	92.24	16.01	3.475	20.60	365.98	92.25	92.25	16.12
3.480	20.43	365.59	92.26	92.26	16.24	3.485	20.27	365.20	92.27	92.27	16.37
3.490	20.11	364.81	92.28	92.28	16.50	3.495	19.94	364.40	92.29	92.29	16.64
3.500	19.77	364.00	92.30	92.30	16.78	3.505	19.60	363.58	92.30	92.30	16.93
3.510	19.43	363.16	92.31	92.31	17.09	3.515	19.26	362.73	92.32	92.32	17.25
3.520	19.08	362.29	92.33	92.33	17.43	3.525	18.91	361.85	92.34	92.34	17.61
3.530	18.73	361.39	92.35	92.35	17.80	3.535	18.55	360.93	92.36	92.36	17.99
3.540	18.37	360.46	92.37	92.37	18.20	3.545	18.18	359.98	92.38	92.38	18.42
3.550	18.00	359.49	92.40	92.40	18.65	3.555	17.81	358.98	92.41	92.41	18.89
3.560	17.62	358.47	92.42	92.42	19.14	3.565	17.42	357.94	92.43	92.43	19.41
3.570	17.22	357.40	92.44	92.44	19.69	3.575	17.02	356.84	92.45	92.45	19.98

Project: Starting Motor
Location: PG. KEBON AGUNG
Contractor: Pengasutan Auto-trafo
Engineer: DWI HERMAWAN
filename: kebon_agung

ETAP PowerStation
4.0.0C
Study Case: MS

Page: 22
Date: 03-17-2009
SN: KLGCNSULT
Revision: Base
Config.: Normal

Motor ID: Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
3.580	16.82	356.27	92.47	92.47	20.29	3.585	16.62	355.68	92.48	92.48	20.61
3.590	16.41	355.08	92.49	92.49	20.95	3.595	16.19	354.46	92.51	92.51	21.31
3.600	15.98	353.81	92.52	92.52	21.69	3.605	15.75	353.15	92.54	92.54	22.09
3.610	15.53	352.46	92.56	92.56	22.51	3.615	15.30	351.74	92.57	92.57	22.96
3.620	15.07	351.00	92.59	92.59	23.43	3.625	14.83	350.23	92.61	92.61	23.94
3.630	14.58	349.42	92.63	92.63	24.47	3.635	14.33	348.58	92.65	92.65	25.04
3.640	14.07	347.70	92.67	92.67	25.64	3.645	13.81	346.78	92.69	92.69	26.29
3.650	13.54	345.81	92.71	92.71	26.98	3.655	13.26	344.78	92.74	92.74	27.72
3.660	12.98	343.70	92.76	92.76	28.51	3.665	12.68	342.55	92.79	92.79	29.35
3.670	12.38	341.33	92.82	92.82	30.27	3.675	12.07	340.02	92.85	92.85	31.25
3.680	11.75	338.62	92.89	92.89	32.31	3.685	11.41	337.11	92.92	92.92	33.47
3.690	11.06	335.47	92.96	92.96	34.72	3.695	10.70	333.69	93.01	93.01	36.08
3.700	10.33	331.74	93.06	93.06	37.57	3.705	9.93	329.59	93.11	93.11	39.20
3.710	9.52	327.20	93.17	93.17	40.99	3.715	9.09	324.52	93.24	93.24	42.96
3.720	8.64	321.49	93.32	93.32	45.13	3.725	8.17	318.02	93.41	93.41	47.52
3.730	7.67	314.01	93.52	93.52	50.16	3.735	7.13	309.29	93.64	93.64	53.06
3.740	6.57	303.66	93.80	93.80	56.23	3.745	5.98	296.82	93.98	93.98	59.61
3.750	5.34	288.15	94.21	94.21	63.11	3.755	4.68	277.67	94.50	94.50	66.43
3.760	3.99	263.95	94.86	94.86	69.02	3.765	3.29	246.15	95.33	95.33	69.80
3.770	2.62	223.26	95.90	95.90	66.99	3.775	2.03	195.24	96.57	96.57	58.59
3.780	1.59	164.68	97.23	97.23	44.21	3.785	1.32	137.34	97.76	97.76	27.50
3.790	1.18	118.44	98.09	98.09	14.10	3.795	1.11	108.23	98.26	98.26	6.28
3.800	1.09	103.58	98.33	98.33	2.58	3.805	1.08	101.65	98.36	98.36	1.02
3.810	1.07	100.88	98.37	98.37	0.40	3.815	1.07	100.58	98.38	98.38	0.16
3.820	1.07	100.46	98.38	98.38	0.06	3.825	1.07	100.41	98.38	98.38	0.02
3.830	1.07	100.40	98.38	98.38	0.01	3.835	1.07	100.39	98.38	98.38	0.00
3.840	1.07	100.39	98.38	98.38	0.00	3.845	1.07	100.39	98.38	98.38	0.00
3.850	1.07	100.39	98.38	98.38	0.00	3.855	1.07	100.39	98.38	98.38	0.00
3.860	1.07	100.39	98.38	98.38	0.00	3.865	1.07	100.39	98.38	98.38	0.00
3.870	1.07	100.39	98.38	98.38	0.00	3.875	1.07	100.39	98.38	98.38	0.00
3.880	1.07	100.39	98.38	98.38	0.00	3.885	1.07	100.39	98.38	98.38	0.00
3.890	1.07	100.39	98.38	98.38	0.00	3.895	1.07	100.39	98.38	98.38	0.00
3.900	1.07	100.39	98.38	98.38	0.00	3.905	1.07	100.39	98.38	98.38	0.00
3.910	1.07	100.39	98.38	98.38	0.00	3.915	1.07	100.39	98.38	98.38	0.00
3.920	1.07	100.39	98.38	98.38	0.00	3.925	1.07	100.39	98.38	98.38	0.00
3.930	1.07	100.39	98.38	98.38	0.00	3.935	1.07	100.39	98.38	98.38	0.00

project:
Starting Motor

location:
PG. KEBON AGUNG
Contract:
Pengasutan Auto-trafo
Engineer:
DWI HERMAWAN
filename:
kebon_agung

ETAP PowerStation
4.0.0C
Study Case: MS

Page: 23
Date: 03-17-2009
SN: KLGCNSULT
Revision: Base
Config: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
3.940	1.07	100.39	98.38	98.38	0.00	3.945	1.07	100.39	98.38	98.38	0.00
3.950	1.07	100.39	98.38	98.38	0.00	3.955	1.07	100.39	98.38	98.38	0.00
3.960	1.07	100.39	98.38	98.38	0.00	3.965	1.07	100.39	98.38	98.38	0.00
3.970	1.07	100.39	98.38	98.38	0.00	3.975	1.07	100.39	98.38	98.38	0.00
3.980	1.07	100.39	98.38	98.38	0.00	3.985	1.07	100.39	98.38	98.38	0.00
3.990	1.07	100.39	98.38	98.38	0.00	3.995	1.07	100.39	98.38	98.38	0.00
4.000	1.07	100.39	98.38	98.38	0.00	4.005	1.07	100.39	98.38	98.38	0.00
4.010	1.07	100.39	98.38	98.38	0.00	4.015	1.07	100.39	98.38	98.38	0.00
4.020	1.07	100.39	98.38	98.38	0.00	4.025	1.07	100.39	98.38	98.38	0.00
4.030	1.07	100.39	98.38	98.38	0.00	4.035	1.07	100.39	98.38	98.38	0.00
4.040	1.07	100.39	98.38	98.38	0.00	4.045	1.07	100.39	98.38	98.38	0.00
4.050	1.07	100.39	98.38	98.38	0.00	4.055	1.07	100.39	98.38	98.38	0.00
4.060	1.07	100.39	98.38	98.38	0.00	4.065	1.07	100.39	98.38	98.38	0.00
4.070	1.07	100.39	98.38	98.38	0.00	4.075	1.07	100.39	98.38	98.38	0.00
4.080	1.07	100.39	98.38	98.38	0.00	4.085	1.07	100.39	98.38	98.38	0.00
4.090	1.07	100.39	98.38	98.38	0.00	4.095	1.07	100.39	98.38	98.38	0.00
4.100	1.07	100.39	98.38	98.38	0.00	4.105	1.07	100.39	98.38	98.38	0.00
4.110	1.07	100.39	98.38	98.38	0.00	4.115	1.07	100.39	98.38	98.38	0.00
4.120	1.07	100.39	98.38	98.38	0.00	4.125	1.07	100.39	98.38	98.38	0.00
4.130	1.07	100.39	98.38	98.38	0.00	4.135	1.07	100.39	98.38	98.38	0.00
4.140	1.07	100.39	98.38	98.38	0.00	4.145	1.07	100.39	98.38	98.38	0.00
4.150	1.07	100.39	98.38	98.38	0.00	4.155	1.07	100.39	98.38	98.38	0.00
4.160	1.07	100.39	98.38	98.38	0.00	4.165	1.07	100.39	98.38	98.38	0.00
4.170	1.07	100.39	98.38	98.38	0.00	4.175	1.07	100.39	98.38	98.38	0.00
4.180	1.07	100.39	98.38	98.38	0.00	4.185	1.07	100.39	98.38	98.38	0.00
4.190	1.07	100.39	98.38	98.38	0.00	4.195	1.07	100.39	98.38	98.38	0.00
4.200	1.07	100.39	98.38	98.38	0.00	4.205	1.07	100.39	98.38	98.38	0.00
4.210	1.07	100.39	98.38	98.38	0.00	4.215	1.07	100.39	98.38	98.38	0.00
4.220	1.07	100.39	98.38	98.38	0.00	4.225	1.07	100.39	98.38	98.38	0.00
4.230	1.07	100.39	98.38	98.38	0.00	4.235	1.07	100.39	98.38	98.38	0.00
4.240	1.07	100.39	98.38	98.38	0.00	4.245	1.07	100.39	98.38	98.38	0.00
4.250	1.07	100.39	98.38	98.38	0.00	4.255	1.07	100.39	98.38	98.38	0.00
4.260	1.07	100.39	98.38	98.38	0.00	4.265	1.07	100.39	98.38	98.38	0.00
4.270	1.07	100.39	98.38	98.38	0.00	4.275	1.07	100.39	98.38	98.38	0.00
4.280	1.07	100.39	98.38	98.38	0.00	4.285	1.07	100.39	98.38	98.38	0.00
4.290	1.07	100.39	98.38	98.38	0.00	4.295	1.07	100.39	98.38	98.38	0.00

Project:
Starting Motor
Location:
PG. KEBON AGUNG
Contract:
Pengasutan Auto-trafo
Engineer:
DWI HERMAWAN
Filename:
kebon_agung

ETAP PowerStation
4.0.0C
Date:
03-17-2009
S/N:
KLGCONSULT
Revision:
Base
Config.: Normal

Page: 24
Date: 03-17-2009
S/N: KLGCONSULT
Revision: Base
Config.: Normal

Motor ID : Mtr1

Time (Sec.)	Ship (%)	Current (% of FLA)	Terminal V(%)	Bus V(%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V(%)	Bus V(%)	Acc Torq (%)
4.300	1.07	100.39	98.38	98.38	0.00	4.305	1.07	100.39	98.38	98.38	0.00
4.310	1.07	100.39	98.38	98.38	0.00	4.315	1.07	100.39	98.38	98.38	0.00
4.320	1.07	100.39	98.38	98.38	0.00	4.325	1.07	100.39	98.38	98.38	0.00
4.330	1.07	100.39	98.38	98.38	0.00	4.335	1.07	100.39	98.38	98.38	0.00
4.340	1.07	100.39	98.38	98.38	0.00	4.345	1.07	100.39	98.38	98.38	0.00
4.350	1.07	100.39	98.38	98.38	0.00	4.355	1.07	100.39	98.38	98.38	0.00
4.360	1.07	100.39	98.38	98.38	0.00	4.365	1.07	100.39	98.38	98.38	0.00
4.370	1.07	100.39	98.38	98.38	0.00	4.375	1.07	100.39	98.38	98.38	0.00
4.380	1.07	100.39	98.38	98.38	0.00	4.385	1.07	100.39	98.38	98.38	0.00
4.390	1.07	100.39	98.38	98.38	0.00	4.395	1.07	100.39	98.38	98.38	0.00
4.400	1.07	100.39	98.38	98.38	0.00	4.405	1.07	100.39	98.38	98.38	0.00
4.410	1.07	100.39	98.38	98.38	0.00	4.415	1.07	100.39	98.38	98.38	0.00
4.420	1.07	100.39	98.38	98.38	0.00	4.425	1.07	100.39	98.38	98.38	0.00
4.430	1.07	100.39	98.38	98.38	0.00	4.435	1.07	100.39	98.38	98.38	0.00
4.440	1.07	100.39	98.38	98.38	0.00	4.445	1.07	100.39	98.38	98.38	0.00
4.450	1.07	100.39	98.38	98.38	0.00	4.455	1.07	100.39	98.38	98.38	0.00
4.460	1.07	100.39	98.38	98.38	0.00	4.465	1.07	100.39	98.38	98.38	0.00
4.470	1.07	100.39	98.38	98.38	0.00	4.475	1.07	100.39	98.38	98.38	0.00
4.480	1.07	100.39	98.38	98.38	0.00	4.485	1.07	100.39	98.38	98.38	0.00
4.490	1.07	100.39	98.38	98.38	0.00	4.495	1.07	100.39	98.38	98.38	0.00
4.500	1.07	100.39	98.38	98.38	0.00	4.505	1.07	100.39	98.38	98.38	0.00
4.510	1.07	100.39	98.38	98.38	0.00	4.515	1.07	100.39	98.38	98.38	0.00
4.520	1.07	100.39	98.38	98.38	0.00	4.525	1.07	100.39	98.38	98.38	0.00
4.530	1.07	100.39	98.38	98.38	0.00	4.535	1.07	100.39	98.38	98.38	0.00
4.540	1.07	100.39	98.38	98.38	0.00	4.545	1.07	100.39	98.38	98.38	0.00
4.550	1.07	100.39	98.38	98.38	0.00	4.555	1.07	100.39	98.38	98.38	0.00
4.560	1.07	100.39	98.38	98.38	0.00	4.565	1.07	100.39	98.38	98.38	0.00
4.570	1.07	100.39	98.38	98.38	0.00	4.575	1.07	100.39	98.38	98.38	0.00
4.580	1.07	100.39	98.38	98.38	0.00	4.585	1.07	100.39	98.38	98.38	0.00
4.590	1.07	100.39	98.38	98.38	0.00	4.595	1.07	100.39	98.38	98.38	0.00
4.600	1.07	100.39	98.38	98.38	0.00	4.605	1.07	100.39	98.38	98.38	0.00
4.610	1.07	100.39	98.38	98.38	0.00	4.615	1.07	100.39	98.38	98.38	0.00
4.620	1.07	100.39	98.38	98.38	0.00	4.625	1.07	100.39	98.38	98.38	0.00
4.630	1.07	100.39	98.38	98.38	0.00	4.635	1.07	100.39	98.38	98.38	0.00
4.640	1.07	100.39	98.38	98.38	0.00	4.645	1.07	100.39	98.38	98.38	0.00
4.650	1.07	100.39	98.38	98.38	0.00	4.655	1.07	100.39	98.38	98.38	0.00

Project:	Starting Motor	ETAP PowerStation	Page:	25
Location:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
Contract:	Pengasutan Auto-trafo		SN:	KLGCONSULT
Engineer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
Filename:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
4.660	1.07	100.39	98.38	98.38	0.00	4.665	1.07	100.39	98.38	98.38	0.00
4.670	1.07	100.39	98.38	98.38	0.00	4.675	1.07	100.39	98.38	98.38	0.00
4.680	1.07	100.39	98.38	98.38	0.00	4.685	1.07	100.39	98.38	98.38	0.00
4.690	1.07	100.39	98.38	98.38	0.00	4.695	1.07	100.39	98.38	98.38	0.00
4.700	1.07	100.39	98.38	98.38	0.00	4.705	1.07	100.39	98.38	98.38	0.00
4.710	1.07	100.39	98.38	98.38	0.00	4.715	1.07	100.39	98.38	98.38	0.00
4.720	1.07	100.39	98.38	98.38	0.00	4.725	1.07	100.39	98.38	98.38	0.00
4.730	1.07	100.39	98.38	98.38	0.00	4.735	1.07	100.39	98.38	98.38	0.00
4.740	1.07	100.39	98.38	98.38	0.00	4.745	1.07	100.39	98.38	98.38	0.00
4.750	1.07	100.39	98.38	98.38	0.00	4.755	1.07	100.39	98.38	98.38	0.00
4.760	1.07	100.39	98.38	98.38	0.00	4.765	1.07	100.39	98.38	98.38	0.00
4.770	1.07	100.39	98.38	98.38	0.00	4.775	1.07	100.39	98.38	98.38	0.00
4.780	1.07	100.39	98.38	98.38	0.00	4.785	1.07	100.39	98.38	98.38	0.00
4.790	1.07	100.39	98.38	98.38	0.00	4.795	1.07	100.39	98.38	98.38	0.00
4.800	1.07	100.39	98.38	98.38	0.00	4.805	1.07	100.39	98.38	98.38	0.00
4.810	1.07	100.39	98.38	98.38	0.00	4.815	1.07	100.39	98.38	98.38	0.00
4.820	1.07	100.39	98.38	98.38	0.00	4.825	1.07	100.39	98.38	98.38	0.00
4.830	1.07	100.39	98.38	98.38	0.00	4.835	1.07	100.39	98.38	98.38	0.00
4.840	1.07	100.39	98.38	98.38	0.00	4.845	1.07	100.39	98.38	98.38	0.00
4.850	1.07	100.39	98.38	98.38	0.00	4.855	1.07	100.39	98.38	98.38	0.00
4.860	1.07	100.39	98.38	98.38	0.00	4.865	1.07	100.39	98.38	98.38	0.00
4.870	1.07	100.39	98.38	98.38	0.00	4.875	1.07	100.39	98.38	98.38	0.00
4.880	1.07	100.39	98.38	98.38	0.00	4.885	1.07	100.39	98.38	98.38	0.00
4.890	1.07	100.39	98.38	98.38	0.00	4.895	1.07	100.39	98.38	98.38	0.00
4.900	1.07	100.39	98.38	98.38	0.00	4.905	1.07	100.39	98.38	98.38	0.00
4.910	1.07	100.39	98.38	98.38	0.00	4.915	1.07	100.39	98.38	98.38	0.00
4.920	1.07	100.39	98.38	98.38	0.00	4.925	1.07	100.39	98.38	98.38	0.00
4.930	1.07	100.39	98.38	98.38	0.00	4.935	1.07	100.39	98.38	98.38	0.00
4.940	1.07	100.39	98.38	98.38	0.00	4.945	1.07	100.39	98.38	98.38	0.00
4.950	1.07	100.39	98.38	98.38	0.00	4.955	1.07	100.39	98.38	98.38	0.00
4.960	1.07	100.39	98.38	98.38	0.00	4.965	1.07	100.39	98.38	98.38	0.00
4.970	1.07	100.39	98.38	98.38	0.00	4.975	1.07	100.39	98.38	98.38	0.00
4.980	1.07	100.39	98.38	98.38	0.00	4.985	1.07	100.39	98.38	98.38	0.00
4.990	1.07	100.39	98.38	98.38	0.00	4.995	1.07	100.39	98.38	98.38	0.00
5.000	1.07	100.39	98.38	98.38	0.00	5.005	1.07	100.39	98.38	98.38	0.00
5.010	1.07	100.39	98.38	98.38	0.00	5.015	1.07	100.39	98.38	98.38	0.00

Project:
Starting Motor
Location:
PG. KEBON AGUNG
Contract:
Pengasutan Auto-trafo
Engineer:
DWI HERMAWAN
filename:
kebon_agung

ETAP PowerStation
4.0.0C
Study Case: MS

Page: 26
Date: 03-17-2009
S/N: KLGCNSULT
Revision: Base
Config.: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
5.020	1.07	100.39	98.38	98.38	0.00	5.025	1.07	100.39	98.38	98.38	0.00
5.030	1.07	100.39	98.38	98.38	0.00	5.035	1.07	100.39	98.38	98.38	0.00
5.040	1.07	100.39	98.38	98.38	0.00	5.045	1.07	100.39	98.38	98.38	0.00
5.050	1.07	100.39	98.38	98.38	0.00	5.055	1.07	100.39	98.38	98.38	0.00
5.060	1.07	100.39	98.38	98.38	0.00	5.065	1.07	100.39	98.38	98.38	0.00
5.070	1.07	100.39	98.38	98.38	0.00	5.075	1.07	100.39	98.38	98.38	0.00
5.080	1.07	100.39	98.38	98.38	0.00	5.085	1.07	100.39	98.38	98.38	0.00
5.090	1.07	100.39	98.38	98.38	0.00	5.095	1.07	100.39	98.38	98.38	0.00
5.100	1.07	100.39	98.38	98.38	0.00	5.105	1.07	100.39	98.38	98.38	0.00
5.110	1.07	100.39	98.38	98.38	0.00	5.115	1.07	100.39	98.38	98.38	0.00
5.120	1.07	100.39	98.38	98.38	0.00	5.125	1.07	100.39	98.38	98.38	0.00
5.130	1.07	100.39	98.38	98.38	0.00	5.135	1.07	100.39	98.38	98.38	0.00
5.140	1.07	100.39	98.38	98.38	0.00	5.145	1.07	100.39	98.38	98.38	0.00
5.150	1.07	100.39	98.38	98.38	0.00	5.155	1.07	100.39	98.38	98.38	0.00
5.160	1.07	100.39	98.38	98.38	0.00	5.165	1.07	100.39	98.38	98.38	0.00
5.170	1.07	100.39	98.38	98.38	0.00	5.175	1.07	100.39	98.38	98.38	0.00
5.180	1.07	100.39	98.38	98.38	0.00	5.185	1.07	100.39	98.38	98.38	0.00
5.190	1.07	100.39	98.38	98.38	0.00	5.195	1.07	100.39	98.38	98.38	0.00
5.200	1.07	100.39	98.38	98.38	0.00	5.205	1.07	100.39	98.38	98.38	0.00
5.210	1.07	100.39	98.38	98.38	0.00	5.215	1.07	100.39	98.38	98.38	0.00
5.220	1.07	100.39	98.38	98.38	0.00	5.225	1.07	100.39	98.38	98.38	0.00
5.230	1.07	100.39	98.38	98.38	0.00	5.235	1.07	100.39	98.38	98.38	0.00
5.240	1.07	100.39	98.38	98.38	0.00	5.245	1.07	100.39	98.38	98.38	0.00
5.250	1.07	100.39	98.38	98.38	0.00	5.255	1.07	100.39	98.38	98.38	0.00
5.260	1.07	100.39	98.38	98.38	0.00	5.265	1.07	100.39	98.38	98.38	0.00
5.270	1.07	100.39	98.38	98.38	0.00	5.275	1.07	100.39	98.38	98.38	0.00
5.280	1.07	100.39	98.38	98.38	0.00	5.285	1.07	100.39	98.38	98.38	0.00
5.290	1.07	100.39	98.38	98.38	0.00	5.295	1.07	100.39	98.38	98.38	0.00
5.300	1.07	100.39	98.38	98.38	0.00	5.305	1.07	100.39	98.38	98.38	0.00
5.310	1.07	100.39	98.38	98.38	0.00	5.315	1.07	100.39	98.38	98.38	0.00
5.320	1.07	100.39	98.38	98.38	0.00	5.325	1.07	100.39	98.38	98.38	0.00
5.330	1.07	100.39	98.38	98.38	0.00	5.335	1.07	100.39	98.38	98.38	0.00
5.340	1.07	100.39	98.38	98.38	0.00	5.345	1.07	100.39	98.38	98.38	0.00
5.350	1.07	100.39	98.38	98.38	0.00	5.355	1.07	100.39	98.38	98.38	0.00
5.360	1.07	100.39	98.38	98.38	0.00	5.365	1.07	100.39	98.38	98.38	0.00
5.370	1.07	100.39	98.38	98.38	0.00	5.375	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Auto-tralo
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation

4.0.0.C

Page: 27
 Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config: Normal

Motor ID : M01L											
Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
5.380	1.07	100.39	98.38	98.38	0.00	5.385	1.07	100.39	98.38	98.38	0.00
5.390	1.07	100.39	98.38	98.38	0.00	5.395	1.07	100.39	98.38	98.38	0.00
5.400	1.07	100.39	98.38	98.38	0.00	5.405	1.07	100.39	98.38	98.38	0.00
5.410	1.07	100.39	98.38	98.38	0.00	5.415	1.07	100.39	98.38	98.38	0.00
5.420	1.07	100.39	98.38	98.38	0.00	5.425	1.07	100.39	98.38	98.38	0.00
5.430	1.07	100.39	98.38	98.38	0.00	5.435	1.07	100.39	98.38	98.38	0.00
5.440	1.07	100.39	98.38	98.38	0.00	5.445	1.07	100.39	98.38	98.38	0.00
5.450	1.07	100.39	98.38	98.38	0.00	5.455	1.07	100.39	98.38	98.38	0.00
5.460	1.07	100.39	98.38	98.38	0.00	5.465	1.07	100.39	98.38	98.38	0.00
5.470	1.07	100.39	98.38	98.38	0.00	5.475	1.07	100.39	98.38	98.38	0.00
5.480	1.07	100.39	98.38	98.38	0.00	5.485	1.07	100.39	98.38	98.38	0.00
5.490	1.07	100.39	98.38	98.38	0.00	5.495	1.07	100.39	98.38	98.38	0.00
5.500	1.07	100.39	98.38	98.38	0.00	5.505	1.07	100.39	98.38	98.38	0.00
5.510	1.07	100.39	98.38	98.38	0.00	5.515	1.07	100.39	98.38	98.38	0.00
5.520	1.07	100.39	98.38	98.38	0.00	5.525	1.07	100.39	98.38	98.38	0.00
5.530	1.07	100.39	98.38	98.38	0.00	5.535	1.07	100.39	98.38	98.38	0.00
5.540	1.07	100.39	98.38	98.38	0.00	5.545	1.07	100.39	98.38	98.38	0.00
5.550	1.07	100.39	98.38	98.38	0.00	5.555	1.07	100.39	98.38	98.38	0.00
5.560	1.07	100.39	98.38	98.38	0.00	5.565	1.07	100.39	98.38	98.38	0.00
5.570	1.07	100.39	98.38	98.38	0.00	5.575	1.07	100.39	98.38	98.38	0.00
5.580	1.07	100.39	98.38	98.38	0.00	5.585	1.07	100.39	98.38	98.38	0.00
5.590	1.07	100.39	98.38	98.38	0.00	5.595	1.07	100.39	98.38	98.38	0.00
5.600	1.07	100.39	98.38	98.38	0.00	5.605	1.07	100.39	98.38	98.38	0.00
5.610	1.07	100.39	98.38	98.38	0.00	5.615	1.07	100.39	98.38	98.38	0.00
5.620	1.07	100.39	98.38	98.38	0.00	5.625	1.07	100.39	98.38	98.38	0.00
5.630	1.07	100.39	98.38	98.38	0.00	5.635	1.07	100.39	98.38	98.38	0.00
5.640	1.07	100.39	98.38	98.38	0.00	5.645	1.07	100.39	98.38	98.38	0.00
5.650	1.07	100.39	98.38	98.38	0.00	5.655	1.07	100.39	98.38	98.38	0.00
5.660	1.07	100.39	98.38	98.38	0.00	5.665	1.07	100.39	98.38	98.38	0.00
5.670	1.07	100.39	98.38	98.38	0.00	5.675	1.07	100.39	98.38	98.38	0.00
5.680	1.07	100.39	98.38	98.38	0.00	5.685	1.07	100.39	98.38	98.38	0.00
5.690	1.07	100.39	98.38	98.38	0.00	5.695	1.07	100.39	98.38	98.38	0.00
5.700	1.07	100.39	98.38	98.38	0.00	5.705	1.07	100.39	98.38	98.38	0.00
5.710	1.07	100.39	98.38	98.38	0.00	5.715	1.07	100.39	98.38	98.38	0.00
5.720	1.07	100.39	98.38	98.38	0.00	5.725	1.07	100.39	98.38	98.38	0.00
5.730	1.07	100.39	98.38	98.38	0.00	5.735	1.07	100.39	98.38	98.38	0.00

Project:
Starting Motor
Location:
PG. KEBON AGUNG
Contract:
Pengasutan Auto-trafo
Engineer:
DWI HERMAWAN
Filename:
kebon_agung

ETAP PowerStation
4.0.0C
Study Case: MS

Page: 28
Date: 03-17-2009
SN: KLGCNSULT
Revision: Base
Config.: Normal

Motor ID: Mtr1

Time (Sec.)	Ship (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
5.740	1.07	100.39	98.38	98.38	0.00	5.745	1.07	100.39	98.38	98.38	0.00
5.750	1.07	100.39	98.38	98.38	0.00	5.755	1.07	100.39	98.38	98.38	0.00
5.760	1.07	100.39	98.38	98.38	0.00	5.765	1.07	100.39	98.38	98.38	0.00
5.770	1.07	100.39	98.38	98.38	0.00	5.775	1.07	100.39	98.38	98.38	0.00
5.780	1.07	100.39	98.38	98.38	0.00	5.785	1.07	100.39	98.38	98.38	0.00
5.790	1.07	100.39	98.38	98.38	0.00	5.795	1.07	100.39	98.38	98.38	0.00
5.800	1.07	100.39	98.38	98.38	0.00	5.805	1.07	100.39	98.38	98.38	0.00
5.810	1.07	100.39	98.38	98.38	0.00	5.815	1.07	100.39	98.38	98.38	0.00
5.820	1.07	100.39	98.38	98.38	0.00	5.825	1.07	100.39	98.38	98.38	0.00
5.830	1.07	100.39	98.38	98.38	0.00	5.835	1.07	100.39	98.38	98.38	0.00
5.840	1.07	100.39	98.38	98.38	0.00	5.845	1.07	100.39	98.38	98.38	0.00
5.850	1.07	100.39	98.38	98.38	0.00	5.855	1.07	100.39	98.38	98.38	0.00
5.860	1.07	100.39	98.38	98.38	0.00	5.865	1.07	100.39	98.38	98.38	0.00
5.870	1.07	100.39	98.38	98.38	0.00	5.875	1.07	100.39	98.38	98.38	0.00
5.880	1.07	100.39	98.38	98.38	0.00	5.885	1.07	100.39	98.38	98.38	0.00
5.890	1.07	100.39	98.38	98.38	0.00	5.895	1.07	100.39	98.38	98.38	0.00
5.900	1.07	100.39	98.38	98.38	0.00	5.905	1.07	100.39	98.38	98.38	0.00
5.910	1.07	100.39	98.38	98.38	0.00	5.915	1.07	100.39	98.38	98.38	0.00
5.920	1.07	100.39	98.38	98.38	0.00	5.925	1.07	100.39	98.38	98.38	0.00
5.930	1.07	100.39	98.38	98.38	0.00	5.935	1.07	100.39	98.38	98.38	0.00
5.940	1.07	100.39	98.38	98.38	0.00	5.945	1.07	100.39	98.38	98.38	0.00
5.950	1.07	100.39	98.38	98.38	0.00	5.955	1.07	100.39	98.38	98.38	0.00
5.960	1.07	100.39	98.38	98.38	0.00	5.965	1.07	100.39	98.38	98.38	0.00
5.970	1.07	100.39	98.38	98.38	0.00	5.975	1.07	100.39	98.38	98.38	0.00
5.980	1.07	100.39	98.38	98.38	0.00	5.985	1.07	100.39	98.38	98.38	0.00
5.990	1.07	100.39	98.38	98.38	0.00	5.995	1.07	100.39	98.38	98.38	0.00
6.000	1.07	100.39	98.38	98.38	0.00	6.005	1.07	100.39	98.38	98.38	0.00
6.010	1.07	100.39	98.38	98.38	0.00	6.015	1.07	100.39	98.38	98.38	0.00
6.020	1.07	100.39	98.38	98.38	0.00	6.025	1.07	100.39	98.38	98.38	0.00
6.030	1.07	100.39	98.38	98.38	0.00	6.035	1.07	100.39	98.38	98.38	0.00
6.040	1.07	100.39	98.38	98.38	0.00	6.045	1.07	100.39	98.38	98.38	0.00
6.050	1.07	100.39	98.38	98.38	0.00	6.055	1.07	100.39	98.38	98.38	0.00
6.060	1.07	100.39	98.38	98.38	0.00	6.065	1.07	100.39	98.38	98.38	0.00
6.070	1.07	100.39	98.38	98.38	0.00	6.075	1.07	100.39	98.38	98.38	0.00
6.080	1.07	100.39	98.38	98.38	0.00	6.085	1.07	100.39	98.38	98.38	0.00
6.090	1.07	100.39	98.38	98.38	0.00	6.095	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Auto-trafo
 Engineer: DWI HERMAWAN
 File Name: kebon_agung

ETAP PowerStation
 4.0.0C
 Study Case: MS
 Motor ID: Mtr1

Page: 29
 Date: 03-17-2009
 S/N: KLGI CONSULT
 Revision: Base
 Config: Normal

Motor ID: Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
6.100	1.07	100.39	98.38	98.38	0.00	6.105	1.07	100.39	98.38	98.38	0.00
6.110	1.07	100.39	98.38	98.38	0.00	6.115	1.07	100.39	98.38	98.38	0.00
6.120	1.07	100.39	98.38	98.38	0.00	6.125	1.07	100.39	98.38	98.38	0.00
6.130	1.07	100.39	98.38	98.38	0.00	6.135	1.07	100.39	98.38	98.38	0.00
6.140	1.07	100.39	98.38	98.38	0.00	6.145	1.07	100.39	98.38	98.38	0.00
6.150	1.07	100.39	98.38	98.38	0.00	6.155	1.07	100.39	98.38	98.38	0.00
6.160	1.07	100.39	98.38	98.38	0.00	6.165	1.07	100.39	98.38	98.38	0.00
6.170	1.07	100.39	98.38	98.38	0.00	6.175	1.07	100.39	98.38	98.38	0.00
6.180	1.07	100.39	98.38	98.38	0.00	6.185	1.07	100.39	98.38	98.38	0.00
6.190	1.07	100.39	98.38	98.38	0.00	6.195	1.07	100.39	98.38	98.38	0.00
6.200	1.07	100.39	98.38	98.38	0.00	6.205	1.07	100.39	98.38	98.38	0.00
6.210	1.07	100.39	98.38	98.38	0.00	6.215	1.07	100.39	98.38	98.38	0.00
6.220	1.07	100.39	98.38	98.38	0.00	6.225	1.07	100.39	98.38	98.38	0.00
6.230	1.07	100.39	98.38	98.38	0.00	6.235	1.07	100.39	98.38	98.38	0.00
6.240	1.07	100.39	98.38	98.38	0.00	6.245	1.07	100.39	98.38	98.38	0.00
6.250	1.07	100.39	98.38	98.38	0.00	6.255	1.07	100.39	98.38	98.38	0.00
6.260	1.07	100.39	98.38	98.38	0.00	6.265	1.07	100.39	98.38	98.38	0.00
6.270	1.07	100.39	98.38	98.38	0.00	6.275	1.07	100.39	98.38	98.38	0.00
6.280	1.07	100.39	98.38	98.38	0.00	6.285	1.07	100.39	98.38	98.38	0.00
6.290	1.07	100.39	98.38	98.38	0.00	6.295	1.07	100.39	98.38	98.38	0.00
6.300	1.07	100.39	98.38	98.38	0.00	6.305	1.07	100.39	98.38	98.38	0.00
6.310	1.07	100.39	98.38	98.38	0.00	6.315	1.07	100.39	98.38	98.38	0.00
6.320	1.07	100.39	98.38	98.38	0.00	6.325	1.07	100.39	98.38	98.38	0.00
6.330	1.07	100.39	98.38	98.38	0.00	6.335	1.07	100.39	98.38	98.38	0.00
6.340	1.07	100.39	98.38	98.38	0.00	6.345	1.07	100.39	98.38	98.38	0.00
6.350	1.07	100.39	98.38	98.38	0.00	6.355	1.07	100.39	98.38	98.38	0.00
6.360	1.07	100.39	98.38	98.38	0.00	6.365	1.07	100.39	98.38	98.38	0.00
6.370	1.07	100.39	98.38	98.38	0.00	6.375	1.07	100.39	98.38	98.38	0.00
6.380	1.07	100.39	98.38	98.38	0.00	6.385	1.07	100.39	98.38	98.38	0.00
6.390	1.07	100.39	98.38	98.38	0.00	6.395	1.07	100.39	98.38	98.38	0.00
6.400	1.07	100.39	98.38	98.38	0.00	6.405	1.07	100.39	98.38	98.38	0.00
6.410	1.07	100.39	98.38	98.38	0.00	6.415	1.07	100.39	98.38	98.38	0.00
6.420	1.07	100.39	98.38	98.38	0.00	6.425	1.07	100.39	98.38	98.38	0.00
6.430	1.07	100.39	98.38	98.38	0.00	6.435	1.07	100.39	98.38	98.38	0.00
6.440	1.07	100.39	98.38	98.38	0.00	6.445	1.07	100.39	98.38	98.38	0.00
6.450	1.07	100.39	98.38	98.38	0.00	6.455	1.07	100.39	98.38	98.38	0.00

Project:	Starting Motor	ETAP PowerStation	Page:	30
Location:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
Contract:	Pengasutan Auto-trafo		SN:	KLGCONSULT
Engineer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
Filename:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
6.460	1.07	100.39	98.38	98.38	0.00	6.465	1.07	100.39	98.38	98.38	0.00
6.470	1.07	100.39	98.38	98.38	0.00	6.475	1.07	100.39	98.38	98.38	0.00
6.480	1.07	100.39	98.38	98.38	0.00	6.485	1.07	100.39	98.38	98.38	0.00
6.490	1.07	100.39	98.38	98.38	0.00	6.495	1.07	100.39	98.38	98.38	0.00
6.500	1.07	100.39	98.38	98.38	0.00	6.505	1.07	100.39	98.38	98.38	0.00
6.510	1.07	100.39	98.38	98.38	0.00	6.515	1.07	100.39	98.38	98.38	0.00
6.520	1.07	100.39	98.38	98.38	0.00	6.525	1.07	100.39	98.38	98.38	0.00
6.530	1.07	100.39	98.38	98.38	0.00	6.535	1.07	100.39	98.38	98.38	0.00
6.540	1.07	100.39	98.38	98.38	0.00	6.545	1.07	100.39	98.38	98.38	0.00
6.550	1.07	100.39	98.38	98.38	0.00	6.555	1.07	100.39	98.38	98.38	0.00
6.560	1.07	100.39	98.38	98.38	0.00	6.565	1.07	100.39	98.38	98.38	0.00
6.570	1.07	100.39	98.38	98.38	0.00	6.575	1.07	100.39	98.38	98.38	0.00
6.580	1.07	100.39	98.38	98.38	0.00	6.585	1.07	100.39	98.38	98.38	0.00
6.590	1.07	100.39	98.38	98.38	0.00	6.595	1.07	100.39	98.38	98.38	0.00
6.600	1.07	100.39	98.38	98.38	0.00	6.605	1.07	100.39	98.38	98.38	0.00
6.610	1.07	100.39	98.38	98.38	0.00	6.615	1.07	100.39	98.38	98.38	0.00
6.620	1.07	100.39	98.38	98.38	0.00	6.625	1.07	100.39	98.38	98.38	0.00
6.630	1.07	100.39	98.38	98.38	0.00	6.635	1.07	100.39	98.38	98.38	0.00
6.640	1.07	100.39	98.38	98.38	0.00	6.645	1.07	100.39	98.38	98.38	0.00
6.650	1.07	100.39	98.38	98.38	0.00	6.655	1.07	100.39	98.38	98.38	0.00
6.660	1.07	100.39	98.38	98.38	0.00	6.665	1.07	100.39	98.38	98.38	0.00
6.670	1.07	100.39	98.38	98.38	0.00	6.675	1.07	100.39	98.38	98.38	0.00
6.680	1.07	100.39	98.38	98.38	0.00	6.685	1.07	100.39	98.38	98.38	0.00
6.690	1.07	100.39	98.38	98.38	0.00	6.695	1.07	100.39	98.38	98.38	0.00
6.700	1.07	100.39	98.38	98.38	0.00	6.705	1.07	100.39	98.38	98.38	0.00
6.710	1.07	100.39	98.38	98.38	0.00	6.715	1.07	100.39	98.38	98.38	0.00
6.720	1.07	100.39	98.38	98.38	0.00	6.725	1.07	100.39	98.38	98.38	0.00
6.730	1.07	100.39	98.38	98.38	0.00	6.735	1.07	100.39	98.38	98.38	0.00
6.740	1.07	100.39	98.38	98.38	0.00	6.745	1.07	100.39	98.38	98.38	0.00
6.750	1.07	100.39	98.38	98.38	0.00	6.755	1.07	100.39	98.38	98.38	0.00
6.760	1.07	100.39	98.38	98.38	0.00	6.765	1.07	100.39	98.38	98.38	0.00
6.770	1.07	100.39	98.38	98.38	0.00	6.775	1.07	100.39	98.38	98.38	0.00
6.780	1.07	100.39	98.38	98.38	0.00	6.785	1.07	100.39	98.38	98.38	0.00
6.790	1.07	100.39	98.38	98.38	0.00	6.795	1.07	100.39	98.38	98.38	0.00
6.800	1.07	100.39	98.38	98.38	0.00	6.805	1.07	100.39	98.38	98.38	0.00
6.810	1.07	100.39	98.38	98.38	0.00	6.815	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Auto-ratio
 Engineer: DWI HERMAWAN
 filename: kebon_agung

ETAP PowerStation

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Page: 31
 Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config: Normal

Motor ID : M01											
Time (Sec.)	Slip (%)	Current (% of F.L.A)	Terminal V (%)	Bus V (%)	Acc. Torq (%)	Time (Sec.)	Slip (%)	Current (% of F.L.A)	Terminal V (%)	Bus V (%)	Acc. Torq (%)
6.820	1.07	100.39	98.38	98.38	0.00	6.825	1.07	100.39	98.38	98.38	0.00
6.830	1.07	100.39	98.38	98.38	0.00	6.835	1.07	100.39	98.38	98.38	0.00
6.840	1.07	100.39	98.38	98.38	0.00	6.845	1.07	100.39	98.38	98.38	0.00
6.850	1.07	100.39	98.38	98.38	0.00	6.855	1.07	100.39	98.38	98.38	0.00
6.860	1.07	100.39	98.38	98.38	0.00	6.865	1.07	100.39	98.38	98.38	0.00
6.870	1.07	100.39	98.38	98.38	0.00	6.875	1.07	100.39	98.38	98.38	0.00
6.880	1.07	100.39	98.38	98.38	0.00	6.885	1.07	100.39	98.38	98.38	0.00
6.890	1.07	100.39	98.38	98.38	0.00	6.895	1.07	100.39	98.38	98.38	0.00
6.900	1.07	100.39	98.38	98.38	0.00	6.905	1.07	100.39	98.38	98.38	0.00
6.910	1.07	100.39	98.38	98.38	0.00	6.915	1.07	100.39	98.38	98.38	0.00
6.920	1.07	100.39	98.38	98.38	0.00	6.925	1.07	100.39	98.38	98.38	0.00
6.930	1.07	100.39	98.38	98.38	0.00	6.935	1.07	100.39	98.38	98.38	0.00
6.940	1.07	100.39	98.38	98.38	0.00	6.945	1.07	100.39	98.38	98.38	0.00
6.950	1.07	100.39	98.38	98.38	0.00	6.955	1.07	100.39	98.38	98.38	0.00
6.960	1.07	100.39	98.38	98.38	0.00	6.965	1.07	100.39	98.38	98.38	0.00
6.970	1.07	100.39	98.38	98.38	0.00	6.975	1.07	100.39	98.38	98.38	0.00
6.980	1.07	100.39	98.38	98.38	0.00	6.985	1.07	100.39	98.38	98.38	0.00
6.990	1.07	100.39	98.38	98.38	0.00	6.995	1.07	100.39	98.38	98.38	0.00
7.000	1.07	100.39	98.38	98.38	0.00	7.005	1.07	100.39	98.38	98.38	0.00
7.010	1.07	100.39	98.38	98.38	0.00	7.015	1.07	100.39	98.38	98.38	0.00
7.020	1.07	100.39	98.38	98.38	0.00	7.025	1.07	100.39	98.38	98.38	0.00
7.030	1.07	100.39	98.38	98.38	0.00	7.035	1.07	100.39	98.38	98.38	0.00
7.040	1.07	100.39	98.38	98.38	0.00	7.045	1.07	100.39	98.38	98.38	0.00
7.050	1.07	100.39	98.38	98.38	0.00	7.055	1.07	100.39	98.38	98.38	0.00
7.060	1.07	100.39	98.38	98.38	0.00	7.065	1.07	100.39	98.38	98.38	0.00
7.070	1.07	100.39	98.38	98.38	0.00	7.075	1.07	100.39	98.38	98.38	0.00
7.080	1.07	100.39	98.38	98.38	0.00	7.085	1.07	100.39	98.38	98.38	0.00
7.090	1.07	100.39	98.38	98.38	0.00	7.095	1.07	100.39	98.38	98.38	0.00
7.100	1.07	100.39	98.38	98.38	0.00	7.105	1.07	100.39	98.38	98.38	0.00
7.110	1.07	100.39	98.38	98.38	0.00	7.115	1.07	100.39	98.38	98.38	0.00
7.120	1.07	100.39	98.38	98.38	0.00	7.125	1.07	100.39	98.38	98.38	0.00
7.130	1.07	100.39	98.38	98.38	0.00	7.135	1.07	100.39	98.38	98.38	0.00
7.140	1.07	100.39	98.38	98.38	0.00	7.145	1.07	100.39	98.38	98.38	0.00
7.150	1.07	100.39	98.38	98.38	0.00	7.155	1.07	100.39	98.38	98.38	0.00
7.160	1.07	100.39	98.38	98.38	0.00	7.165	1.07	100.39	98.38	98.38	0.00
7.170	1.07	100.39	98.38	98.38	0.00	7.175	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Auto-trafo
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation

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Date: 03-17-2009

S/N: KLGI CONSULT

Study Case: MS

Revision: Base

Config: Normal

Motor ID : Mtr1

Time	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
7.180	1.07	100.39	98.38	98.38	0.00	7.185	1.07	100.39	98.38	98.38	0.00
7.190	1.07	100.39	98.38	98.38	0.00	7.195	1.07	100.39	98.38	98.38	0.00
7.200	1.07	100.39	98.38	98.38	0.00	7.205	1.07	100.39	98.38	98.38	0.00
7.210	1.07	100.39	98.38	98.38	0.00	7.215	1.07	100.39	98.38	98.38	0.00
7.220	1.07	100.39	98.38	98.38	0.00	7.225	1.07	100.39	98.38	98.38	0.00
7.230	1.07	100.39	98.38	98.38	0.00	7.235	1.07	100.39	98.38	98.38	0.00
7.240	1.07	100.39	98.38	98.38	0.00	7.245	1.07	100.39	98.38	98.38	0.00
7.250	1.07	100.39	98.38	98.38	0.00	7.255	1.07	100.39	98.38	98.38	0.00
7.260	1.07	100.39	98.38	98.38	0.00	7.265	1.07	100.39	98.38	98.38	0.00
7.270	1.07	100.39	98.38	98.38	0.00	7.275	1.07	100.39	98.38	98.38	0.00
7.280	1.07	100.39	98.38	98.38	0.00	7.285	1.07	100.39	98.38	98.38	0.00
7.290	1.07	100.39	98.38	98.38	0.00	7.295	1.07	100.39	98.38	98.38	0.00
7.300	1.07	100.39	98.38	98.38	0.00	7.305	1.07	100.39	98.38	98.38	0.00
7.310	1.07	100.39	98.38	98.38	0.00	7.315	1.07	100.39	98.38	98.38	0.00
7.320	1.07	100.39	98.38	98.38	0.00	7.325	1.07	100.39	98.38	98.38	0.00
7.330	1.07	100.39	98.38	98.38	0.00	7.335	1.07	100.39	98.38	98.38	0.00
7.340	1.07	100.39	98.38	98.38	0.00	7.345	1.07	100.39	98.38	98.38	0.00
7.350	1.07	100.39	98.38	98.38	0.00	7.355	1.07	100.39	98.38	98.38	0.00
7.360	1.07	100.39	98.38	98.38	0.00	7.365	1.07	100.39	98.38	98.38	0.00
7.370	1.07	100.39	98.38	98.38	0.00	7.375	1.07	100.39	98.38	98.38	0.00
7.380	1.07	100.39	98.38	98.38	0.00	7.385	1.07	100.39	98.38	98.38	0.00
7.390	1.07	100.39	98.38	98.38	0.00	7.395	1.07	100.39	98.38	98.38	0.00
7.400	1.07	100.39	98.38	98.38	0.00	7.405	1.07	100.39	98.38	98.38	0.00
7.410	1.07	100.39	98.38	98.38	0.00	7.415	1.07	100.39	98.38	98.38	0.00
7.420	1.07	100.39	98.38	98.38	0.00	7.425	1.07	100.39	98.38	98.38	0.00
7.430	1.07	100.39	98.38	98.38	0.00	7.435	1.07	100.39	98.38	98.38	0.00
7.440	1.07	100.39	98.38	98.38	0.00	7.445	1.07	100.39	98.38	98.38	0.00
7.450	1.07	100.39	98.38	98.38	0.00	7.455	1.07	100.39	98.38	98.38	0.00
7.460	1.07	100.39	98.38	98.38	0.00	7.465	1.07	100.39	98.38	98.38	0.00
7.470	1.07	100.39	98.38	98.38	0.00	7.475	1.07	100.39	98.38	98.38	0.00
7.480	1.07	100.39	98.38	98.38	0.00	7.485	1.07	100.39	98.38	98.38	0.00
7.490	1.07	100.39	98.38	98.38	0.00	7.495	1.07	100.39	98.38	98.38	0.00
7.500	1.07	100.39	98.38	98.38	0.00	7.505	1.07	100.39	98.38	98.38	0.00
7.510	1.07	100.39	98.38	98.38	0.00	7.515	1.07	100.39	98.38	98.38	0.00
7.520	1.07	100.39	98.38	98.38	0.00	7.525	1.07	100.39	98.38	98.38	0.00
7.530	1.07	100.39	98.38	98.38	0.00	7.535	1.07	100.39	98.38	98.38	0.00

Project:

Starting Motor

PG. KEBON AGUNG

Pengasutan Auto-trafo

DWI HERMAWAN

kebon_agung

ETAP PowerStation

4.0.0C

Location:

Contract:

Engineer:

filename:

Page: 33

Date: 03-17-2009

SN: KLGCNSULT

Revision: Base

Config: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
7.540	1.07	100.39	98.38	98.38	0.00	7.545	1.07	100.39	98.38	98.38	0.00
7.550	1.07	100.39	98.38	98.38	0.00	7.555	1.07	100.39	98.38	98.38	0.00
7.560	1.07	100.39	98.38	98.38	0.00	7.565	1.07	100.39	98.38	98.38	0.00
7.570	1.07	100.39	98.38	98.38	0.00	7.575	1.07	100.39	98.38	98.38	0.00
7.580	1.07	100.39	98.38	98.38	0.00	7.585	1.07	100.39	98.38	98.38	0.00
7.590	1.07	100.39	98.38	98.38	0.00	7.595	1.07	100.39	98.38	98.38	0.00
7.600	1.07	100.39	98.38	98.38	0.00	7.605	1.07	100.39	98.38	98.38	0.00
7.610	1.07	100.39	98.38	98.38	0.00	7.615	1.07	100.39	98.38	98.38	0.00
7.620	1.07	100.39	98.38	98.38	0.00	7.625	1.07	100.39	98.38	98.38	0.00
7.630	1.07	100.39	98.38	98.38	0.00	7.635	1.07	100.39	98.38	98.38	0.00
7.640	1.07	100.39	98.38	98.38	0.00	7.645	1.07	100.39	98.38	98.38	0.00
7.650	1.07	100.39	98.38	98.38	0.00	7.655	1.07	100.39	98.38	98.38	0.00
7.660	1.07	100.39	98.38	98.38	0.00	7.665	1.07	100.39	98.38	98.38	0.00
7.670	1.07	100.39	98.38	98.38	0.00	7.675	1.07	100.39	98.38	98.38	0.00
7.680	1.07	100.39	98.38	98.38	0.00	7.685	1.07	100.39	98.38	98.38	0.00
7.690	1.07	100.39	98.38	98.38	0.00	7.695	1.07	100.39	98.38	98.38	0.00
7.700	1.07	100.39	98.38	98.38	0.00	7.705	1.07	100.39	98.38	98.38	0.00
7.710	1.07	100.39	98.38	98.38	0.00	7.715	1.07	100.39	98.38	98.38	0.00
7.720	1.07	100.39	98.38	98.38	0.00	7.725	1.07	100.39	98.38	98.38	0.00
7.730	1.07	100.39	98.38	98.38	0.00	7.735	1.07	100.39	98.38	98.38	0.00
7.740	1.07	100.39	98.38	98.38	0.00	7.745	1.07	100.39	98.38	98.38	0.00
7.750	1.07	100.39	98.38	98.38	0.00	7.755	1.07	100.39	98.38	98.38	0.00
7.760	1.07	100.39	98.38	98.38	0.00	7.765	1.07	100.39	98.38	98.38	0.00
7.770	1.07	100.39	98.38	98.38	0.00	7.775	1.07	100.39	98.38	98.38	0.00
7.780	1.07	100.39	98.38	98.38	0.00	7.785	1.07	100.39	98.38	98.38	0.00
7.790	1.07	100.39	98.38	98.38	0.00	7.795	1.07	100.39	98.38	98.38	0.00
7.800	1.07	100.39	98.38	98.38	0.00	7.805	1.07	100.39	98.38	98.38	0.00
7.810	1.07	100.39	98.38	98.38	0.00	7.815	1.07	100.39	98.38	98.38	0.00
7.820	1.07	100.39	98.38	98.38	0.00	7.825	1.07	100.39	98.38	98.38	0.00
7.830	1.07	100.39	98.38	98.38	0.00	7.835	1.07	100.39	98.38	98.38	0.00
7.840	1.07	100.39	98.38	98.38	0.00	7.845	1.07	100.39	98.38	98.38	0.00
7.850	1.07	100.39	98.38	98.38	0.00	7.855	1.07	100.39	98.38	98.38	0.00
7.860	1.07	100.39	98.38	98.38	0.00	7.865	1.07	100.39	98.38	98.38	0.00
7.870	1.07	100.39	98.38	98.38	0.00	7.875	1.07	100.39	98.38	98.38	0.00
7.880	1.07	100.39	98.38	98.38	0.00	7.885	1.07	100.39	98.38	98.38	0.00
7.890	1.07	100.39	98.38	98.38	0.00	7.895	1.07	100.39	98.38	98.38	0.00

Project:
Location:
Contract:
Engineer:
filename:

Starting Motor
PG. KEBON AGUNG
Pengasutan Auto-trafo
DWI HERMAWAN
kebon_agung

ETAP PowerStation
4.0.0C
Date: 03-17-2009
SN: KLGCNSULT
Revision: Base
Config: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
7.900	1.07	100.39	98.38	98.38	0.00	7.905	1.07	100.39	98.38	98.38	0.00
7.910	1.07	100.39	98.38	98.38	0.00	7.915	1.07	100.39	98.38	98.38	0.00
7.920	1.07	100.39	98.38	98.38	0.00	7.925	1.07	100.39	98.38	98.38	0.00
7.930	1.07	100.39	98.38	98.38	0.00	7.935	1.07	100.39	98.38	98.38	0.00
7.940	1.07	100.39	98.38	98.38	0.00	7.945	1.07	100.39	98.38	98.38	0.00
7.950	1.07	100.39	98.38	98.38	0.00	7.955	1.07	100.39	98.38	98.38	0.00
7.960	1.07	100.39	98.38	98.38	0.00	7.965	1.07	100.39	98.38	98.38	0.00
7.970	1.07	100.39	98.38	98.38	0.00	7.975	1.07	100.39	98.38	98.38	0.00
7.980	1.07	100.39	98.38	98.38	0.00	7.985	1.07	100.39	98.38	98.38	0.00
7.990	1.07	100.39	98.38	98.38	0.00	7.995	1.07	100.39	98.38	98.38	0.00
8.000	1.07	100.39	98.38	98.38	0.00						

ect:	Starting Motor	ETAP PowerStation	Page:	7
ation:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
tract:	Pengasutan Resistor		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
name:	kebon_agung		Config.:	Normal

SWITCHING MOTORS

Motor ID	Nameplate								Starting Device				Switch Off		Equipment Cable ID
	Type	Qty	HP/kW	kV	RPM	FLA	%PF	%Eff	H*	Type	%Tap	kvar	%Ws	Sec.	
	Ind.	I	200.0	0.380	1800	251.9	93.8	95.9	0.25	Resistor	50.00			2.00	

is total inertia constant of the shaft in MW-Sec/MVA

SWITCHING MOTORS

Motor ID	Motor Model			Equipment Parameters				Circuit Parameters						Equipment Cable ID
	Type	Class	ID	X/R	Xlr	Xoc	Td0'	Rs	Xs	Xm	Rrl	Rr2	Xrl	Xr2
Mtr1	SGL2	HV-LS-HT	LV100HP2P					2.8	10.9	297.4	1.0	2.2	15.6	4.3

All reactances are in percent (machine base) and time constants are in seconds.

- BL1: Double-Cage model with integrated cages
- BL2: Double-Cage model with independent cages
- GL1: Single-Cage model
- GL2: Single-Cage model with deep-bar effect
- SC: Torque Slip Characteristic

MOTOR MECHANICAL LOAD

Motor ID	Load Torque ($= a_0 + a_1 W + a_2 W^2 + a_3 W^3$)				
	Model ID	a0	a1	a2	
Mtr1	OPEN VALVE	4.0	-48.0	247.0	-116.0

Elect: Starting Motor
Station: PG. KEBON AGUNG
Distract: Pengasutan Resistor
Engineer: DWI HERMAWAN
Name: kebon_agung

ETAP PowerStation
4.0.0.C

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Date: 03-17-2009
SN: KLGCONSULT
Revision: Base
Config.: Normal

MOTOR ACCELERATION

Motor ID : Mrl1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time	Slip	Terminal	Bus	Acc Torq
						(Sec.)	(%)	(%)	V (%)	(%)
0.000	100.00	0.00	0.00	100.00	0.00	0.005	100.00	0.00	100.00	0.00
0.010	100.00	0.00	0.00	100.00	0.00	0.015	100.00	0.00	100.00	0.00
0.020	100.00	0.00	0.00	100.00	0.00	0.025	100.00	0.00	100.00	0.00
0.030	100.00	0.00	0.00	100.00	0.00	0.035	100.00	0.00	100.00	0.00
0.040	100.00	0.00	0.00	100.00	0.00	0.045	100.00	0.00	100.00	0.00
0.050	100.00	0.00	0.00	100.00	0.00	0.055	100.00	0.00	100.00	0.00
0.060	100.00	0.00	0.00	100.00	0.00	0.065	100.00	0.00	100.00	0.00
0.070	100.00	0.00	0.00	100.00	0.00	0.075	100.00	0.00	100.00	0.00
0.080	100.00	0.00	0.00	100.00	0.00	0.085	100.00	0.00	100.00	0.00
0.090	100.00	0.00	0.00	100.00	0.00	0.095	100.00	0.00	100.00	0.00
0.100	100.00	0.00	0.00	100.00	0.00	0.105	100.00	0.00	100.00	0.00
0.110	100.00	0.00	0.00	100.00	0.00	0.115	100.00	0.00	100.00	0.00
0.120	100.00	0.00	0.00	100.00	0.00	0.125	100.00	0.00	100.00	0.00
0.130	100.00	0.00	0.00	100.00	0.00	0.135	100.00	0.00	100.00	0.00
0.140	100.00	0.00	0.00	100.00	0.00	0.145	100.00	0.00	100.00	0.00
0.150	100.00	0.00	0.00	100.00	0.00	0.155	100.00	0.00	100.00	0.00
0.160	100.00	0.00	0.00	100.00	0.00	0.165	100.00	0.00	100.00	0.00
0.170	100.00	0.00	0.00	100.00	0.00	0.175	100.00	0.00	100.00	0.00
0.180	100.00	0.00	0.00	100.00	0.00	0.185	100.00	0.00	100.00	0.00
0.190	100.00	0.00	0.00	100.00	0.00	0.195	100.00	0.00	100.00	0.00
0.200	100.00	0.00	0.00	100.00	0.00	0.205	100.00	0.00	100.00	0.00
0.210	100.00	0.00	0.00	100.00	0.00	0.215	100.00	0.00	100.00	0.00
0.220	100.00	0.00	0.00	100.00	0.00	0.225	100.00	0.00	100.00	0.00
0.230	100.00	0.00	0.00	100.00	0.00	0.235	100.00	0.00	100.00	0.00
0.240	100.00	0.00	0.00	100.00	0.00	0.245	100.00	0.00	100.00	0.00
0.250	100.00	0.00	0.00	100.00	0.00	0.255	100.00	0.00	100.00	0.00
0.260	100.00	0.00	0.00	100.00	0.00	0.265	100.00	0.00	100.00	0.00
0.270	100.00	0.00	0.00	100.00	0.00	0.275	100.00	0.00	100.00	0.00
0.280	100.00	0.00	0.00	100.00	0.00	0.285	100.00	0.00	100.00	0.00
0.290	100.00	0.00	0.00	100.00	0.00	0.295	100.00	0.00	100.00	0.00
0.300	100.00	0.00	0.00	100.00	0.00	0.305	100.00	0.00	100.00	0.00
0.310	100.00	0.00	0.00	100.00	0.00	0.315	100.00	0.00	100.00	0.00
0.320	100.00	0.00	0.00	100.00	0.00	0.325	100.00	0.00	100.00	0.00
0.330	100.00	0.00	0.00	100.00	0.00	0.335	100.00	0.00	100.00	0.00

ect:	Starting Motor	ETAP PowerStation	Page:	13
ation:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
tract:	Pengasutan Resistor		SN:	KLGCONSULT
neer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
name:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
0.340	100.00	0.00	0.00	100.00	0.00	0.345	100.00	0.00	0.00	100.00	0.00
0.350	100.00	0.00	0.00	100.00	0.00	0.355	100.00	0.00	0.00	100.00	0.00
0.360	100.00	0.00	0.00	100.00	0.00	0.365	100.00	0.00	0.00	100.00	0.00
0.370	100.00	0.00	0.00	100.00	0.00	0.375	100.00	0.00	0.00	100.00	0.00
0.380	100.00	0.00	0.00	100.00	0.00	0.385	100.00	0.00	0.00	100.00	0.00
0.390	100.00	0.00	0.00	100.00	0.00	0.395	100.00	0.00	0.00	100.00	0.00
0.400	100.00	0.00	0.00	100.00	0.00	0.405	100.00	0.00	0.00	100.00	0.00
0.410	100.00	0.00	0.00	100.00	0.00	0.415	100.00	0.00	0.00	100.00	0.00
0.420	100.00	0.00	0.00	100.00	0.00	0.425	100.00	0.00	0.00	100.00	0.00
0.430	100.00	0.00	0.00	100.00	0.00	0.435	100.00	0.00	0.00	100.00	0.00
0.440	100.00	0.00	0.00	100.00	0.00	0.445	100.00	0.00	0.00	100.00	0.00
0.450	100.00	0.00	0.00	100.00	0.00	0.455	100.00	0.00	0.00	100.00	0.00
0.460	100.00	0.00	0.00	100.00	0.00	0.465	100.00	0.00	0.00	100.00	0.00
0.470	100.00	0.00	0.00	100.00	0.00	0.475	100.00	0.00	0.00	100.00	0.00
0.480	100.00	0.00	0.00	100.00	0.00	0.485	100.00	0.00	0.00	100.00	0.00
0.490	100.00	0.00	0.00	100.00	0.00	0.495	100.00	0.00	0.00	100.00	0.00
0.500	99.84	298.14	47.68	95.35	15.55	0.505	99.69	297.85	47.68	95.36	15.59
0.510	99.53	297.55	47.68	95.36	15.63	0.515	99.38	297.25	47.68	95.37	15.68
0.520	99.22	296.96	47.69	95.37	15.72	0.525	99.06	296.66	47.69	95.38	15.76
0.530	98.90	296.36	47.69	95.38	15.80	0.535	98.74	296.07	47.69	95.38	15.83
0.540	98.58	295.77	47.69	95.39	15.87	0.545	98.43	295.47	47.70	95.39	15.91
0.550	98.27	295.17	47.70	95.40	15.94	0.555	98.11	294.88	47.70	95.40	15.98
0.560	97.95	294.58	47.70	95.41	16.01	0.565	97.79	294.28	47.71	95.41	16.04
0.570	97.62	293.98	47.71	95.42	16.07	0.575	97.46	293.69	47.71	95.42	16.10
0.580	97.30	293.39	47.71	95.43	16.13	0.585	97.14	293.09	47.71	95.43	16.16
0.590	96.98	292.79	47.72	95.43	16.19	0.595	96.82	292.50	47.72	95.44	16.21
0.600	96.65	292.20	47.72	95.44	16.24	0.605	96.49	291.90	47.72	95.45	16.26
0.610	96.33	291.60	47.73	95.45	16.29	0.615	96.17	291.31	47.73	95.46	16.31
0.620	96.00	291.01	47.73	95.46	16.33	0.625	95.84	290.71	47.73	95.47	16.35
0.630	95.67	290.42	47.74	95.47	16.37	0.635	95.51	290.12	47.74	95.48	16.39
0.640	95.35	289.83	47.74	95.48	16.40	0.645	95.18	289.53	47.74	95.48	16.42
0.650	95.02	289.24	47.74	95.49	16.43	0.655	94.85	288.94	47.75	95.49	16.45
0.660	94.69	288.65	47.75	95.50	16.46	0.665	94.52	288.35	47.75	95.50	16.47
0.670	94.36	288.06	47.75	95.51	16.48	0.675	94.19	287.77	47.76	95.51	16.49
0.680	94.03	287.47	47.76	95.52	16.50	0.685	93.86	287.18	47.76	95.52	16.51
0.690	93.70	286.89	47.76	95.52	16.51	0.695	93.53	286.60	47.76	95.53	16.52

Effect: Starting Motor
 Generation: PG. KEBON AGUNG
 Protect: Pengasutan Resistor
 React: DWI HERMAWAN
 Name: kebon_agung

ETAP PowerStation

4.0.0C

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Date: 03-17-2009

SN: KLGCNSULT

Revision: Base

Config.: Normal

Study Case: MS

Motor ID: M1L

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
0.700	93.37	286.31	47.77	95.53	16.52	0.705	93.20	286.02	47.77	95.54	16.52
0.710	93.04	285.73	47.77	95.54	16.53	0.715	92.87	285.44	47.77	95.55	16.53
0.720	92.71	285.15	47.78	95.55	16.53	0.725	92.54	284.86	47.78	95.56	16.53
0.730	92.38	284.57	47.78	95.56	16.52	0.735	92.21	284.29	47.78	95.56	16.52
0.740	92.05	284.00	47.78	95.57	16.52	0.745	91.88	283.71	47.79	95.57	16.51
0.750	91.71	283.43	47.79	95.58	16.50	0.755	91.55	283.14	47.79	95.58	16.50
0.760	91.38	282.86	47.79	95.59	16.49	0.765	91.22	282.58	47.80	95.59	16.48
0.770	91.06	282.29	47.80	95.60	16.47	0.775	90.89	282.01	47.80	95.60	16.46
0.780	90.73	281.73	47.80	95.60	16.44	0.785	90.56	281.45	47.80	95.61	16.43
0.790	90.40	281.17	47.81	95.61	16.42	0.795	90.23	280.89	47.81	95.62	16.40
0.800	90.07	280.62	47.81	95.62	16.39	0.805	89.91	280.34	47.81	95.63	16.37
0.810	89.74	280.06	47.81	95.63	16.35	0.815	89.58	279.79	47.82	95.63	16.33
0.820	89.42	279.51	47.82	95.64	16.31	0.825	89.25	279.24	47.82	95.64	16.29
0.830	89.11	278.97	47.82	95.65	16.27	0.835	88.93	278.70	47.83	95.65	16.24
0.840	88.76	278.42	47.83	95.65	16.22	0.845	88.60	278.15	47.83	95.66	16.20
0.850	88.44	277.89	47.83	95.66	16.17	0.855	88.28	277.62	47.83	95.67	16.14
0.860	88.12	277.35	47.84	95.67	16.12	0.865	87.96	277.08	47.84	95.68	16.09
0.870	87.80	276.82	47.84	95.68	16.06	0.875	87.64	276.55	47.84	95.68	16.03
0.880	87.48	276.29	47.84	95.69	16.00	0.885	87.32	276.03	47.85	95.69	15.97
0.890	87.16	275.77	47.85	95.70	15.93	0.895	87.00	275.51	47.85	95.70	15.90
0.900	86.84	275.25	47.85	95.70	15.87	0.905	86.68	274.99	47.85	95.71	15.83
0.910	86.52	274.73	47.86	95.71	15.80	0.915	86.36	274.48	47.86	95.72	15.76
0.920	86.21	274.22	47.86	95.72	15.72	0.925	86.05	273.97	47.86	95.72	15.68
0.930	85.89	273.71	47.86	95.73	15.64	0.935	85.74	273.46	47.87	95.73	15.60
0.940	85.58	273.21	47.87	95.74	15.56	0.945	85.43	272.96	47.87	95.74	15.52
0.950	85.27	272.71	47.87	95.74	15.48	0.955	85.12	272.47	47.87	95.75	15.44
0.960	84.96	272.22	47.88	95.75	15.40	0.965	84.81	271.97	47.88	95.75	15.35
0.970	84.66	271.73	47.88	95.76	15.31	0.975	84.50	271.49	47.88	95.76	15.26
0.980	84.35	271.25	47.88	95.77	15.22	0.985	84.20	271.00	47.88	95.77	15.17
0.990	84.05	270.76	47.89	95.77	15.12	0.995	83.90	270.53	47.89	95.78	15.08
1.000	83.75	270.29	47.89	95.78	15.03	1.005	83.60	270.05	47.89	95.78	14.98
1.010	83.45	269.82	47.89	95.79	14.93	1.015	83.30	269.58	47.90	95.79	14.88
1.020	83.15	269.35	47.90	95.80	14.83	1.025	83.00	269.12	47.90	95.80	14.78
1.030	82.86	268.89	47.90	95.80	14.73	1.035	82.71	268.66	47.90	95.81	14.68
1.040	82.56	268.43	47.90	95.81	14.62	1.045	82.42	268.21	47.91	95.81	14.57
1.050	82.27	267.98	47.91	95.82	14.52	1.055	82.13	267.76	47.91	95.82	14.46

ject:	Starting Motor	ETAP PowerStation	Page:	15
cation:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
Contract:	Pengasutan Resistor		SN:	KLGCONSULT
Engineer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
ename:	kebon_agung		Config.:	Normal

[Motor ID : Mtr1](#)

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
1.060	81.98	267.53	47.91	95.82	14.41	1.065	81.84	267.31	47.91	95.83	14.35
1.070	81.70	267.09	47.92	95.83	14.30	1.075	81.55	266.87	47.92	95.83	14.24
1.080	81.41	266.65	47.92	95.84	14.19	1.085	81.27	266.43	47.92	95.84	14.13
1.090	81.13	266.22	47.92	95.84	14.07	1.095	80.99	266.00	47.92	95.85	14.02
1.100	80.85	265.79	47.93	95.85	13.96	1.105	80.71	265.58	47.93	95.85	13.90
1.110	80.57	265.37	47.93	95.86	13.84	1.115	80.43	265.16	47.93	95.86	13.78
1.120	80.30	264.95	47.93	95.86	13.72	1.125	80.16	264.74	47.93	95.87	13.66
1.130	80.02	264.53	47.93	95.87	13.60	1.135	79.89	264.33	47.94	95.87	13.54
1.140	79.75	264.13	47.94	95.88	13.48	1.145	79.62	263.92	47.94	95.88	13.42
1.150	79.49	263.72	47.94	95.88	13.36	1.155	79.35	263.52	47.94	95.89	13.30
1.160	79.22	263.32	47.94	95.89	13.24	1.165	79.09	263.12	47.95	95.89	13.18
1.170	78.96	262.93	47.95	95.89	13.12	1.175	78.83	262.73	47.95	95.90	13.05
1.180	78.70	262.54	47.95	95.90	12.99	1.185	78.57	262.34	47.95	95.90	12.93
1.190	78.44	262.15	47.95	95.91	12.87	1.195	78.31	261.96	47.95	95.91	12.80
1.200	78.18	261.77	47.96	95.91	12.74	1.205	78.06	261.58	47.96	95.92	12.68
1.210	77.93	261.40	47.96	95.92	12.61	1.215	77.80	261.21	47.96	95.92	12.55
1.220	77.68	261.03	47.96	95.92	12.49	1.225	77.55	260.84	47.96	95.93	12.42
1.230	77.43	260.66	47.96	95.93	12.36	1.235	77.31	260.48	47.97	95.93	12.30
1.240	77.19	260.30	47.97	95.94	12.23	1.245	77.06	260.12	47.97	95.94	12.17
1.250	76.94	259.94	47.97	95.94	12.10	1.255	76.82	259.77	47.97	95.94	12.04
1.260	76.70	259.59	47.97	95.95	11.97	1.265	76.58	259.42	47.97	95.95	11.91
1.270	76.46	259.24	47.98	95.95	11.85	1.275	76.35	259.07	47.98	95.95	11.78
1.280	76.23	258.90	47.98	95.96	11.72	1.285	76.11	258.73	47.98	95.96	11.65
1.290	76.00	258.56	47.98	95.96	11.59	1.295	75.88	258.40	47.98	95.96	11.52
1.300	75.77	258.23	47.98	95.97	11.46	1.305	75.65	258.07	47.99	95.97	11.39
1.310	75.54	257.90	47.99	95.97	11.33	1.315	75.43	257.74	47.99	95.98	11.26
1.320	75.31	257.58	47.99	95.98	11.20	1.325	75.20	257.42	47.99	95.98	11.13
1.330	75.09	257.26	47.99	95.98	11.07	1.335	74.98	257.10	47.99	95.99	11.01
1.340	74.87	256.94	47.99	95.99	10.94	1.345	74.76	256.79	47.99	95.99	10.88
1.350	74.66	256.63	48.00	95.99	10.81	1.355	74.55	256.48	48.00	95.99	10.75
1.360	74.44	256.32	48.00	96.00	10.68	1.365	74.34	256.17	48.00	96.00	10.62
1.370	74.23	256.02	48.00	96.00	10.56	1.375	74.12	255.87	48.00	96.00	10.49
1.380	74.02	255.72	48.00	96.01	10.43	1.385	73.92	255.58	48.00	96.01	10.36
1.390	73.81	255.43	48.01	96.01	10.30	1.395	73.71	255.28	48.01	96.01	10.24
1.400	73.61	255.14	48.01	96.02	10.17	1.405	73.51	255.00	48.01	96.02	10.11
1.410	73.41	254.86	48.01	96.02	10.05	1.415	73.31	254.71	48.01	96.02	9.98

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Object: Pengasutan Resistor
 Engineer: DWI HERMAWAN
 Name: kebon_agung

ETAP PowerStation

4.0.0C

Page: 16
 Date: 03-17-2009
 SN: KLGC0NSULT
 Revision: Base
 Config: Normal

Study Case MS

Motor ID : Mtr1									
Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)
1.420	73.21	254.57	48.01	96.02	9.92	1.425	73.11	254.43	48.01
1.430	73.01	254.30	48.01	96.03	9.80	1.435	72.91	254.16	48.02
1.440	72.82	254.02	48.02	96.03	9.67	1.445	72.72	253.89	48.02
1.450	72.63	253.75	48.02	96.04	9.55	1.455	72.53	253.62	48.02
1.460	72.44	253.49	48.02	96.04	9.42	1.465	72.34	253.36	48.02
1.470	72.25	253.23	48.02	96.05	9.30	1.475	72.16	253.10	48.02
1.480	72.07	252.97	48.02	96.05	9.18	1.485	71.97	252.84	48.03
1.490	71.88	252.72	48.03	96.05	9.06	1.495	71.79	252.59	48.03
1.500	71.70	252.47	48.03	96.06	8.94	1.505	71.62	252.34	48.03
1.510	71.53	252.22	48.03	96.06	8.82	1.515	71.44	252.10	48.03
1.520	71.35	251.98	48.03	96.06	8.70	1.525	71.27	251.86	48.03
1.530	71.18	251.74	48.03	96.07	8.58	1.535	71.10	251.62	48.04
1.540	71.01	251.51	48.04	96.07	8.46	1.545	70.93	251.39	48.04
1.550	70.84	251.28	48.04	96.08	8.35	1.555	70.76	251.16	48.04
1.560	70.68	251.05	48.04	96.08	8.23	1.565	70.60	250.94	48.04
1.570	70.51	250.82	48.04	96.08	8.12	1.575	70.43	250.71	48.04
1.580	70.35	250.60	48.04	96.09	8.01	1.585	70.27	250.49	48.04
1.590	70.20	250.39	48.04	96.09	7.89	1.595	70.12	250.28	48.05
1.600	70.04	250.17	48.05	96.09	7.78	1.605	69.96	250.07	48.05
1.610	69.88	249.96	48.05	96.10	7.67	1.615	69.81	249.86	48.05
1.620	69.73	249.75	48.05	96.10	7.56	1.625	69.66	249.65	48.05
1.630	69.58	249.55	48.05	96.10	7.45	1.635	69.51	249.45	48.05
1.640	69.44	249.35	48.05	96.11	7.35	1.645	69.36	249.25	48.05
1.650	69.29	249.15	48.05	96.11	7.24	1.655	69.22	249.06	48.06
1.660	69.15	248.96	48.06	96.11	7.14	1.665	69.08	248.86	48.06
1.670	69.01	248.77	48.06	96.12	7.03	1.675	68.94	248.67	48.06
1.680	68.87	248.58	48.06	96.12	6.93	1.685	68.80	248.49	48.06
1.690	68.73	248.39	48.06	96.12	6.83	1.695	68.66	248.30	48.06
1.700	68.59	248.21	48.06	96.12	6.73	1.705	68.53	248.12	48.06
1.710	68.46	248.03	48.06	96.13	6.63	1.715	68.40	247.94	48.06
1.720	68.33	247.86	48.06	96.13	6.53	1.725	68.27	247.77	48.07
1.730	68.20	247.68	48.07	96.13	6.43	1.735	68.14	247.60	48.07
1.740	68.07	247.51	48.07	96.13	6.33	1.745	68.01	247.43	48.07
1.750	67.95	247.34	48.07	96.14	6.24	1.755	67.89	247.26	48.07
1.760	67.83	247.18	48.07	96.14	6.14	1.765	67.76	247.10	48.07
1.770	67.70	247.02	48.07	96.14	6.05	1.775	67.64	246.94	48.07

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contact: Pengasutan Resistor
 Engineer: DWI HERMAWAN
 Name: kebon_agung

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Date: 03-17-2009

SN: KLGCCONSULT

Study Case: MS

Revision: Base

Config.: Normal

Motor ID : Mtr1

	Time	Slip (%)	Current (% of FLA)	Terminal V(%)	Bus V(%)	Ace Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V(%)	Bus V(%)	Acc Torq (%)
1.780	67.58	246.86	48.07	96.14	5.96	1.785	67.52	246.78	48.07	96.15	5.91	
1.790	67.47	246.70	48.07	96.15	5.87	1.795	67.41	246.62	48.07	96.15	5.82	
1.800	67.35	246.54	48.07	96.15	5.78	1.805	67.29	246.47	48.08	96.15	5.73	
1.810	67.24	246.39	48.08	96.15	5.69	1.815	67.18	246.32	48.08	96.15	5.64	
1.820	67.12	246.24	48.08	96.15	5.60	1.825	67.07	246.17	48.08	96.16	5.56	
1.830	67.01	246.10	48.08	96.16	5.51	1.835	66.96	246.02	48.08	96.16	5.47	
1.840	66.90	245.95	48.08	96.16	5.43	1.845	66.85	245.88	48.08	96.16	5.39	
1.850	66.80	245.81	48.08	96.16	5.34	1.855	66.74	245.74	48.08	96.16	5.30	
1.860	66.69	245.67	48.08	96.16	5.26	1.865	66.64	245.60	48.08	96.16	5.22	
1.870	66.59	245.53	48.08	96.17	5.18	1.875	66.53	245.46	48.08	96.17	5.14	
1.880	66.48	245.40	48.08	96.17	5.10	1.885	66.43	245.33	48.08	96.17	5.06	
1.890	66.38	245.26	48.08	96.17	5.02	1.895	66.33	245.20	48.09	96.17	4.98	
1.900	66.28	245.13	48.09	96.17	4.94	1.905	66.23	245.07	48.09	96.17	4.90	
1.910	66.19	245.00	48.09	96.17	4.86	1.915	66.14	244.94	48.09	96.17	4.82	
1.920	66.09	244.88	48.09	96.18	4.78	1.925	66.04	244.82	48.09	96.18	4.74	
1.930	66.00	244.75	48.09	96.18	4.71	1.935	65.95	244.69	48.09	96.18	4.67	
1.940	65.90	244.63	48.09	96.18	4.63	1.945	65.86	244.57	48.09	96.18	4.59	
1.950	65.81	244.51	48.09	96.18	4.56	1.955	65.77	244.45	48.09	96.18	4.52	
1.960	65.72	244.39	48.09	96.18	4.48	1.965	65.68	244.33	48.09	96.18	4.45	
1.970	65.63	244.28	48.09	96.19	4.41	1.975	65.59	244.22	48.09	96.19	4.38	
1.980	65.55	244.16	48.09	96.19	4.34	1.985	65.50	244.11	48.09	96.19	4.31	
1.990	65.46	244.05	48.09	96.19	4.27	1.995	65.42	243.99	48.09	96.19	4.24	
2.000	65.37	243.94	48.10	96.19	4.20	2.005	65.33	243.88	48.10	96.19	4.17	
2.010	65.29	243.83	48.10	96.19	4.13	2.015	65.25	243.78	48.10	96.19	4.10	
2.020	65.21	243.72	48.10	96.19	4.07	2.025	65.17	243.67	48.10	96.19	4.03	
2.030	65.13	243.62	48.10	96.20	4.00	2.035	65.09	243.57	48.10	96.20	3.97	
2.040	65.05	243.52	48.10	96.20	3.94	2.045	65.01	243.47	48.10	96.20	3.90	
2.050	64.97	243.42	48.10	96.20	3.87	2.055	64.93	243.37	48.10	96.20	3.84	
2.060	64.90	243.32	48.10	96.20	3.81	2.065	64.86	243.27	48.10	96.20	3.78	
2.070	64.82	243.22	48.10	96.20	3.75	2.075	64.78	243.17	48.10	96.20	3.71	
2.080	64.75	243.12	48.10	96.20	3.68	2.085	64.71	243.07	48.10	96.20	3.65	
2.090	64.67	243.03	48.10	96.20	3.62	2.095	64.64	242.98	48.10	96.21	3.59	
2.100	64.60	242.93	48.10	96.21	3.56	2.105	64.57	242.89	48.10	96.21	3.53	
2.110	64.53	242.84	48.10	96.21	3.50	2.115	64.50	242.80	48.10	96.21	3.48	
2.120	64.46	242.75	48.10	96.21	3.45	2.125	64.43	242.71	48.10	96.21	3.42	
2.130	64.39	242.66	48.11	96.21	3.39	2.135	64.36	242.62	48.11	96.21	3.36	

ject: Starting Motor
Location: PG. KEBON AGUNG
tract: Pengasutan Resistor
Engineer: DWI HERMAWAN
Name: kebon_agung

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SN: KLGCNSULT

Revision: Base

Config.: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Ace Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
2.140	64.33	242.58	48.11	96.21	3.33	2.145	64.29	242.53	48.11	96.21	3.31
2.150	64.26	242.49	48.11	96.21	3.28	2.155	64.23	242.45	48.11	96.21	3.25
2.160	64.20	242.41	48.11	96.21	3.22	2.165	64.17	242.37	48.11	96.22	3.20
2.170	64.13	242.33	48.11	96.22	3.17	2.175	64.10	242.29	48.11	96.22	3.14
2.180	64.07	242.25	48.11	96.22	3.12	2.185	64.04	242.21	48.11	96.22	3.09
2.190	64.01	242.17	48.11	96.22	3.06	2.195	63.98	242.13	48.11	96.22	3.04
2.200	63.95	242.09	48.11	96.22	3.01	2.205	63.92	242.05	48.11	96.22	2.99
2.210	63.89	242.01	48.11	96.22	2.96	2.215	63.86	241.97	48.11	96.22	2.94
2.220	63.83	241.94	48.11	96.22	2.91	2.225	63.80	241.90	48.11	96.22	2.89
2.230	63.77	241.86	48.11	96.22	2.86	2.235	63.74	241.82	48.11	96.22	2.84
2.240	63.72	241.79	48.11	96.22	2.82	2.245	63.69	241.75	48.11	96.22	2.79
2.250	63.66	241.72	48.11	96.23	2.77	2.255	63.63	241.68	48.11	96.23	2.75
2.260	63.61	241.65	48.11	96.23	2.72	2.265	63.58	241.61	48.11	96.23	2.70
2.270	63.55	241.58	48.11	96.23	2.68	2.275	63.53	241.54	48.11	96.23	2.65
2.280	63.50	241.51	48.11	96.23	2.63	2.285	63.47	241.48	48.11	96.23	2.61
2.290	63.45	241.44	48.11	96.23	2.59	2.295	63.42	241.41	48.12	96.23	2.56
2.300	63.40	241.38	48.12	96.23	2.54	2.305	63.37	241.34	48.12	96.23	2.52
2.310	63.35	241.31	48.12	96.23	2.50	2.315	63.32	241.28	48.12	96.23	2.48
2.320	63.30	241.25	48.12	96.23	2.46	2.325	63.27	241.22	48.12	96.23	2.44
2.330	63.25	241.19	48.12	96.23	2.42	2.335	63.22	241.16	48.12	96.23	2.39
2.340	63.20	241.13	48.12	96.23	2.37	2.345	63.18	241.10	48.12	96.24	2.35
2.350	63.15	241.07	48.12	96.24	2.33	2.355	63.13	241.04	48.12	96.24	2.31
2.360	63.11	241.01	48.12	96.24	2.29	2.365	63.08	240.98	48.12	96.24	2.27
2.370	63.06	240.95	48.12	96.24	2.25	2.375	63.04	240.92	48.12	96.24	2.24
2.380	63.02	240.89	48.12	96.24	2.22	2.385	63.00	240.86	48.12	96.24	2.20
2.390	62.97	240.84	48.12	96.24	2.18	2.395	62.95	240.81	48.12	96.24	2.16
2.430	62.81	240.62	48.12	96.24	2.03	2.435	62.79	240.60	48.12	96.24	2.02
2.440	62.77	240.57	48.12	96.24	2.14	2.405	62.91	240.75	48.12	96.24	2.12
2.450	62.73	240.52	48.12	96.24	1.96	2.455	62.71	240.50	48.12	96.24	1.95
2.460	62.69	240.47	48.12	96.25	1.93	2.465	62.67	240.45	48.12	96.25	1.91
2.470	62.65	240.42	48.12	96.25	1.90	2.475	62.63	240.40	48.12	96.25	1.88
2.480	62.61	240.37	48.12	96.25	1.86	2.485	62.59	240.35	48.12	96.25	1.85
2.490	62.58	240.33	48.12	96.25	1.83	2.495	62.56	240.30	48.12	96.25	1.82

ect:	Starting Motor	ETAP PowerStation	Page:	19
ation:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
tract:	Pengasutan Resistor		SN:	KLGCONSULT
ineer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
name:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
2.500	62.54	240.28	48.12	96.25	1.80	2.505	62.13	451.52	90.44	90.44	41.31
2.510	61.72	450.60	90.46	90.46	40.94	2.515	61.31	449.70	90.48	90.48	40.56
2.520	60.91	448.80	90.50	90.50	40.19	2.525	60.51	447.91	90.52	90.52	39.82
2.530	60.12	447.04	90.54	90.54	39.45	2.535	59.72	446.17	90.55	90.55	39.08
2.540	59.34	445.32	90.57	90.57	38.72	2.545	58.95	444.48	90.59	90.59	38.36
2.550	58.57	443.65	90.61	90.61	38.00	2.555	58.20	442.83	90.63	90.63	37.65
2.560	57.82	442.01	90.64	90.64	37.29	2.565	57.45	441.21	90.66	90.66	36.94
2.570	57.09	440.42	90.68	90.68	36.60	2.575	56.72	439.64	90.69	90.69	36.25
2.580	56.36	438.87	90.71	90.71	35.91	2.585	56.01	438.10	90.73	90.73	35.57
2.590	55.66	437.35	90.74	90.74	35.24	2.595	55.31	436.60	90.76	90.76	34.91
2.600	54.96	435.87	90.77	90.77	34.58	2.605	54.62	435.14	90.79	90.79	34.25
2.610	54.28	434.42	90.80	90.80	33.93	2.615	53.94	433.71	90.82	90.82	33.60
2.620	53.61	433.01	90.83	90.83	33.29	2.625	53.28	432.32	90.85	90.85	32.97
2.630	52.95	431.63	90.86	90.86	32.66	2.635	52.63	430.95	90.88	90.88	32.35
2.640	52.31	430.28	90.89	90.89	32.05	2.645	51.99	429.62	90.90	90.90	31.75
2.650	51.68	428.97	90.92	90.92	31.45	2.655	51.36	428.32	90.93	90.93	31.15
2.660	51.06	427.68	90.95	90.95	30.86	2.665	50.75	427.05	90.96	90.96	30.57
2.670	50.45	426.43	90.97	90.97	30.29	2.675	50.15	425.81	90.99	90.99	30.00
2.680	49.85	425.20	91.00	91.00	29.72	2.685	49.55	424.60	91.01	91.01	29.45
2.690	49.26	424.00	91.02	91.02	29.17	2.695	48.97	423.41	91.04	91.04	28.90
2.700	48.69	422.82	91.05	91.05	28.64	2.705	48.40	422.25	91.06	91.06	28.37
2.710	48.12	421.67	91.07	91.07	28.11	2.715	47.84	421.11	91.08	91.08	27.85
2.720	47.57	420.55	91.10	91.10	27.60	2.725	47.29	420.00	91.11	91.11	27.35
2.730	47.02	419.45	91.12	91.12	27.10	2.735	46.75	418.91	91.13	91.13	26.85
2.740	46.49	418.37	91.14	91.14	26.61	2.745	46.22	417.84	91.15	91.15	26.37
2.750	45.96	417.32	91.16	91.16	26.14	2.755	45.70	416.80	91.18	91.18	25.90
2.760	45.45	416.28	91.19	91.19	25.67	2.765	45.19	415.77	91.20	91.20	25.45
2.770	44.94	415.27	91.21	91.21	25.22	2.775	44.69	414.77	91.22	91.22	25.00
2.780	44.44	414.28	91.23	91.23	24.78	2.785	44.19	413.79	91.24	91.24	24.56
2.790	43.95	413.30	91.25	91.25	24.35	2.795	43.71	412.82	91.26	91.26	24.14
2.800	43.47	412.35	91.27	91.27	23.93	2.805	43.23	411.88	91.28	91.28	23.73
2.810	43.00	411.41	91.29	91.29	23.53	2.815	42.76	410.95	91.30	91.30	23.33
2.820	42.53	410.49	91.31	91.31	23.13	2.825	42.30	410.04	91.32	91.32	22.94
2.830	42.08	409.59	91.33	91.33	22.75	2.835	41.85	409.15	91.34	91.34	22.56
2.840	41.63	408.71	91.35	91.35	22.38	2.845	41.40	408.27	91.36	91.36	22.19
2.850	41.18	407.84	91.36	91.36	22.01	2.855	40.97	407.41	91.37	91.37	21.83

ject: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Resistor
 Engineer: DWI HERMAWAN
 Name: kebon_agung

ETAP PowerStation

4.0.0C

Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

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Motor ID: Murl

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
2.860	40.75	406.98	91.38	91.38	21.66	2.865	40.53	406.56	91.39	91.39	21.49
2.870	40.32	406.14	91.40	91.40	21.32	2.875	40.11	405.73	91.41	91.41	21.15
2.880	39.90	405.32	91.42	91.42	20.98	2.885	39.69	404.91	91.43	91.43	20.82
2.890	39.48	404.51	91.43	91.43	20.66	2.895	39.28	404.10	91.44	91.44	20.50
2.900	39.07	403.71	91.45	91.45	20.35	2.905	38.87	403.31	91.46	91.46	20.19
2.910	38.67	402.92	91.47	91.47	20.04	2.915	38.47	402.53	91.48	91.48	19.90
2.920	38.28	402.15	91.48	91.48	19.75	2.925	38.08	401.76	91.49	91.49	19.61
2.930	37.88	401.38	91.50	91.50	19.46	2.935	37.69	401.01	91.51	91.51	19.33
2.940	37.50	400.63	91.52	91.52	19.19	2.945	37.31	400.26	91.52	91.52	19.05
2.950	37.12	399.89	91.53	91.53	18.92	2.955	36.93	399.53	91.54	91.54	18.79
2.990	35.65	397.03	91.59	91.59	17.94	2.995	35.47	396.68	91.60	91.60	17.82
3.000	35.29	396.34	91.61	91.61	17.71	3.005	35.12	395.99	91.61	91.61	17.60
2.970	36.37	398.44	91.56	91.56	18.41	2.975	36.19	398.09	91.57	91.57	18.29
2.980	36.01	397.73	91.58	91.58	18.17	2.985	35.83	397.38	91.58	91.58	18.05
3.020	34.60	396.98	91.64	91.64	17.28	3.025	34.42	394.64	91.64	91.64	17.18
3.030	34.25	394.31	91.65	91.65	17.08	3.035	34.08	393.98	91.66	91.66	16.98
3.040	33.91	393.65	91.66	91.66	16.89	3.045	33.75	393.32	91.67	91.67	16.79
3.050	33.58	392.99	91.68	91.68	16.70	3.055	33.41	392.67	91.68	91.68	16.61
3.060	33.25	392.35	91.69	91.69	16.52	3.065	33.08	392.02	91.70	91.70	16.44
3.070	32.92	391.70	91.70	91.70	16.35	3.075	32.76	391.38	91.71	91.71	16.27
3.080	32.60	391.07	91.72	91.72	16.19	3.085	32.43	390.75	91.72	91.72	16.11
3.090	32.27	390.44	91.73	91.73	16.03	3.095	32.11	390.12	91.74	91.74	15.95
3.100	31.96	389.81	91.74	91.74	15.88	3.105	31.80	389.50	91.75	91.75	15.81
3.110	31.64	389.19	91.76	91.76	15.74	3.115	31.48	388.88	91.76	91.76	15.67
3.120	31.33	388.58	91.77	91.77	15.60	3.125	31.17	388.27	91.78	91.78	15.54
3.130	31.02	387.96	91.78	91.78	15.47	3.135	30.86	387.66	91.79	91.79	15.41
3.140	30.71	387.36	91.80	91.80	15.35	3.145	30.56	387.05	91.80	91.80	15.29
3.150	30.40	386.75	91.81	91.81	15.24	3.155	30.25	386.45	91.81	91.81	15.18
3.160	30.10	386.15	91.82	91.82	15.13	3.165	29.95	385.85	91.83	91.83	15.08
3.170	29.80	385.55	91.83	91.83	15.03	3.175	29.65	385.25	91.84	91.84	14.98
3.180	29.50	384.96	91.85	91.85	14.93	3.185	29.35	384.66	91.85	91.85	14.89
3.190	29.20	384.36	91.86	91.86	14.85	3.195	29.05	384.07	91.87	91.87	14.81
3.200	28.91	383.77	91.87	91.87	14.77	3.205	28.76	383.48	91.88	91.88	14.73
3.210	28.61	383.18	91.88	91.88	14.69	3.215	28.46	382.89	91.89	91.89	14.66

Object: Starting Motor
 Location: PG. KEBON AGUNG
 Contact: Pengasutan Resistor
 Engineer: DWI HERMAWAN
 Name: kebon_agung

ETAP PowerStation

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Date: 03-17-2009

SN: KLGCONSULT

Study Case: MS

Revision: Base

Config.: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
3.220	28.32	382.59	91.90	91.90	14.63	3.225	28.17	382.30	91.90	91.90	14.60
3.230	28.03	382.00	91.91	91.91	14.57	3.235	27.88	381.71	91.92	91.92	14.54
3.240	27.74	381.41	91.92	91.92	14.52	3.245	27.59	381.12	91.93	91.93	14.49
3.250	27.45	380.83	91.93	91.93	14.47	3.255	27.30	380.53	91.94	91.94	14.45
3.260	27.16	380.24	91.95	91.95	14.44	3.265	27.01	379.94	91.95	91.95	14.42
3.270	26.87	379.65	91.96	91.96	14.41	3.275	26.72	379.35	91.96	91.96	14.40
3.280	26.58	379.05	91.97	91.97	14.39	3.285	26.44	378.76	91.98	91.98	14.38
3.290	26.29	378.46	91.98	91.98	14.37	3.295	26.15	378.16	91.99	91.99	14.37
3.300	26.01	377.87	92.00	92.00	14.37	3.305	25.86	377.57	92.00	92.00	14.37
3.310	25.72	377.27	92.01	92.01	14.37	3.315	25.57	376.97	92.02	92.02	14.37
3.320	25.43	376.67	92.02	92.02	14.38	3.325	25.29	376.37	92.03	92.03	14.39
3.330	25.14	376.06	92.03	92.03	14.40	3.335	25.00	375.76	92.04	92.04	14.42
3.340	24.85	375.45	92.05	92.05	14.43	3.345	24.71	375.15	92.05	92.05	14.45
3.350	24.56	374.84	92.06	92.06	14.47	3.355	24.42	374.53	92.07	92.07	14.49
3.360	24.27	374.22	92.07	92.07	14.52	3.365	24.13	373.91	92.08	92.08	14.55
3.370	23.98	373.60	92.09	92.09	14.58	3.375	23.84	373.28	92.09	92.09	14.61
3.380	23.69	372.96	92.10	92.10	14.65	3.385	23.54	372.64	92.11	92.11	14.69
3.390	23.40	372.32	92.11	92.11	14.73	3.395	23.25	372.00	92.12	92.12	14.78
3.400	23.10	371.67	92.13	92.13	14.82	3.405	22.95	371.35	92.14	92.14	14.87
3.410	22.80	371.02	92.14	92.14	14.93	3.415	22.65	370.68	92.15	92.15	14.99
3.420	22.50	370.35	92.16	92.16	15.05	3.425	22.35	370.01	92.16	92.16	15.11
3.430	22.20	369.67	92.17	92.17	15.18	3.435	22.04	369.33	92.18	92.18	15.25
3.440	21.89	368.98	92.19	92.19	15.33	3.445	21.74	368.63	92.19	92.19	15.41
3.450	21.58	368.27	92.20	92.20	15.50	3.455	21.43	367.92	92.21	92.21	15.58
3.460	21.27	367.55	92.22	92.22	15.68	3.465	21.11	367.19	92.23	92.23	15.77
3.470	20.95	366.82	92.23	92.23	15.88	3.475	20.79	366.44	92.24	92.24	15.99
3.480	20.63	366.06	92.25	92.25	16.10	3.485	20.47	365.68	92.26	92.26	16.22
3.490	20.31	365.29	92.27	92.27	16.34	3.495	20.14	364.89	92.28	92.28	16.47
3.500	19.97	364.49	92.28	92.28	16.61	3.505	19.81	364.08	92.29	92.29	16.75
3.510	19.64	363.67	92.30	92.30	16.90	3.515	19.47	363.25	92.31	92.31	17.05
3.520	19.30	362.82	92.32	92.32	17.22	3.525	19.12	362.39	92.33	92.33	17.39
3.530	18.95	361.94	92.34	92.34	17.57	3.535	18.77	361.49	92.35	92.35	17.75
3.540	18.59	361.03	92.36	92.36	17.95	3.545	18.41	360.56	92.37	92.37	18.16
3.550	18.22	360.08	92.38	92.38	18.37	3.555	18.04	359.59	92.39	92.39	18.60
3.560	17.85	359.09	92.40	92.40	18.84	3.565	17.66	358.58	92.42	92.42	19.09
3.570	17.46	358.05	92.43	92.43	19.35	3.575	17.27	357.52	92.44	92.44	19.62

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contact: Pengasutan Resistor
 Engineer: DWI HERMAWAN
 Name: kebon_agung

ETAP PowerStation
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Date: 03-17-2009

S/N: KLGCONSULT

Revision: Base

Config.: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
3.580	17.07	356.96	92.45	91.91	3.585	16.87	356.40	92.46	92.46	20.22	
3.590	16.66	355.81	92.48	92.48	3.595	16.45	355.21	92.49	92.49	20.88	
3.600	16.24	354.59	92.51	92.51	3.605	16.02	353.95	92.52	92.52	21.61	
3.610	15.80	353.29	92.54	92.54	3.615	15.58	352.61	92.55	92.55	22.42	
3.620	15.35	351.90	92.57	92.57	3.625	15.12	351.16	92.59	92.59	23.33	
3.630	14.88	350.39	92.60	92.60	3.635	14.63	349.60	92.62	92.62	24.36	
3.640	14.38	348.76	92.64	92.64	3.645	14.13	347.89	92.66	92.66	25.51	
3.650	13.87	346.98	92.68	92.68	3.655	13.60	346.92	92.71	92.71	26.83	
3.660	13.32	345.00	92.73	92.73	3.665	13.04	343.94	92.76	92.76	28.33	
3.670	12.75	342.80	92.78	92.78	3.675	12.45	341.59	92.81	92.81	30.07	
3.680	12.14	340.31	92.84	92.84	3.685	11.82	338.93	92.88	92.88	32.08	
3.690	11.48	337.44	92.91	92.91	3.695	11.14	335.84	92.95	92.95	34.44	
3.700	10.78	334.09	93.00	93.00	3.705	10.41	332.18	93.05	93.05	37.24	
3.710	10.02	330.07	93.10	93.10	3.715	9.61	327.74	93.16	93.16	40.59	
3.720	9.19	325.12	93.23	93.23	3.725	8.74	322.17	93.30	93.30	44.64	
3.730	8.27	318.81	93.39	93.39	3.735	7.78	314.92	93.49	93.49	49.58	
3.740	7.25	310.36	93.62	93.62	3.745	6.70	304.95	93.76	93.76	55.53	
3.750	6.11	298.40	93.94	93.94	3.755	5.48	290.32	94.16	94.16	62.36	
3.760	4.82	280.18	94.43	94.43	3.765	4.14	267.18	94.78	94.78	68.58	
3.770	3.44	250.35	95.22	95.22	3.775	2.76	228.61	95.77	95.77	68.00	
3.780	2.15	201.58	96.42	96.42	3.785	1.67	171.16	97.09	97.09	47.66	
3.790	1.36	142.59	97.66	97.66	3.795	1.20	121.68	98.04	98.04	16.50	
3.800	1.12	109.82	98.23	98.23	3.805	1.09	104.26	98.32	98.32	3.13	
3.810	1.08	101.92	98.36	98.36	3.815	1.07	100.99	98.37	98.37	0.49	
3.820	1.07	100.62	98.38	98.38	3.825	1.07	100.48	98.38	98.38	0.07	
3.830	1.07	100.42	98.38	98.38	3.835	1.07	100.40	98.38	98.38	0.01	
3.840	1.07	100.39	98.38	98.38	3.845	1.07	100.39	98.38	98.38	0.00	
3.850	1.07	100.39	98.38	98.38	3.855	1.07	100.39	98.38	98.38	0.00	
3.860	1.07	100.39	98.38	98.38	3.865	1.07	100.39	98.38	98.38	0.00	
3.870	1.07	100.39	98.38	98.38	3.875	1.07	100.39	98.38	98.38	0.00	
3.880	1.07	100.39	98.38	98.38	3.885	1.07	100.39	98.38	98.38	0.00	
3.890	1.07	100.39	98.38	98.38	3.895	1.07	100.39	98.38	98.38	0.00	
3.900	1.07	100.39	98.38	98.38	3.905	1.07	100.39	98.38	98.38	0.00	
3.910	1.07	100.39	98.38	98.38	3.915	1.07	100.39	98.38	98.38	0.00	
3.920	1.07	100.39	98.38	98.38	3.925	1.07	100.39	98.38	98.38	0.00	
3.930	1.07	100.39	98.38	98.38	3.935	1.07	100.39	98.38	98.38	0.00	

Object: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Resistor
 Engineer: DWI HERMAWAN
 Name: kebon_agung

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Page: 23
 Date: 03-17-2009
 SN: KLGCNSULT
 Revision: Base
 Config.: Normal

Motor ID: Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
3.940	1.07	100.39	98.38	98.38	0.00	3.945	1.07	100.39	98.38	98.38	0.00
3.950	1.07	100.39	98.38	98.38	0.00	3.955	1.07	100.39	98.38	98.38	0.00
3.960	1.07	100.39	98.38	98.38	0.00	3.965	1.07	100.39	98.38	98.38	0.00
3.970	1.07	100.39	98.38	98.38	0.00	3.975	1.07	100.39	98.38	98.38	0.00
3.980	1.07	100.39	98.38	98.38	0.00	3.985	1.07	100.39	98.38	98.38	0.00
3.990	1.07	100.39	98.38	98.38	0.00	3.995	1.07	100.39	98.38	98.38	0.00
4.000	1.07	100.39	98.38	98.38	0.00	4.005	1.07	100.39	98.38	98.38	0.00
4.010	1.07	100.39	98.38	98.38	0.00	4.015	1.07	100.39	98.38	98.38	0.00
4.020	1.07	100.39	98.38	98.38	0.00	4.025	1.07	100.39	98.38	98.38	0.00
4.030	1.07	100.39	98.38	98.38	0.00	4.035	1.07	100.39	98.38	98.38	0.00
4.040	1.07	100.39	98.38	98.38	0.00	4.045	1.07	100.39	98.38	98.38	0.00
4.050	1.07	100.39	98.38	98.38	0.00	4.055	1.07	100.39	98.38	98.38	0.00
4.060	1.07	100.39	98.38	98.38	0.00	4.065	1.07	100.39	98.38	98.38	0.00
4.070	1.07	100.39	98.38	98.38	0.00	4.075	1.07	100.39	98.38	98.38	0.00
4.080	1.07	100.39	98.38	98.38	0.00	4.085	1.07	100.39	98.38	98.38	0.00
4.090	1.07	100.39	98.38	98.38	0.00	4.095	1.07	100.39	98.38	98.38	0.00
4.100	1.07	100.39	98.38	98.38	0.00	4.105	1.07	100.39	98.38	98.38	0.00
4.110	1.07	100.39	98.38	98.38	0.00	4.115	1.07	100.39	98.38	98.38	0.00
4.120	1.07	100.39	98.38	98.38	0.00	4.125	1.07	100.39	98.38	98.38	0.00
4.130	1.07	100.39	98.38	98.38	0.00	4.135	1.07	100.39	98.38	98.38	0.00
4.140	1.07	100.39	98.38	98.38	0.00	4.145	1.07	100.39	98.38	98.38	0.00
4.150	1.07	100.39	98.38	98.38	0.00	4.155	1.07	100.39	98.38	98.38	0.00
4.160	1.07	100.39	98.38	98.38	0.00	4.165	1.07	100.39	98.38	98.38	0.00
4.170	1.07	100.39	98.38	98.38	0.00	4.175	1.07	100.39	98.38	98.38	0.00
4.180	1.07	100.39	98.38	98.38	0.00	4.185	1.07	100.39	98.38	98.38	0.00
4.190	1.07	100.39	98.38	98.38	0.00	4.195	1.07	100.39	98.38	98.38	0.00
4.200	1.07	100.39	98.38	98.38	0.00	4.205	1.07	100.39	98.38	98.38	0.00
4.210	1.07	100.39	98.38	98.38	0.00	4.215	1.07	100.39	98.38	98.38	0.00
4.220	1.07	100.39	98.38	98.38	0.00	4.225	1.07	100.39	98.38	98.38	0.00
4.230	1.07	100.39	98.38	98.38	0.00	4.235	1.07	100.39	98.38	98.38	0.00
4.240	1.07	100.39	98.38	98.38	0.00	4.245	1.07	100.39	98.38	98.38	0.00
4.250	1.07	100.39	98.38	98.38	0.00	4.255	1.07	100.39	98.38	98.38	0.00
4.260	1.07	100.39	98.38	98.38	0.00	4.265	1.07	100.39	98.38	98.38	0.00
4.270	1.07	100.39	98.38	98.38	0.00	4.275	1.07	100.39	98.38	98.38	0.00
4.280	1.07	100.39	98.38	98.38	0.00	4.285	1.07	100.39	98.38	98.38	0.00
4.290	1.07	100.39	98.38	98.38	0.00	4.295	1.07	100.39	98.38	98.38	0.00

ject: Starting Motor
 ation: PG. KEBON AGUNG
 tract: Pengasutan Resistor
 ineer: DWI HERMAWAN
 name: kebon_agung

ETAP PowerStation

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Page: 24
 Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

Motor ID: Mrl

Time (Sec.)	Slip (%)	Current (% of F.L.A)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of F.L.A)	Terminal V (%)	Bus V (%)	Acc Torq (%)
4.300	1.07	100.39	98.38	98.38	0.00	4.305	1.07	100.39	98.38	98.38	0.00
4.310	1.07	100.39	98.38	98.38	0.00	4.315	1.07	100.39	98.38	98.38	0.00
4.320	1.07	100.39	98.38	98.38	0.00	4.325	1.07	100.39	98.38	98.38	0.00
4.330	1.07	100.39	98.38	98.38	0.00	4.335	1.07	100.39	98.38	98.38	0.00
4.340	1.07	100.39	98.38	98.38	0.00	4.345	1.07	100.39	98.38	98.38	0.00
4.350	1.07	100.39	98.38	98.38	0.00	4.355	1.07	100.39	98.38	98.38	0.00
4.360	1.07	100.39	98.38	98.38	0.00	4.365	1.07	100.39	98.38	98.38	0.00
4.370	1.07	100.39	98.38	98.38	0.00	4.375	1.07	100.39	98.38	98.38	0.00
4.380	1.07	100.39	98.38	98.38	0.00	4.385	1.07	100.39	98.38	98.38	0.00
4.390	1.07	100.39	98.38	98.38	0.00	4.395	1.07	100.39	98.38	98.38	0.00
4.400	1.07	100.39	98.38	98.38	0.00	4.405	1.07	100.39	98.38	98.38	0.00
4.410	1.07	100.39	98.38	98.38	0.00	4.415	1.07	100.39	98.38	98.38	0.00
4.420	1.07	100.39	98.38	98.38	0.00	4.425	1.07	100.39	98.38	98.38	0.00
4.430	1.07	100.39	98.38	98.38	0.00	4.435	1.07	100.39	98.38	98.38	0.00
4.440	1.07	100.39	98.38	98.38	0.00	4.445	1.07	100.39	98.38	98.38	0.00
4.450	1.07	100.39	98.38	98.38	0.00	4.455	1.07	100.39	98.38	98.38	0.00
4.460	1.07	100.39	98.38	98.38	0.00	4.465	1.07	100.39	98.38	98.38	0.00
4.470	1.07	100.39	98.38	98.38	0.00	4.475	1.07	100.39	98.38	98.38	0.00
4.480	1.07	100.39	98.38	98.38	0.00	4.485	1.07	100.39	98.38	98.38	0.00
4.490	1.07	100.39	98.38	98.38	0.00	4.495	1.07	100.39	98.38	98.38	0.00
4.500	1.07	100.39	98.38	98.38	0.00	4.505	1.07	100.39	98.38	98.38	0.00
4.510	1.07	100.39	98.38	98.38	0.00	4.515	1.07	100.39	98.38	98.38	0.00
4.520	1.07	100.39	98.38	98.38	0.00	4.525	1.07	100.39	98.38	98.38	0.00
4.530	1.07	100.39	98.38	98.38	0.00	4.535	1.07	100.39	98.38	98.38	0.00
4.540	1.07	100.39	98.38	98.38	0.00	4.545	1.07	100.39	98.38	98.38	0.00
4.550	1.07	100.39	98.38	98.38	0.00	4.555	1.07	100.39	98.38	98.38	0.00
4.560	1.07	100.39	98.38	98.38	0.00	4.565	1.07	100.39	98.38	98.38	0.00
4.570	1.07	100.39	98.38	98.38	0.00	4.575	1.07	100.39	98.38	98.38	0.00
4.580	1.07	100.39	98.38	98.38	0.00	4.585	1.07	100.39	98.38	98.38	0.00
4.590	1.07	100.39	98.38	98.38	0.00	4.595	1.07	100.39	98.38	98.38	0.00
4.600	1.07	100.39	98.38	98.38	0.00	4.605	1.07	100.39	98.38	98.38	0.00
4.610	1.07	100.39	98.38	98.38	0.00	4.615	1.07	100.39	98.38	98.38	0.00
4.620	1.07	100.39	98.38	98.38	0.00	4.625	1.07	100.39	98.38	98.38	0.00
4.630	1.07	100.39	98.38	98.38	0.00	4.635	1.07	100.39	98.38	98.38	0.00
4.640	1.07	100.39	98.38	98.38	0.00	4.645	1.07	100.39	98.38	98.38	0.00
4.650	1.07	100.39	98.38	98.38	0.00	4.655	1.07	100.39	98.38	98.38	0.00

Object: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengastutian Resistor
 Engineer: DWI HERMAWAN
 Username: kebon_agung

ETAP PowerStation
 4.0.0C
 Study Case: MS

Page: 25
 Date: 03-17-2009
 S/N: KLGCONSULT
 Revision: Base
 Config: Normal

Motor ID: Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
4.660	1.07	100.39	98.38	98.38	0.00	4.665	1.07	100.39	98.38	98.38	0.00
4.670	1.07	100.39	98.38	98.38	0.00	4.675	1.07	100.39	98.38	98.38	0.00
4.680	1.07	100.39	98.38	98.38	0.00	4.685	1.07	100.39	98.38	98.38	0.00
4.690	1.07	100.39	98.38	98.38	0.00	4.695	1.07	100.39	98.38	98.38	0.00
4.700	1.07	100.39	98.38	98.38	0.00	4.705	1.07	100.39	98.38	98.38	0.00
4.710	1.07	100.39	98.38	98.38	0.00	4.715	1.07	100.39	98.38	98.38	0.00
4.720	1.07	100.39	98.38	98.38	0.00	4.725	1.07	100.39	98.38	98.38	0.00
4.730	1.07	100.39	98.38	98.38	0.00	4.735	1.07	100.39	98.38	98.38	0.00
4.740	1.07	100.39	98.38	98.38	0.00	4.745	1.07	100.39	98.38	98.38	0.00
4.750	1.07	100.39	98.38	98.38	0.00	4.755	1.07	100.39	98.38	98.38	0.00
4.760	1.07	100.39	98.38	98.38	0.00	4.765	1.07	100.39	98.38	98.38	0.00
4.770	1.07	100.39	98.38	98.38	0.00	4.775	1.07	100.39	98.38	98.38	0.00
4.780	1.07	100.39	98.38	98.38	0.00	4.785	1.07	100.39	98.38	98.38	0.00
4.790	1.07	100.39	98.38	98.38	0.00	4.795	1.07	100.39	98.38	98.38	0.00
4.800	1.07	100.39	98.38	98.38	0.00	4.805	1.07	100.39	98.38	98.38	0.00
4.810	1.07	100.39	98.38	98.38	0.00	4.815	1.07	100.39	98.38	98.38	0.00
4.820	1.07	100.39	98.38	98.38	0.00	4.825	1.07	100.39	98.38	98.38	0.00
4.830	1.07	100.39	98.38	98.38	0.00	4.835	1.07	100.39	98.38	98.38	0.00
4.840	1.07	100.39	98.38	98.38	0.00	4.845	1.07	100.39	98.38	98.38	0.00
4.850	1.07	100.39	98.38	98.38	0.00	4.855	1.07	100.39	98.38	98.38	0.00
4.860	1.07	100.39	98.38	98.38	0.00	4.865	1.07	100.39	98.38	98.38	0.00
4.870	1.07	100.39	98.38	98.38	0.00	4.875	1.07	100.39	98.38	98.38	0.00
4.880	1.07	100.39	98.38	98.38	0.00	4.885	1.07	100.39	98.38	98.38	0.00
4.890	1.07	100.39	98.38	98.38	0.00	4.895	1.07	100.39	98.38	98.38	0.00
4.900	1.07	100.39	98.38	98.38	0.00	4.905	1.07	100.39	98.38	98.38	0.00
4.910	1.07	100.39	98.38	98.38	0.00	4.915	1.07	100.39	98.38	98.38	0.00
4.920	1.07	100.39	98.38	98.38	0.00	4.925	1.07	100.39	98.38	98.38	0.00
4.930	1.07	100.39	98.38	98.38	0.00	4.935	1.07	100.39	98.38	98.38	0.00
4.940	1.07	100.39	98.38	98.38	0.00	4.945	1.07	100.39	98.38	98.38	0.00
4.950	1.07	100.39	98.38	98.38	0.00	4.955	1.07	100.39	98.38	98.38	0.00
4.960	1.07	100.39	98.38	98.38	0.00	4.965	1.07	100.39	98.38	98.38	0.00
4.970	1.07	100.39	98.38	98.38	0.00	4.975	1.07	100.39	98.38	98.38	0.00
4.980	1.07	100.39	98.38	98.38	0.00	4.985	1.07	100.39	98.38	98.38	0.00
4.990	1.07	100.39	98.38	98.38	0.00	4.995	1.07	100.39	98.38	98.38	0.00
5.000	1.07	100.39	98.38	98.38	0.00	5.005	1.07	100.39	98.38	98.38	0.00
5.010	1.07	100.39	98.38	98.38	0.00	5.015	1.07	100.39	98.38	98.38	0.00

Object: Starting Motor
 Location: PG KEBON AGUNG
 Contract: Pengasutan Resistor
 Engineer: DWI HERMAWAN
 filename: kebon_agung

ETAP PowerStation
 4.0.0C
 Date: 03-17-2009
 S/N: KLGCNSULT
 Revision: Base
 Config: Normal

Study Case: MS

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Motor ID : Mrl1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
5.020	1.07	100.39	98.38	98.38	0.00	5.025	1.07	100.39	98.38	98.38	0.00
5.030	1.07	100.39	98.38	98.38	0.00	5.035	1.07	100.39	98.38	98.38	0.00
5.040	1.07	100.39	98.38	98.38	0.00	5.045	1.07	100.39	98.38	98.38	0.00
5.050	1.07	100.39	98.38	98.38	0.00	5.055	1.07	100.39	98.38	98.38	0.00
5.060	1.07	100.39	98.38	98.38	0.00	5.065	1.07	100.39	98.38	98.38	0.00
5.070	1.07	100.39	98.38	98.38	0.00	5.075	1.07	100.39	98.38	98.38	0.00
5.080	1.07	100.39	98.38	98.38	0.00	5.085	1.07	100.39	98.38	98.38	0.00
5.090	1.07	100.39	98.38	98.38	0.00	5.095	1.07	100.39	98.38	98.38	0.00
5.100	1.07	100.39	98.38	98.38	0.00	5.105	1.07	100.39	98.38	98.38	0.00
5.110	1.07	100.39	98.38	98.38	0.00	5.115	1.07	100.39	98.38	98.38	0.00
5.120	1.07	100.39	98.38	98.38	0.00	5.125	1.07	100.39	98.38	98.38	0.00
5.130	1.07	100.39	98.38	98.38	0.00	5.135	1.07	100.39	98.38	98.38	0.00
5.140	1.07	100.39	98.38	98.38	0.00	5.145	1.07	100.39	98.38	98.38	0.00
5.150	1.07	100.39	98.38	98.38	0.00	5.155	1.07	100.39	98.38	98.38	0.00
5.160	1.07	100.39	98.38	98.38	0.00	5.165	1.07	100.39	98.38	98.38	0.00
5.170	1.07	100.39	98.38	98.38	0.00	5.175	1.07	100.39	98.38	98.38	0.00
5.180	1.07	100.39	98.38	98.38	0.00	5.185	1.07	100.39	98.38	98.38	0.00
5.190	1.07	100.39	98.38	98.38	0.00	5.195	1.07	100.39	98.38	98.38	0.00
5.200	1.07	100.39	98.38	98.38	0.00	5.205	1.07	100.39	98.38	98.38	0.00
5.210	1.07	100.39	98.38	98.38	0.00	5.215	1.07	100.39	98.38	98.38	0.00
5.220	1.07	100.39	98.38	98.38	0.00	5.225	1.07	100.39	98.38	98.38	0.00
5.230	1.07	100.39	98.38	98.38	0.00	5.235	1.07	100.39	98.38	98.38	0.00
5.240	1.07	100.39	98.38	98.38	0.00	5.245	1.07	100.39	98.38	98.38	0.00
5.250	1.07	100.39	98.38	98.38	0.00	5.255	1.07	100.39	98.38	98.38	0.00
5.260	1.07	100.39	98.38	98.38	0.00	5.265	1.07	100.39	98.38	98.38	0.00
5.270	1.07	100.39	98.38	98.38	0.00	5.275	1.07	100.39	98.38	98.38	0.00
5.280	1.07	100.39	98.38	98.38	0.00	5.285	1.07	100.39	98.38	98.38	0.00
5.290	1.07	100.39	98.38	98.38	0.00	5.295	1.07	100.39	98.38	98.38	0.00
5.300	1.07	100.39	98.38	98.38	0.00	5.305	1.07	100.39	98.38	98.38	0.00
5.310	1.07	100.39	98.38	98.38	0.00	5.315	1.07	100.39	98.38	98.38	0.00
5.320	1.07	100.39	98.38	98.38	0.00	5.325	1.07	100.39	98.38	98.38	0.00
5.330	1.07	100.39	98.38	98.38	0.00	5.335	1.07	100.39	98.38	98.38	0.00
5.340	1.07	100.39	98.38	98.38	0.00	5.345	1.07	100.39	98.38	98.38	0.00
5.350	1.07	100.39	98.38	98.38	0.00	5.355	1.07	100.39	98.38	98.38	0.00
5.360	1.07	100.39	98.38	98.38	0.00	5.365	1.07	100.39	98.38	98.38	0.00
5.370	1.07	100.39	98.38	98.38	0.00	5.375	1.07	100.39	98.38	98.38	0.00

ject: Starting Motor
 Location: PG. KEBON AGUNG
 Contractor: Pengasutan Resistor
 Engineer: DWI HERMAWAN
 Name: kebon_agung

ETAP PowerStation
 4.0.0C

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Date:

03-17-2009

SN: KLGCONSULT

Revision: Base

Config.: Normal

Study Case: MS

Motor ID: MtrL

Time (Sec.)	Slip (%)	Current (% of F.L.A)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of F.L.A)	Terminal V (%)	Bus V (%)	Acc Torq (%)
5.380	1.07	100.39	98.38	98.38	0.00	5.385	1.07	100.39	98.38	98.38	0.00
5.390	1.07	100.39	98.38	98.38	0.00	5.395	1.07	100.39	98.38	98.38	0.00
5.400	1.07	100.39	98.38	98.38	0.00	5.405	1.07	100.39	98.38	98.38	0.00
5.410	1.07	100.39	98.38	98.38	0.00	5.415	1.07	100.39	98.38	98.38	0.00
5.420	1.07	100.39	98.38	98.38	0.00	5.425	1.07	100.39	98.38	98.38	0.00
5.430	1.07	100.39	98.38	98.38	0.00	5.435	1.07	100.39	98.38	98.38	0.00
5.440	1.07	100.39	98.38	98.38	0.00	5.445	1.07	100.39	98.38	98.38	0.00
5.450	1.07	100.39	98.38	98.38	0.00	5.455	1.07	100.39	98.38	98.38	0.00
5.460	1.07	100.39	98.38	98.38	0.00	5.465	1.07	100.39	98.38	98.38	0.00
5.470	1.07	100.39	98.38	98.38	0.00	5.475	1.07	100.39	98.38	98.38	0.00
5.480	1.07	100.39	98.38	98.38	0.00	5.485	1.07	100.39	98.38	98.38	0.00
5.490	1.07	100.39	98.38	98.38	0.00	5.495	1.07	100.39	98.38	98.38	0.00
5.500	1.07	100.39	98.38	98.38	0.00	5.505	1.07	100.39	98.38	98.38	0.00
5.510	1.07	100.39	98.38	98.38	0.00	5.515	1.07	100.39	98.38	98.38	0.00
5.520	1.07	100.39	98.38	98.38	0.00	5.525	1.07	100.39	98.38	98.38	0.00
5.530	1.07	100.39	98.38	98.38	0.00	5.535	1.07	100.39	98.38	98.38	0.00
5.540	1.07	100.39	98.38	98.38	0.00	5.545	1.07	100.39	98.38	98.38	0.00
5.550	1.07	100.39	98.38	98.38	0.00	5.555	1.07	100.39	98.38	98.38	0.00
5.560	1.07	100.39	98.38	98.38	0.00	5.565	1.07	100.39	98.38	98.38	0.00
5.570	1.07	100.39	98.38	98.38	0.00	5.575	1.07	100.39	98.38	98.38	0.00
5.580	1.07	100.39	98.38	98.38	0.00	5.585	1.07	100.39	98.38	98.38	0.00
5.590	1.07	100.39	98.38	98.38	0.00	5.595	1.07	100.39	98.38	98.38	0.00
5.600	1.07	100.39	98.38	98.38	0.00	5.605	1.07	100.39	98.38	98.38	0.00
5.610	1.07	100.39	98.38	98.38	0.00	5.615	1.07	100.39	98.38	98.38	0.00
5.620	1.07	100.39	98.38	98.38	0.00	5.625	1.07	100.39	98.38	98.38	0.00
5.630	1.07	100.39	98.38	98.38	0.00	5.635	1.07	100.39	98.38	98.38	0.00
5.640	1.07	100.39	98.38	98.38	0.00	5.645	1.07	100.39	98.38	98.38	0.00
5.650	1.07	100.39	98.38	98.38	0.00	5.655	1.07	100.39	98.38	98.38	0.00
5.660	1.07	100.39	98.38	98.38	0.00	5.665	1.07	100.39	98.38	98.38	0.00
5.670	1.07	100.39	98.38	98.38	0.00	5.675	1.07	100.39	98.38	98.38	0.00
5.680	1.07	100.39	98.38	98.38	0.00	5.685	1.07	100.39	98.38	98.38	0.00
5.690	1.07	100.39	98.38	98.38	0.00	5.695	1.07	100.39	98.38	98.38	0.00
5.700	1.07	100.39	98.38	98.38	0.00	5.705	1.07	100.39	98.38	98.38	0.00
5.710	1.07	100.39	98.38	98.38	0.00	5.715	1.07	100.39	98.38	98.38	0.00
5.720	1.07	100.39	98.38	98.38	0.00	5.725	1.07	100.39	98.38	98.38	0.00
5.730	1.07	100.39	98.38	98.38	0.00	5.735	1.07	100.39	98.38	98.38	0.00

ject: Starting Motor
ation: PG. KEBON AGUNG
tract: Pengasutan Resistor
ineer: DWI HERMAWAN
name: kebon_agung

ETAP PowerStation
4.0/C

Date: 03-17-2009
SN: KLGCONSULT
Revision: Base
Config.: Normal

Motor ID: Mrl

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
5.740	1.07	100.39	98.38	98.38	0.00	5.745	1.07	100.39	98.38	98.38	0.00
5.750	1.07	100.39	98.38	98.38	0.00	5.755	1.07	100.39	98.38	98.38	0.00
5.760	1.07	100.39	98.38	98.38	0.00	5.765	1.07	100.39	98.38	98.38	0.00
5.770	1.07	100.39	98.38	98.38	0.00	5.775	1.07	100.39	98.38	98.38	0.00
5.780	1.07	100.39	98.38	98.38	0.00	5.785	1.07	100.39	98.38	98.38	0.00
5.790	1.07	100.39	98.38	98.38	0.00	5.795	1.07	100.39	98.38	98.38	0.00
5.800	1.07	100.39	98.38	98.38	0.00	5.805	1.07	100.39	98.38	98.38	0.00
5.810	1.07	100.39	98.38	98.38	0.00	5.815	1.07	100.39	98.38	98.38	0.00
5.820	1.07	100.39	98.38	98.38	0.00	5.825	1.07	100.39	98.38	98.38	0.00
5.830	1.07	100.39	98.38	98.38	0.00	5.835	1.07	100.39	98.38	98.38	0.00
5.840	1.07	100.39	98.38	98.38	0.00	5.845	1.07	100.39	98.38	98.38	0.00
5.850	1.07	100.39	98.38	98.38	0.00	5.855	1.07	100.39	98.38	98.38	0.00
5.860	1.07	100.39	98.38	98.38	0.00	5.865	1.07	100.39	98.38	98.38	0.00
5.870	1.07	100.39	98.38	98.38	0.00	5.875	1.07	100.39	98.38	98.38	0.00
5.880	1.07	100.39	98.38	98.38	0.00	5.885	1.07	100.39	98.38	98.38	0.00
5.890	1.07	100.39	98.38	98.38	0.00	5.895	1.07	100.39	98.38	98.38	0.00
5.900	1.07	100.39	98.38	98.38	0.00	5.905	1.07	100.39	98.38	98.38	0.00
5.910	1.07	100.39	98.38	98.38	0.00	5.915	1.07	100.39	98.38	98.38	0.00
5.920	1.07	100.39	98.38	98.38	0.00	5.925	1.07	100.39	98.38	98.38	0.00
5.930	1.07	100.39	98.38	98.38	0.00	5.935	1.07	100.39	98.38	98.38	0.00
5.940	1.07	100.39	98.38	98.38	0.00	5.945	1.07	100.39	98.38	98.38	0.00
5.950	1.07	100.39	98.38	98.38	0.00	5.955	1.07	100.39	98.38	98.38	0.00
5.960	1.07	100.39	98.38	98.38	0.00	5.965	1.07	100.39	98.38	98.38	0.00
5.970	1.07	100.39	98.38	98.38	0.00	5.975	1.07	100.39	98.38	98.38	0.00
5.980	1.07	100.39	98.38	98.38	0.00	5.985	1.07	100.39	98.38	98.38	0.00
5.990	1.07	100.39	98.38	98.38	0.00	5.995	1.07	100.39	98.38	98.38	0.00
6.000	1.07	100.39	98.38	98.38	0.00	6.005	1.07	100.39	98.38	98.38	0.00
6.010	1.07	100.39	98.38	98.38	0.00	6.015	1.07	100.39	98.38	98.38	0.00
6.020	1.07	100.39	98.38	98.38	0.00	6.025	1.07	100.39	98.38	98.38	0.00
6.030	1.07	100.39	98.38	98.38	0.00	6.035	1.07	100.39	98.38	98.38	0.00
6.040	1.07	100.39	98.38	98.38	0.00	6.045	1.07	100.39	98.38	98.38	0.00
6.050	1.07	100.39	98.38	98.38	0.00	6.055	1.07	100.39	98.38	98.38	0.00
6.060	1.07	100.39	98.38	98.38	0.00	6.065	1.07	100.39	98.38	98.38	0.00
6.070	1.07	100.39	98.38	98.38	0.00	6.075	1.07	100.39	98.38	98.38	0.00
6.080	1.07	100.39	98.38	98.38	0.00	6.085	1.07	100.39	98.38	98.38	0.00
6.090	1.07	100.39	98.38	98.38	0.00	6.095	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Infract: Pengasutan Resistor
 Engineer: DWI HERMAWAN
 Name: kebon_agung

ETAP PowerStation

4.0.0C

Page: 29
 Date: 03-17-2009
 SN: KLGC0NSULT
 Revision: Base
 Config: Normal

Motor ID : Mrl.									
Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time	Slip	Current	Terminal
						(Sec.)	(%)	(% of FLA)	V (%)
6.100	1.07	100.39	98.38	98.38	0.00	6.105	1.07	100.39	98.38
6.110	1.07	100.39	98.38	98.38	0.00	6.115	1.07	100.39	98.38
6.120	1.07	100.39	98.38	98.38	0.00	6.125	1.07	100.39	98.38
6.130	1.07	100.39	98.38	98.38	0.00	6.135	1.07	100.39	98.38
6.140	1.07	100.39	98.38	98.38	0.00	6.145	1.07	100.39	98.38
6.150	1.07	100.39	98.38	98.38	0.00	6.155	1.07	100.39	98.38
6.160	1.07	100.39	98.38	98.38	0.00	6.165	1.07	100.39	98.38
6.170	1.07	100.39	98.38	98.38	0.00	6.175	1.07	100.39	98.38
6.180	1.07	100.39	98.38	98.38	0.00	6.185	1.07	100.39	98.38
6.190	1.07	100.39	98.38	98.38	0.00	6.195	1.07	100.39	98.38
6.200	1.07	100.39	98.38	98.38	0.00	6.205	1.07	100.39	98.38
6.210	1.07	100.39	98.38	98.38	0.00	6.215	1.07	100.39	98.38
6.220	1.07	100.39	98.38	98.38	0.00	6.225	1.07	100.39	98.38
6.230	1.07	100.39	98.38	98.38	0.00	6.235	1.07	100.39	98.38
6.240	1.07	100.39	98.38	98.38	0.00	6.245	1.07	100.39	98.38
6.250	1.07	100.39	98.38	98.38	0.00	6.255	1.07	100.39	98.38
6.260	1.07	100.39	98.38	98.38	0.00	6.265	1.07	100.39	98.38
6.270	1.07	100.39	98.38	98.38	0.00	6.275	1.07	100.39	98.38
6.280	1.07	100.39	98.38	98.38	0.00	6.285	1.07	100.39	98.38
6.290	1.07	100.39	98.38	98.38	0.00	6.295	1.07	100.39	98.38
6.300	1.07	100.39	98.38	98.38	0.00	6.305	1.07	100.39	98.38
6.310	1.07	100.39	98.38	98.38	0.00	6.315	1.07	100.39	98.38
6.320	1.07	100.39	98.38	98.38	0.00	6.325	1.07	100.39	98.38
6.330	1.07	100.39	98.38	98.38	0.00	6.335	1.07	100.39	98.38
6.340	1.07	100.39	98.38	98.38	0.00	6.345	1.07	100.39	98.38
6.350	1.07	100.39	98.38	98.38	0.00	6.355	1.07	100.39	98.38
6.360	1.07	100.39	98.38	98.38	0.00	6.365	1.07	100.39	98.38
6.370	1.07	100.39	98.38	98.38	0.00	6.375	1.07	100.39	98.38
6.380	1.07	100.39	98.38	98.38	0.00	6.385	1.07	100.39	98.38
6.390	1.07	100.39	98.38	98.38	0.00	6.395	1.07	100.39	98.38
6.400	1.07	100.39	98.38	98.38	0.00	6.405	1.07	100.39	98.38
6.410	1.07	100.39	98.38	98.38	0.00	6.415	1.07	100.39	98.38
6.420	1.07	100.39	98.38	98.38	0.00	6.425	1.07	100.39	98.38
6.430	1.07	100.39	98.38	98.38	0.00	6.435	1.07	100.39	98.38
6.440	1.07	100.39	98.38	98.38	0.00	6.445	1.07	100.39	98.38
6.450	1.07	100.39	98.38	98.38	0.00	6.455	1.07	100.39	98.38

Object: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengaturan Resistor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation
4.0.0C

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Date: 03-17-2009

S/N: KLGCCONSULT

Study Case: MS

Revision: Base

Config.: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V(%)	Bus V(%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V(%)	Bus V(%)	Acc Torq. (%)
6.460	1.07	100.39	98.38	98.38	0.00	6.465	1.07	100.39	98.38	98.38	0.00
6.470	1.07	100.39	98.38	98.38	0.00	6.475	1.07	100.39	98.38	98.38	0.00
6.480	1.07	100.39	98.38	98.38	0.00	6.485	1.07	100.39	98.38	98.38	0.00
6.490	1.07	100.39	98.38	98.38	0.00	6.495	1.07	100.39	98.38	98.38	0.00
6.500	1.07	100.39	98.38	98.38	0.00	6.505	1.07	100.39	98.38	98.38	0.00
6.510	1.07	100.39	98.38	98.38	0.00	6.515	1.07	100.39	98.38	98.38	0.00
6.520	1.07	100.39	98.38	98.38	0.00	6.525	1.07	100.39	98.38	98.38	0.00
6.530	1.07	100.39	98.38	98.38	0.00	6.535	1.07	100.39	98.38	98.38	0.00
6.540	1.07	100.39	98.38	98.38	0.00	6.545	1.07	100.39	98.38	98.38	0.00
6.550	1.07	100.39	98.38	98.38	0.00	6.555	1.07	100.39	98.38	98.38	0.00
6.560	1.07	100.39	98.38	98.38	0.00	6.565	1.07	100.39	98.38	98.38	0.00
6.570	1.07	100.39	98.38	98.38	0.00	6.575	1.07	100.39	98.38	98.38	0.00
6.580	1.07	100.39	98.38	98.38	0.00	6.585	1.07	100.39	98.38	98.38	0.00
6.590	1.07	100.39	98.38	98.38	0.00	6.595	1.07	100.39	98.38	98.38	0.00
6.600	1.07	100.39	98.38	98.38	0.00	6.605	1.07	100.39	98.38	98.38	0.00
6.610	1.07	100.39	98.38	98.38	0.00	6.615	1.07	100.39	98.38	98.38	0.00
6.620	1.07	100.39	98.38	98.38	0.00	6.625	1.07	100.39	98.38	98.38	0.00
6.630	1.07	100.39	98.38	98.38	0.00	6.635	1.07	100.39	98.38	98.38	0.00
6.640	1.07	100.39	98.38	98.38	0.00	6.645	1.07	100.39	98.38	98.38	0.00
6.650	1.07	100.39	98.38	98.38	0.00	6.655	1.07	100.39	98.38	98.38	0.00
6.660	1.07	100.39	98.38	98.38	0.00	6.665	1.07	100.39	98.38	98.38	0.00
6.670	1.07	100.39	98.38	98.38	0.00	6.675	1.07	100.39	98.38	98.38	0.00
6.680	1.07	100.39	98.38	98.38	0.00	6.685	1.07	100.39	98.38	98.38	0.00
6.690	1.07	100.39	98.38	98.38	0.00	6.695	1.07	100.39	98.38	98.38	0.00
6.700	1.07	100.39	98.38	98.38	0.00	6.705	1.07	100.39	98.38	98.38	0.00
6.710	1.07	100.39	98.38	98.38	0.00	6.715	1.07	100.39	98.38	98.38	0.00
6.720	1.07	100.39	98.38	98.38	0.00	6.725	1.07	100.39	98.38	98.38	0.00
6.730	1.07	100.39	98.38	98.38	0.00	6.735	1.07	100.39	98.38	98.38	0.00
6.740	1.07	100.39	98.38	98.38	0.00	6.745	1.07	100.39	98.38	98.38	0.00
6.750	1.07	100.39	98.38	98.38	0.00	6.755	1.07	100.39	98.38	98.38	0.00
6.760	1.07	100.39	98.38	98.38	0.00	6.765	1.07	100.39	98.38	98.38	0.00
6.770	1.07	100.39	98.38	98.38	0.00	6.775	1.07	100.39	98.38	98.38	0.00
6.780	1.07	100.39	98.38	98.38	0.00	6.785	1.07	100.39	98.38	98.38	0.00
6.790	1.07	100.39	98.38	98.38	0.00	6.795	1.07	100.39	98.38	98.38	0.00
6.800	1.07	100.39	98.38	98.38	0.00	6.805	1.07	100.39	98.38	98.38	0.00
6.810	1.07	100.39	98.38	98.38	0.00	6.815	1.07	100.39	98.38	98.38	0.00

ject:
Starting Motor
PG. KEBON AGUNG
ntract:
Penangutan Resistor
gineer:
DWI HERMANAWAN
ename:
kebon_agung

Study Case: MS

Motor ID : Mrl

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc.Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc.Torq (%)
						(Sec.)	(%)				
6.820	1.07	100.39	98.38	98.38	0.00	6.825	1.07	100.39	98.38	98.38	0.00
6.830	1.07	100.39	98.38	98.38	0.00	6.835	1.07	100.39	98.38	98.38	0.00
6.840	1.07	100.39	98.38	98.38	0.00	6.845	1.07	100.39	98.38	98.38	0.00
6.850	1.07	100.39	98.38	98.38	0.00	6.855	1.07	100.39	98.38	98.38	0.00
6.860	1.07	100.39	98.38	98.38	0.00	6.865	1.07	100.39	98.38	98.38	0.00
6.870	1.07	100.39	98.38	98.38	0.00	6.875	1.07	100.39	98.38	98.38	0.00
6.880	1.07	100.39	98.38	98.38	0.00	6.885	1.07	100.39	98.38	98.38	0.00
6.890	1.07	100.39	98.38	98.38	0.00	6.895	1.07	100.39	98.38	98.38	0.00
6.900	1.07	100.39	98.38	98.38	0.00	6.905	1.07	100.39	98.38	98.38	0.00
6.910	1.07	100.39	98.38	98.38	0.00	6.915	1.07	100.39	98.38	98.38	0.00
6.920	1.07	100.39	98.38	98.38	0.00	6.925	1.07	100.39	98.38	98.38	0.00
6.930	1.07	100.39	98.38	98.38	0.00	6.935	1.07	100.39	98.38	98.38	0.00
6.940	1.07	100.39	98.38	98.38	0.00	6.945	1.07	100.39	98.38	98.38	0.00
6.950	1.07	100.39	98.38	98.38	0.00	6.955	1.07	100.39	98.38	98.38	0.00
6.960	1.07	100.39	98.38	98.38	0.00	6.965	1.07	100.39	98.38	98.38	0.00
6.970	1.07	100.39	98.38	98.38	0.00	6.975	1.07	100.39	98.38	98.38	0.00
6.980	1.07	100.39	98.38	98.38	0.00	6.985	1.07	100.39	98.38	98.38	0.00
6.990	1.07	100.39	98.38	98.38	0.00	6.995	1.07	100.39	98.38	98.38	0.00
7.000	1.07	100.39	98.38	98.38	0.00	7.005	1.07	100.39	98.38	98.38	0.00
7.010	1.07	100.39	98.38	98.38	0.00	7.015	1.07	100.39	98.38	98.38	0.00
7.020	1.07	100.39	98.38	98.38	0.00	7.025	1.07	100.39	98.38	98.38	0.00
7.030	1.07	100.39	98.38	98.38	0.00	7.035	1.07	100.39	98.38	98.38	0.00
7.040	1.07	100.39	98.38	98.38	0.00	7.045	1.07	100.39	98.38	98.38	0.00
7.050	1.07	100.39	98.38	98.38	0.00	7.055	1.07	100.39	98.38	98.38	0.00
7.060	1.07	100.39	98.38	98.38	0.00	7.065	1.07	100.39	98.38	98.38	0.00
7.070	1.07	100.39	98.38	98.38	0.00	7.075	1.07	100.39	98.38	98.38	0.00
7.080	1.07	100.39	98.38	98.38	0.00	7.085	1.07	100.39	98.38	98.38	0.00
7.090	1.07	100.39	98.38	98.38	0.00	7.095	1.07	100.39	98.38	98.38	0.00
7.100	1.07	100.39	98.38	98.38	0.00	7.105	1.07	100.39	98.38	98.38	0.00
7.110	1.07	100.39	98.38	98.38	0.00	7.115	1.07	100.39	98.38	98.38	0.00
7.120	1.07	100.39	98.38	98.38	0.00	7.125	1.07	100.39	98.38	98.38	0.00
7.130	1.07	100.39	98.38	98.38	0.00	7.135	1.07	100.39	98.38	98.38	0.00
7.140	1.07	100.39	98.38	98.38	0.00	7.145	1.07	100.39	98.38	98.38	0.00
7.150	1.07	100.39	98.38	98.38	0.00	7.155	1.07	100.39	98.38	98.38	0.00
7.160	1.07	100.39	98.38	98.38	0.00	7.165	1.07	100.39	98.38	98.38	0.00
7.170	1.07	100.39	98.38	98.38	0.00	7.175	1.07	100.39	98.38	98.38	0.00

Object: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Resistor
 Engineer: DWI HERMAWAN
 Name: kebon_agung

ETAP PowerStation
 4.0.0C
 Study Case: MS

Page: 32
 Date: 03-17-2009
 S/N: KLGCNSULT
 Revision: Base
 Config: Normal

Motor ID: Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
7.180	1.07	100.39	98.38	98.38	0.00	7.185	1.07	100.39	98.38	98.38	0.00
7.190	1.07	100.39	98.38	98.38	0.00	7.195	1.07	100.39	98.38	98.38	0.00
7.200	1.07	100.39	98.38	98.38	0.00	7.205	1.07	100.39	98.38	98.38	0.00
7.210	1.07	100.39	98.38	98.38	0.00	7.215	1.07	100.39	98.38	98.38	0.00
7.220	1.07	100.39	98.38	98.38	0.00	7.225	1.07	100.39	98.38	98.38	0.00
7.230	1.07	100.39	98.38	98.38	0.00	7.235	1.07	100.39	98.38	98.38	0.00
7.240	1.07	100.39	98.38	98.38	0.00	7.245	1.07	100.39	98.38	98.38	0.00
7.250	1.07	100.39	98.38	98.38	0.00	7.255	1.07	100.39	98.38	98.38	0.00
7.260	1.07	100.39	98.38	98.38	0.00	7.265	1.07	100.39	98.38	98.38	0.00
7.270	1.07	100.39	98.38	98.38	0.00	7.275	1.07	100.39	98.38	98.38	0.00
7.280	1.07	100.39	98.38	98.38	0.00	7.285	1.07	100.39	98.38	98.38	0.00
7.290	1.07	100.39	98.38	98.38	0.00	7.295	1.07	100.39	98.38	98.38	0.00
7.300	1.07	100.39	98.38	98.38	0.00	7.305	1.07	100.39	98.38	98.38	0.00
7.310	1.07	100.39	98.38	98.38	0.00	7.315	1.07	100.39	98.38	98.38	0.00
7.320	1.07	100.39	98.38	98.38	0.00	7.325	1.07	100.39	98.38	98.38	0.00
7.330	1.07	100.39	98.38	98.38	0.00	7.335	1.07	100.39	98.38	98.38	0.00
7.340	1.07	100.39	98.38	98.38	0.00	7.345	1.07	100.39	98.38	98.38	0.00
7.350	1.07	100.39	98.38	98.38	0.00	7.355	1.07	100.39	98.38	98.38	0.00
7.360	1.07	100.39	98.38	98.38	0.00	7.365	1.07	100.39	98.38	98.38	0.00
7.370	1.07	100.39	98.38	98.38	0.00	7.375	1.07	100.39	98.38	98.38	0.00
7.380	1.07	100.39	98.38	98.38	0.00	7.385	1.07	100.39	98.38	98.38	0.00
7.390	1.07	100.39	98.38	98.38	0.00	7.395	1.07	100.39	98.38	98.38	0.00
7.400	1.07	100.39	98.38	98.38	0.00	7.405	1.07	100.39	98.38	98.38	0.00
7.410	1.07	100.39	98.38	98.38	0.00	7.415	1.07	100.39	98.38	98.38	0.00
7.420	1.07	100.39	98.38	98.38	0.00	7.425	1.07	100.39	98.38	98.38	0.00
7.430	1.07	100.39	98.38	98.38	0.00	7.435	1.07	100.39	98.38	98.38	0.00
7.440	1.07	100.39	98.38	98.38	0.00	7.445	1.07	100.39	98.38	98.38	0.00
7.450	1.07	100.39	98.38	98.38	0.00	7.455	1.07	100.39	98.38	98.38	0.00
7.460	1.07	100.39	98.38	98.38	0.00	7.465	1.07	100.39	98.38	98.38	0.00
7.470	1.07	100.39	98.38	98.38	0.00	7.475	1.07	100.39	98.38	98.38	0.00
7.480	1.07	100.39	98.38	98.38	0.00	7.485	1.07	100.39	98.38	98.38	0.00
7.490	1.07	100.39	98.38	98.38	0.00	7.495	1.07	100.39	98.38	98.38	0.00
7.500	1.07	100.39	98.38	98.38	0.00	7.505	1.07	100.39	98.38	98.38	0.00
7.510	1.07	100.39	98.38	98.38	0.00	7.515	1.07	100.39	98.38	98.38	0.00
7.520	1.07	100.39	98.38	98.38	0.00	7.525	1.07	100.39	98.38	98.38	0.00
7.530	1.07	100.39	98.38	98.38	0.00	7.535	1.07	100.39	98.38	98.38	0.00

Objekt:
 Starting Motor
 PG. KEBON AGUNG
 Location:
 Pengetutan Resistor
 Inract:
 DWI HERMAWAN
 name:
 kebon_agung

ETAP PowerStation

4.0.0C

Page:
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 Date:
 03-17-2009
 SN:
 KLGCONSULT
 Revision:
 Base
 Config:
 Normal

Study Case: MS

Motor ID : Mrl_

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
						7.545	1.07				
7.550	1.07	100.39	98.38	98.38	0.00	7.555	1.07	100.39	98.38	98.38	0.00
7.560	1.07	100.39	98.38	98.38	0.00	7.565	1.07	100.39	98.38	98.38	0.00
7.570	1.07	100.39	98.38	98.38	0.00	7.575	1.07	100.39	98.38	98.38	0.00
7.580	1.07	100.39	98.38	98.38	0.00	7.585	1.07	100.39	98.38	98.38	0.00
7.590	1.07	100.39	98.38	98.38	0.00	7.595	1.07	100.39	98.38	98.38	0.00
7.600	1.07	100.39	98.38	98.38	0.00	7.605	1.07	100.39	98.38	98.38	0.00
7.610	1.07	100.39	98.38	98.38	0.00	7.615	1.07	100.39	98.38	98.38	0.00
7.620	1.07	100.39	98.38	98.38	0.00	7.625	1.07	100.39	98.38	98.38	0.00
7.630	1.07	100.39	98.38	98.38	0.00	7.635	1.07	100.39	98.38	98.38	0.00
7.640	1.07	100.39	98.38	98.38	0.00	7.645	1.07	100.39	98.38	98.38	0.00
7.650	1.07	100.39	98.38	98.38	0.00	7.655	1.07	100.39	98.38	98.38	0.00
7.660	1.07	100.39	98.38	98.38	0.00	7.665	1.07	100.39	98.38	98.38	0.00
7.670	1.07	100.39	98.38	98.38	0.00	7.675	1.07	100.39	98.38	98.38	0.00
7.680	1.07	100.39	98.38	98.38	0.00	7.685	1.07	100.39	98.38	98.38	0.00
7.690	1.07	100.39	98.38	98.38	0.00	7.695	1.07	100.39	98.38	98.38	0.00
7.700	1.07	100.39	98.38	98.38	0.00	7.705	1.07	100.39	98.38	98.38	0.00
7.710	1.07	100.39	98.38	98.38	0.00	7.715	1.07	100.39	98.38	98.38	0.00
7.720	1.07	100.39	98.38	98.38	0.00	7.725	1.07	100.39	98.38	98.38	0.00
7.730	1.07	100.39	98.38	98.38	0.00	7.735	1.07	100.39	98.38	98.38	0.00
7.740	1.07	100.39	98.38	98.38	0.00	7.745	1.07	100.39	98.38	98.38	0.00
7.750	1.07	100.39	98.38	98.38	0.00	7.755	1.07	100.39	98.38	98.38	0.00
7.760	1.07	100.39	98.38	98.38	0.00	7.765	1.07	100.39	98.38	98.38	0.00
7.770	1.07	100.39	98.38	98.38	0.00	7.775	1.07	100.39	98.38	98.38	0.00
7.780	1.07	100.39	98.38	98.38	0.00	7.785	1.07	100.39	98.38	98.38	0.00
7.790	1.07	100.39	98.38	98.38	0.00	7.795	1.07	100.39	98.38	98.38	0.00
7.800	1.07	100.39	98.38	98.38	0.00	7.805	1.07	100.39	98.38	98.38	0.00
7.810	1.07	100.39	98.38	98.38	0.00	7.815	1.07	100.39	98.38	98.38	0.00
7.820	1.07	100.39	98.38	98.38	0.00	7.825	1.07	100.39	98.38	98.38	0.00
7.830	1.07	100.39	98.38	98.38	0.00	7.835	1.07	100.39	98.38	98.38	0.00
7.840	1.07	100.39	98.38	98.38	0.00	7.845	1.07	100.39	98.38	98.38	0.00
7.850	1.07	100.39	98.38	98.38	0.00	7.855	1.07	100.39	98.38	98.38	0.00
7.860	1.07	100.39	98.38	98.38	0.00	7.865	1.07	100.39	98.38	98.38	0.00
7.870	1.07	100.39	98.38	98.38	0.00	7.875	1.07	100.39	98.38	98.38	0.00
7.880	1.07	100.39	98.38	98.38	0.00	7.885	1.07	100.39	98.38	98.38	0.00
7.890	1.07	100.39	98.38	98.38	0.00	7.895	1.07	100.39	98.38	98.38	0.00

Project:
Starting Motor
PG. KEBON AGUNG
Location:
attract:
Pengasutan Resistor
Engineer:
DWI HERMAWAN
Name:
kebon_agung

ETAP PowerStation
4.0.0C
Date:
03-17-2009
SN:
KLGCONSULT
Revision:
Base
Config.:
Normal

Motor ID : Mrl

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Ace.Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Ace.Torq (%)
7.900	1.07	100.39	98.38	98.38	0.00	7.905	1.07	100.39	98.38	98.38	0.00
7.910	1.07	100.39	98.38	98.38	0.00	7.915	1.07	100.39	98.38	98.38	0.00
7.920	1.07	100.39	98.38	98.38	0.00	7.925	1.07	100.39	98.38	98.38	0.00
7.930	1.07	100.39	98.38	98.38	0.00	7.935	1.07	100.39	98.38	98.38	0.00
7.940	1.07	100.39	98.38	98.38	0.00	7.945	1.07	100.39	98.38	98.38	0.00
7.950	1.07	100.39	98.38	98.38	0.00	7.955	1.07	100.39	98.38	98.38	0.00
7.960	1.07	100.39	98.38	98.38	0.00	7.965	1.07	100.39	98.38	98.38	0.00
7.970	1.07	100.39	98.38	98.38	0.00	7.975	1.07	100.39	98.38	98.38	0.00
7.980	1.07	100.39	98.38	98.38	0.00	7.985	1.07	100.39	98.38	98.38	0.00
7.990	1.07	100.39	98.38	98.38	0.00	7.995	1.07	100.39	98.38	98.38	0.00
8.000	1.07	100.39	98.38	98.38	0.00						

Project:	Starting Motor	ETAP PowerStation	Page:	7
Location:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
Contract:	Pengasutan Reactor		SN:	KLGCONSULT
Engineer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
Filename:	kebon_agung		Config.:	Normal

SWITCHING MOTORS

Motor	Nameplate										Starting Device					Equipment Cable ID
	ID	Type	Qty	HP/kW	kV	RPM	FLA	%PF	%Eff	H*	Type	%Tap	kvar	%Ws	Sec.	
Mtr1	Ind. 1 200.0 0.380 1800 251.9 93.8 95.9 0.25 Reactor 50.00 2.00															

* H is total inertia constant of the shaft in MW-Sec/MVA

SWITCHING MOTORS

Motor	Motor Model				Equipment Parameters				Circuit Parameters					Xr2	
	ID	Type	Class	ID	X/R	Xlr	Xoc	Td0'	Rs	Xs	Xm	Rr1	Rr2	Xr1	
Mtr1	SGL2	HV-LS-HT	LV100HP2P						2.8	10.9	297.4	1.0	2.2	15.6	4.3

All reactances are in percent (machine base) and time constants are in seconds.

- DBL1: Double-Cage model with integrated cages
- DBL2: Double-Cage model with independent cages
- SGL1: Single-Cage model
- SGL2: Single-Cage model with deep-bar effect
- TSC: Torque Slip Characteristic

MOTOR MECHANICAL LOAD

Motor	Load Torque (= a0 + a1 W + a2 W ² + a3 W ³)					
	ID	Model ID	a0	a1	a2	
Mtr1	OPEN VALVE		4.0	-48.0	247.0	-116.0

Project: Starting Motor
 Location: PG. KERON AGUNG
 Contract: Pengasutan Reaktor
 Engineer: DWI HERMAWAN
 Filename: kerbon_agung

ETAP PowerStation

4.0.0C

Page: 12
 Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config: Normal

MOTOR ACCELERATION

Motor ID : Mrl

Time (Sec.)	Slip (%)	Current (% of F.L.A)	Terminal V(%)	Bus V(%)	Acc Torq (%)	Time	Slip	Current	Terminal	Bus	Acc Torq
						(Sec.)	(%)	(% of F.L.A)	V(%)	V(%)	(%)
0.000	100.00	0.00	0.00	100.00	0.00	0.005	100.00	0.00	0.00	100.00	0.00
0.010	100.00	0.00	0.00	100.00	0.00	0.015	100.00	0.00	0.00	100.00	0.00
0.020	100.00	0.00	0.00	100.00	0.00	0.025	100.00	0.00	0.00	100.00	0.00
0.030	100.00	0.00	0.00	100.00	0.00	0.035	100.00	0.00	0.00	100.00	0.00
0.040	100.00	0.00	0.00	100.00	0.00	0.045	100.00	0.00	0.00	100.00	0.00
0.050	100.00	0.00	0.00	100.00	0.00	0.055	100.00	0.00	0.00	100.00	0.00
0.060	100.00	0.00	0.00	100.00	0.00	0.065	100.00	0.00	0.00	100.00	0.00
0.070	100.00	0.00	0.00	100.00	0.00	0.075	100.00	0.00	0.00	100.00	0.00
0.080	100.00	0.00	0.00	100.00	0.00	0.085	100.00	0.00	0.00	100.00	0.00
0.090	100.00	0.00	0.00	100.00	0.00	0.095	100.00	0.00	0.00	100.00	0.00
0.100	100.00	0.00	0.00	100.00	0.00	0.105	100.00	0.00	0.00	100.00	0.00
0.110	100.00	0.00	0.00	100.00	0.00	0.115	100.00	0.00	0.00	100.00	0.00
0.120	100.00	0.00	0.00	100.00	0.00	0.125	100.00	0.00	0.00	100.00	0.00
0.130	100.00	0.00	0.00	100.00	0.00	0.135	100.00	0.00	0.00	100.00	0.00
0.140	100.00	0.00	0.00	100.00	0.00	0.145	100.00	0.00	0.00	100.00	0.00
0.150	100.00	0.00	0.00	100.00	0.00	0.155	100.00	0.00	0.00	100.00	0.00
0.160	100.00	0.00	0.00	100.00	0.00	0.165	100.00	0.00	0.00	100.00	0.00
0.170	100.00	0.00	0.00	100.00	0.00	0.175	100.00	0.00	0.00	100.00	0.00
0.180	100.00	0.00	0.00	100.00	0.00	0.185	100.00	0.00	0.00	100.00	0.00
0.190	100.00	0.00	0.00	100.00	0.00	0.195	100.00	0.00	0.00	100.00	0.00
0.200	100.00	0.00	0.00	100.00	0.00	0.205	100.00	0.00	0.00	100.00	0.00
0.210	100.00	0.00	0.00	100.00	0.00	0.215	100.00	0.00	0.00	100.00	0.00
0.220	100.00	0.00	0.00	100.00	0.00	0.225	100.00	0.00	0.00	100.00	0.00
0.230	100.00	0.00	0.00	100.00	0.00	0.235	100.00	0.00	0.00	100.00	0.00
0.240	100.00	0.00	0.00	100.00	0.00	0.245	100.00	0.00	0.00	100.00	0.00
0.250	100.00	0.00	0.00	100.00	0.00	0.255	100.00	0.00	0.00	100.00	0.00
0.280	100.00	0.00	0.00	100.00	0.00	0.285	100.00	0.00	0.00	100.00	0.00
0.290	100.00	0.00	0.00	100.00	0.00	0.295	100.00	0.00	0.00	100.00	0.00
0.300	100.00	0.00	0.00	100.00	0.00	0.305	100.00	0.00	0.00	100.00	0.00
0.310	100.00	0.00	0.00	100.00	0.00	0.315	100.00	0.00	0.00	100.00	0.00
0.320	100.00	0.00	0.00	100.00	0.00	0.325	100.00	0.00	0.00	100.00	0.00
0.330	100.00	0.00	0.00	100.00	0.00	0.335	100.00	0.00	0.00	100.00	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation

4.0.0C

Page: 13
 Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config: Normal

Motor ID : MRL

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
0.340	100.00	0.00	0.00	100.00	0.00	0.345	100.00	0.00	0.00	100.00	0.00
0.350	100.00	0.00	0.00	100.00	0.00	0.355	100.00	0.00	0.00	100.00	0.00
0.360	100.00	0.00	0.00	100.00	0.00	0.365	100.00	0.00	0.00	100.00	0.00
0.370	100.00	0.00	0.00	100.00	0.00	0.375	100.00	0.00	0.00	100.00	0.00
0.380	100.00	0.00	0.00	100.00	0.00	0.385	100.00	0.00	0.00	100.00	0.00
0.390	100.00	0.00	0.00	100.00	0.00	0.395	100.00	0.00	0.00	100.00	0.00
0.400	100.00	0.00	0.00	100.00	0.00	0.405	100.00	0.00	0.00	100.00	0.00
0.410	100.00	0.00	0.00	100.00	0.00	0.415	100.00	0.00	0.00	100.00	0.00
0.420	100.00	0.00	0.00	100.00	0.00	0.425	100.00	0.00	0.00	100.00	0.00
0.430	100.00	0.00	0.00	100.00	0.00	0.435	100.00	0.00	0.00	100.00	0.00
0.440	100.00	0.00	0.00	100.00	0.00	0.445	100.00	0.00	0.00	100.00	0.00
0.450	100.00	0.00	0.00	100.00	0.00	0.455	100.00	0.00	0.00	100.00	0.00
0.460	100.00	0.00	0.00	100.00	0.00	0.465	100.00	0.00	0.00	100.00	0.00
0.470	100.00	0.00	0.00	100.00	0.00	0.475	100.00	0.00	0.00	100.00	0.00
0.480	100.00	0.00	0.00	100.00	0.00	0.485	100.00	0.00	0.00	100.00	0.00
0.490	100.00	0.00	0.00	100.00	0.00	0.495	100.00	0.00	0.00	100.00	0.00
0.500	99.85	293.46	46.93	93.85	14.95	0.505	99.70	293.18	46.93	93.86	14.99
0.510	99.55	292.90	46.93	93.87	15.03	0.515	99.40	292.63	46.94	93.87	15.07
0.520	99.25	292.35	46.94	93.88	15.11	0.525	99.10	292.08	46.94	93.88	15.15
0.530	98.94	291.80	46.94	93.89	15.19	0.535	98.79	291.52	46.95	93.89	15.23
0.540	98.64	291.25	46.95	93.90	15.27	0.545	98.49	290.97	46.95	93.91	15.30
0.550	98.33	290.69	46.96	93.91	15.34	0.555	98.18	290.42	46.96	93.92	15.37
0.560	98.02	290.14	46.96	93.92	15.41	0.565	97.87	289.86	46.96	93.93	15.44
0.570	97.72	289.58	46.97	93.94	15.47	0.575	97.56	289.31	46.97	93.94	15.50
0.580	97.40	289.03	46.97	93.95	15.53	0.585	97.25	288.75	46.98	93.95	15.56
0.590	97.09	288.47	46.98	93.96	15.59	0.595	96.94	288.20	46.98	93.97	15.62
0.600	96.78	287.92	46.99	93.97	15.65	0.605	96.62	287.64	46.99	93.98	15.67
0.610	96.47	287.36	46.99	93.98	15.69	0.615	96.31	287.09	46.99	93.99	15.72
0.620	96.15	286.81	47.00	94.00	15.74	0.625	95.99	286.53	47.00	94.00	15.76
0.630	95.84	286.26	47.00	94.01	15.78	0.635	95.68	285.98	47.01	94.01	15.80
0.640	95.52	285.70	47.01	94.02	15.82	0.645	95.36	285.43	47.01	94.02	15.84
0.650	95.20	285.15	47.02	94.03	15.85	0.655	95.04	284.87	47.02	94.04	15.87
0.660	94.88	284.60	47.02	94.04	15.89	0.665	94.73	284.32	47.02	94.05	15.90
0.670	94.57	284.05	47.03	94.05	15.91	0.675	94.41	283.77	47.03	94.06	15.92
0.680	94.25	283.50	47.03	94.07	15.93	0.685	94.09	283.23	47.04	94.07	15.94
0.690	93.93	282.95	47.04	94.08	15.95	0.695	93.77	282.68	47.04	94.08	15.96

Project:	Starting Motor	ETAP PowerStation	Page:	14
Location:	PG. KEBON AGUNG	4.0.0C	Date:	03-17-2009
Contract:	Pengasutan Reactor		SN:	KLGCONSULT
Engineer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
Filename:	kebon_agung		Config.:	Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
0.700	93.61	282.41	47.04	94.09	15.97	0.705	93.45	282.13	47.05	94.09	15.97
0.710	93.29	281.86	47.05	94.10	15.98	0.715	93.13	281.59	47.05	94.11	15.98
0.720	92.97	281.32	47.06	94.11	15.98	0.725	92.81	281.05	47.06	94.12	15.98
0.730	92.65	280.78	47.06	94.12	15.99	0.735	92.49	280.51	47.06	94.13	15.99
0.740	92.33	280.24	47.07	94.14	15.98	0.745	92.17	279.97	47.07	94.14	15.98
0.750	92.01	279.70	47.07	94.15	15.98	0.755	91.85	279.43	47.08	94.15	15.97
0.760	91.69	279.17	47.08	94.16	15.97	0.765	91.53	278.90	47.08	94.16	15.96
0.770	91.37	278.63	47.08	94.17	15.96	0.775	91.21	278.37	47.09	94.17	15.95
0.780	91.05	278.10	47.09	94.18	15.94	0.785	90.89	277.84	47.09	94.19	15.93
0.790	90.73	277.57	47.10	94.19	15.92	0.795	90.57	277.31	47.10	94.20	15.91
0.800	90.42	277.05	47.10	94.20	15.89	0.805	90.26	276.79	47.10	94.21	15.88
0.810	90.10	276.53	47.11	94.21	15.87	0.815	89.94	276.27	47.11	94.22	15.85
0.820	89.78	276.01	47.11	94.23	15.83	0.825	89.62	275.75	47.12	94.23	15.82
0.830	89.46	275.49	47.12	94.24	15.80	0.835	89.31	275.24	47.12	94.24	15.78
0.840	89.15	274.98	47.12	94.25	15.76	0.845	88.99	274.72	47.13	94.25	15.74
0.850	88.83	274.47	47.13	94.26	15.72	0.855	88.68	274.21	47.13	94.26	15.69
0.860	88.52	273.96	47.13	94.27	15.67	0.865	88.36	273.71	47.14	94.27	15.65
0.870	88.21	273.46	47.14	94.28	15.62	0.875	88.05	273.21	47.14	94.28	15.60
0.880	87.90	272.96	47.14	94.29	15.57	0.885	87.74	272.71	47.15	94.30	15.54
0.890	87.58	272.46	47.15	94.30	15.51	0.895	87.43	272.21	47.15	94.31	15.48
0.900	87.28	271.97	47.16	94.31	15.45	0.905	87.12	271.72	47.16	94.32	15.42
0.910	86.97	271.48	47.16	94.32	15.39	0.915	86.81	271.24	47.16	94.33	15.36
0.920	86.66	270.99	47.17	94.33	15.33	0.925	86.51	270.75	47.17	94.34	15.29
0.930	86.35	270.51	47.17	94.34	15.26	0.935	86.20	270.27	47.17	94.35	15.22
0.940	86.05	270.03	47.18	94.35	15.19	0.945	85.90	269.79	47.18	94.36	15.15
0.950	85.75	269.56	47.18	94.36	15.11	0.955	85.60	269.32	47.18	94.37	15.08
0.960	85.45	269.09	47.19	94.37	15.04	0.965	85.30	268.85	47.19	94.38	15.00
0.970	85.15	268.62	47.19	94.38	14.96	0.975	85.00	268.39	47.19	94.39	14.92
0.980	84.85	268.16	47.20	94.39	14.88	0.985	84.70	267.93	47.20	94.40	14.83
0.990	84.55	267.70	47.20	94.40	14.79	0.995	84.40	267.47	47.20	94.41	14.75
1.000	84.26	267.25	47.21	94.41	14.70	1.005	84.11	267.02	47.21	94.42	14.66
1.010	83.96	266.80	47.21	94.42	14.61	1.015	83.82	266.57	47.21	94.43	14.57
1.020	83.67	266.35	47.22	94.43	14.52	1.025	83.53	266.13	47.22	94.44	14.48
1.030	83.38	265.91	47.22	94.44	14.43	1.035	83.24	265.69	47.22	94.44	14.38
1.040	83.10	265.47	47.22	94.45	14.33	1.045	82.95	265.25	47.23	94.45	14.29
1.050	82.81	265.04	47.23	94.46	14.24	1.055	82.67	264.82	47.23	94.46	14.19

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation

4.0.0C

Page: 15
 Date: 03-17-2009
 SN: KLGCNSULT
 Revision: Base
 Config: Normal

Motor ID : Mrl

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
1.060	82.53	264.61	47.23	94.47	14.14	1.065	82.39	264.40	47.24	94.47	14.09
1.070	82.25	264.18	47.24	94.48	14.03	1.075	82.11	263.97	47.24	94.48	13.98
1.080	81.97	263.76	47.24	94.49	13.93	1.085	81.83	263.56	47.24	94.49	13.88
1.090	81.69	263.35	47.25	94.49	13.83	1.095	81.55	263.14	47.25	94.50	13.77
1.100	81.41	262.94	47.25	94.50	13.72	1.105	81.28	262.73	47.25	94.51	13.67
1.110	81.14	262.53	47.26	94.51	13.61	1.115	81.01	262.33	47.26	94.52	13.56
1.120	80.87	262.13	47.26	94.52	13.50	1.125	80.74	261.93	47.26	94.52	13.45
1.130	80.60	261.73	47.26	94.53	13.39	1.135	80.47	261.53	47.27	94.53	13.33
1.140	80.34	261.34	47.27	94.54	13.28	1.145	80.20	261.14	47.27	94.54	13.22
1.150	80.07	260.95	47.27	94.54	13.16	1.155	79.94	260.75	47.27	94.55	13.11
1.160	79.81	260.56	47.28	94.55	13.05	1.165	79.68	260.37	47.28	94.56	12.99
1.170	79.55	260.18	47.28	94.56	12.93	1.175	79.42	259.99	47.28	94.57	12.88
1.180	79.29	259.81	47.28	94.57	12.82	1.185	79.17	259.62	47.29	94.57	12.76
1.190	79.04	259.44	47.29	94.58	12.70	1.195	78.91	259.25	47.29	94.58	12.64
1.200	78.79	259.07	47.29	94.58	12.58	1.205	78.66	258.89	47.29	94.59	12.52
1.210	78.54	258.71	47.30	94.59	12.46	1.215	78.41	258.53	47.30	94.60	12.40
1.220	78.29	258.35	47.30	94.60	12.34	1.225	78.17	258.17	47.30	94.60	12.28
1.230	78.04	257.99	47.30	94.61	12.22	1.235	77.92	257.82	47.31	94.61	12.16
1.240	77.80	257.64	47.31	94.61	12.10	1.245	77.68	257.47	47.31	94.62	12.04
1.250	77.56	257.30	47.31	94.62	11.98	1.255	77.44	257.13	47.31	94.63	11.92
1.260	77.32	256.96	47.31	94.63	11.86	1.265	77.21	256.79	47.32	94.63	11.80
1.270	77.09	256.62	47.32	94.64	11.73	1.275	76.97	256.46	47.32	94.64	11.67
1.280	76.85	256.29	47.32	94.64	11.61	1.285	76.74	256.13	47.32	94.65	11.55
1.290	76.62	255.96	47.33	94.65	11.49	1.295	76.51	255.80	47.33	94.65	11.43
1.300	76.40	255.64	47.33	94.66	11.37	1.305	76.28	255.48	47.33	94.66	11.30
1.310	76.17	255.32	47.33	94.66	11.24	1.315	76.06	255.16	47.33	94.67	11.18
1.320	75.95	255.00	47.34	94.67	11.12	1.325	75.84	254.85	47.34	94.67	11.06
1.330	75.73	254.69	47.34	94.68	11.00	1.335	75.62	254.54	47.34	94.68	10.93
1.340	75.51	254.39	47.34	94.68	10.87	1.345	75.40	254.23	47.34	94.69	10.81
1.350	75.29	254.08	47.35	94.69	10.75	1.355	75.19	253.93	47.35	94.69	10.69
1.360	75.08	253.79	47.35	94.70	10.63	1.365	74.97	253.64	47.35	94.70	10.56
1.370	74.87	253.49	47.35	94.70	10.50	1.375	74.76	253.34	47.35	94.71	10.44
1.380	74.66	253.20	47.35	94.71	10.38	1.385	74.56	253.06	47.36	94.71	10.32
1.390	74.45	252.91	47.36	94.72	10.26	1.395	74.35	252.77	47.36	94.72	10.20
1.400	74.25	252.63	47.36	94.72	10.14	1.405	74.15	252.49	47.36	94.72	10.08
1.410	74.05	252.35	47.36	94.73	10.01	1.415	73.95	252.21	47.36	94.73	9.95

Project: Starting Motor
 Location: PG. KERON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

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Page: 16
 Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config: Nominal

Motor ID : M01L

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)						
						Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
1.420	73.85	252.08	47.37	94.73	9.89	1.425	73.75	251.94	47.37	94.74	9.83
1.430	73.66	251.81	47.37	94.74	9.77	1.435	73.56	251.67	47.37	94.74	9.71
1.440	73.46	251.54	47.37	94.74	9.65	1.445	73.37	251.41	47.37	94.75	9.59
1.450	73.27	251.28	47.37	94.75	9.53	1.455	73.18	251.15	47.38	94.75	9.47
1.460	73.08	251.02	47.38	94.76	9.41	1.465	72.99	250.89	47.38	94.76	9.35
1.470	72.89	250.76	47.38	94.76	9.29	1.475	72.80	250.64	47.38	94.76	9.24
1.480	72.71	250.51	47.38	94.77	9.18	1.485	72.62	250.39	47.38	94.77	9.12
1.490	72.53	250.26	47.39	94.77	9.06	1.495	72.44	250.14	47.39	94.77	9.00
1.500	72.35	250.02	47.39	94.78	8.94	1.505	72.26	249.90	47.39	94.78	8.88
1.510	72.17	249.78	47.39	94.78	8.83	1.515	72.08	249.66	47.39	94.78	8.77
1.520	72.00	249.54	47.39	94.79	8.71	1.525	71.91	249.42	47.39	94.79	8.65
1.530	71.82	249.31	47.40	94.79	8.60	1.535	71.74	249.19	47.40	94.79	8.54
1.540	71.65	249.08	47.40	94.80	8.48	1.545	71.57	248.96	47.40	94.80	8.43
1.550	71.49	248.85	47.40	94.80	8.37	1.555	71.40	248.74	47.40	94.80	8.31
1.560	71.32	248.63	47.40	94.81	8.26	1.565	71.24	248.51	47.40	94.81	8.20
1.570	71.16	248.41	47.41	94.81	8.15	1.575	71.08	248.30	47.41	94.81	8.09
1.580	71.00	248.19	47.41	94.81	8.03	1.585	70.92	248.08	47.41	94.82	7.98
1.590	70.84	247.97	47.41	94.82	7.93	1.595	70.76	247.87	47.41	94.82	7.87
1.600	70.68	247.76	47.41	94.82	7.82	1.605	70.60	247.66	47.41	94.83	7.76
1.610	70.52	247.56	47.41	94.83	7.71	1.615	70.45	247.45	47.42	94.83	7.66
1.620	70.37	247.35	47.42	94.83	7.60	1.625	70.30	247.25	47.42	94.83	7.55
1.630	70.22	247.15	47.42	94.84	7.50	1.635	70.15	247.05	47.42	94.84	7.44
1.640	70.07	246.95	47.42	94.84	7.39	1.645	70.00	246.86	47.42	94.84	7.34
1.650	69.93	246.76	47.42	94.85	7.29	1.655	69.85	246.66	47.42	94.85	7.23
1.660	69.78	246.57	47.42	94.85	7.18	1.665	69.71	246.47	47.43	94.85	7.13
1.670	69.64	246.38	47.43	94.85	7.08	1.675	69.57	246.29	47.43	94.86	7.03
1.680	69.50	246.19	47.43	94.86	6.98	1.685	69.43	246.10	47.43	94.86	6.93
1.710	69.09	245.65	47.43	94.87	6.68	1.715	69.03	245.57	47.44	94.87	6.63
1.720	68.96	245.48	47.44	94.87	6.59	1.725	68.89	245.39	47.44	94.87	6.54
1.730	68.83	245.31	47.44	94.88	6.49	1.735	68.76	245.22	47.44	94.88	6.44
1.740	68.70	245.14	47.44	94.88	6.39	1.745	68.64	245.06	47.44	94.88	6.35
1.750	68.57	244.97	47.44	94.88	6.30	1.755	68.51	244.89	47.44	94.88	6.25
1.760	68.45	244.81	47.44	94.89	6.21	1.765	68.39	244.73	47.44	94.89	6.16
1.770	68.33	244.65	47.44	94.89	6.11	1.775	68.27	244.57	47.45	94.89	6.07

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation
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 SN: KLGCONSULT
 Revision: Base
 Config: Normal

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 SN:

Motor ID : Mtr1.

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
1.780	68.21	244.49	47.45	94.89	6.02	1.785	68.15	244.41	47.45	94.89	5.98
1.790	68.09	244.34	47.45	94.90	5.93	1.795	68.03	244.26	47.45	94.90	5.89
1.800	67.97	244.18	47.45	94.90	5.85	1.805	67.91	244.11	47.45	94.90	5.80
1.810	67.85	244.03	47.45	94.90	5.76	1.815	67.80	243.96	47.45	94.90	5.71
1.820	67.74	243.88	47.45	94.91	5.67	1.825	67.68	243.81	47.45	94.91	5.63
1.830	67.63	243.74	47.45	94.91	5.58	1.835	67.57	243.66	47.46	94.91	5.54
1.840	67.52	243.59	47.46	94.91	5.50	1.845	67.46	243.52	47.46	94.91	5.46
1.850	67.41	243.45	47.46	94.91	5.42	1.855	67.35	243.38	47.46	94.92	5.37
1.860	67.30	243.31	47.46	94.92	5.33	1.865	67.25	243.24	47.46	94.92	5.29
1.870	67.20	243.18	47.46	94.92	5.25	1.875	67.14	243.11	47.46	94.92	5.21
1.880	67.09	243.04	47.46	94.92	5.17	1.885	67.04	242.98	47.46	94.92	5.13
1.890	66.99	242.91	47.46	94.93	5.09	1.895	66.94	242.84	47.46	94.93	5.05
1.900	66.89	242.78	47.46	94.93	5.01	1.905	66.84	242.72	47.47	94.93	4.97
1.910	66.79	242.65	47.47	94.93	4.93	1.915	66.74	242.59	47.47	94.93	4.90
1.920	66.69	242.53	47.47	94.93	4.86	1.925	66.64	242.46	47.47	94.94	4.82
1.930	66.60	242.40	47.47	94.94	4.78	1.935	66.55	242.34	47.47	94.94	4.74
1.940	66.50	242.28	47.47	94.94	4.71	1.945	66.45	242.22	47.47	94.94	4.67
1.950	66.41	242.16	47.47	94.94	4.63	1.955	66.36	242.10	47.47	94.94	4.60
1.960	66.32	242.04	47.47	94.94	4.56	1.965	66.27	241.98	47.47	94.95	4.52
1.970	66.23	241.93	47.47	94.95	4.49	1.975	66.18	241.87	47.47	94.95	4.45
1.980	66.14	241.81	47.47	94.95	4.42	1.985	66.09	241.76	47.48	94.95	4.38
1.990	66.05	241.70	47.48	94.95	4.35	1.995	66.01	241.65	47.48	94.95	4.31
2.000	65.96	241.59	47.48	94.95	4.28	2.005	65.92	241.54	47.48	94.96	4.24
2.010	65.88	241.48	47.48	94.96	4.21	2.015	65.84	241.43	47.48	94.96	4.18
2.020	65.80	241.38	47.48	94.96	4.14	2.025	65.76	241.32	47.48	94.96	4.11
2.030	65.71	241.27	47.48	94.96	4.08	2.035	65.67	241.22	47.48	94.96	4.04
2.040	65.63	241.17	47.48	94.96	4.01	2.045	65.59	241.12	47.48	94.96	3.98
2.050	65.55	241.07	47.48	94.97	3.95	2.055	65.52	241.02	47.48	94.97	3.92
2.060	65.48	240.97	47.48	94.97	3.88	2.065	65.44	240.92	47.48	94.97	3.85
2.070	65.40	240.87	47.48	94.97	3.82	2.075	65.36	240.82	47.49	94.97	3.79
2.080	65.32	240.77	47.49	94.97	3.76	2.085	65.29	240.73	47.49	94.97	3.73
2.090	65.25	240.68	47.49	94.97	3.70	2.095	65.21	240.63	47.49	94.97	3.67
2.100	65.18	240.59	47.49	94.98	3.64	2.105	65.14	240.54	47.49	94.98	3.61
2.110	65.10	240.49	47.49	94.98	3.58	2.115	65.07	240.45	47.49	94.98	3.55
2.120	65.03	240.40	47.49	94.98	3.52	2.125	65.00	240.36	47.49	94.98	3.49
2.130	64.96	240.32	47.49	94.98	3.47	2.135	64.93	240.27	47.49	94.98	3.44

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

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Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
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Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config: Normal

Motor ID: Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
2.140	64.90	240.23	47.49	94.98	3.41	2.145	64.86	240.19	47.49	94.98	3.38
2.150	64.83	240.14	47.49	94.98	3.35	2.155	64.79	240.10	47.49	94.99	3.33
2.160	64.76	240.06	47.49	94.99	3.30	2.165	64.73	240.02	47.49	94.99	3.27
2.170	64.70	239.98	47.49	94.99	3.24	2.175	64.66	239.94	47.49	94.99	3.22
2.180	64.63	239.90	47.49	94.99	3.19	2.185	64.60	239.86	47.50	94.99	3.16
2.190	64.57	239.82	47.50	94.99	3.14	2.195	64.54	239.78	47.50	94.99	3.11
2.200	64.51	239.74	47.50	94.99	3.09	2.205	64.48	239.70	47.50	94.99	3.06
2.210	64.45	239.66	47.50	94.99	3.04	2.215	64.42	239.62	47.50	95.00	3.01
2.220	64.39	239.59	47.50	95.00	2.99	2.225	64.36	239.55	47.50	95.00	2.96
2.230	64.33	239.51	47.50	95.00	2.94	2.235	64.30	239.47	47.50	95.00	2.91
2.240	64.27	239.44	47.50	95.00	2.89	2.245	64.24	239.40	47.50	95.00	2.86
2.250	64.21	239.37	47.50	95.00	2.84	2.255	64.18	239.33	47.50	95.00	2.82
2.260	64.16	239.29	47.50	95.00	2.79	2.265	64.13	239.26	47.50	95.00	2.77
2.270	64.10	239.23	47.50	95.00	2.75	2.275	64.07	239.19	47.50	95.00	2.72
2.280	64.05	239.16	47.50	95.01	2.70	2.285	64.02	239.12	47.50	95.01	2.68
2.290	63.99	239.09	47.50	95.01	2.66	2.295	63.97	239.06	47.50	95.01	2.63
2.300	63.94	239.02	47.50	95.01	2.61	2.305	63.91	238.99	47.50	95.01	2.59
2.310	63.89	238.96	47.50	95.01	2.57	2.315	63.86	238.93	47.51	95.01	2.55
2.320	63.84	238.90	47.51	95.01	2.53	2.325	63.81	238.86	47.51	95.01	2.50
2.330	63.79	238.83	47.51	95.01	2.48	2.335	63.76	238.80	47.51	95.01	2.46
2.340	63.74	238.77	47.51	95.01	2.44	2.345	63.72	238.74	47.51	95.01	2.42
2.350	63.69	238.71	47.51	95.01	2.40	2.355	63.67	238.68	47.51	95.02	2.38
2.360	63.64	238.65	47.51	95.02	2.36	2.365	63.62	238.62	47.51	95.02	2.34
2.370	63.60	238.59	47.51	95.02	2.32	2.375	63.57	238.56	47.51	95.02	2.30
2.380	63.55	238.54	47.51	95.02	2.28	2.385	63.53	238.51	47.51	95.02	2.26
2.390	63.51	238.48	47.51	95.02	2.24	2.395	63.48	238.45	47.51	95.02	2.22
2.400	63.46	238.42	47.51	95.02	2.21	2.405	63.44	238.40	47.51	95.02	2.19
2.410	63.42	238.37	47.51	95.02	2.17	2.415	63.40	238.34	47.51	95.02	2.15
2.420	63.38	238.32	47.51	95.02	2.13	2.425	63.35	238.29	47.51	95.02	2.11
2.430	63.33	238.26	47.51	95.02	2.10	2.435	63.31	238.24	47.51	95.02	2.08
2.440	63.29	238.21	47.51	95.03	2.06	2.445	63.27	238.19	47.51	95.03	2.04
2.450	63.25	238.16	47.51	95.03	2.02	2.455	63.23	238.13	47.51	95.03	2.01
2.460	63.21	238.11	47.51	95.03	1.99	2.465	63.19	238.09	47.51	95.03	1.97
2.470	63.17	238.06	47.51	95.03	1.96	2.475	63.15	238.04	47.51	95.03	1.94
2.480	63.13	238.01	47.51	95.03	1.92	2.485	63.11	237.99	47.51	95.03	1.91
2.490	63.10	237.97	47.52	95.03	1.89	2.495	63.08	237.94	47.52	95.03	1.87

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

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 Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config: Normal

Motor ID : MrL

Time (Sec)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
2.500	63.06	237.92	47.52	95.03	1.86	2.505	62.64	457.69	90.42	90.42	41.78
2.510	62.23	451.75	90.44	90.44	41.40	2.515	61.82	450.83	90.46	90.46	41.03
2.520	61.41	449.91	90.47	90.47	40.65	2.525	61.01	449.01	90.49	90.49	40.28
2.530	60.61	448.13	90.51	90.51	39.91	2.535	60.21	447.25	90.53	90.53	39.54
2.540	59.82	446.38	90.55	90.55	39.17	2.545	59.43	445.53	90.57	90.57	38.81
2.550	59.05	444.68	90.59	90.59	38.45	2.555	58.66	443.85	90.60	90.60	38.09
2.560	58.29	443.02	90.62	90.62	37.73	2.565	57.91	442.21	90.64	90.64	37.38
2.570	57.54	441.41	90.66	90.66	37.03	2.575	57.18	440.61	90.67	90.67	36.68
2.580	56.81	439.83	90.69	90.69	36.34	2.585	56.45	439.05	90.71	90.71	35.99
2.590	56.09	438.29	90.72	90.72	35.66	2.595	55.74	437.53	90.74	90.74	35.32
2.600	55.39	436.78	90.75	90.75	34.99	2.605	55.04	436.05	90.77	90.77	34.66
2.610	54.70	435.32	90.78	90.78	34.33	2.615	54.36	434.60	90.80	90.80	34.00
2.620	54.02	433.88	90.81	90.81	33.68	2.625	53.69	433.18	90.83	90.83	33.36
2.630	53.36	432.48	90.84	90.84	33.05	2.635	53.03	431.80	90.86	90.86	32.74
2.640	52.71	431.12	90.87	90.87	32.43	2.645	52.39	430.45	90.89	90.89	32.12
2.650	52.07	429.78	90.90	90.90	31.82	2.655	51.75	429.13	90.92	90.92	31.52
2.660	51.44	428.48	90.93	90.93	31.22	2.665	51.13	427.84	90.94	90.94	30.93
2.670	50.82	427.20	90.96	90.96	30.64	2.675	50.52	426.58	90.97	90.97	30.36
2.680	50.22	425.96	90.98	90.98	30.07	2.685	49.92	425.35	91.00	91.00	29.79
2.690	49.63	424.74	91.01	91.01	29.51	2.695	49.33	424.14	91.02	91.02	29.24
2.700	49.04	423.55	91.03	91.03	28.97	2.705	48.76	422.96	91.05	91.05	28.70
2.710	48.47	422.39	91.06	91.06	28.44	2.715	48.19	421.81	91.07	91.07	28.17
2.720	47.91	421.25	91.08	91.08	27.92	2.725	47.63	420.68	91.09	91.09	27.66
2.730	47.36	420.13	91.11	91.11	27.41	2.735	47.09	419.58	91.12	91.12	27.16
2.740	46.82	419.04	91.13	91.13	26.91	2.745	46.55	418.50	91.14	91.14	26.67
2.750	46.29	417.97	91.15	91.15	26.43	2.755	46.03	417.44	91.16	91.16	26.19
2.760	45.77	416.92	91.17	91.17	25.96	2.765	45.51	416.41	91.18	91.18	25.73
2.770	45.25	415.90	91.19	91.19	25.50	2.775	45.00	415.39	91.21	91.21	25.27
2.780	44.75	414.89	91.22	91.22	25.05	2.785	44.50	414.40	91.23	91.23	24.83
2.790	44.25	413.91	91.24	91.24	24.62	2.795	44.01	413.42	91.25	91.25	24.40
2.800	43.77	412.94	91.26	91.26	24.19	2.805	43.53	412.46	91.27	91.27	23.98
2.810	43.29	411.99	91.28	91.28	23.78	2.815	43.05	411.53	91.29	91.29	23.58
2.820	42.82	411.06	91.30	91.30	23.38	2.825	42.59	410.61	91.31	91.31	23.18
2.830	42.36	410.15	91.32	91.32	22.99	2.835	42.13	409.70	91.33	91.33	22.79
2.840	41.90	409.26	91.33	91.33	22.61	2.845	41.68	408.81	91.34	91.34	22.42
2.850	41.46	408.38	91.35	91.35	22.24	2.855	41.24	407.94	91.36	91.36	22.06

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation

4.00C

Page: 20
 Date: 03-17-2009
 SN: KLGCNSULT
 Revision: Base
 Config: Normal

Motor ID : MtrL

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
2.860	41.02	407.51	91.37	91.37	21.88	2.865	40.80	407.09	91.38	91.38	21.70
2.870	40.59	406.66	91.39	91.39	21.53	2.875	40.37	406.24	91.40	91.40	21.36
2.880	40.16	405.83	91.41	91.41	21.19	2.885	39.95	405.42	91.42	91.42	21.02
2.890	39.74	405.01	91.42	91.42	20.86	2.895	39.53	404.60	91.43	91.43	20.70
2.900	39.33	404.20	91.44	91.44	20.54	2.905	39.12	403.80	91.45	91.45	20.39
2.910	38.92	403.41	91.46	91.46	20.23	2.915	38.72	403.01	91.47	91.47	20.08
2.920	38.52	402.63	91.47	91.47	19.93	2.925	38.32	402.24	91.48	91.48	19.78
2.930	38.13	401.86	91.49	91.49	19.64	2.935	37.93	401.48	91.50	91.50	19.50
2.940	37.74	401.10	91.51	91.51	19.36	2.945	37.55	400.72	91.51	91.51	19.22
2.950	37.35	400.35	91.52	91.52	19.09	2.955	37.17	399.98	91.53	91.53	18.95
2.960	36.98	399.61	91.54	91.54	18.82	2.965	36.79	399.25	91.55	91.55	18.69
2.970	36.60	398.89	91.55	91.55	18.57	2.975	36.42	398.53	91.56	91.56	18.44
2.980	36.24	398.17	91.57	91.57	18.32	2.985	36.05	397.82	91.58	91.58	18.20
2.990	35.87	397.46	91.58	91.58	18.08	2.995	35.69	397.11	91.59	91.59	17.96
3.000	35.51	396.77	91.60	91.60	17.85	3.005	35.34	396.42	91.60	91.60	17.74
3.010	35.16	396.08	91.61	91.61	17.63	3.015	34.99	395.74	91.62	91.62	17.52
3.020	34.81	395.40	91.63	91.63	17.41	3.025	34.64	395.06	91.63	91.63	17.31
3.030	34.47	394.72	91.64	91.64	17.21	3.035	34.29	394.39	91.65	91.65	17.11
3.040	34.12	394.06	91.65	91.65	17.01	3.045	33.96	393.73	91.66	91.66	16.91
3.050	33.79	393.40	91.67	91.67	16.82	3.055	33.62	393.07	91.68	91.68	16.72
3.060	33.45	392.75	91.68	91.68	16.63	3.065	33.29	392.42	91.69	91.69	16.54
3.070	33.12	392.10	91.70	91.70	16.46	3.075	32.96	391.78	91.70	91.70	16.37
3.080	32.80	391.46	91.71	91.71	16.29	3.085	32.63	391.14	91.72	91.72	16.21
3.090	32.47	390.83	91.72	91.72	16.13	3.095	32.31	390.51	91.73	91.73	16.05
3.100	32.15	390.20	91.74	91.74	15.97	3.105	31.99	389.89	91.74	91.74	15.90
3.110	31.84	389.58	91.75	91.75	15.82	3.115	31.68	389.27	91.76	91.76	15.75
3.120	31.52	388.96	91.76	91.76	15.68	3.125	31.36	388.65	91.77	91.77	15.62
3.130	31.21	388.34	91.77	91.77	15.55	3.135	31.05	388.04	91.78	91.78	15.49
3.140	30.90	387.73	91.79	91.79	15.43	3.145	30.75	387.43	91.79	91.79	15.37
3.150	30.59	387.13	91.80	91.80	15.31	3.155	30.44	386.83	91.81	91.81	15.25
3.190	29.39	384.73	91.85	91.85	14.90	3.195	29.24	384.44	91.86	91.86	14.86
3.200	29.09	384.14	91.86	91.86	14.82	3.205	28.94	383.84	91.87	91.87	14.78
3.210	28.79	383.55	91.88	91.88	14.74	3.215	28.65	383.25	91.88	91.88	14.70

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation

4.0 OC

Page: 21
 Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config: Normal

Motor ID: M1r1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
3.220	28.50	382.96	91.89	91.89	14.67	3.225	28.35	382.66	91.89	91.89	14.63
3.230	28.21	382.37	91.90	91.90	14.60	3.235	28.06	382.07	91.91	91.91	14.58
3.240	27.92	381.78	91.91	91.91	14.55	3.245	27.77	381.49	91.92	91.92	14.52
3.250	27.63	381.19	91.93	91.93	14.50	3.255	27.48	380.90	91.93	91.93	14.48
3.260	27.34	380.60	91.94	91.94	14.46	3.265	27.19	380.31	91.94	91.94	14.44
3.270	27.05	380.01	91.95	91.95	14.42	3.275	26.90	379.72	91.96	91.96	14.41
3.280	26.76	379.42	91.96	91.96	14.40	3.285	26.62	379.13	91.97	91.97	14.39
3.290	26.47	378.83	91.98	91.98	14.38	3.295	26.33	378.53	91.98	91.98	14.37
3.300	26.18	378.24	91.99	91.99	14.37	3.305	26.04	377.94	91.99	91.99	14.37
3.310	25.90	377.64	92.00	92.00	14.37	3.315	25.75	377.34	92.01	92.01	14.37
3.320	25.61	377.04	92.01	92.01	14.37	3.325	25.47	376.74	92.02	92.02	14.38
3.330	25.32	376.44	92.03	92.03	14.39	3.335	25.18	376.14	92.03	92.03	14.40
3.340	25.03	375.83	92.04	92.04	14.41	3.345	24.89	375.53	92.05	92.05	14.43
3.350	24.74	375.22	92.05	92.05	14.44	3.355	24.60	374.91	92.06	92.06	14.47
3.360	24.45	374.61	92.07	92.07	14.49	3.365	24.31	374.30	92.07	92.07	14.51
3.370	24.16	373.98	92.08	92.08	14.54	3.375	24.02	373.67	92.09	92.09	14.57
3.380	23.87	373.36	92.09	92.09	14.60	3.385	23.73	373.04	92.10	92.10	14.64
3.390	23.58	372.72	92.11	92.11	14.68	3.395	23.43	372.40	92.11	92.11	14.72
3.400	23.28	372.08	92.12	92.12	14.76	3.405	23.14	371.75	92.13	92.13	14.81
3.410	22.99	371.43	92.13	92.13	14.86	3.415	22.84	371.10	92.14	92.14	14.92
3.420	22.69	370.77	92.15	92.15	14.97	3.425	22.54	370.43	92.16	92.16	15.03
3.430	22.39	370.09	92.16	92.16	15.10	3.435	22.23	369.75	92.17	92.17	15.17
3.440	22.08	369.41	92.18	92.18	15.24	3.445	21.93	369.06	92.19	92.19	15.31
3.450	21.77	368.71	92.19	92.19	15.39	3.455	21.62	368.36	92.20	92.20	15.47
3.460	21.46	368.00	92.21	92.21	15.56	3.465	21.31	367.64	92.22	92.22	15.65
3.470	21.15	367.28	92.22	92.22	15.75	3.475	20.99	366.91	92.23	92.23	15.85
3.480	20.83	366.53	92.24	92.24	15.96	3.485	20.67	366.15	92.25	92.25	16.07
3.490	20.51	365.77	92.26	92.26	16.19	3.495	20.35	365.38	92.27	92.27	16.31
3.500	20.18	364.99	92.27	92.27	16.44	3.505	20.02	364.59	92.28	92.28	16.57
3.510	19.85	364.18	92.29	92.29	16.71	3.515	19.68	363.77	92.30	92.30	16.86
3.520	19.51	363.35	92.31	92.31	17.01	3.525	19.34	362.93	92.32	92.32	17.18
3.530	19.16	362.49	92.33	92.33	17.35	3.535	18.99	362.05	92.34	92.34	17.52
3.540	18.81	361.60	92.35	92.35	17.71	3.545	18.63	361.14	92.36	92.36	17.90
3.550	18.45	360.68	92.37	92.37	18.11	3.555	18.27	360.20	92.38	92.38	18.32
3.560	18.08	359.71	92.39	92.39	18.54	3.565	17.89	359.21	92.40	92.40	18.78
3.570	17.70	358.70	92.41	92.41	19.03	3.575	17.51	358.18	92.42	92.42	19.28

Project:	Starting Motor	ETAP PowerStation 4.0.0C	Page:	22
Location:	PG. KEBON AGUNG		Date:	03-17-2009
Contract:	Pengasutan Reactor		SN:	KLGCONSULT
Engineer:	DWI HERMAWAN	Study Case: MS	Revision:	Base
Filename:	kebon_agung		Config.:	Normal

[Motor ID : Mtr1](#)

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
3.580	17.32	357.65	92.44	92.44	19.56	3.585	17.12	357.10	92.45	92.45	19.84
3.590	16.92	356.53	92.46	92.46	20.14	3.595	16.71	355.96	92.47	92.47	20.46
3.600	16.50	355.36	92.49	92.49	20.79	3.605	16.29	354.74	92.50	92.50	21.14
3.610	16.08	354.11	92.52	92.52	21.51	3.615	15.86	353.45	92.53	92.53	21.90
3.620	15.63	352.77	92.55	92.55	22.32	3.625	15.41	352.07	92.56	92.56	22.75
3.630	15.17	351.34	92.58	92.58	23.21	3.635	14.94	350.58	92.60	92.60	23.70
3.640	14.69	349.79	92.62	92.62	24.22	3.645	14.45	348.97	92.64	92.64	24.78
3.650	14.19	348.11	92.66	92.66	25.36	3.655	13.93	347.20	92.68	92.68	25.99
3.660	13.67	346.25	92.70	92.70	26.66	3.665	13.39	345.26	92.72	92.72	27.37
3.670	13.11	344.20	92.75	92.75	28.14	3.675	12.82	343.08	92.78	92.78	28.96
3.680	12.52	341.89	92.81	92.81	29.84	3.685	12.21	340.63	92.84	92.84	30.79
3.690	11.89	339.27	92.87	92.87	31.82	3.695	11.57	337.81	92.91	92.91	32.93
3.700	11.22	336.24	92.94	92.94	34.13	3.705	10.87	334.53	92.99	92.99	35.44
3.710	10.50	332.66	93.03	93.03	36.87	3.715	10.12	330.60	93.09	93.09	38.44
3.720	9.71	328.33	93.14	93.14	40.15	3.725	9.29	325.79	93.21	93.21	42.03
3.730	8.85	322.92	93.28	93.28	44.11	3.735	8.39	319.67	93.37	93.37	46.40
3.740	7.90	315.92	93.47	93.47	48.92	3.745	7.38	311.54	93.58	93.58	51.71
3.750	6.83	306.36	93.72	93.72	54.75	3.755	6.25	300.11	93.89	93.89	58.05
3.760	5.64	292.45	94.10	94.10	61.51	3.765	4.99	282.87	94.36	94.36	64.96
3.770	4.31	270.65	94.68	94.68	67.99	3.775	3.61	254.85	95.10	95.10	69.76
3.780	2.92	234.38	95.63	95.63	68.85	3.785	2.29	208.58	96.26	96.26	63.21
3.790	1.77	178.63	96.93	96.93	51.38	3.795	1.42	149.00	97.54	97.54	35.03
3.800	1.23	125.88	97.96	97.96	19.54	3.805	1.14	111.99	98.20	98.20	9.20
3.810	1.10	105.22	98.31	98.31	3.90	3.815	1.08	102.32	98.35	98.35	1.57
3.820	1.07	101.14	98.37	98.37	0.62	3.825	1.07	100.68	98.38	98.38	0.24
3.830	1.07	100.50	98.38	98.38	0.09	3.835	1.07	100.43	98.38	98.38	0.04
3.840	1.07	100.40	98.38	98.38	0.01	3.845	1.07	100.39	98.38	98.38	0.01
3.850	1.07	100.39	98.38	98.38	0.00	3.855	1.07	100.39	98.38	98.38	0.00
3.860	1.07	100.39	98.38	98.38	0.00	3.865	1.07	100.39	98.38	98.38	0.00
3.870	1.07	100.39	98.38	98.38	0.00	3.875	1.07	100.39	98.38	98.38	0.00
3.880	1.07	100.39	98.38	98.38	0.00	3.885	1.07	100.39	98.38	98.38	0.00
3.890	1.07	100.39	98.38	98.38	0.00	3.895	1.07	100.39	98.38	98.38	0.00
3.900	1.07	100.39	98.38	98.38	0.00	3.905	1.07	100.39	98.38	98.38	0.00
3.910	1.07	100.39	98.38	98.38	0.00	3.915	1.07	100.39	98.38	98.38	0.00
3.920	1.07	100.39	98.38	98.38	0.00	3.925	1.07	100.39	98.38	98.38	0.00
3.930	1.07	100.39	98.38	98.38	0.00	3.935	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
Location: PG. KEBON AGUNG
Contract: Pengasutan Reactor
Engineer: DWI HERMAWAN
Filename: kebon_agung

ETAP PowerStation

4.00C

Page: 23
Date: 03-17-2009
SN: KLGCNSULT
Revision: Base
Config.: Normal

Motor ID: Murl

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
3.940	1.07	100.39	98.38	98.38	0.00	3.945	1.07	100.39	98.38	98.38	0.00
3.950	1.07	100.39	98.38	98.38	0.00	3.955	1.07	100.39	98.38	98.38	0.00
3.960	1.07	100.39	98.38	98.38	0.00	3.965	1.07	100.39	98.38	98.38	0.00
3.970	1.07	100.39	98.38	98.38	0.00	3.975	1.07	100.39	98.38	98.38	0.00
3.980	1.07	100.39	98.38	98.38	0.00	3.985	1.07	100.39	98.38	98.38	0.00
3.990	1.07	100.39	98.38	98.38	0.00	3.995	1.07	100.39	98.38	98.38	0.00
4.000	1.07	100.39	98.38	98.38	0.00	4.005	1.07	100.39	98.38	98.38	0.00
4.010	1.07	100.39	98.38	98.38	0.00	4.015	1.07	100.39	98.38	98.38	0.00
4.020	1.07	100.39	98.38	98.38	0.00	4.025	1.07	100.39	98.38	98.38	0.00
4.030	1.07	100.39	98.38	98.38	0.00	4.035	1.07	100.39	98.38	98.38	0.00
4.040	1.07	100.39	98.38	98.38	0.00	4.045	1.07	100.39	98.38	98.38	0.00
4.050	1.07	100.39	98.38	98.38	0.00	4.055	1.07	100.39	98.38	98.38	0.00
4.060	1.07	100.39	98.38	98.38	0.00	4.065	1.07	100.39	98.38	98.38	0.00
4.070	1.07	100.39	98.38	98.38	0.00	4.075	1.07	100.39	98.38	98.38	0.00
4.080	1.07	100.39	98.38	98.38	0.00	4.085	1.07	100.39	98.38	98.38	0.00
4.090	1.07	100.39	98.38	98.38	0.00	4.095	1.07	100.39	98.38	98.38	0.00
4.100	1.07	100.39	98.38	98.38	0.00	4.105	1.07	100.39	98.38	98.38	0.00
4.110	1.07	100.39	98.38	98.38	0.00	4.115	1.07	100.39	98.38	98.38	0.00
4.120	1.07	100.39	98.38	98.38	0.00	4.125	1.07	100.39	98.38	98.38	0.00
4.130	1.07	100.39	98.38	98.38	0.00	4.135	1.07	100.39	98.38	98.38	0.00
4.140	1.07	100.39	98.38	98.38	0.00	4.145	1.07	100.39	98.38	98.38	0.00
4.150	1.07	100.39	98.38	98.38	0.00	4.155	1.07	100.39	98.38	98.38	0.00
4.160	1.07	100.39	98.38	98.38	0.00	4.165	1.07	100.39	98.38	98.38	0.00
4.170	1.07	100.39	98.38	98.38	0.00	4.175	1.07	100.39	98.38	98.38	0.00
4.180	1.07	100.39	98.38	98.38	0.00	4.185	1.07	100.39	98.38	98.38	0.00
4.190	1.07	100.39	98.38	98.38	0.00	4.195	1.07	100.39	98.38	98.38	0.00
4.200	1.07	100.39	98.38	98.38	0.00	4.205	1.07	100.39	98.38	98.38	0.00
4.210	1.07	100.39	98.38	98.38	0.00	4.215	1.07	100.39	98.38	98.38	0.00
4.220	1.07	100.39	98.38	98.38	0.00	4.225	1.07	100.39	98.38	98.38	0.00
4.230	1.07	100.39	98.38	98.38	0.00	4.235	1.07	100.39	98.38	98.38	0.00
4.240	1.07	100.39	98.38	98.38	0.00	4.245	1.07	100.39	98.38	98.38	0.00
4.250	1.07	100.39	98.38	98.38	0.00	4.255	1.07	100.39	98.38	98.38	0.00
4.260	1.07	100.39	98.38	98.38	0.00	4.265	1.07	100.39	98.38	98.38	0.00
4.270	1.07	100.39	98.38	98.38	0.00	4.275	1.07	100.39	98.38	98.38	0.00
4.280	1.07	100.39	98.38	98.38	0.00	4.285	1.07	100.39	98.38	98.38	0.00
4.290	1.07	100.39	98.38	98.38	0.00	4.295	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

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 Config: Normal

Motor ID : Mtr1											
Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Ace Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Ace Torq (%)
4.300	1.07	100.39	98.38	98.38	0.00	4.305	1.07	100.39	98.38	98.38	0.00
4.310	1.07	100.39	98.38	98.38	0.00	4.315	1.07	100.39	98.38	98.38	0.00
4.320	1.07	100.39	98.38	98.38	0.00	4.325	1.07	100.39	98.38	98.38	0.00
4.330	1.07	100.39	98.38	98.38	0.00	4.335	1.07	100.39	98.38	98.38	0.00
4.340	1.07	100.39	98.38	98.38	0.00	4.345	1.07	100.39	98.38	98.38	0.00
4.350	1.07	100.39	98.38	98.38	0.00	4.355	1.07	100.39	98.38	98.38	0.00
4.360	1.07	100.39	98.38	98.38	0.00	4.365	1.07	100.39	98.38	98.38	0.00
4.370	1.07	100.39	98.38	98.38	0.00	4.375	1.07	100.39	98.38	98.38	0.00
4.380	1.07	100.39	98.38	98.38	0.00	4.385	1.07	100.39	98.38	98.38	0.00
4.390	1.07	100.39	98.38	98.38	0.00	4.395	1.07	100.39	98.38	98.38	0.00
4.400	1.07	100.39	98.38	98.38	0.00	4.405	1.07	100.39	98.38	98.38	0.00
4.410	1.07	100.39	98.38	98.38	0.00	4.415	1.07	100.39	98.38	98.38	0.00
4.420	1.07	100.39	98.38	98.38	0.00	4.425	1.07	100.39	98.38	98.38	0.00
4.430	1.07	100.39	98.38	98.38	0.00	4.435	1.07	100.39	98.38	98.38	0.00
4.440	1.07	100.39	98.38	98.38	0.00	4.445	1.07	100.39	98.38	98.38	0.00
4.450	1.07	100.39	98.38	98.38	0.00	4.455	1.07	100.39	98.38	98.38	0.00
4.460	1.07	100.39	98.38	98.38	0.00	4.465	1.07	100.39	98.38	98.38	0.00
4.470	1.07	100.39	98.38	98.38	0.00	4.475	1.07	100.39	98.38	98.38	0.00
4.480	1.07	100.39	98.38	98.38	0.00	4.485	1.07	100.39	98.38	98.38	0.00
4.490	1.07	100.39	98.38	98.38	0.00	4.495	1.07	100.39	98.38	98.38	0.00
4.500	1.07	100.39	98.38	98.38	0.00	4.505	1.07	100.39	98.38	98.38	0.00
4.510	1.07	100.39	98.38	98.38	0.00	4.515	1.07	100.39	98.38	98.38	0.00
4.520	1.07	100.39	98.38	98.38	0.00	4.525	1.07	100.39	98.38	98.38	0.00
4.530	1.07	100.39	98.38	98.38	0.00	4.535	1.07	100.39	98.38	98.38	0.00
4.540	1.07	100.39	98.38	98.38	0.00	4.545	1.07	100.39	98.38	98.38	0.00
4.550	1.07	100.39	98.38	98.38	0.00	4.555	1.07	100.39	98.38	98.38	0.00
4.560	1.07	100.39	98.38	98.38	0.00	4.565	1.07	100.39	98.38	98.38	0.00
4.570	1.07	100.39	98.38	98.38	0.00	4.575	1.07	100.39	98.38	98.38	0.00
4.580	1.07	100.39	98.38	98.38	0.00	4.585	1.07	100.39	98.38	98.38	0.00
4.590	1.07	100.39	98.38	98.38	0.00	4.595	1.07	100.39	98.38	98.38	0.00
4.600	1.07	100.39	98.38	98.38	0.00	4.605	1.07	100.39	98.38	98.38	0.00
4.610	1.07	100.39	98.38	98.38	0.00	4.615	1.07	100.39	98.38	98.38	0.00
4.620	1.07	100.39	98.38	98.38	0.00	4.625	1.07	100.39	98.38	98.38	0.00
4.630	1.07	100.39	98.38	98.38	0.00	4.635	1.07	100.39	98.38	98.38	0.00
4.640	1.07	100.39	98.38	98.38	0.00	4.645	1.07	100.39	98.38	98.38	0.00
4.650	1.07	100.39	98.38	98.38	0.00	4.655	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

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Date: 03-17-2009
 SN: KLGCONSULT
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Motor ID: Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
4.660	1.07	100.39	98.38	98.38	0.00	4.665	1.07	100.39	98.38	98.38	0.00
4.670	1.07	100.39	98.38	98.38	0.00	4.675	1.07	100.39	98.38	98.38	0.00
4.680	1.07	100.39	98.38	98.38	0.00	4.685	1.07	100.39	98.38	98.38	0.00
4.690	1.07	100.39	98.38	98.38	0.00	4.695	1.07	100.39	98.38	98.38	0.00
4.700	1.07	100.39	98.38	98.38	0.00	4.705	1.07	100.39	98.38	98.38	0.00
4.710	1.07	100.39	98.38	98.38	0.00	4.715	1.07	100.39	98.38	98.38	0.00
4.720	1.07	100.39	98.38	98.38	0.00	4.725	1.07	100.39	98.38	98.38	0.00
4.730	1.07	100.39	98.38	98.38	0.00	4.735	1.07	100.39	98.38	98.38	0.00
4.740	1.07	100.39	98.38	98.38	0.00	4.745	1.07	100.39	98.38	98.38	0.00
4.750	1.07	100.39	98.38	98.38	0.00	4.755	1.07	100.39	98.38	98.38	0.00
4.760	1.07	100.39	98.38	98.38	0.00	4.765	1.07	100.39	98.38	98.38	0.00
4.770	1.07	100.39	98.38	98.38	0.00	4.775	1.07	100.39	98.38	98.38	0.00
4.780	1.07	100.39	98.38	98.38	0.00	4.785	1.07	100.39	98.38	98.38	0.00
4.790	1.07	100.39	98.38	98.38	0.00	4.795	1.07	100.39	98.38	98.38	0.00
4.800	1.07	100.39	98.38	98.38	0.00	4.805	1.07	100.39	98.38	98.38	0.00
4.810	1.07	100.39	98.38	98.38	0.00	4.815	1.07	100.39	98.38	98.38	0.00
4.820	1.07	100.39	98.38	98.38	0.00	4.825	1.07	100.39	98.38	98.38	0.00
4.830	1.07	100.39	98.38	98.38	0.00	4.835	1.07	100.39	98.38	98.38	0.00
4.840	1.07	100.39	98.38	98.38	0.00	4.845	1.07	100.39	98.38	98.38	0.00
4.850	1.07	100.39	98.38	98.38	0.00	4.855	1.07	100.39	98.38	98.38	0.00
4.860	1.07	100.39	98.38	98.38	0.00	4.865	1.07	100.39	98.38	98.38	0.00
4.870	1.07	100.39	98.38	98.38	0.00	4.875	1.07	100.39	98.38	98.38	0.00
4.880	1.07	100.39	98.38	98.38	0.00	4.885	1.07	100.39	98.38	98.38	0.00
4.890	1.07	100.39	98.38	98.38	0.00	4.895	1.07	100.39	98.38	98.38	0.00
4.900	1.07	100.39	98.38	98.38	0.00	4.905	1.07	100.39	98.38	98.38	0.00
4.910	1.07	100.39	98.38	98.38	0.00	4.915	1.07	100.39	98.38	98.38	0.00
4.920	1.07	100.39	98.38	98.38	0.00	4.925	1.07	100.39	98.38	98.38	0.00
4.930	1.07	100.39	98.38	98.38	0.00	4.935	1.07	100.39	98.38	98.38	0.00
4.940	1.07	100.39	98.38	98.38	0.00	4.945	1.07	100.39	98.38	98.38	0.00
4.950	1.07	100.39	98.38	98.38	0.00	4.955	1.07	100.39	98.38	98.38	0.00
4.960	1.07	100.39	98.38	98.38	0.00	4.965	1.07	100.39	98.38	98.38	0.00
4.970	1.07	100.39	98.38	98.38	0.00	4.975	1.07	100.39	98.38	98.38	0.00
4.980	1.07	100.39	98.38	98.38	0.00	4.985	1.07	100.39	98.38	98.38	0.00
4.990	1.07	100.39	98.38	98.38	0.00	4.995	1.07	100.39	98.38	98.38	0.00
5.000	1.07	100.39	98.38	98.38	0.00	5.005	1.07	100.39	98.38	98.38	0.00
5.010	1.07	100.39	98.38	98.38	0.00	5.015	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

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 Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
 Config: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq, (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
5.020	1.07	100.39	98.38	98.38	0.00	5.025	1.07	100.39	98.38	98.38	0.00
5.030	1.07	100.39	98.38	98.38	0.00	5.035	1.07	100.39	98.38	98.38	0.00
5.040	1.07	100.39	98.38	98.38	0.00	5.045	1.07	100.39	98.38	98.38	0.00
5.050	1.07	100.39	98.38	98.38	0.00	5.055	1.07	100.39	98.38	98.38	0.00
5.060	1.07	100.39	98.38	98.38	0.00	5.065	1.07	100.39	98.38	98.38	0.00
5.070	1.07	100.39	98.38	98.38	0.00	5.075	1.07	100.39	98.38	98.38	0.00
5.080	1.07	100.39	98.38	98.38	0.00	5.085	1.07	100.39	98.38	98.38	0.00
5.090	1.07	100.39	98.38	98.38	0.00	5.095	1.07	100.39	98.38	98.38	0.00
5.100	1.07	100.39	98.38	98.38	0.00	5.105	1.07	100.39	98.38	98.38	0.00
5.110	1.07	100.39	98.38	98.38	0.00	5.115	1.07	100.39	98.38	98.38	0.00
5.120	1.07	100.39	98.38	98.38	0.00	5.125	1.07	100.39	98.38	98.38	0.00
5.130	1.07	100.39	98.38	98.38	0.00	5.135	1.07	100.39	98.38	98.38	0.00
5.140	1.07	100.39	98.38	98.38	0.00	5.145	1.07	100.39	98.38	98.38	0.00
5.150	1.07	100.39	98.38	98.38	0.00	5.155	1.07	100.39	98.38	98.38	0.00
5.160	1.07	100.39	98.38	98.38	0.00	5.165	1.07	100.39	98.38	98.38	0.00
5.170	1.07	100.39	98.38	98.38	0.00	5.175	1.07	100.39	98.38	98.38	0.00
5.180	1.07	100.39	98.38	98.38	0.00	5.185	1.07	100.39	98.38	98.38	0.00
5.190	1.07	100.39	98.38	98.38	0.00	5.195	1.07	100.39	98.38	98.38	0.00
5.200	1.07	100.39	98.38	98.38	0.00	5.205	1.07	100.39	98.38	98.38	0.00
5.210	1.07	100.39	98.38	98.38	0.00	5.215	1.07	100.39	98.38	98.38	0.00
5.220	1.07	100.39	98.38	98.38	0.00	5.225	1.07	100.39	98.38	98.38	0.00
5.230	1.07	100.39	98.38	98.38	0.00	5.235	1.07	100.39	98.38	98.38	0.00
5.240	1.07	100.39	98.38	98.38	0.00	5.245	1.07	100.39	98.38	98.38	0.00
5.250	1.07	100.39	98.38	98.38	0.00	5.255	1.07	100.39	98.38	98.38	0.00
5.260	1.07	100.39	98.38	98.38	0.00	5.265	1.07	100.39	98.38	98.38	0.00
5.270	1.07	100.39	98.38	98.38	0.00	5.275	1.07	100.39	98.38	98.38	0.00
5.280	1.07	100.39	98.38	98.38	0.00	5.285	1.07	100.39	98.38	98.38	0.00
5.290	1.07	100.39	98.38	98.38	0.00	5.295	1.07	100.39	98.38	98.38	0.00
5.300	1.07	100.39	98.38	98.38	0.00	5.305	1.07	100.39	98.38	98.38	0.00
5.310	1.07	100.39	98.38	98.38	0.00	5.315	1.07	100.39	98.38	98.38	0.00
5.320	1.07	100.39	98.38	98.38	0.00	5.325	1.07	100.39	98.38	98.38	0.00
5.330	1.07	100.39	98.38	98.38	0.00	5.335	1.07	100.39	98.38	98.38	0.00
5.340	1.07	100.39	98.38	98.38	0.00	5.345	1.07	100.39	98.38	98.38	0.00
5.350	1.07	100.39	98.38	98.38	0.00	5.355	1.07	100.39	98.38	98.38	0.00
5.360	1.07	100.39	98.38	98.38	0.00	5.365	1.07	100.39	98.38	98.38	0.00
5.370	1.07	100.39	98.38	98.38	0.00	5.375	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
Location: PG. KEBON AGUNG
Contract: Pengasutan Reactor
Engineer: DWI HERMAWAN
Filename: kebon_agung

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Motor ID : Mtr1

Time (Sec)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
5.380	1.07	100.39	98.38	98.38	0.00	5.385	1.07	100.39	98.38	98.38	0.00
5.390	1.07	100.39	98.38	98.38	0.00	5.395	1.07	100.39	98.38	98.38	0.00
5.400	1.07	100.39	98.38	98.38	0.00	5.405	1.07	100.39	98.38	98.38	0.00
5.410	1.07	100.39	98.38	98.38	0.00	5.415	1.07	100.39	98.38	98.38	0.00
5.420	1.07	100.39	98.38	98.38	0.00	5.425	1.07	100.39	98.38	98.38	0.00
5.430	1.07	100.39	98.38	98.38	0.00	5.435	1.07	100.39	98.38	98.38	0.00
5.440	1.07	100.39	98.38	98.38	0.00	5.445	1.07	100.39	98.38	98.38	0.00
5.450	1.07	100.39	98.38	98.38	0.00	5.455	1.07	100.39	98.38	98.38	0.00
5.460	1.07	100.39	98.38	98.38	0.00	5.465	1.07	100.39	98.38	98.38	0.00
5.470	1.07	100.39	98.38	98.38	0.00	5.475	1.07	100.39	98.38	98.38	0.00
5.480	1.07	100.39	98.38	98.38	0.00	5.485	1.07	100.39	98.38	98.38	0.00
5.490	1.07	100.39	98.38	98.38	0.00	5.495	1.07	100.39	98.38	98.38	0.00
5.500	1.07	100.39	98.38	98.38	0.00	5.505	1.07	100.39	98.38	98.38	0.00
5.510	1.07	100.39	98.38	98.38	0.00	5.515	1.07	100.39	98.38	98.38	0.00
5.520	1.07	100.39	98.38	98.38	0.00	5.525	1.07	100.39	98.38	98.38	0.00
5.530	1.07	100.39	98.38	98.38	0.00	5.535	1.07	100.39	98.38	98.38	0.00
5.540	1.07	100.39	98.38	98.38	0.00	5.545	1.07	100.39	98.38	98.38	0.00
5.550	1.07	100.39	98.38	98.38	0.00	5.555	1.07	100.39	98.38	98.38	0.00
5.560	1.07	100.39	98.38	98.38	0.00	5.565	1.07	100.39	98.38	98.38	0.00
5.570	1.07	100.39	98.38	98.38	0.00	5.575	1.07	100.39	98.38	98.38	0.00
5.580	1.07	100.39	98.38	98.38	0.00	5.585	1.07	100.39	98.38	98.38	0.00
5.590	1.07	100.39	98.38	98.38	0.00	5.595	1.07	100.39	98.38	98.38	0.00
5.600	1.07	100.39	98.38	98.38	0.00	5.605	1.07	100.39	98.38	98.38	0.00
5.610	1.07	100.39	98.38	98.38	0.00	5.615	1.07	100.39	98.38	98.38	0.00
5.620	1.07	100.39	98.38	98.38	0.00	5.625	1.07	100.39	98.38	98.38	0.00
5.630	1.07	100.39	98.38	98.38	0.00	5.635	1.07	100.39	98.38	98.38	0.00
5.640	1.07	100.39	98.38	98.38	0.00	5.645	1.07	100.39	98.38	98.38	0.00
5.650	1.07	100.39	98.38	98.38	0.00	5.655	1.07	100.39	98.38	98.38	0.00
5.660	1.07	100.39	98.38	98.38	0.00	5.665	1.07	100.39	98.38	98.38	0.00
5.670	1.07	100.39	98.38	98.38	0.00	5.675	1.07	100.39	98.38	98.38	0.00
5.680	1.07	100.39	98.38	98.38	0.00	5.685	1.07	100.39	98.38	98.38	0.00
5.690	1.07	100.39	98.38	98.38	0.00	5.695	1.07	100.39	98.38	98.38	0.00
5.700	1.07	100.39	98.38	98.38	0.00	5.705	1.07	100.39	98.38	98.38	0.00
5.710	1.07	100.39	98.38	98.38	0.00	5.715	1.07	100.39	98.38	98.38	0.00
5.720	1.07	100.39	98.38	98.38	0.00	5.725	1.07	100.39	98.38	98.38	0.00
5.730	1.07	100.39	98.38	98.38	0.00	5.735	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation

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Date: 03-17-2009
 SN: KLGCONSULT
 Revision: Base
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Motor ID : Mtr1.

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
5.740	1.07	100.39	98.38	98.38	0.00	5.745	1.07	100.39	98.38	98.38	0.00
5.750	1.07	100.39	98.38	98.38	0.00	5.755	1.07	100.39	98.38	98.38	0.00
5.760	1.07	100.39	98.38	98.38	0.00	5.765	1.07	100.39	98.38	98.38	0.00
5.770	1.07	100.39	98.38	98.38	0.00	5.775	1.07	100.39	98.38	98.38	0.00
5.780	1.07	100.39	98.38	98.38	0.00	5.785	1.07	100.39	98.38	98.38	0.00
5.790	1.07	100.39	98.38	98.38	0.00	5.795	1.07	100.39	98.38	98.38	0.00
5.800	1.07	100.39	98.38	98.38	0.00	5.805	1.07	100.39	98.38	98.38	0.00
5.810	1.07	100.39	98.38	98.38	0.00	5.815	1.07	100.39	98.38	98.38	0.00
5.820	1.07	100.39	98.38	98.38	0.00	5.825	1.07	100.39	98.38	98.38	0.00
5.830	1.07	100.39	98.38	98.38	0.00	5.835	1.07	100.39	98.38	98.38	0.00
5.840	1.07	100.39	98.38	98.38	0.00	5.845	1.07	100.39	98.38	98.38	0.00
5.850	1.07	100.39	98.38	98.38	0.00	5.855	1.07	100.39	98.38	98.38	0.00
5.860	1.07	100.39	98.38	98.38	0.00	5.865	1.07	100.39	98.38	98.38	0.00
5.870	1.07	100.39	98.38	98.38	0.00	5.875	1.07	100.39	98.38	98.38	0.00
5.880	1.07	100.39	98.38	98.38	0.00	5.885	1.07	100.39	98.38	98.38	0.00
5.890	1.07	100.39	98.38	98.38	0.00	5.895	1.07	100.39	98.38	98.38	0.00
5.900	1.07	100.39	98.38	98.38	0.00	5.905	1.07	100.39	98.38	98.38	0.00
5.910	1.07	100.39	98.38	98.38	0.00	5.915	1.07	100.39	98.38	98.38	0.00
5.920	1.07	100.39	98.38	98.38	0.00	5.925	1.07	100.39	98.38	98.38	0.00
5.930	1.07	100.39	98.38	98.38	0.00	5.935	1.07	100.39	98.38	98.38	0.00
5.940	1.07	100.39	98.38	98.38	0.00	5.945	1.07	100.39	98.38	98.38	0.00
5.950	1.07	100.39	98.38	98.38	0.00	5.955	1.07	100.39	98.38	98.38	0.00
5.960	1.07	100.39	98.38	98.38	0.00	5.965	1.07	100.39	98.38	98.38	0.00
5.970	1.07	100.39	98.38	98.38	0.00	5.975	1.07	100.39	98.38	98.38	0.00
5.980	1.07	100.39	98.38	98.38	0.00	5.985	1.07	100.39	98.38	98.38	0.00
5.990	1.07	100.39	98.38	98.38	0.00	5.995	1.07	100.39	98.38	98.38	0.00
6.000	1.07	100.39	98.38	98.38	0.00	6.005	1.07	100.39	98.38	98.38	0.00
6.010	1.07	100.39	98.38	98.38	0.00	6.015	1.07	100.39	98.38	98.38	0.00
6.020	1.07	100.39	98.38	98.38	0.00	6.025	1.07	100.39	98.38	98.38	0.00
6.030	1.07	100.39	98.38	98.38	0.00	6.035	1.07	100.39	98.38	98.38	0.00
6.040	1.07	100.39	98.38	98.38	0.00	6.045	1.07	100.39	98.38	98.38	0.00
6.050	1.07	100.39	98.38	98.38	0.00	6.055	1.07	100.39	98.38	98.38	0.00
6.060	1.07	100.39	98.38	98.38	0.00	6.065	1.07	100.39	98.38	98.38	0.00
6.070	1.07	100.39	98.38	98.38	0.00	6.075	1.07	100.39	98.38	98.38	0.00
6.080	1.07	100.39	98.38	98.38	0.00	6.085	1.07	100.39	98.38	98.38	0.00
6.090	1.07	100.39	98.38	98.38	0.00	6.095	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasulan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation

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 Date: 03-17-2009
 SN: KLGCNSULT
 Revision: Base
 Config: Normal

Motor ID: Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
6.100	1.07	100.39	98.38	98.38	0.00	6.105	1.07	100.39	98.38	98.38	0.00
6.110	1.07	100.39	98.38	98.38	0.00	6.115	1.07	100.39	98.38	98.38	0.00
6.120	1.07	100.39	98.38	98.38	0.00	6.125	1.07	100.39	98.38	98.38	0.00
6.130	1.07	100.39	98.38	98.38	0.00	6.135	1.07	100.39	98.38	98.38	0.00
6.140	1.07	100.39	98.38	98.38	0.00	6.145	1.07	100.39	98.38	98.38	0.00
6.150	1.07	100.39	98.38	98.38	0.00	6.155	1.07	100.39	98.38	98.38	0.00
6.160	1.07	100.39	98.38	98.38	0.00	6.165	1.07	100.39	98.38	98.38	0.00
6.170	1.07	100.39	98.38	98.38	0.00	6.175	1.07	100.39	98.38	98.38	0.00
6.180	1.07	100.39	98.38	98.38	0.00	6.185	1.07	100.39	98.38	98.38	0.00
6.190	1.07	100.39	98.38	98.38	0.00	6.195	1.07	100.39	98.38	98.38	0.00
6.200	1.07	100.39	98.38	98.38	0.00	6.205	1.07	100.39	98.38	98.38	0.00
6.210	1.07	100.39	98.38	98.38	0.00	6.215	1.07	100.39	98.38	98.38	0.00
6.220	1.07	100.39	98.38	98.38	0.00	6.225	1.07	100.39	98.38	98.38	0.00
6.230	1.07	100.39	98.38	98.38	0.00	6.235	1.07	100.39	98.38	98.38	0.00
6.240	1.07	100.39	98.38	98.38	0.00	6.245	1.07	100.39	98.38	98.38	0.00
6.250	1.07	100.39	98.38	98.38	0.00	6.255	1.07	100.39	98.38	98.38	0.00
6.260	1.07	100.39	98.38	98.38	0.00	6.265	1.07	100.39	98.38	98.38	0.00
6.270	1.07	100.39	98.38	98.38	0.00	6.275	1.07	100.39	98.38	98.38	0.00
6.280	1.07	100.39	98.38	98.38	0.00	6.285	1.07	100.39	98.38	98.38	0.00
6.290	1.07	100.39	98.38	98.38	0.00	6.295	1.07	100.39	98.38	98.38	0.00
6.300	1.07	100.39	98.38	98.38	0.00	6.305	1.07	100.39	98.38	98.38	0.00
6.310	1.07	100.39	98.38	98.38	0.00	6.315	1.07	100.39	98.38	98.38	0.00
6.320	1.07	100.39	98.38	98.38	0.00	6.325	1.07	100.39	98.38	98.38	0.00
6.330	1.07	100.39	98.38	98.38	0.00	6.335	1.07	100.39	98.38	98.38	0.00
6.340	1.07	100.39	98.38	98.38	0.00	6.345	1.07	100.39	98.38	98.38	0.00
6.350	1.07	100.39	98.38	98.38	0.00	6.355	1.07	100.39	98.38	98.38	0.00
6.360	1.07	100.39	98.38	98.38	0.00	6.365	1.07	100.39	98.38	98.38	0.00
6.370	1.07	100.39	98.38	98.38	0.00	6.375	1.07	100.39	98.38	98.38	0.00
6.380	1.07	100.39	98.38	98.38	0.00	6.385	1.07	100.39	98.38	98.38	0.00
6.390	1.07	100.39	98.38	98.38	0.00	6.395	1.07	100.39	98.38	98.38	0.00
6.400	1.07	100.39	98.38	98.38	0.00	6.405	1.07	100.39	98.38	98.38	0.00
6.410	1.07	100.39	98.38	98.38	0.00	6.415	1.07	100.39	98.38	98.38	0.00
6.420	1.07	100.39	98.38	98.38	0.00	6.425	1.07	100.39	98.38	98.38	0.00
6.430	1.07	100.39	98.38	98.38	0.00	6.435	1.07	100.39	98.38	98.38	0.00
6.440	1.07	100.39	98.38	98.38	0.00	6.445	1.07	100.39	98.38	98.38	0.00
6.450	1.07	100.39	98.38	98.38	0.00	6.455	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

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 Date: 03-17-2009
 SN: KLGCNSULT
 Revision: Base
 Config: Normal

Motor ID : Mtr1

Time (Sec.)	Ship (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq. (%)
6.460	1.07	100.39	98.38	98.38	0.00	6.465	1.07	100.39	98.38	98.38	0.00
6.470	1.07	100.39	98.38	98.38	0.00	6.475	1.07	100.39	98.38	98.38	0.00
6.480	1.07	100.39	98.38	98.38	0.00	6.485	1.07	100.39	98.38	98.38	0.00
6.490	1.07	100.39	98.38	98.38	0.00	6.495	1.07	100.39	98.38	98.38	0.00
6.500	1.07	100.39	98.38	98.38	0.00	6.505	1.07	100.39	98.38	98.38	0.00
6.510	1.07	100.39	98.38	98.38	0.00	6.515	1.07	100.39	98.38	98.38	0.00
6.520	1.07	100.39	98.38	98.38	0.00	6.525	1.07	100.39	98.38	98.38	0.00
6.530	1.07	100.39	98.38	98.38	0.00	6.535	1.07	100.39	98.38	98.38	0.00
6.540	1.07	100.39	98.38	98.38	0.00	6.545	1.07	100.39	98.38	98.38	0.00
6.550	1.07	100.39	98.38	98.38	0.00	6.555	1.07	100.39	98.38	98.38	0.00
6.560	1.07	100.39	98.38	98.38	0.00	6.565	1.07	100.39	98.38	98.38	0.00
6.570	1.07	100.39	98.38	98.38	0.00	6.575	1.07	100.39	98.38	98.38	0.00
6.580	1.07	100.39	98.38	98.38	0.00	6.585	1.07	100.39	98.38	98.38	0.00
6.590	1.07	100.39	98.38	98.38	0.00	6.595	1.07	100.39	98.38	98.38	0.00
6.600	1.07	100.39	98.38	98.38	0.00	6.605	1.07	100.39	98.38	98.38	0.00
6.610	1.07	100.39	98.38	98.38	0.00	6.615	1.07	100.39	98.38	98.38	0.00
6.620	1.07	100.39	98.38	98.38	0.00	6.625	1.07	100.39	98.38	98.38	0.00
6.630	1.07	100.39	98.38	98.38	0.00	6.635	1.07	100.39	98.38	98.38	0.00
6.640	1.07	100.39	98.38	98.38	0.00	6.645	1.07	100.39	98.38	98.38	0.00
6.650	1.07	100.39	98.38	98.38	0.00	6.655	1.07	100.39	98.38	98.38	0.00
6.660	1.07	100.39	98.38	98.38	0.00	6.665	1.07	100.39	98.38	98.38	0.00
6.670	1.07	100.39	98.38	98.38	0.00	6.675	1.07	100.39	98.38	98.38	0.00
6.680	1.07	100.39	98.38	98.38	0.00	6.685	1.07	100.39	98.38	98.38	0.00
6.690	1.07	100.39	98.38	98.38	0.00	6.695	1.07	100.39	98.38	98.38	0.00
6.700	1.07	100.39	98.38	98.38	0.00	6.705	1.07	100.39	98.38	98.38	0.00
6.710	1.07	100.39	98.38	98.38	0.00	6.715	1.07	100.39	98.38	98.38	0.00
6.720	1.07	100.39	98.38	98.38	0.00	6.725	1.07	100.39	98.38	98.38	0.00
6.730	1.07	100.39	98.38	98.38	0.00	6.735	1.07	100.39	98.38	98.38	0.00
6.740	1.07	100.39	98.38	98.38	0.00	6.745	1.07	100.39	98.38	98.38	0.00
6.750	1.07	100.39	98.38	98.38	0.00	6.755	1.07	100.39	98.38	98.38	0.00
6.760	1.07	100.39	98.38	98.38	0.00	6.765	1.07	100.39	98.38	98.38	0.00
6.770	1.07	100.39	98.38	98.38	0.00	6.775	1.07	100.39	98.38	98.38	0.00
6.780	1.07	100.39	98.38	98.38	0.00	6.785	1.07	100.39	98.38	98.38	0.00
6.790	1.07	100.39	98.38	98.38	0.00	6.795	1.07	100.39	98.38	98.38	0.00
6.800	1.07	100.39	98.38	98.38	0.00	6.805	1.07	100.39	98.38	98.38	0.00
6.810	1.07	100.39	98.38	98.38	0.00	6.815	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

ETAP PowerStation

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 Date: 03-17-2009
 SN: KLGCNSULT
 Revision: Base
 Config: Normal

Motor ID: Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq, (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
6.820	1.07	100.39	98.38	98.38	0.00	6.825	1.07	100.39	98.38	98.38	0.00
6.830	1.07	100.39	98.38	98.38	0.00	6.835	1.07	100.39	98.38	98.38	0.00
6.840	1.07	100.39	98.38	98.38	0.00	6.845	1.07	100.39	98.38	98.38	0.00
6.850	1.07	100.39	98.38	98.38	0.00	6.855	1.07	100.39	98.38	98.38	0.00
6.860	1.07	100.39	98.38	98.38	0.00	6.865	1.07	100.39	98.38	98.38	0.00
6.870	1.07	100.39	98.38	98.38	0.00	6.875	1.07	100.39	98.38	98.38	0.00
6.880	1.07	100.39	98.38	98.38	0.00	6.885	1.07	100.39	98.38	98.38	0.00
6.890	1.07	100.39	98.38	98.38	0.00	6.895	1.07	100.39	98.38	98.38	0.00
6.900	1.07	100.39	98.38	98.38	0.00	6.905	1.07	100.39	98.38	98.38	0.00
6.910	1.07	100.39	98.38	98.38	0.00	6.915	1.07	100.39	98.38	98.38	0.00
6.920	1.07	100.39	98.38	98.38	0.00	6.925	1.07	100.39	98.38	98.38	0.00
6.930	1.07	100.39	98.38	98.38	0.00	6.935	1.07	100.39	98.38	98.38	0.00
6.940	1.07	100.39	98.38	98.38	0.00	6.945	1.07	100.39	98.38	98.38	0.00
6.950	1.07	100.39	98.38	98.38	0.00	6.955	1.07	100.39	98.38	98.38	0.00
6.960	1.07	100.39	98.38	98.38	0.00	6.965	1.07	100.39	98.38	98.38	0.00
6.970	1.07	100.39	98.38	98.38	0.00	6.975	1.07	100.39	98.38	98.38	0.00
6.980	1.07	100.39	98.38	98.38	0.00	6.985	1.07	100.39	98.38	98.38	0.00
6.990	1.07	100.39	98.38	98.38	0.00	6.995	1.07	100.39	98.38	98.38	0.00
7.000	1.07	100.39	98.38	98.38	0.00	7.005	1.07	100.39	98.38	98.38	0.00
7.010	1.07	100.39	98.38	98.38	0.00	7.015	1.07	100.39	98.38	98.38	0.00
7.020	1.07	100.39	98.38	98.38	0.00	7.025	1.07	100.39	98.38	98.38	0.00
7.030	1.07	100.39	98.38	98.38	0.00	7.035	1.07	100.39	98.38	98.38	0.00
7.040	1.07	100.39	98.38	98.38	0.00	7.045	1.07	100.39	98.38	98.38	0.00
7.050	1.07	100.39	98.38	98.38	0.00	7.055	1.07	100.39	98.38	98.38	0.00
7.060	1.07	100.39	98.38	98.38	0.00	7.065	1.07	100.39	98.38	98.38	0.00
7.070	1.07	100.39	98.38	98.38	0.00	7.075	1.07	100.39	98.38	98.38	0.00
7.080	1.07	100.39	98.38	98.38	0.00	7.085	1.07	100.39	98.38	98.38	0.00
7.090	1.07	100.39	98.38	98.38	0.00	7.095	1.07	100.39	98.38	98.38	0.00
7.100	1.07	100.39	98.38	98.38	0.00	7.105	1.07	100.39	98.38	98.38	0.00
7.110	1.07	100.39	98.38	98.38	0.00	7.115	1.07	100.39	98.38	98.38	0.00
7.120	1.07	100.39	98.38	98.38	0.00	7.125	1.07	100.39	98.38	98.38	0.00
7.130	1.07	100.39	98.38	98.38	0.00	7.135	1.07	100.39	98.38	98.38	0.00
7.140	1.07	100.39	98.38	98.38	0.00	7.145	1.07	100.39	98.38	98.38	0.00
7.150	1.07	100.39	98.38	98.38	0.00	7.155	1.07	100.39	98.38	98.38	0.00
7.160	1.07	100.39	98.38	98.38	0.00	7.165	1.07	100.39	98.38	98.38	0.00
7.170	1.07	100.39	98.38	98.38	0.00	7.175	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reactor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

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 Config: Normal

Motor ID : Mtr1

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
7.180	1.07	100.39	98.38	98.38	0.00	7.185	1.07	100.39	98.38	98.38	0.00
7.190	1.07	100.39	98.38	98.38	0.00	7.195	1.07	100.39	98.38	98.38	0.00
7.200	1.07	100.39	98.38	98.38	0.00	7.205	1.07	100.39	98.38	98.38	0.00
7.210	1.07	100.39	98.38	98.38	0.00	7.215	1.07	100.39	98.38	98.38	0.00
7.220	1.07	100.39	98.38	98.38	0.00	7.225	1.07	100.39	98.38	98.38	0.00
7.230	1.07	100.39	98.38	98.38	0.00	7.235	1.07	100.39	98.38	98.38	0.00
7.240	1.07	100.39	98.38	98.38	0.00	7.245	1.07	100.39	98.38	98.38	0.00
7.250	1.07	100.39	98.38	98.38	0.00	7.255	1.07	100.39	98.38	98.38	0.00
7.260	1.07	100.39	98.38	98.38	0.00	7.265	1.07	100.39	98.38	98.38	0.00
7.270	1.07	100.39	98.38	98.38	0.00	7.275	1.07	100.39	98.38	98.38	0.00
7.280	1.07	100.39	98.38	98.38	0.00	7.285	1.07	100.39	98.38	98.38	0.00
7.290	1.07	100.39	98.38	98.38	0.00	7.295	1.07	100.39	98.38	98.38	0.00
7.300	1.07	100.39	98.38	98.38	0.00	7.305	1.07	100.39	98.38	98.38	0.00
7.310	1.07	100.39	98.38	98.38	0.00	7.315	1.07	100.39	98.38	98.38	0.00
7.320	1.07	100.39	98.38	98.38	0.00	7.325	1.07	100.39	98.38	98.38	0.00
7.330	1.07	100.39	98.38	98.38	0.00	7.335	1.07	100.39	98.38	98.38	0.00
7.340	1.07	100.39	98.38	98.38	0.00	7.345	1.07	100.39	98.38	98.38	0.00
7.350	1.07	100.39	98.38	98.38	0.00	7.355	1.07	100.39	98.38	98.38	0.00
7.360	1.07	100.39	98.38	98.38	0.00	7.365	1.07	100.39	98.38	98.38	0.00
7.370	1.07	100.39	98.38	98.38	0.00	7.375	1.07	100.39	98.38	98.38	0.00
7.380	1.07	100.39	98.38	98.38	0.00	7.385	1.07	100.39	98.38	98.38	0.00
7.390	1.07	100.39	98.38	98.38	0.00	7.395	1.07	100.39	98.38	98.38	0.00
7.400	1.07	100.39	98.38	98.38	0.00	7.405	1.07	100.39	98.38	98.38	0.00
7.410	1.07	100.39	98.38	98.38	0.00	7.415	1.07	100.39	98.38	98.38	0.00
7.420	1.07	100.39	98.38	98.38	0.00	7.425	1.07	100.39	98.38	98.38	0.00
7.430	1.07	100.39	98.38	98.38	0.00	7.435	1.07	100.39	98.38	98.38	0.00
7.440	1.07	100.39	98.38	98.38	0.00	7.445	1.07	100.39	98.38	98.38	0.00
7.450	1.07	100.39	98.38	98.38	0.00	7.455	1.07	100.39	98.38	98.38	0.00
7.460	1.07	100.39	98.38	98.38	0.00	7.465	1.07	100.39	98.38	98.38	0.00
7.470	1.07	100.39	98.38	98.38	0.00	7.475	1.07	100.39	98.38	98.38	0.00
7.480	1.07	100.39	98.38	98.38	0.00	7.485	1.07	100.39	98.38	98.38	0.00
7.490	1.07	100.39	98.38	98.38	0.00	7.495	1.07	100.39	98.38	98.38	0.00
7.500	1.07	100.39	98.38	98.38	0.00	7.505	1.07	100.39	98.38	98.38	0.00
7.510	1.07	100.39	98.38	98.38	0.00	7.515	1.07	100.39	98.38	98.38	0.00
7.520	1.07	100.39	98.38	98.38	0.00	7.525	1.07	100.39	98.38	98.38	0.00
7.530	1.07	100.39	98.38	98.38	0.00	7.535	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
Location: PG. KEBON AGUNG
Contract: Pengasutan Reactor
Engineer: DWI HERMAWAN
Filename: kebon_agung

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Revision: Base
Config: Normal

Study Case: MS**Motor ID: MtrL**

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
7.540	1.07	100.39	98.38	98.38	0.00	7.545	1.07	100.39	98.38	98.38	0.00
7.550	1.07	100.39	98.38	98.38	0.00	7.555	1.07	100.39	98.38	98.38	0.00
7.560	1.07	100.39	98.38	98.38	0.00	7.565	1.07	100.39	98.38	98.38	0.00
7.570	1.07	100.39	98.38	98.38	0.00	7.575	1.07	100.39	98.38	98.38	0.00
7.580	1.07	100.39	98.38	98.38	0.00	7.585	1.07	100.39	98.38	98.38	0.00
7.590	1.07	100.39	98.38	98.38	0.00	7.595	1.07	100.39	98.38	98.38	0.00
7.600	1.07	100.39	98.38	98.38	0.00	7.605	1.07	100.39	98.38	98.38	0.00
7.610	1.07	100.39	98.38	98.38	0.00	7.615	1.07	100.39	98.38	98.38	0.00
7.620	1.07	100.39	98.38	98.38	0.00	7.625	1.07	100.39	98.38	98.38	0.00
7.630	1.07	100.39	98.38	98.38	0.00	7.635	1.07	100.39	98.38	98.38	0.00
7.640	1.07	100.39	98.38	98.38	0.00	7.645	1.07	100.39	98.38	98.38	0.00
7.650	1.07	100.39	98.38	98.38	0.00	7.655	1.07	100.39	98.38	98.38	0.00
7.660	1.07	100.39	98.38	98.38	0.00	7.665	1.07	100.39	98.38	98.38	0.00
7.670	1.07	100.39	98.38	98.38	0.00	7.675	1.07	100.39	98.38	98.38	0.00
7.680	1.07	100.39	98.38	98.38	0.00	7.685	1.07	100.39	98.38	98.38	0.00
7.690	1.07	100.39	98.38	98.38	0.00	7.695	1.07	100.39	98.38	98.38	0.00
7.700	1.07	100.39	98.38	98.38	0.00	7.705	1.07	100.39	98.38	98.38	0.00
7.710	1.07	100.39	98.38	98.38	0.00	7.715	1.07	100.39	98.38	98.38	0.00
7.720	1.07	100.39	98.38	98.38	0.00	7.725	1.07	100.39	98.38	98.38	0.00
7.730	1.07	100.39	98.38	98.38	0.00	7.735	1.07	100.39	98.38	98.38	0.00
7.740	1.07	100.39	98.38	98.38	0.00	7.745	1.07	100.39	98.38	98.38	0.00
7.750	1.07	100.39	98.38	98.38	0.00	7.755	1.07	100.39	98.38	98.38	0.00
7.760	1.07	100.39	98.38	98.38	0.00	7.765	1.07	100.39	98.38	98.38	0.00
7.770	1.07	100.39	98.38	98.38	0.00	7.775	1.07	100.39	98.38	98.38	0.00
7.780	1.07	100.39	98.38	98.38	0.00	7.785	1.07	100.39	98.38	98.38	0.00
7.790	1.07	100.39	98.38	98.38	0.00	7.795	1.07	100.39	98.38	98.38	0.00
7.800	1.07	100.39	98.38	98.38	0.00	7.805	1.07	100.39	98.38	98.38	0.00
7.810	1.07	100.39	98.38	98.38	0.00	7.815	1.07	100.39	98.38	98.38	0.00
7.820	1.07	100.39	98.38	98.38	0.00	7.825	1.07	100.39	98.38	98.38	0.00
7.830	1.07	100.39	98.38	98.38	0.00	7.835	1.07	100.39	98.38	98.38	0.00
7.840	1.07	100.39	98.38	98.38	0.00	7.845	1.07	100.39	98.38	98.38	0.00
7.850	1.07	100.39	98.38	98.38	0.00	7.855	1.07	100.39	98.38	98.38	0.00
7.860	1.07	100.39	98.38	98.38	0.00	7.865	1.07	100.39	98.38	98.38	0.00
7.870	1.07	100.39	98.38	98.38	0.00	7.875	1.07	100.39	98.38	98.38	0.00
7.880	1.07	100.39	98.38	98.38	0.00	7.885	1.07	100.39	98.38	98.38	0.00
7.890	1.07	100.39	98.38	98.38	0.00	7.895	1.07	100.39	98.38	98.38	0.00

Project: Starting Motor
 Location: PG. KEBON AGUNG
 Contract: Pengasutan Reaktor
 Engineer: DWI HERMAWAN
 Filename: kebon_agung

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SN:	KLGCONSULT
Revision:	Base
Config.:	Normal

Motor ID : M001

Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)	Time (Sec.)	Slip (%)	Current (% of FLA)	Terminal V (%)	Bus V (%)	Acc Torq (%)
7.900	1.07	100.39	98.38	98.38	0.00	7.905	1.07	100.39	98.38	98.38	0.00
7.910	1.07	100.39	98.38	98.38	0.00	7.915	1.07	100.39	98.38	98.38	0.00
7.920	1.07	100.39	98.38	98.38	0.00	7.925	1.07	100.39	98.38	98.38	0.00
7.930	1.07	100.39	98.38	98.38	0.00	7.935	1.07	100.39	98.38	98.38	0.00
7.940	1.07	100.39	98.38	98.38	0.00	7.945	1.07	100.39	98.38	98.38	0.00
7.950	1.07	100.39	98.38	98.38	0.00	7.955	1.07	100.39	98.38	98.38	0.00
7.960	1.07	100.39	98.38	98.38	0.00	7.965	1.07	100.39	98.38	98.38	0.00
7.970	1.07	100.39	98.38	98.38	0.00	7.975	1.07	100.39	98.38	98.38	0.00
7.980	1.07	100.39	98.38	98.38	0.00	7.985	1.07	100.39	98.38	98.38	0.00
7.990	1.07	100.39	98.38	98.38	0.00	7.995	1.07	100.39	98.38	98.38	0.00
8.000	1.07	100.39	98.38	98.38	0.00						

Pengasutan Auto-Trafo Tap 0% - 100%

Tap %	Arus % dari FLA (A)	Tegangan Terminal % dari Vt (V)	Bus Tegangan % dari Vt (V)	Torsi % dari T _{sc} (N-m)	Slip (%)
0	0	0	100	-3,79292	100
10	6,24522	9,98677	99,8677	-2,94426	100
20	24,8821	19,8946	99,473	-0,425051	100
30	55,6184	29,6466	99,822	3,68592	99,9631
40	97,9794	39,1699	97,9247	9,26247	99,9073
50	151,326	48,3974	96,7948	16,1381	99,8385
60	214,879	57,2692	95,4487	24,115	99,7587
70	287,746	65,7337	93,9054	32,9744	99,6701
80	368,948	73,7484	92,1854	42,4867	99,5749
90	457,454	81,2798	90,2108	52,4218	99,4755
100	552,208	88,3039	88,3039	62,5577	99,3741

Pengasutan Resistor Tap 0% - 100%

Tap %	Arus % dari FLA (A)	Tegangan Terminal % dari Vt (V)	Bus Tegangan % dari Vt (V)	Torsi % dari T_{sc} (N-m)	Slip (%)
0	0	0	100	-3,79292	100
10	62,2058	9,94738	99,4738	-2,95094	100
20	123,466	19,7436	98,7179	-0,0475985	100
30	183,4	29,3277	97,9589	3,525889	99,9647
40	241,701	38,6505	96,6265	8,91859	99,9108
50	298,142	47,6762	95,3524	15,5485	99,8444
60	253,586	56,3822	93,9704	23,2572	99,7673
70	404,988	64,77619	92,517	31,8952	99,6809
80	455,425	72,8274	91,0343	41,3381	99,5864
90	504,181	80,6239	89,5822	51,5183	99,4845
100	552,208	88,3039	88,3039	62,5577	99,3741

Pengasutan Reactor Tap 0% - 100%

Tap %	Arus % dari FLA (A)	Tegangan Terminal % dari Vt (V)	Bus Tegangan % dari Vt (V)	Torsi % dari T _{sc} (N-m)	Slip (%)
0	0	0	100	-3,79292	100
10	61,7481	9,87419	98,7419	-2,96328	100
20	121,936	19,4988	97,949	-0,557723	100
30	180,59	28,8782	96,2608	3,30329	99,9669
40	237,748	38,0185	95,0461	8,5062	99,9149
50	293,455	46,9267	93,8533	14,6451	99,8505
60	347,764	55,6111	92,6852	22,5224	99,7747
70	400,73	64,081	91,5442	31,1487	99,6883
80	452,415	72,346	90,4325	40,7434	99,5923
90	502,885	80,4167	89,3519	51,2343	99,4874
100	552,208	88,3039	88,3039	62,5577	99,3741