

DAFTAR PUSTAKA

- [1] Tiberto, P. 2017. EMSA 2016 Conference Chair's Foreword. *IEEE Trans. Magn.* **Vol. 53** 1
- [2] Audi, A. 2021. *Jurnal Saintek Maritim*, Volume 21 Nomor 2, Maret 2021. **Vol. 21** 126–40
- [3] Muis Alie, M. Z. 2016. *Omae2016-54041 Finite Element Analysis on the Hull Girder Ultimate*. 1–10
- [4] Low, E. 2020. *Singapore coastline packed with ships full of oil no one wants*. Jakarta Post
- [5] Almeida, R. 2013. *Bumper Profits for Chemical Tankers Spurs Newbuild Order*. GCaptain
- [6] L. D. 2022. *LNG ship orders reached record heights in 2021*. ShippWatch
- [7] De Opfeart Beheer. 2014. *Damen Double Hull Oil Tanker 8000*. Sh. Technol.
- [8] Winarto, C., Iskandar, B. H., dan Arkeman, Y. 2017. *Perbandingan Kinerja Kapal-kapal Tanker Angkutan BBM dan Minyak Mentah Menggunakan Multivariate Analysis of Variance: Studi Kasus PT. Pertamina (Persero) War*. Penelit. Perhub. **Vol. 29** 45
- [9] Anonim. 2014. *Ukuran Ukuran Pokok Kapal dan Bentuk Bentuk Kapal*. Marit. World
- [10] Awan, P. 2013. *Rencana Bukaannya Kulit (Shell Expansion Plan)*. Cyber Ships
- [11] IACS. 2007. *Bulk Carriers – Guidelines for Surveys, Assessment and Repair of Hull Structures*.
- [12] Kharis, M., and Pribadi, T. W. 2014. *Analisis Teknis dan Ekonomis Konversi Kapal Tanker Single Hull Menjadi Double Hull*. Jurusan Teknik ITS. **Vol. 2** 5
- [13] SODES. 2015. *Safety Measures For Oil Tankers*. BIM
- [14] Bachman. 1991
- [15] Anonim. 2018. *Double hulls are a preventive measure implemented*

to reduce the risk of ship-source pollution in the marine environment.
Clearsesas

- [16] Muis Alie, M. Z., Mustafa, W. dan Yusuf, R. 2021. *Prediction of Fatigue Life on Double Hull Oil Tanker with Single and Double Longitudinal Bulkheads.* **Vol. 9** 731–40
- [17] Rules, S. Oil, C. S. R., Csr, K., dan Glory, A. 2015. *Analisa Fatigue Crude Oil Tanker 306507 Dwt Berdasarkan Common Structural Rules (Csr) Oil Tanker.* Jurusan Teknik Perkapalan. **Vol. 3** 83–91
- [18] Biro Klasifikasi Indonesia. 2019. *Rules for Hull Rules Hull 2019 ed.* **Vol. 2** Page 20–7
- [19] Zainuri, A. M. 2008. *Kekuatan Bahan.* Politeknik Negeri Malang.
- [20] Muis Alie, M. Z., dan Yusuf, R. 2020. *Pendekatan sederhana analisis prediksi umur kapal.* 1–57
- [21] Mulyati. 2014. *Mekanika Bahan, Tegangan dan Regangan Mech. Eng.* 1–20
- [22] Anonim. 2010. *Sanggapramana*
- [23] Bannantine, J. A., Comer, J. J., dan Handrock, J. L. 1990. *FUNDAMENTALS OF METAL FATIGUE ANALYSIS.* 1–271
- [24] F. H. O., JK. P., Beghin, D., Caldwell, J. B. G P H. dan E S T. 2010. *Structural Analysis and Design.* Sh. Struct. Anal. Des. 17–38
- [25] Veritas, D. N. 2009. *Csa - Direct Analysis of Ship Structures.* 1–51
- [26] DNV, GL., (2017b). 2017. *Rules for Classification: Ships Hull Girder Strength.* **Pt. 3 Ch. 5**
- [27] Isworo, H., dan Ansyah, P. R. 2018. *Buku Ajar Metode Elemen Hingga.* **Vol. 1** 68
- [28] Ardianus, A., Sujiantanti, S. H., dan Setyawan, D. 2017. *Analisa Kekuatan Konstruksi Sekat Melintang Kapal Tanker dengan Metode Elemen Hingga.* Jurusan Teknik ITS. **Vol. 6** 2–9
- [29] OOFEM. 2020. *Application of Open-Source Software in Ship Structural Analysis.* OOFEM Researchgate
- [30] Mulyadi, S. 2011. *Analisa tegangan-regangan produk tongkat lansia*

dengan menggunakan metode elemen hingga. J. ROTOR. Vol. 4 1

- [31] Muis Alie, M. Z. e. al. 2012. *Analisa Kekuatan Sisa Struktur Kapal Bulk Carrier dan Kapal Tanker yang mengalami kerusakan akibat tubrukan.*

LAMPIRAN

**LAMPIRAN I Tabel Kekuatan Batas Momen-Lentur Kondisi Utuh
(Intact) Kapal Tanker T3**

Sagging		Hogging	
Momen (10^{13})	Rotasi	Momen (10^{13})	Rotasi
0	0	0	0
-1.99601	-0.1381	1.996	0.1381
-2.45721	-0.2085	2.4572	0.2085
-2.45721	-0.2746	2.4572	0.2746
-2.45721	-0.3307	2.4572	0.3307
-2.45721	-0.3512	2.4572	0.3512
-2.45721	-0.3515	2.4572	0.3515
-2.45721	-0.3521	2.4572	0.3521
-2.45721	-0.3527	2.4572	0.3527
-2.45721	-0.3534	2.4572	0.3534
-2.45721	-0.3541	2.4572	0.3541
-2.45721	-0.3557	2.4572	0.3557
-2.45721	-0.3563	2.4572	0.3563
-2.45721	-0.3561	2.4572	0.3561
-2.45721	-0.3561	2.4572	0.3561

**LAMPIRAN II Tabel Kekuatan Batas Momen-Lentur Kondisi Utuh
(Intact) Kapal Tanker T4**

Sagging		Hogging	
Momen (10¹³)	Rotasi	Momen (10¹³)	Rotasi
0	0	0	0
-0.0952	-0.0065	0.095238	0.0065
-0.1905	-0.013	0.190476	0.013
-0.2857	-0.0195	0.285714	0.0195
-0.381	-0.026	0.380952	0.026
-0.4762	-0.0325	0.47619	0.0325
-0.5714	-0.039	0.571429	0.039
-0.6667	-0.0455	0.666667	0.0455
-0.7619	-0.052	0.761905	0.052
-0.8571	-0.0585	0.857143	0.0585
-0.9524	-0.065	0.952381	0.065
-1.0476	-0.0715	1.04762	0.0715
-1.1429	-0.078	1.14286	0.078
-1.2381	-0.0845	1.2381	0.0845
-1.3333	-0.091	1.33333	0.091
-1.4286	-0.0975	1.42857	0.0975
-1.5238	-0.104	1.52381	0.104
-1.6191	-0.1105	1.61905	0.1105
-1.7143	-0.117	1.71425	0.117
-1.8091	-0.1235	1.80905	0.1235
-1.9022	-0.1299	1.90221	0.1299
-1.9969	-0.1365	1.99685	0.1365
-2.0818	-0.1427	2.08183	0.1427
-2.0818	-0.1484	2.08183	0.1484
-2.0818	-0.1557	2.08183	0.1557
-2.0818	-0.1614	2.08183	0.1614
-2.0818	-0.1653	2.08183	0.1653
-2.0818	-0.1653	2.08183	0.1653
-2.0818	-0.4042	2.08183	0.4042

**LAMPIRAN III Tabel Kekuatan Batas Momen-Lentur Kondisi
Kerusakan (*Damage*) Kapal Tanker T3**

Sagging		Hogging	
Momen (10^{13})	Rotasi	Momen (10^{13})	Rotasi
0	0	0	0
-0.5455	-0.0394	0.5455	0.0394
-1.0909	-0.0789	1.0909	0.0789
-1.6354	-0.1183	1.6354	0.1183
-1.7649	-0.1278	1.7649	0.1278
-1.881	-0.1366	1.881	0.1366
-2.0152	-0.1509	2.0152	0.1509
-2.1678	-0.176	2.1678	0.176
-2.1678	-0.2147	2.1678	0.2147
-2.1678	-0.2538	2.1678	0.2538
-2.1678	-0.2956	2.1678	0.2956
-2.1678	-0.3366	2.1678	0.3366
-2.1678	-0.3792	2.1678	0.3792

**LAMPIRAN IV Tabel Kekuatan Batas Momen-Lentur Kondisi
Kerusakan (*Damage*) Kapal Tanker T4**

Sagging		Hogging	
Momen (10¹³)	Rotasi	Momen (10¹³)	Rotasi
0	0	0	0
-0.0923077	-0.00658618	0.0923077	0.00658618
-0.103846	-0.00740948	0.103846	0.00740948
-0.115388	-0.00823296	0.115388	0.00823296
-0.132701	-0.0094683	0.132701	0.0094683
-0.150015	-0.01070364	0.150015	0.01070364
-0.167329	-0.01193898	0.167329	0.01193898
-0.193299	-0.013792	0.193299	0.013792
-0.227926	-0.01626268	0.227926	0.01626268
-0.271211	-0.01935104	0.271211	0.01935104
-0.323152	-0.023057	0.323152	0.023057
-0.380466	-0.0271464	0.380466	0.0271464
-0.43778	-0.0312358	0.43778	0.0312358
-0.496474	-0.0354238	0.496474	0.0354238
-0.555168	-0.0396116	0.555168	0.0396116
-0.614222	-0.0438252	0.614222	0.0438252
-0.673277	-0.0480388	0.673277	0.0480388
-0.732331	-0.0522526	0.732331	0.0522526
-0.79148	-0.0564728	0.79148	0.0564728
-0.850628	-0.0606932	0.850628	0.0606932
-0.909799	-0.0649152	0.909799	0.0649152
-0.96897	-0.069137	0.96897	0.069137
-1.02731	-0.0732994	1.02731	0.0732994
-1.08564	-0.077462	1.08564	0.077462
-1.17309	-0.083705	1.17309	0.083705
-1.2652	-0.0902898	1.2652	0.0902898
-1.35727	-0.0968752	1.35727	0.0968752
-1.44924	-0.1034574	1.44924	0.1034574
-1.51462	-0.1081394	1.51462	0.1081394
-1.56113	-0.1114728	1.56113	0.1114728
-1.6076	-0.1148046	1.6076	0.1148046
-1.65318	-0.118078	1.65318	0.118078
-1.69881	-0.1213636	1.69881	0.1213636
-1.76608	-0.1262362	1.76608	0.1262362
-1.82592	-0.1306018	1.82592	0.1306018
-1.886	-0.135059	1.886	0.135059

Lanjutan Tabel Lampiran IV

-1.94657	-0.1397744	1.94657	0.1397744
-1.98951	-0.1440542	1.98951	0.1440542
-1.98951	-0.1505072	1.98951	0.153234
-1.98951	-0.150524	1.98951	0.1581225
-1.98951	-0.1505352	1.98951	0.165231
-1.98951	-0.39213	1.98951	0.392134