

GUIDE FOR BUILDING AND CLASSING

DRILLSHIPS AUGUST 2011

NOTICE NO. 4 – January 2018

The following Changes were approved by the ABS Rules Committee on 30 May 2017 and become **EFFECTIVE AS OF 1 JANUARY 2018.**

(See <http://www.eagle.org> for the consolidated version of the Guide for Building and Classing Drillships, 2011 with all Notices and Corrigenda incorporated.)

Notes - The date in the parentheses means the date that the Rule becomes effective for new construction based on the contract date for construction, unless otherwise noted. (See 1-1-4/3.3 of the ABS Rules for Conditions of Classification – Offshore Units and Structures (Part 1).)

APPENDIX 2 FATIGUE STRENGTH ASSESSMENT OF DRILLSHIPS

(Revise Appendix 2, Figure 1, as follows:)

FIGURE 1 (continued) Basic Design S-N Curves (2018)

Notes (For Appendix 2, Figure 1) (2018)

a) Basic design S-N curves

S-N curves represent the relationship between the applied stress range (S_B) and the number of cycles (N) to failure under the stress range. The basic design curves consist of bi-linear relationships between $\log(S_B)$ and $\log(N)$. They are based upon a statistical analysis of appropriate experimental data and may be taken to represent two standard deviations below the mean line.

The first segment of the S-N curve is for $N \leq 10^7$ and is of the form:

$$\log(N) = \log(K_2) - m \log(S_B)$$

where

$$\log(K_2) = \log(K_1) - 2\sigma$$

N is the predicted number of cycles to failure under stress range S_B ;

K_1 is a constant relating to the mean S-N curve;

σ is the standard deviation of $\log N$;

m is the inverse slope of the S-N curve.

K_2 is a constant relating to the first segment of the S-N curve.

The second segment of the S-N curve is for $N > 10^7$ and is of the form:

$$\log(N) = \log(K_3) - (m + 2) \log(S_B)$$

where

$$\log(K_3) = \log(K_2) - 2 \log(f_q)$$

K_3 is a constant relating to the second segment of the S-N curve;

f_q is the stress range at the intersection of the two segments of the S-N curve.

The relevant values of these terms are shown in the table below.

The S-N curves have a change of inverse slope from m to $m + 2$ at $N = 10^7$ cycles.

Details of basic S-N curves

Class	K_1	σ	m	K_2	f_q (N/mm ²)	K_3
B	2.343×10^{15}	0.1821	4.0	1.013×10^{15}	100.321	1.019×10^{19}
C	1.082×10^{14}	0.2041	3.5	4.227×10^{13}	78.190	2.584×10^{17}
D	3.988×10^{12}	0.2095	3.0	1.520×10^{12}	53.364	4.328×10^{15}
E	3.289×10^{12}	0.2509	3.0	1.036×10^{12}	46.963	2.284×10^{15}
F	1.726×10^{12}	0.2183	3.0	0.632×10^{12}	39.824	1.002×10^{15}
F₂	1.231×10^{12}	0.2279	3.0	0.431×10^{12}	35.061	0.530×10^{15}
G	0.566×10^{12}	0.1793	3.0	0.248×10^{12}	29.157	0.211×10^{15}
W	0.368×10^{12}	0.1846	3.0	0.157×10^{12}	25.054	0.987×10^{14}