Critical Review

Title: Buckling Analysis of Pressure Vessel Based on Finite Element Method
Journal Details: Procedia Engineering, Volume 130, 2015, Pages 355–363, Pressure Vessel Technology: Preparing for the Future
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Paper Summary:

Local buckling of pressure vessels has not been implemented in the pressure vessel codes. ASME S8 D2 has created a code to perform FEA on the pressure vessels, but it does not describe the local buckling, it just addresses the global buckling that too it is a design based code. Then the authors describe a specific design of the pressure vessel, perform the FEA on that vessel and discuss the results in comparison with the BPVC code.

Note:

This review is with the aspect of Communication Skills and the key things that have been evaluated are the presentation, content understandability and other documentation skills.

Critical Review:

The key **plus** points of the paper are as follows:
1. The problem statement has been defined clearly.
2. The practices from the ASME code have been summarized so that the reader can understand the basics design ideology written in the codes without referring to the actual codes.
3. The design parameters have been documented along with the respective units in a form of table and the authors do not leave any space for ambiguity.
4. The authors mention the element type in ANSYS that they have used for FEA (In many papers authors do not mention it). I think it is a good practice to mention the type of element.
5. The loads and BCs are clearly stated and have been depicted in a figure.

The key **negative** points of the paper are as follows:
1. The scale of the deformation is not shown in the figures. So it is difficult to know if the deformations are on the real scale.
2. In ANSYS, the remote mass can be added by different methods, even though the results will not differ a lot in the present case, I think it should have been mentioned at least as a footnote.
3. The paper does not document mesh quality metrics and does not study the mesh convergence.
4. The components in the assembly drawing are not named. So it is difficult for a person without the pressure vessel background to understand the nomenclature.
5. The assumptions made to perform the analysis have not been documented properly. e.g. If the integration is a reduced Gauss quadrature or a full quadrature. These properties are the set in ANSYS using the keypoint (KP) command, so just specifying the element does not define these parameters.

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