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Interactive comment on "A fracture mechanics framework for optimising design and inspection of offshore Wind Turbine support structures against fatigue failure" *by* Peyman Amirafshari et al.

Arno van Wingerde (Referee)

arno.van.wingerde@iwes.fraunhofer.de

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There is not that much actual research, either numerical or experimental, presented in the paper, but it serves as an introduction and application. What makes the paper worthwhile is a nice combination of design standards, fracture mechanics and probabilistic approach presented with a practical application.

The first 20 pages paper provides a lengthy albeit still readable introduction on Fracture mechanics and probabilistic design. Consider condensing a bit: reference to a national standard is of limited interest for people using other standards and should just be used to outline the real topic of the paper.

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Discussion paper

The principle of using fracture mechanics on based probabilistic design is demonstrated applied to a weld in a monopile and a weld in a plate, showing the possibility of the technique. Given the length of the paper a list of symbols and definitions may be useful.

A number of small recommended edits: 19: In-service => in-service 22: showed to possess => showed 26: framework => the framework. In general articles and plurals seem to be missing here and there, the English is Ok but would benefit from a read-over by a native speaker. 37: Turbine (OWT)=> Turbines (OWTs) 38: Social acceptance is also an important driver of OWT, you might wish to mention it here 42: structure => structures 53: approach => approach, 58: is => are 76: POND => PoND suggestion 103: relived => relieved 151: natriting "treat (a substance) with nitric acid, especially so as to introduce nitro groups". I am pretty sure you didn't mean that the an equation. . .. 171: or air-filled offshore structure where the pressure or absence of water inside the structure can be used as a simple way to detect through-thickness cracks. 202: Failure => the Failure 219: Fig. 6 => Fig. 7 Check figure references as this happens several times in the paper. 224: a picture with the ïĄş-ïĄě diagram of mild steel helps explain this. 228: Fig. 6 => Fig. 7 231-255: the explanation of the various options on the BS which only matters for Lr>0.9 could be omitted altogether 257: figure 7 shows on the axes: Kr against Lr which are material properties: OK for the FALD curve, but not correct for the example assessment points “safe”/”unsafe” 287: size has => size ac has 292: Fig.8 => Fig. 9 295: PODs => PoDs 346: POD => PoD please check the paper for that 471: units missing Young Modulus 210 => Young's modulus 210.000 MPa 480: Primary => The primary 568: posseses => possesses a 568: (0.62 Ys) => (Ys = 0.62) 609: require three times less inspection interval => allow for thrice the inspection window

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