

Response to Anonymous Referee #1

1,

(1) comments from Referees

One major issue is that the authors have not included corresponding citations in the text, though it is presumed that some parameter numbers are suggested by traditional books. It is thus difficult for readers to figure out how and where those parameters or indices values are calculated or selected. It is also difficult to judge which parts were originally proposed by the authors.

(2) author's response

Corresponding citations was added in the revision. And the parameter numbers were highlight which were proposed for the first time, i.e., Assessment index by various structural failure modes (M_1 (Eq. (9)), M_2 (Eq. (13)), M_3 (Eq. (19)), M_4 (Eq. (20))), structural vulnerability indices (V_1 (Eq. (9)), V_2 (Eq. (12)), V_3 (Eq. (17)), V_4 (Eq. (18)), , Eq. (19)) and Assessment criteria (Table 10).

(3) author's changes in manuscript.

Corresponding citations was added in the revision.

And the parameter numbers were highlight which were proposed for the first time, i.e.,

- Assessment index by various structural failure modes: M_1 (Eq. (9)), M_2 (Eq. (13)), M_3 (Eq. (19)), M_4 (Eq. (20)),
- structural vulnerability indices: V_1 (Eq. (9)), V_2 (Eq. (12)), V_3 (Eq. (17)), V_4 (Eq. (18)), , Eq. (19) and
- Section 4.6: Assessment criteria (Table 10)

2,

(1) comments from Referees

Another major issue is that only the literature from Chinese researchers/engineers is mentioned. How the international community is treating the similar problems? What are the existing methods used in practices to evaluate the risk indices? This is not clear yet to readers.

(2) author's response

Risk assessment studies of engineering structures under environmental loads are mainly focused on large-span bridges, houses and other buildings under wind and seismic loads, and corresponding vulnerability curves were obtained. While there are little conclusions and applications of risk assessment studies of sea ice loads on marine platforms, no risk assessment indexes and method. The fundamental studies are mainly focused on ice force calculation methods, structural failure mode analysis, ice force resistance of engineering structures, and fatigue life calculation. The above work would be the basic theory for the sea ice risk assessment indicator system and assessment method of marine structures.

(3) author's changes in manuscript.

The above contents were added in section “INTRODUCTION”, Page 2, line 18-24
Corresponding citations was added in the revision.

3,

(1) comments from Referees

Many small issues for the authors' reference:

Page 2, Line 6: It should be ‘;’ after Li et al., 2018.

Page 2, Line 12: It should be Guo et al. (2018).

Page 4: In Figure 2 it is better mark (a)-(e) on the photo as well.

Page 5, Line 4: ‘According to the synthetic index method, : : ’, reference?

Page 5, Line 17: Add (Eq. (2)) after ‘the overall risk I_e is calculated’.

Pages 5-6: The position of Eqs. (1)-(3) should be adjusted to the corresponding text places. Page 5, Lines 20-21: Note that parameter name should be italic.

Page 6: Please provide references to Eqs. (4) and (5).

Page 7, Line 2: The parameter should be italic.

Page 7, Lines 5-16: References should be provided on how to calculate force, including the source of Eq. (6).

Page 8: What are the differences between Eqs. (7) and (8)? Reference?

Page 8, Line 10: What are the hot spots?

Page 8, Line 11: Note parameter name should be italic.

Page 9, Line 9: ‘According to Technical Guidelines for Risk Assessment and Zoning of Sea Ice Disasters, : : ’, reference?

Page 9, Table 2: The last column, delete ‘cm’.

Page 10, Line 6: It should be Yue et al. (2007b).

Page 10, Table 3: The last column, section numbers are not right.

Page 11: Add reference to Eq. (9).

Page 11, Lines 7-8: Note parameter names should be italic.

Page 11, Line 9: Correct the double ‘)’ after 2007b.

Page 11, Lines 16-17: Reference for Eq. (12)? 自定义Parameter name italic? What is frequency ratio?

Page 12, Lines 3-7: Parameter names italic? What is $_st$?

Page 12, Lines 13-14: f_2 or f ? What does fundamental frequency mean?

Page 12, Lines 15-19: Reference? 自定义

Page 12: Please explain where 0.5 comes in Eq. (19). Reference? 自定义

Page 13, Line 2: Please provide the reference.

Page 13: The numbering for Table 7 and Table 8 should be exchanged since the latter was mentioned first in the text.

Page 13: In the original Table 7, weight coefficients should not be bold.

Page 14: In the original Table 7, last row, the position of 100% is not right.

Page 14: In the original Table 8, could the authors explain why the weights are not added to 1?

Page 15: The section name 4.6 should be bold.

Page 15: Reference for Table 10? 自定义

Page 16: Maybe the authors consider rotating Tables 11 and 12 90 degrees so that the readers can more easily read?

Page 18: In Table 13 the parameter name should be italic.

Page 19, Line 5: The label for the amplification factor is wrong.

Pages 20-21: Reference style is not consistent.

(2) author's response

A: Every issues has been revised, except the following:

- a. I don't understand the comments on "Page 5, Line 17: Add (Eq. (2)) after 'the overall risk I_e is calculated'." and "Page 12, Lines 3-7: What is ___st? "
- b. The parameter n which were proposed for the first time were indicated as comment 1, including the following list items.

Page 11: Add reference to Eq. (9).

Page 11, Lines 16-17: Reference for Eq. (12)?

Page 12, Lines 15-19: Reference?

Page 15: Reference for Table 10?

- c. Page 12: Please explain where 0.5 comes in Eq. (19).

The ice-induced vibration value M_3 is the third assessment index by various structural failure modes, which is expressed as:

$$M_3 = V_1 * V_2 * V_3 * V_4^{0.5}, \quad (19)$$

where V_1 , V_2 , V_3 , and V_4 are respectively calculated.

Because the contribution of V_4 (Function index) is lower than other 3 Structural vulnerability indexes (V_1 Overturning index, V_2 Dynamic index, V_3 Ice-induced vibration index), so the author added the 0.5 times power on V_4 .

(3) author's changes in manuscript.

The draft was revised following the comments. And the explanation for Eq. (19) was added on in page 13, Line 10-11.