

## DAFTAR ISI

ABSTRAK	<b>Error! Bookmark not defined.</b>
KATA PENGANTAR	<b>Error! Bookmark not defined.</b>
DAFTAR ISI	v
DAFTAR GAMBAR	ix
DAFTAR TABEL	xi
DAFTAR LAMPIRAN	xii
BAB I PENDAHULUAN	<b>Error! Bookmark not defined.</b>
1.1 Latar Belakang Penelitian.....	<b>Error! Bookmark not defined.</b>
1.2 Rumusan Masalah Penelitian.....	<b>Error! Bookmark not defined.</b>
1.3 Tujuan Penelitian .....	<b>Error! Bookmark not defined.</b>
1.4 Manfaat / Signifikansi Penelitian.....	<b>Error! Bookmark not defined.</b>
1.5 Struktur Organisasi Skripsi .....	<b>Error! Bookmark not defined.</b>
BAB II KAJIAN PUSTAKA	<b>Error! Bookmark not defined.</b>
2.1 Sistem Tenaga Listrik .....	<b>Error! Bookmark not defined.</b>
2.2 Pembangkitan.....	<b>Error! Bookmark not defined.</b>
2.3 Transmisi .....	<b>Error! Bookmark not defined.</b>
2.4 Sistem Distribusi.....	<b>Error! Bookmark not defined.</b>
2.4.1 Jaringan Distribusi .....	<b>Error! Bookmark not defined.</b>
2.5 Gardu Induk .....	<b>Error! Bookmark not defined.</b>
2.5.1 Klasifikasi Gardu Induk .....	<b>Error! Bookmark not defined.</b>
2.6 Fasilitas dan Peralatan Gardu Induk .....	<b>Error! Bookmark not defined.</b>
2.6.1 <i>Switch Yard (Switchgear)</i> .....	<b>Error! Bookmark not defined.</b>
2.6.2 Gedung Kontrol.....	<b>Error! Bookmark not defined.</b>
2.7 Kubikel 20 kV Gardu Induk .....	<b>Error! Bookmark not defined.</b>
2.8 Jenis dan Fungsi Kubikel.....	<b>Error! Bookmark not defined.</b>
2.9 Bagian-bagian Kubikel .....	<b>Error! Bookmark not defined.</b>

**Ariento Dwi Prasetyo, 2018**

**ANALISIS *RISK PRIORITY NUMBER* PADA KUBIKEL 20 KV DI GARDU  
INDUK MENGGUNAKAN LOGIKA *FUZZY***

Universitas Pendidikan Indonesia | [repository.upi.edu](http://repository.upi.edu) |  
[perpustakaan.upi.edu](http://perpustakaan.upi.edu)

2.9.1	Kompartemen.....	<b>Error! Bookmark not defined.</b>
2.9.2	Rel / Busbar 20 kV .....	<b>Error! Bookmark not defined.</b>
2.9.3	Kontak Pemutus .....	<b>Error! Bookmark not defined.</b>
2.9.4	Transformator Arus .....	<b>Error! Bookmark not defined.</b>
2.9.5	Transformator Tegangan.....	<b>Error! Bookmark not defined.</b>
2.9.6	Sirkuit Pentanahan .....	<b>Error! Bookmark not defined.</b>
2.9.7	Pemisah Hubung Tanah (PMS Tanah)..	<b>Error! Bookmark not defined.</b>
2.9.8	Terminal Penghubung .....	<b>Error! Bookmark not defined.</b>
2.9.9	Mekanik Kubikel.....	<b>Error! Bookmark not defined.</b>
2.9.10	Meter dan Rele .....	<b>Error! Bookmark not defined.</b>
2.9.11	Lampu Indikator.....	<b>Error! Bookmark not defined.</b>
2.9.12	Pemanas ( <i>Heater</i> ).....	<b>Error! Bookmark not defined.</b>
2.9.13	<i>Handle</i> Kubikel .....	<b>Error! Bookmark not defined.</b>
2.9.14	Sistem <i>Interlock</i> .....	<b>Error! Bookmark not defined.</b>
2.10	Kubikel CB <i>Outgoing</i> .....	<b>Error! Bookmark not defined.</b>
2.11	Failure Mode and Effect Analysis (FMEA)	<b>Error! Bookmark not defined.</b>
2.11.1	Pengertian FMEA .....	<b>Error! Bookmark not defined.</b>
2.11.2	Langkah – Langkah FMEA.....	<b>Error! Bookmark not defined.</b>
2.11.3	Penetapan <i>Severity</i> .....	<b>Error! Bookmark not defined.</b>
2.11.4	Penetapan <i>Occurrence</i> .....	<b>Error! Bookmark not defined.</b>
2.11.5	Penetapan <i>Detection</i> .....	<b>Error! Bookmark not defined.</b>
2.12	Logika <i>Fuzzy</i> .....	<b>Error! Bookmark not defined.</b>
2.12.1	Kelebihan dan Kekurangan Logika <i>Fuzzy</i>	<b>Error! Bookmark not defined.</b>
2.12.2	Fungsi Keanggotaan.....	<b>Error! Bookmark not defined.</b>
2.12.3	<i>Fuzzyfikasi</i> .....	<b>Error! Bookmark not defined.</b>
2.12.4	Aturan Dasar .....	<b>Error! Bookmark not defined.</b>
2.12.5	<i>Defuzzyfikasi</i> .....	<b>Error! Bookmark not defined.</b>
2.13	Diagram Pareto .....	<b>Error! Bookmark not defined.</b>

**Ariento Dwi Prasetyo, 2018**

**ANALISIS RISK PRIORITY NUMBER PADA KUBIKEL 20 KV DI GARDU  
INDUK MENGGUNAKAN LOGIKA FUZZY**

Universitas Pendidikan Indonesia | repository.upi.edu |  
perpustakaan.upi.edu

2.14 Keandalan .....	<b>Error! Bookmark not defined.</b>
2.15 Mean Time Between Failure (MTBF) .....	<b>Error! Bookmark not defined.</b>
2.16 Mean Time To Recover (MTTR) .....	<b>Error! Bookmark not defined.</b>
2.17 Probabilitas .....	<b>Error! Bookmark not defined.</b>
2.17.1 Distribusi <i>Weibull</i> .....	<b>Error! Bookmark not defined.</b>
2.17.2 Distribusi <i>Normal</i> .....	<b>Error! Bookmark not defined.</b>
2.17.3 Distribusi <i>Lognormal</i> .....	<b>Error! Bookmark not defined.</b>
2.17.4 Distribusi <i>Exponential</i> .....	<b>Error! Bookmark not defined.</b>
2.18 Umur Ekonomis .....	<b>Error! Bookmark not defined.</b>
2.19 Depresiasi.....	<b>Error! Bookmark not defined.</b>
<b>BAB III METODE PENELITIAN</b>	<b>Error! Bookmark not defined.</b>
3.1 Lokasi Penelitian.....	<b>Error! Bookmark not defined.</b>
3.2 Metode Penelitian .....	<b>Error! Bookmark not defined.</b>
3.3 Metode Pengumpulan Data.....	<b>Error! Bookmark not defined.</b>
3.4 Metode Pengolahan Data .....	<b>Error! Bookmark not defined.</b>
3.5 Penetapan Nilai <i>Severity</i> , <i>Occurrence</i> dan <i>Detection</i>	<b>Error! Bookmark not defined.</b>
3.6 Logika <i>Fuzzy</i> .....	<b>Error! Bookmark not defined.</b>
3.6.1 Fungsi Keanggotaan.....	<b>Error! Bookmark not defined.</b>
3.6.2 Aturan Dasar .....	<b>Error! Bookmark not defined.</b>
3.7 Keandalan Kubikel .....	<b>Error! Bookmark not defined.</b>
3.8 Umur Ekonomis .....	<b>Error! Bookmark not defined.</b>
<b>BAB IV TEMUAN DAN PEMBAHASAN</b>	<b>Error! Bookmark not defined.</b>
4.1 Temuan .....	<b>Error! Bookmark not defined.</b>
4.1.1 Analisis <i>Fuzzy-FMEA</i> .....	<b>Error! Bookmark not defined.</b>
4.1.2 Data Operasi Kubikel.....	<b>Error! Bookmark not defined.</b>
4.1.3 Data Beban.....	<b>Error! Bookmark not defined.</b>
4.1.4 Analisis <i>Reliability</i> .....	<b>Error! Bookmark not defined.</b>
4.1.5 Analisis Umur Ekonomis .....	<b>Error! Bookmark not defined.</b>

**Ariento Dwi Prasetyo, 2018**

**ANALISIS RISK PRIORITY NUMBER PADA KUBIKEL 20 KV DI GARDU  
INDUK MENGGUNAKAN LOGIKA FUZZY**

Universitas Pendidikan Indonesia | repository.upi.edu |  
perpustakaan.upi.edu

4.2 Pembahasan Penelitian .....	<b>Error! Bookmark not defined.</b>
<b>BAB V SIMPULAN, IMPLIKASI DAN REKOMENDASI</b>	<b>Error! Bookmark not defined.</b>
5.1 Simpulan .....	<b>Error! Bookmark not defined.</b>
5.2 Implikasi .....	<b>Error! Bookmark not defined.</b>
5.3 Rekomendasi.....	<b>Error! Bookmark not defined.</b>
<b>DAFTAR PUSTAKA</b>	<b>Error! Bookmark not defined.</b>
<b>LAMPIRAN - LAMPIRAN</b>	<b>Error! Bookmark not defined.</b>

**Ariento Dwi Prasetyo, 2018**

**ANALISIS *RISK PRIORITY NUMBER* PADA KUBIKEL 20 KV DI GARDU  
INDUK MENGGUNAKAN LOGIKA *FUZZY***

Universitas Pendidikan Indonesia | [repository.upi.edu](https://repository.upi.edu) |  
[perpustakaan.upi.edu](https://perpustakaan.upi.edu)

## DAFTAR GAMBAR

Gambar 2.1 Skema Sistem Tenaga Listrik .....	<b>Error! Bookmark not defined.</b>
Gambar 2.2 Switch Yard Gardu Induk Konvensional	<b>Error! Bookmark not defined.</b>
Gambar 2.3 Switchgear Gardu Induk SF6 .....	<b>Error! Bookmark not defined.</b>
Gambar 2.4 Transformator Daya .....	<b>Error! Bookmark not defined.</b>
Gambar 2.5 <i>Circuit Breaker</i> .....	<b>Error! Bookmark not defined.</b>
Gambar 2.6 <i>Disconnecting Switch</i> .....	<b>Error! Bookmark not defined.</b>
Gambar 2.7 <i>Lightning Arrester</i> .....	<b>Error! Bookmark not defined.</b>
Gambar 2.8 <i>Current Transformer</i> .....	<b>Error! Bookmark not defined.</b>
Gambar 2.9 Rel (Busbar) pada GI Konvensional ..	<b>Error! Bookmark not defined.</b>
Gambar 2.10 Panel Kontrol.....	<b>Error! Bookmark not defined.</b>
Gambar 2.11 <i>Battery</i> Sumber Arus DC .....	<b>Error! Bookmark not defined.</b>
Gambar 2.12 Kubikel 20kV .....	<b>Error! Bookmark not defined.</b>
Gambar 2.13 Rel / Busbar 20 kV .....	<b>Error! Bookmark not defined.</b>
Gambar 2.14 PMT Jenis Vakum.....	<b>Error! Bookmark not defined.</b>
Gambar 2.15 CT Tipe Cincin / <i>Ring</i> .....	<b>Error! Bookmark not defined.</b>
Gambar 2.16 PT dengan Pelebur .....	<b>Error! Bookmark not defined.</b>
Gambar 2.17 Simbol Diagram PMT .....	<b>Error! Bookmark not defined.</b>
Gambar 2.18 Grafik fungsi keanggotaan linier .....	<b>Error! Bookmark not defined.</b>
Gambar 2.19 Grafik fungsi keanggotaan segitiga..	<b>Error! Bookmark not defined.</b>
Gambar 2.20 Grafik fungsi keanggotaan Trapesium	<b>Error! Bookmark not defined.</b>
Gambar 2.21 Grafik fungsi keanggotaan Gaussia..	<b>Error! Bookmark not defined.</b>
Gambar 3.1 Diagram Alir penelitian.....	<b>Error! Bookmark not defined.</b>
Gambar 3.2 Diagram Alir Tahapan FMEA.....	<b>Error! Bookmark not defined.</b>
Gambar 3.3 Diagram Alir Tahapan Logika <i>Fuzzy</i> .	<b>Error! Bookmark not defined.</b>
Gambar 3.4 Fungsi Keanggotaan <i>severity</i> .....	<b>Error! Bookmark not defined.</b>
Gambar 3.5 Fungsi Keanggotaan <i>occurrence</i> .....	<b>Error! Bookmark not defined.</b>
Gambar 3.6 Fungsi Keanggotaan <i>detection</i> .....	<b>Error! Bookmark not defined.</b>

**Ariento Dwi Prasetyo, 2018**

**ANALISIS RISK PRIORITY NUMBER PADA KUBIKEL 20 KV DI GARDU  
INDUK MENGGUNAKAN LOGIKA FUZZY**

Universitas Pendidikan Indonesia | repository.upi.edu |  
perpustakaan.upi.edu

- Gambar 3.7 Fungsi Keanggotaan FRPN .....**Error! Bookmark not defined.**
- Gambar 3.8 Diagram Alir Analisis Keandalan Kubikel**Error! Bookmark not defined.**
- Gambar 3.9 Diagram Alir Analisis Umur Ekonomis Kubikel**Error! Bookmark not defined.**
- Gambar 4.1 Diagram Pareto Kubikel.....**Error! Bookmark not defined.**
- Gambar 4.2 Grafik Data Beban Cibabat Baru .....**Error! Bookmark not defined.**
- Gambar 4.3 Grafik Data Beban Braga .....**Error! Bookmark not defined.**
- Gambar 4.4 Hasil Distribusi ID Plot MTTR.....**Error! Bookmark not defined.**
- Gambar 4.5 Hasil Distribusi ID Plot MTBF .....**Error! Bookmark not defined.**
- Gambar 4.6 Hasil Distribusi ID Plot MTTR.....**Error! Bookmark not defined.**
- Gambar 4.7 Hasil Distribusi ID Plot MTTR.....**Error! Bookmark not defined.**
- Gambar 4.8 *Kurva Umur Ekonomis Kubikel Gardu Induk Cibabat Baru***Error! Bookmark not defined.**
- Gambar 4.9 *Kurva Umur Ekonomis Kubikel Gardu Induk Braga***Error! Bookmark not defined.**

**Ariento Dwi Prasetyo, 2018**

**ANALISIS *RISK PRIORITY NUMBER* PADA KUBIKEL 20 KV DI GARDU  
INDUK MENGGUNAKAN LOGIKA *FUZZY***

Universitas Pendidikan Indonesia | repository.upi.edu |  
perpustakaan.upi.edu

## DAFTAR TABEL

Tabel 2.1 <i>Sepuluh Langkah Melakukan FMEA</i> .....	<b>Error! Bookmark not defined.</b>
Tabel 2.2 <i>Peringkat Severity</i> .....	<b>Error! Bookmark not defined.</b>
Tabel 2.3 <i>Peringkat Occurrence</i> .....	<b>Error! Bookmark not defined.</b>
Tabel 2.4 <i>Peringkat detection</i> .....	<b>Error! Bookmark not defined.</b>
Tabel 4.1 <i>Worksheet Data Fuzzy-FMEA</i> .....	<b>Error! Bookmark not defined.</b>
Tabel 4.2 <i>Hasil Pengolahan Fuzzy-FMEA</i> .....	<b>Error! Bookmark not defined.</b>
Tabel 4.3 <i>Data Gangguan Kubikel di Gardu Induk Cibabat Baru</i>	<b>Error! Bookmark not defined.</b>
Tabel 4.4 <i>Data Gangguan Kubikel di Gardu Induk Braga</i>	<b>Error! Bookmark not defined.</b>
Tabel 4.5 <i>Data Beban di Gardu Induk Cibabat Baru</i>	<b>Error! Bookmark not defined.</b>
Tabel 4.6 <i>Data Beban di Gardu Induk Braga</i> .....	<b>Error! Bookmark not defined.</b>
Tabel 4.7 <i>Hasil Nilai Uji Distribusi MTTR pada Cibabat Baru</i>	<b>Error! Bookmark not defined.</b>
Tabel 4.8 <i>Hasil Nilai Uji Distribusi MTBF pada Cibabat Baru</i>	<b>Error! Bookmark not defined.</b>
Tabel 4.9 <i>Data Perhitungan TTF untuk <math>\sigma</math> Cibabat Baru</i>	<b>Error! Bookmark not defined.</b>
Tabel 4.10 <i>Hasil Nilai Uji Distribusi MTTR Braga</i>	<b>Error! Bookmark not defined.</b>
Tabel 4.11 <i>Hasil Nilai Uji Distribusi MTBF pada Braga</i>	<b>Error! Bookmark not defined.</b>
Tabel 4.12 <i>Data perhitungan TTF untuk <math>\sigma</math> Braga</i> .	<b>Error! Bookmark not defined.</b>
Tabel 4.13 <i>Ekuivalent Annual Cost Kubikel Gardu Induk Cibabat Baru</i>	<b>Error! Bookmark not defined.</b>
Tabel 4.14 <i>Ekuivalent Annual Cost Kubikel Gardu Induk Braga</i>	<b>Error! Bookmark not defined.</b>

**Ariento Dwi Prasetyo, 2018**

**ANALISIS RISK PRIORITY NUMBER PADA KUBIKEL 20 KV DI GARDU  
INDUK MENGGUNAKAN LOGIKA FUZZY**

Universitas Pendidikan Indonesia | repository.upi.edu |  
perpustakaan.upi.edu

## DAFTAR LAMPIRAN

Lampiran 1 Logika *Fuzzy* dengan Perangkat Matlab **Error! Bookmark not defined.**

Lampiran 2 Perhitungan Nilai Keandalan..... **Error! Bookmark not defined.**

Lampiran 3 Tabel Z..... **Error! Bookmark not defined.**

Lampiran 4 Peramalan Frekuensi Kegagalan dengan Perangkat Minitab **Error! Bookmark not defined.**

Lampiran 5 Surat Tugas Dosen Pembimbing ..... **Error! Bookmark not defined.**

Lampiran 6 Surat Izin Penelitian..... **Error! Bookmark not defined.**

Lampiran 7 Buku Bimbingan..... **Error! Bookmark not defined.**

Lampiran 8 Dokumentasi Wawancara ..... **Error! Bookmark not defined.**

**Ariento Dwi Prasetyo, 2018**

**ANALISIS *RISK PRIORITY NUMBER* PADA KUBIKEL 20 KV DI GARDU  
INDUK MENGGUNAKAN LOGIKA *FUZZY***

Universitas Pendidikan Indonesia | [repository.upi.edu](https://repository.upi.edu) |  
[perpustakaan.upi.edu](https://perpustakaan.upi.edu)

**Ariento Dwi Prasetyo, 2018**

**ANALISIS *RISK PRIORITY NUMBER* PADA KUBIKEL 20 KV DI GARDU INDUK  
MENGUNAKAN LOGIKA *FUZZY***

Universitas Pendidikan Indonesia | [repository.upi.edu](http://repository.upi.edu) |  
[perpustakaan.upi.edu](http://perpustakaan.upi.edu)