

DAFTAR ISI

ABSTRACT	i
ABSTRAKSI	ii
KATA PENGANTAR.....	iii
DAFTAR ISI.....	v
DAFTAR GAMBAR.....	x
DAFTAR TABEL	xiii
DAFTAR LAMPIRAN.....	xvi
DAFTAR SINGKATAN.....	xvii
DAFTAR LAMBANG	xix
DAFTAR ISTILAH	xx
BAB I Pendahuluan	1
I.1 Latar Belakang	1
I.2 Perumusan Masalah.....	8
I.3 Tujuan Masalah	8
I.4 Batasan Penelitian	9
I.5 Manfaat Penelitian.....	9
I.6 Sistematika Penulisan.....	10
BAB II Landasan Teori.....	12
II.1 <i>Reliability, Availability, Maintainability Analysis (RAM Analysis)</i>	12
II.2 <i>Reliability</i>	12
II.2.1 Fungsi Keandalan ($R(T)$)	13
II.2.2 Fungsi Laju Kerusakan (λ).....	14

II.2.3	<i>Mean Time to Failure (MTTF)</i>	14
II.2.4	<i>Mean Time Between Failure (MTBF)</i>	16
II.3	<i>Failure Data Analysis</i>	18
II.3.1	<i>OREDA</i>	19
II.3.2	<i>Failure Mode Effect Analysis</i>	19
II.4	<i>Keandalan Sistem (Reliability of Systems)</i>	21
II.4.1	<i>Reliability Block Diagram Sistem Seri</i>	22
II.4.2	<i>Reliability Block Diagram Sistem Paralel</i>	23
II.4.3	<i>Reliability Block Diagram Seri Paralel</i>	25
II.4.4	<i>Reliability Block Diagram k-out-of-n configuration</i>	26
II.4.5	<i>Low Level Redundancy dan High Level Redundancy</i>	27
II.5	<i>State Dependent System</i>	28
II.5.1	<i>Load-Sharing System</i>	28
II.5.2	<i>Standby System</i>	29
II.5.3	<i>Standby System with Switching Failures</i>	30
II.6	<i>Maintainability</i>	30
II.6.1	<i>Analysis of Downtime</i>	31
II.6.2	<i>Distribusi Waktu Perbaikan (Repair Time Distribution)</i>	32
II.6.3	Sistem Dengan Komponen Redundasi.....	33
II.7	<i>Availability</i>	33
II.7.1	<i>Inherent Availability</i>	35
II.7.2	<i>Operational Availability</i>	35
II.7.3	<i>Exponential Availability Model</i>	35
II.7.4	<i>System Availability</i>	36

II.8	<i>Plant Availability Factor</i>	38
II.8.1	<i>Leading Indicator</i>	38
II.8.2	<i>Lagging Indicator</i>	39
II.9	<i>System Simulation Blocksim 8</i>	40
II.9.1	<i>Reliability and Availability Analysis via Simulation</i>	40
II.9.2	<i>Throughput Analysis</i>	41
II.9.3	<i>Reliability Importance Measures</i>	41
BAB III	Metodologi Penelitian	43
III.1	Model Konseptual	43
III.2	Sistematika Penyelesaian Masalah.....	47
III.2.1	Tahap Identifikasi Masalah.....	49
III.2.2	Tahap Pengumpulan Data	50
III.2.3	Pengolahan Data	50
III.2.4	Tahap Analisis	53
BAB IV	Pengumpulan dan Pengolahan Data	54
IV.1	Pengumpulan Data	54
IV.1.1	Deskripsi Fasilitas Pemrosesan Gas Bumi.....	54
IV.1.2	Kegiatan Perawatan <i>Subsea Production System</i>	66
IV.2	Pengolahan Data.....	67
IV.2.1	Data Perbaikan	67
IV.3	Perhitungan RAM	68
IV.3.1	Pemodelan Reliability Block Diagram (RBD)	68
IV.3.2	Perumusan dan Perhitungan <i>Reliability</i> dengan <i>Analytical Approach</i> .	75
IV.3.3	Perumusan dan Perhitungan <i>Availability</i> dengan <i>Analytical Approach</i> ... <td>91</td>	91

IV.3.4 Perhitungan <i>Maintainability</i>	108
IV.4 Pemodelan dan Simulasi RAM menggunakan Blocksim (<i>Simulation Approach</i>).....	108
BAB V Analysis.....	115
V.1 Analisis <i>Reliability Block Diagram</i>	115
V.2 Analisis <i>System Reliability</i>	115
V.3 Analisis <i>Availability</i>	117
V.3.1 Analisis <i>Inherent Availability</i>	118
V.3.2 Analisis <i>Operational Availability</i>	120
V.4 Analisis selisih <i>Inherent</i> dan <i>Operational Availability</i>	121
V.5 Analisis <i>Plant Availability Factor</i>	123
V.5.1 Analisis <i>Leading Indicator</i>	123
V.5.2 Analisis <i>Lagging Indicator</i>	124
V.5.3 <i>Throughput System</i>	125
V.6 Analisis <i>Maintainability</i>	126
V.7 Analisis <i>Plant Performance Killer</i>	128
V.8 <i>Improvement</i>	129
V.8.1 <i>Improvement</i> pada Sistem	129
V.8.2 Analisis Hasil Simulasi	130
BAB VI Kesimpulan dan Saran.....	132
VI.1 Kesimpulan.....	132
VI.1.1 <i>RAM Analysis</i>	132
VI.1.2 <i>Plant Availability Factor</i>	133
VI.1.3 Usulan untuk meningkatkan <i>Availability System</i>	133

VI.2 Saran.....	134
VI.2.1 Saran Bagi Perusahaan.....	134
VI.2.2 Saran Bagi Penelitian Selanjutnya	134
DAFTAR PUSTAKA.....	135